

TECHNICAL RESCUE ARB CLIMBER WILDERNESS SAR ACCESS & RESCUE

Updated with new data and products monthly.

Water Rescue



Make Searching Open Waters Safer & Easier with JW Fishers Underwater Equipment

Hand Held Underwater Metal Detectors



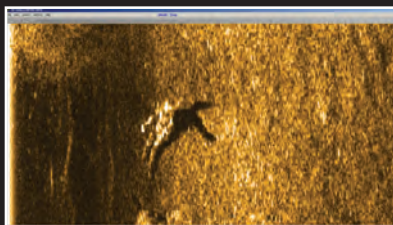
Pulse 8X

- Detects ALL metals on land & underwater
- Audio and Visual output
- Commercial construction
- Ideal for evidence recovery
- Rated #1 by US Homeland Security

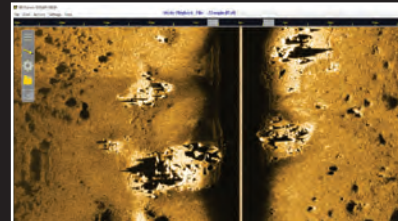
SAR-1

- "Snareless" design with VIBRATING handle
- Bright red LED display
- Specialized for low visibility environments
- 200' depth rating

Side Scan Sonar



* Simulated Drowning Victim



600kHz - CW

- Simple to operate
- Up to 225' (75m) range on each side
- Displays images on laptop or tablet
- Commercial construction
- Works in all waters, regardless of clarity
- In use by public safety dive teams

450kHz / 900 kHz - CHIRP

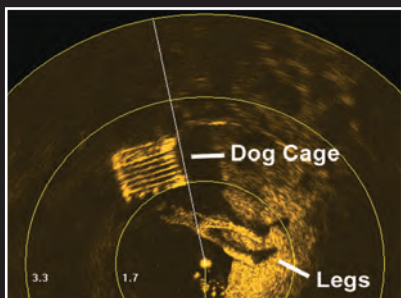
- Fully digital
- Up to 495' (150m) range on each side
- Breaks down for easy transport (case included)
- Commercial construction
- Low cost and easy operation
- Complete turnkey system

Remote Operated Vehicle with Sector Scanning Sonar



SeaLion-3

- 7 vectored, thruster system
- Front and rear 1080p HD cameras
- Two monitors for viewing and control
- Picture in picture (PIP) functionality
- Easily transportable
- Commercial construction
- 1,000' depth capability



SCAN-650

- Target sizing capability
- 360° sweep pattern
- High resolution imagery
- User friendly software
- Commercial construction
- ROV, pole or tripod mountable
- Starting at \$6,995



PHONE: (508) 822-7330
info@jwfishers.com
jwfishers.com

BUYERS GUIDES

Water Rescue Equipment



OTHER EQUIPMENT FOR WATER RESCUERS.....

Ropes, descenders & carabiners are in **Rope Equipment**

Helmets, headtorches, med-packs, spine-care & stretchers are in **PPE & CasEvac**

'Black' tactical and theatre/film rope, hardware & access items are in **'Black' Equipment**

Larger cases, area lighting, tripods & high directional are in **USAR/Extrication**

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in grey= coming in 2026/27

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Click on guide/page number below to go straight to that page

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ANIMAL PPE

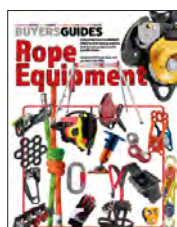
- 342 Dog/Animal PFDs

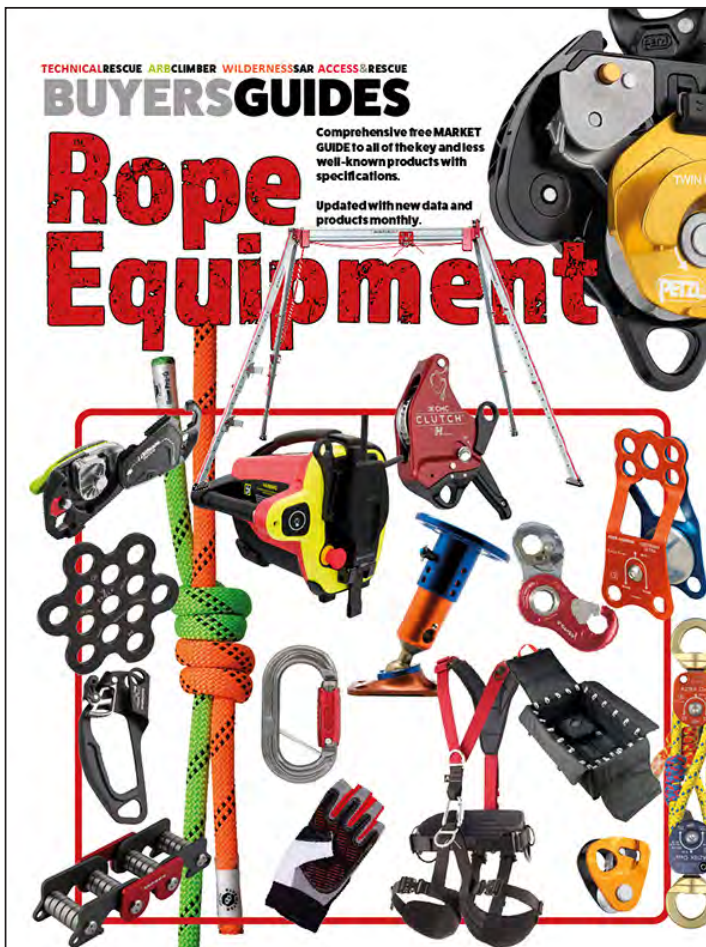
Welcome to our **BUYERS GUIDES**. These are free to all as a page-turning pdf or you can download a regular PDF by clicking on the cloud icon. Many of these GUIDES originally appeared in our print magazines so have been updated and will continue to be updated every month. The same link that you used this time can be used anytime to see the latest version. New Guides and those appearing in forthcoming magazines will also be incorporated into the relevant **BUYERS GUIDES** building into an amazingly comprehensive guide to the best products on the market.

The tabulated data in our GUIDES is non-subjective although the comprehensive introductions do have subjective comment and pick out key and interesting products.

MANUFACTURERS can contact us at any time to update the information on a product(s).
admin@rescuemagazines.com.

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BUYERS GUIDES are free to pass on in their published, unmodified form





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'BLACK' = not only military and tactical equipment but also film/theatre. This may simply be that the product is black or camouflaged but there are also specialist tactical and theatrical rigging products in here

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WATER RESCUE pt2

In December 2026 we will add the following product groups to this **BUYERS GUIDE**:

Hovercraft
Air Boats
RWCs (JetBikes)
Inflatable Rescue Boats

Check out our other BUYERS GUIDES



KEY TO TABLES:

CONVERSION RATE USED Q3 '26=

NB: DUE to erratic US trading policies in 2026, prices will fluctuate faster than we (or anyone) can keep pace.

1.34 US\$ to the GBP£

1.15 Euro€ to the GBP£

0.85 Euro€ to the US\$

Across all of our BUYERS GUIDE tables, some of the data entries are quite complex in appearance and you do need to refer to the individual keys to fully understand the information in the tables. Note that in the print magazine we have tended to round down lbf (pounds force) from KiloNewtons as a straight 2.2lb:1kg conversion but these GUIDES use the actual lbf to KN conversion which is a little higher at almost 225lbf:1kN

Cyan blue is always a variant of the main model shown. data relating specifically to that version will be **highlighted** in cyan blue or any squares or circles may be outlined in cyan blue     the cyan blue outline is admittedly difficult to spot on the green square or circle.

  An outline square or circle of any colour = an **OPTION**, not part of the data shown

 a solid Diamond indicates **suitability for**, and **intended usage**, as indicated by the manufacturer

 a solid circle indicates that the usage or feature indicated is **partial** or **OK but not ideal**. this may be a use for which it is not intended but it cope OK in that role like a descender being used as an ascender. These also appear as an outline if they are an **option**. 

 The main flags shown are the **origin** of the company listed but there may be a **smaller inset flag** like this Taiwan  flag, indicating that **the country of manufacture** is different.

COSTS are all approximate and rounded up. **We include VAT at 20% and State tax at 10%** but these can all vary, especially state taxes in the US. **£\$€** Prices shown in **burnt orange** are **currency conversions only**. They do not reflect import costs like shipping, duty and local taxes so are a very rough guide only

Page corners are colour coded to common groups of equipment eg. **rope=**

Rope -related hardware =

Pulleys, hauling kits etc=

Safety/PPE =

Software & Bags =

Boats & Watercraft=

Tools/Knives=

Technology/drones/UAVs=

UPDATED Sep '26

WATER RESCUE HELMETS

There was a time, in the last century, when the only game in town for water rescue helmets was *Wild-Water* (which, we always thought was a brand but it's actually a model by M.A.C.K. France) and *Pro-Tec* and these were unashamedly borrowed from canoeing/kayaking rather than being purpose-designed rescue helmets. For pure water rescue, you didn't really need anything different as long as you could stick an elasticated headband *Petzl* headtorch on it and these two brands remain as good today as they were then. *Pro-tec* earned some extra kudos from being selected as an alternative safety helmet by some of the US special forces but for rescue, where the teams involved are dealing with conditions and disciplines outside of simply paddling a watercraft, some wanted more. In the second decade of this century, true multi-role helmets developed that truly could deal with water rescue AND firefighting and USAR and climbing and are sometimes a little bit too clever for their own good. They are more akin to a full spec fire-rescue helmet that can be used for water rescue at a push. Hardcore water rescuers still prefer something lighter. Even so, you can see from the NRS helmet at the top that the addition of a small peak over the eyes and integral lighting and rails for night vision has transformed the humble canoe helmet into something pretty flash. The telling specification in the following tables is WEIGHT. The more roles the helmet can tackle the heavier it will be. If you can carry different specialist helmets for your various requirements then that would generally be preferable in terms of each helmet's suitability to that specific task but if you're a Technical Rescue team dealing with rope rescue, USAR, con-space, water rescue, maybe vehicle extrication and specialist fire roles, that's a lot of real estate and money occupied by helmets. *SweetProtection*, best known for their skiing helmets, have entered the rescue market with their excellent *Ascender SAR* shown on the right. Fully kitted (in red) and stripped down for water rescue (in yellow) this is a modular helmet that strips down to 500g for in-water rescue and is certified across a number of disciplines including whitewater. **Note that SWIFTWATER and WHITEWATER are not necessarily the same thing.** Swiftwater is any fast-moving water but whitewater is graded (for sport) such that the high end grades - 5+ are NOT applicable even to icons

escuemagazines.com

like the *Wild-Water* helmet. CHECK the small-print CAREFULLY. This is related to speed of impact which is why the *Ascender SAR* is unique in having a MIPS system which counters the rotational impact of hitting an object - no surprise since MIPS originated with ski helmets but surely no bad thing to have in a helmet that could hit a mid-stream rock at relatively high speed. *KASK* too have now produced the *Quantum* as a lighter weight multi-role helmet (see ad opposite) that is also certified for swiftwater as well as its more familiar climbing as well as wildland firefighting. This is a much lighter helmet than the more firefighting oriented *Gallet F2*, *Draeger* and *Pab* helmets.

Back to the lighter, more water-centred helmets and we mainly have canoeing to thank for the lightest, cheapest, helmets and it's fair to say that for many years, water rescuers had to choose between a very specific, close-fitting canoe helmet that would work extremely well in-water but in no other rescue situation (apart maybe from con-space rescue), or a multi-role that could be used for water, rope rescue, extrication, USAR and even wildland firefighting but is bigger, heavier and more expensive and is not perfect for in-water use. Now we have a plethora of models to choose from not only because multi-role helmets evolved to encompass water more directly like the *Draeger Aquarescue* but because the original canoe helmets have evolved to encompass more water activities like the Dutch *Mystic Legacy* above-left. Some of these bring additional speed and height impact hazards for wake boarding, kite surfing, foil and hydroplane surfing spawning specialist helmets like the German *Ion* range.

Gath and *Gecko* both scooped up the surf rescue market some time ago with their head-hugging models while *Gecko's Marine* also carved out a venerated niche in rescue boat use after the RNLI in the UK chose them to upgrade their entire fleet of helmets. The *Fire* version below shows the full ear protection on such rescue-craft helmets as distinct from the cut-away design (around the ears) more common in swim or in-water oriented helmets. Ironically, in an era of increased water-rescue requirements, the iconic Pacific brand has discontinued its *R6 Seeker* and currently does not have any water certified helmets but watch this space!

KASK QUANTUM SERIES



PRESENTING THE UPDATED KASK QUANTUM SERIES

The KASK Series made to engage the extreme elements, with fire-resistant and fire-retardant materials. Made EN 1385 compliant with Quantum Protection Panels*.

Ready for wildland firefighting, technical, water, and mountain rescue.

Where the unexpected, unknown, unpredictable call home.

This is what KASK Quantum Series was made for.



Every KASK helmet is tested for Rotational Impact Performance.

KASK

Performance is a beautiful thing.

IN THE FOLLOWING TABLES.....

Any use, feature, accessory or component that is inherent in the tool is shown as a solid coloured square ■■■■■■
If it's an option it is shown as an outline square □□□□□□

A circle ●●●●●● in the 'USE' row indicates that the helmet or feature is OK but not ideal. A model variant is shown in cyan blue and any features or specifications that differ from the standard are also in cyan or will have a cyan outline to a square or circle ■■■■■■.

USES: refers to the range of activities that the helmet is INTENDED for as defined by the standards or the manufacturers stated uses. Multi-Role helmets are usually heavier and bulkier so not perfect for water or in-water rescue but good enough!

- ◆ = KAYAK/CANOE - and non-powered watercraft
- ◆ = SURF/SWIM RESCUE - May be indistinguishable from the Swiftwater category and even canoe helmets - low bulk, fast draining or close fit to not take on water and cause drag. No nape extension that can 'snag' water and snap the head upwards.
- ◆ = SWIFTWATER - As above plus surface/bankside use. More multi-role in that they may be used for rope entries, boat use and swimming.
- ◆ = BOAT CREW/PWC - Powered watercraft and rescue boats that may travel at high speeds
- ◆ = TACTICAL - suitable for military or police use - often just the colour but some will incorporate Rails for military accessories.
- ◆ = USAR - suitable for urban rescue, extrication and disaster response. Often a little bulky for extreme con-space but - user-decides.
- ◆ = FIREFIGHTING - inherent fire retardancy - helmet furniture will also withstand heat
- ◆ = ROPE RESCUE - required impact resistance to crown and sides enabling full vertical/at height use.

ORIGIN: The company's home country, not necessarily the country of manufacture which is indicated by an inset flag or two equally sized flags if the tool is made in both countries.

COST: Prices are a guide only & include 10% state tax or 20% VAT. They vary by state/country. Rounded up to the nearest Pound£/US Dollar\$/Euro€. £\$€ = currency conversion only and may not include bulk shipping, import duty and taxes etc.

Cost shown is basic model-no accessories.

WEIGHT: Is for a mid-sized helmet (if sized) and excludes add-on brackets and fittings like ear protection/lighting unless stated in the NOTES.

STANDARDS / PROTECTION: some class/grade restrictions show where known. Lower weight on the head is considered a key requirement for rescue swimming, heavier multi-roles more suited to bankside work. Some need the addition of optional padding/flotation and some have different vent requirements but all can be used for water rescue in some specific form or with some specific exclusions.

EN 1385 ■ Canoeing/rafting/surf/Dive There is no true standard for surfing helmets and general dive helmets (other than deep-sea commercial types) so the canoe/whitewater standard does most of the heavy lifting for water rescue helmets. Cave rescue generally uses EN 12492 but where sumps and

diving are involved this may also require EN1385. Whitewater grade restrictions I-VI shown if known. **PAS 028** ■ Marine/Fast-Craft used on high speed water craft - a high degree of impact resistance and environmental protection - often with visor and ear protection options.

EN 12492 ■ Climbing/Mountaineering

One of two that cover rope access and rescue.

EN397 ■ Work at height with protection against falling objects is not usually relevant as it has limited side and impact resistance in a fall and a chin strap designed to separate at low loads.

EN 16473 ■ Technical rescue/USAR Europe-specific - designed to provide rescuers with a multi-role helmet covering flood & swiftwater rescue, USAR incidents, rope rescue, wilderness SAR and other technical rescue operations like trench and confined space rescue.

ISO18639 ■ Technical rescue/USAR - worldwide - crosses over for most USAR activities but more RTC/vehicle rescue, less vertical rope rescue

NFPA ■ 1951 Technical rescue US version EN

16471 ■ Wildland fire fighting - NOT structural.

only applicable as an additional standard that Park rangers and firefighters might need alongside other standards in a true multi-role helmet.

EN1077 ■ Ski/Snowboard (impact) high speed impact resistance, sometimes with MIPS, the rotational resistance technology, could well become a favoured standard in water rescue. Along with....

FS/ATV1 ■ Quad bikes (UK Only) For land use but may show useful impact resistance for RWC/Jet-bikes?

KWF ■ Forestry/Arb a German forestry 'award' for helmets particularly suitable for tree work. This may not seem to be of much use in water rescue but vegetation, floating/stuck timber creating dams etc. means that this is a consideration.

SIZES: Number of different sizes and the range

SIZE ADJUST: How the sizes are adjusted

VENTED: Holes and open shapes to vent head-heat. Some have very few and are shown as ●

RAILS: Military style, heavy duty attachments

EYE PROTECT: Visor or goggles. 'lost'=store inside shell □ option

EAR PROTECT: A full ear cover to protect from water hydraulics, impact and cold. Some will have a grill or similar form of augmentation to improve hearing that would otherwise be muffled. The more technical multi-role helmets may have comms-integral ear protection (see NOTES). partial ear coverage is shown as ●

CHIN STRAP: The means of securing (web material is given in STRAPS/HEADBANDS)

SHELL: Main shell material

PADDING / LINER: Inside comfort and impact

STRAPS/HEADBAND: materials used

LIGHT BRACKET CLIPS: Integrated clips/hooks for a headband/clip on lighting

REFLECTIVE: Light-reflective tape/decals to enhance visibility to others in low light or when using search and area lighting.

OTHER COLOURS: Options other than shown.

IMAGES NOT TO SCALE

- ◆ = KAYAK/CANOE
- ◆ = SURF/SWIM RESCUE
- ◆ = SWIFTWATER
- ◆ = BOAT CREW/PWC
- ◆ = TACTICAL
- ◆ = USAR
- ◆ = FIREFIGHTING
- ◆ = ROPE RESCUE
- = Partial feature/OK- not ideal
- = Option ~ = approximate
- COST: Including VAT/Local Tax
- £\$€ = currency conversion only,
- CHIN STRAP: QR=Quick-release
- FR=Fire Resistant

STANDARDS:

- EN1385 Canoeing/rafting
- PAS 028 Marine/Fast-Craft
- EN12492 Climbing/Mountaineering
- EN397 Height safety
- UIAA Mountaineering
- ISO18639 Technical rescue
- EN16473 Technical rescue
- NFPA 1951-Technical rescue
- EN16471 Wildland fire fighting
- EN1077 Ski/Snowboard
- FS/ATV1 ATV/quad bikes (UK)
- KWF Forestry/Arb

MATERIALS: PC=Polycarbonate
(E)PP=(Expanded) Polypropylene
ABS=Acrylonitrile Butadiene Styrene
PTP=Polybutylene Terephthalate
EPS=Expanded Polystyrene
HD= High Density

COMPANY

MODEL

product code

USES

ORIGIN

COST inc 10%state tax/20%VAT

WEIGHT

SIZES

SIZE ADJUST

CHIN STRAP

STANDARDS/PROTECTION

CONSTRUCTION

SHELL

PADDING / LINER

STRAPS/HEADBAND

FEATURES

LIGHT BRACKET CLIPS

RAILS EYE PROTECT

VENTED EAR PROTECT

REFLECTIVE

OTHER COLOURS

NOTES

italics=Manufacturer comments

WEBSITE

WATER RESCUE HELMETS

				
				
BUSCH PROTECTIVE	BUSCH PROTECTIVE	CREWSAVER	DRAEGER	DRAEGER
ATR-1	ATR-1M	KORTEX	HPS AQUA-RESCUE	HPS 3500 RESCUE
ATR-1	ATR-1M	631xxx	R56xxx	R58xxx
				
				
£296 N/A €345	N/A \$400 N/A	£40 \$52 €47	£188 \$240 €221	£212 \$270 €250
680-720g / 1.5-1.6lb	680g / 1.5lb	350-450g / 0.77-1lb	645g / 1.4lb	710g / 1.57lb
3 sizes 48-66cm 19-26"	1 size 54-62cm 21.26-24.4"	2 sizes 54-62cm 21.26-24.4"	1 size 52-62cm 20-24.4"	1 size 50-64cm 19.7-25"
Ratchet dial & crown pad	Ratchet dial & crown pad	Ratchet dial	Ratchet dial	Ratchet dial
QR, Velcro & padding	QR & Velcro	QR & retainer	QR & retainer	QR, Velcro
				
				
'SMC' carbon-fiber reinforced Duroplast (ABS)	'SMC' carbon-fiber reinforced Duroplast (ABS)	ABS	ABS	Fibre reinforced, heat-resistant Thermoplastic
EPP/EPP/foam pad system	Closed cell EVA/EPP foam	PU foam	Waterproof EVA	HD Impact foam
FR ?	?	Nylon	FR Nomex/Aramid	FR Nomex/Aramid
				
				
				
				
				
Slight brim deflects water & sun. Not for US market. =Luminous	Specifically for the US market		Doesn't meet Firefighting standards but has the same Aramid (tough) chinstrap as the 3500 Rescue	*Complies with addition of extra protection panels
busch-protective.com	busch-protective.com	crewsaver.com	ooo.com	ooo.com

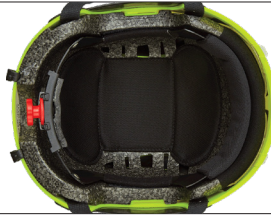
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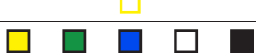
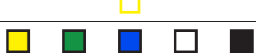
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 ◆ = ROPE RESCUE
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MATERIALS: PC=Polycarbonate
 (E)PP=(Expanded) Polypropylene
 ABS=Acrylonitrile Butadiene Styrene
 PTP=Polybutylene Terephthalate
 EPS=Expanded Polystyrene
 HD= High Density

				
				
COMPANY	FUTURE SAFETY	FUTURE SAFETY	FUTURE SAFETY	GATH
MODEL	BLUERAY	MANTA 3	MANTA 4	GEDI
product code	MH2	MH3	MH4	000
USES	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
ORIGIN	🇬🇧	🇬🇧	🇬🇧	🇦🇺
COST inc 10%state tax/20%VAT	£164 \$000 €000	£164 \$000 €000	£164 \$000 €000	£160 \$205 €170
WEIGHT	680g / 1.5lb	606g / 1.33lb	670g / 1.47lb	450-490g / 0.9-1 lb
SIZES	1 size 54-62cm 21-24.4"	2 sizes 53-65cm 21-24"	2 sizes 53-65cm 21-24"	6 sizes
SIZE ADJUST	Ratchet dial	Ratchet dial	Ratchet dial	?
CHIN STRAP	QR & retainer	QR & retainer	QR & retainer	Padded Velcro & QR
STANDARDS/PROTECTION	■ ■	■ ■ ■	■ ■ ■ ■ ■	■ + SLSA & CS-00305(surf)
CONSTRUCTION				
	SHELL	Carbon composite	ABS	ABS
	PADDING / LINER	replaceable foam/EPP	EPP	EPP
	STRAPS/HEADBAND	Nylon		Nylon/10mm EVA
FEATURES	LIGHT BRACKET CLIPS	- ■	□ ■	□ ■
	RAILS EYE PROTECT	- □ half or full	□ ■ lost goggle-visor	□ ■ lost goggle-visor
	VENTED EAR PROTECT	NO ■ comms option	■ +clip-on covers □	■ +clip-on covers □
	REFLECTIVE	■	■ +*	■ +*
OTHER COLOURS	■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
NOTES	Picture has optional visor	*luminous strips that can clip on to cover vents.	*luminous strips that can clip on to cover vents. Additional standards to MH3	*Complies with addition of extra protection panels *except for ventilation requirements
WEBSITE	future-safety.com	future-safety.com	future-safety.com	gathsports.com

				
				
GATH	GATH	GATH	GATH	GECKO
EVA	SFC	NEO	RGM	SURF
				
£145 \$186 €170	£000 \$000	£168 \$226 €196	£000 \$000 €000	£168 \$226 €196
000g / 000lb	000g / 000lb	000g / 000lb	000g / 000lb	500g / 1.1lb
000	000	S, L,	000	2 sizes 52-59cm/
?	?	?	?	Inflate liner+ chin strap
padded Velcro & QR	padded Velcro & QR	padded Velcro & QR	padded Velcro & Fastex	padded Velcro & Fastex
				
ABS	ABS	ABS	ABS	Fibreglass
EVA+custom strips	EVA+custom strips	EVA+custom strips	EVA+custom strips	Inflatable
Nylon/10mm EVA	Nylon/10mm EVA	Nylon/2mm Neoprene	Nylon/10mm EVA	Nylon & Neoprene/inflate
				 Stick-on pads
--	--	--	--	--
	 Detachable			 Detachable
				
ooo	ooo	ooo	ooo	Colour shown is Fluro green, 2 other greens plus black & matt black.
gathsports.com	gathsports.com	gathsports.com	geckoheadgear.com	geckoheadgear.com

IMAGES NOT TO SCALE

◆ = KAYAK/CANOE
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 ◆ = TACTICAL
 ◆ = USAR
 ◆ = FIREFIGHTING
 ◆ = ROPE RESCUE

●●●●● = Partial feature/OK - not ideal
 □□□□□ = Option ~ = approximate

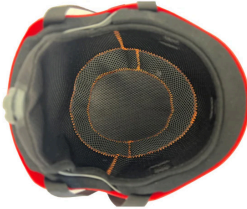
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 (E)PP=(Expanded) Polypropylene
 ABS=Acrylonitrile Butadiene Styrene
 PTP=Polybutylene Terephthalate
 EPS=Expanded Polystyrene
 HD= High Density

			
			
GECKO	GECKO	GUL	HIKO
MARINE OPEN	MARINE CUT-AWAY	EVO 2	BUCKAROO V2
 £270 \$402 €375 670g / 1.47lb 3 sizes 52-65cm/ Inflate liner+ Fastex+3-bar padded Velcro & Fastex	 £324 \$483 €451 620g / 1.36lb 2 sizes 57-62cm/ Inflate liner+ Fastex padded Velcro & Fastex	2 sizes 54-62cm 21.26-24.4" Ratchet dial QR & Chin cup cl I-IV  ABS Inflatable Nylon - -- Detachable -	 £51 \$67 €57 000g / 000lb 2 sizes 54-62cm 21.26-24.4" Ratchet dial QR & Chin cup cl I-IV  ABS Inflatable Nylon - -- - -
One each of the yellow and orange=fluoro. + black & matt black. Ear vent can have an accessory stud for comms/LED/visor etc, geckoheadgear.com	One each of the yellow and orange=fluoro. + black & matt black. Optional ear defenders, comms etcvisors, LED lighting etc geckoheadgear.com		hikosport.com

				
				
HIKO	ION	ION	ION	IONIC RESCUE
BUCKAROO V2 +	SLASH AMP	MISSION	SLASH CORE	VAPOR
74005xxx	000	000	000	SAF46060
				
£52 \$69 €59	£80 \$120 €111	£120 \$178 €167	£55 \$81 €76	£65 \$87 €75
350-450g / 0.77-1lb	-440g / 0.97lb	390-430g / 0.86-0.95lb	~400g / 0.96lb	000g / 000lb
4" 2 sizes 54-62cm 21.26-24.4"	2 sizes 53-61cm/ 0-0"	1 size 55-60cm/ 0-0"	3 sizes 51-61cm	4 sizes 53-62cm/ 20.8-24.4"
Ratchet dial	Ratchet dial	Ratchet dial	Ratchet dial	Ratchet dial
QR & Chin cup	velcro & QR	Fidlock (magnet)	velcro & QR	velcro & QR
 cl I-IV		 B (no ears)		
				
ABS	ABS, PP, PU	Polycarbonate & Polyurethane	ABS, PP, PU	ABS
PU Foam	Removable EPP	EPS	EPP	
Nylon	Nylon	Nylon	Nylon	
	--	--	--	
--	--	--	--	--
	 Detachable	 Detachable		
-	-		-	-
				
As Buckaroo with	360° adjustable fit, rear cog adjusts fit all-around, not just the head band.	High shock absorption. Weight with and without ear pads	360° adjustable fit, rear cog adjusts fit all-around, not just the head band.	000
hikosport.com	ion-products.com	ion-products.com	ion-products.com	ionicrescue.com

[illegible]

				
				
MACK	MACK	MACK	MSA	MYSTIC
WILD-WATER RACING (MIDI)	WILD-WATER COMPETITION	TORRENT (CLUB)	GALLET F2XR	LEGACY IMPACT PRO
CAWWC	CAWWB	CAWWA	000	35009.250730
				
£62 \$75 €60	£66 \$80 €64	£75 \$100 €85	£240 \$224 €265	£117 \$168 €130
355g / 0.78lb	500g / 1.1lb	350-450g / 0.77-1lb	750g / 1.65lb	480g / 1lb
1 size *52-58cm/20.4-22.8"	1 size *52-58cm/20.4-22.8"	1 size 53-59cm/20.8-23.2"	1 size 00cm/ 0-0"	3 sizes 53-61cm/ 20.9-24"
QR & retainer	QR & retainer	QR & retainer	Ratchet dial	Velcro & fit pads
			velcro & FR QR buckle	Cam buckle & retainer
				
				
ABS/PE	ABS/PE	ABS/PE	PU coated Thermoplastic	ABS
			EPS & Removable textile	EVA
		Nylon	FR Polyester & Aramide	Nylon
				
				
				
				
*Size adjusts via padding.	*Size adjusts via padding which is denser & more precise for fitting than the Racing version.	000	Price is base model - double that to include all of the accessories	Also <i>Mystic Impact Pro</i> but specifically NOT intended for rescue-we will clarify this.
mack-kayak.com	mack-kayak.com	mack-kayak.com	msasafety.com	mysticboarding.com

IMAGES NOT TO SCALE

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NRS RESCUE	NRS RESCUE	NRS RESCUE	NRS RESCUE
TACTYL	NESO	HAVOC LIVERY	VIA
42603	42602xx	42604xx	42601xx
    	    	    	    
£74 \$110 €100	£75 \$88 €80	£43 \$64 €60	£41 \$61 €50
600g / 1.05lb	408g / 0.9lb	453g / 1lb	245g / 0.65lb
4 sizes 51-61cm 20-24"	4 sizes 51-61cm 20-24"	1 size 55-59cm 21.5-23"	4 sizes 51-61cm 20-24"
Ratchet dial (DARC)	Ratchet dial (DARC)	Ratchet dial	Ratchet dial
FidLock magnetic buckle	FidLock magnetic buckle	QR & retainer	*QR & retainer
			
			
ABS plastic	ABS plastic	ABS plastic	ABS plastic
Closed cell EVA/EPP foam	EPP foam	Closed cell EVA	Closed cell EVA/EPP foam
Nylon	Nylon	Nylon	Nylon
■ NVG/MPLS	--	--	--
■ ARC Slight peak	- Slight peak	--	--
● □	● -	● -	● -
■	-	-	-
   	     	   	    
Slight brim deflects water & sun. "Adaptable comfort & rugged protection in a lightweight & refined package"	"A do-it-all, whitewater helmet with comfortable all-day wear"	"Protect almost any adult with the same helmet size - no more mixing & matching"	*Colour-coded buckle to identify sizes
nrs.com/rescue	nrs.com/rescue	nrs.com/rescue	nrs.com/rescue

				
				
NRS/WRSI	NRS/WRSI	NRS/WRSI	PALM	PALM
CURRENT	CURRENT PRO	TRIDENT	AP4000	AP2000
43000.xx	43006.xx	43002.xx	13850	11480
				
				
£125 \$165 €130	£140 \$198 €156	£200 \$200 €225	£48 \$64 €55	£48 \$64 €55
658g / 1.45lb	794g / 1.74lb	658g / 1.5lb	426-478g / 9.9-1.04lb	529g / 1.16lb
3 sizes 53-62cm/ 20.9-24.2"	3 sizes 53-62cm/ 20.9-24.2"	3 sizes 53-62cm/ 20.9-24.2"	2 sizes 54-62cm 21.2-24.4"	1 size 52-58cm 20.5-22.8"
IRS auto-tension via chin-	IRS auto-tension via chin-	IRS auto-tension via chin-	Pin&hole ladder	fit-pads & pin/hole 'ladder'
QR & retainer	QR & retainer	QR & retainer	QR & retainer	QR & retainer
				
				
ABS plastic & PE sub-shell	ABS plastic & PE sub-shell	Carbon-fibre Composite. & PE sub-shell	Injection moulded PP	Injection moulded PP
EVA foam	EVA foam	EVA foam	PE Foam	PE foam
			Nylon	Nylon
			--	--
- Slight peak	- Full peak	- Full Peak	--	--
 		--	 	 
optional stickers	optional stickers	optional stickers	-	-
  	  	    	  	  
WRSi= Whitewater Research and Safety Institute - now owned by NRS. Replaceable liner.	Replaceable liner. Sun/water deflection peak is countered for swimming by the IRS cradle retention system	Replaceable liner. Sun/water deflection peak is countered for swimming by the IRS cradle retention system		
nrs.com/rescue	nrs.com/rescue	nrs.com/rescue	palm.equipment	palm.equipment

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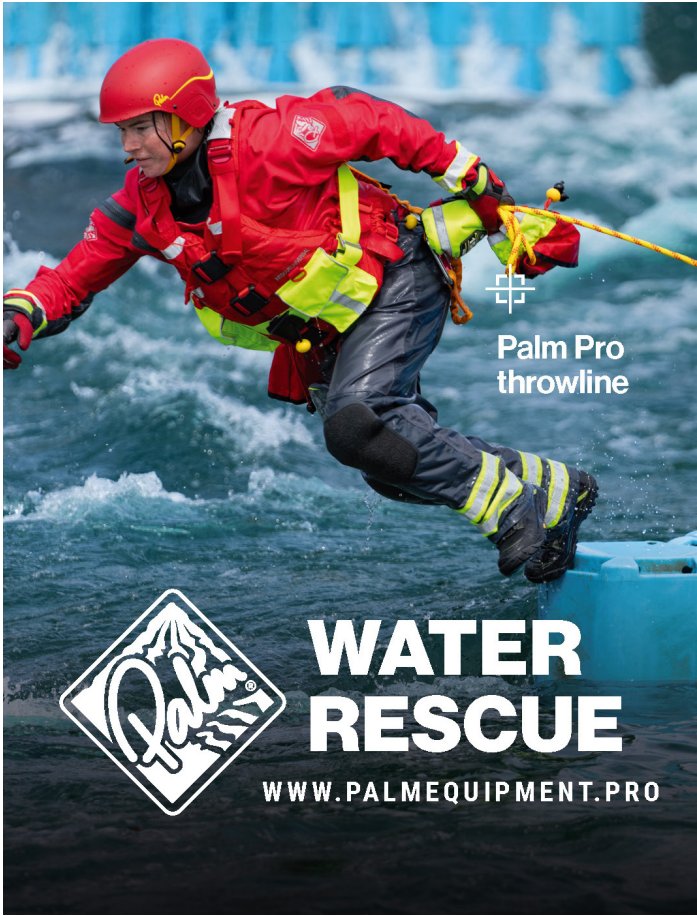
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PALM	PEAKPS	PREDATOR	PREDATOR
SHUCK 2.0	FREERIDE	FR7-W	HALF CUT
13733		EN1385	000
			
£129 \$186 €155	£50 \$70 €60	£80 \$90 €85	£79 \$90 €95
492-555g / 1.08-1.22lb	415g / 0.9lb	500g / 1.10lb	470g / 1lb
3 sizes 51-61cm 20-24"	2 sizes 52-60cm/20.4-23.6"	2 sizes 53-60cm 21-23.6"	6 sizes 54-61cm
Ratchet dial	Ratchet dial + pads	Internal fit-pad system	PD1 dial-fit adjustment
QR & retainer	QR & retainer	QR buckle	fidlock magnetic
			
			
HD ABS injection-moulded	ABS	HD ABS injection-moulded	high-impact ABS
EPP/Polygiene Treated liner	Waterproof EVA foam	EPS foam liner	EPS foam liner
HT Polyester	Nylon		nylon webbing
--	--	--	--
- Slight peak	--	- Slight peak	--
-  Detachable	● -	full cut ear protect	■ -
		rescue stickers available	stickers available
  		 	  
removable liner & separate ears	Additional Fit pads	ooo	
palm.equipment	protecbrand.com	predatorhelmets.com	predatorhelmets.com

		
		
	PREDATOR	PRO-TEC
	FULL CUT	FULL CUT WATER
	000	
		
		
£52 \$59 €62	£75 \$101 €88	
000g / 000lb	450g / 0.99lb	
6 sizes 53-61cm	4 sizes cm/00"	
PD1 dial-fit adjuster	Internal fit-pad system	
nexus buckle	Adjustable nylon chinstrap	
		
ABS	high-impact ABS	HD ABS injection-moulded
eva foam		Dual-density waterproof EVA foam liner
dacron webbing		
--		--
--		--
		
stickers available		
		
predatorhelmets.com	protecbrand.com	

WATER RESCUE HELMETS



Palm Pro throwline

WATER RESCUE

WWW.PALMEQUIPMENT.PRO



NRS
RESCUE

SWIFTWATER RESCUE EQUIPMENT

- Dry suits • Wetsuits • Footwear • Gloves • Helmets
- Life Jackets • Rescue hardware and more...

nrs.com/rescue | rescue@nrs.com

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COMPANY		PRO-TEC	PRO-TEC	ROSENBAUER	SHRED READY
MODEL		ACE WATER	ACE WAKE	HEROS 10 UNVENTED	RESCUE PRO
product code				1576xxx 1577xxx	
USES		◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆	◆◆◆◆◆◆◆◆◆◆
ORIGIN		🇺🇸	🇺🇸	🇩🇪	🇺🇸
COST inc 10%state tax/20%VAT		£63 \$85 €73	£110 \$101 €88	£000 \$000 €000	£75 \$86 €80
WEIGHT		400g / 0.88lb	~460g / 1lb	800g / 1.76lb	00g / 00lb
SIZES		6 sizes 52-64cm/20.4-25.2"	6 sizes 52-64cm/20.4-25.2"	1 size 48-67cm/18.9-25.2"	3 sizes 00-00cm/21-24.8"
SIZE ADJUST		pin/hole 'ladder'	fit-pads & pin/hole 'ladder'	Ratchet Dial	Ratchet Dial
CHIN STRAP		Padded & QR buckle	Padded & QR buckle	QR & retainer	QR & retainer
STANDARDS/PROTECTION		■	■	■ ■ ■ ■ ■ +AS/NZ	■
CONSTRUCTION					
	SHELL	HD ABS injection-moulded	HD ABS injection-moulded	FR Thermoplastic	ABS
	PADDING / LINER	Dual-density waterproof EVA foam liner	Dual-density waterproof EVA foam liner	replaceable	
	STRAPS/HEADBAND	Nylon	Nylon	FR	Nylon
FEATURES	LIGHT BRACKET CLIPS	--	--	■ ■	■ NVG shroud -
	RAILS EYE PROTECT	--	--	● □ goggle-or full visor	■ ARC -
	VENTED EAR PROTECT	■ -	■ ■ Detachable	● □ Detachable	■ -
	REFLECTIVE	-	-	optional stickers	-
	OTHER COLOURS	■ ■	■ □ ■	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■
NOTES			additional fit-pads not on the Ace Water	Top 5-level LED is integral, optional rear LED above adjustment dial. Vented or unvented non-	ooo
WEBSITE		protecbrand.com	protecbrand.com	rosenbauer.com	shredready.com

				
				
SHRED READY	SHRED READY	SHRED READY	SHRED READY	SPREU BOOTE
TACTICAL RESCUE	STD-HALF CUT	FULL CUT	SESH	BUMPER
				18 1 0440
				
				
£118 \$134 €141	£97 \$110 €116	£106 \$120 €126	£57 \$65 €68	£50 \$69 €56
00g / 00lb	00g / 00lb	00g / 0lb	00g / 0.0lb	495-565g / 1.1-1.24lb
3 sizes 00-00cm/21-24.8"	1 size 54-62 cm	0	0	2 sizes 52-60cm/20.4-23.6"
Ratchet Dial	=	=		pin/hole 'ladder'
QR & retainer	BOA	=		QR buckle
				 cl I-IV
				
ABS			ABS injection-moulded	HDPE
			EVA foam liner	EVA
Nylon				Nylon (replaceable)
■ NVG shroud -	--	--	--	--
■ ARC -	--	--	- Peak	--
■ -	full ear coverage	full ear coverage	half-cut ear coverage	● 
-	-	-	-	-
■	  	  	  	  
ooo	ooo	ooo	ooo	
shredready.com	shredready.com	shredready.com	shredready.com	spreuboote.com

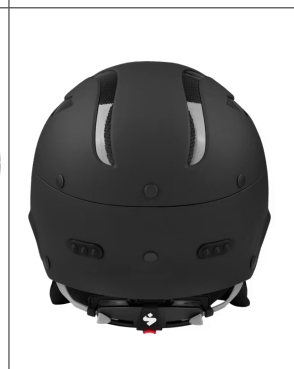
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COMPANY		SRE (Ndiver)	Sweet Protection	Sweet Protection	Sweet Protection
MODEL		SEAHAWK	ASCENDER SAR	ROCKER	WANDERER 2
product code		helmet-hawkxxx		845109xx	845128SNBRS
USES		◆◆◆◆◆	◆◆◆◆◆◆◆◆◆	◆◆◆◆◆◆◆◆◆	◆◆◆◆◆◆◆◆◆
ORIGIN		🇬🇧	🇳🇴	🇳🇴	🇳🇴
COST inc 10%state tax/20%VAT		£39 \$58 €54	£111 \$149.95 €130	£220 \$297 €257	£120 \$150 €130
WEIGHT		450g / 1lb	395g / 0.87lb	530g / 1.3lb	550g / 1.2lb
SIZES		1 size 54-62cm/21.26-24.4"	1 size 53-61cm/ 20.8-24"	2 sizes	3 sizes
SIZE ADJUST		Ratchet dial	Ratchet Grip	Ratchet Grip (Occigrip)	Ratchet Grip (Occigrip)
CHIN STRAP		QR buckle& Retainer	QR buckle& Retainer	QR + 3x Ladder buckles	QR + 3x Ladder buckles
STANDARDS/PROTECTION		■ cl I-IV	■ ■ ■	■	■
CONSTRUCTION					
	SHELL	ABS injection-moulded	ABS thermoplastic shell	ABS plastic	ABS plastic
	PADDING / LINER	EVA foam liner	EPP multi impact+ comfort		
	STRAPS/HEADBAND	Nylon			
FEATURES	LIGHT BRACKET CLIPS	--	■	--	■
	RAILS EYE PROTECT	--	--	--	--
	VENTED EAR PROTECT	■ ●	● ■ Detachable	■ ■	■ ■
	REFLECTIVE	-	■	-	-
OTHER COLOURS		■ ■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■
NOTES <i>italics=Manufacturer comments</i>			ear protection not shown	Peak is detachable. Augmented hearing thru pad.	inc adjustable padding and helmet bag.
WEBSITE		ndiver-rescue.com	sweetprotection.com	sweetprotection.com	sweetprotection.com

				
				
TEAM WENDY	TEAM WENDY	TYPHOON	TYPHOON	WRS International
EXFIL RESCUER MARITIME	EXFIL SAR BACKCOUNTRY SARTACTICAL	ESSENTIAL	PERFORMANCE+	TECHNICAL RESCUE
86-R3-xx-xPUES ...xPUMS	82R-xx	P206xxx / 225670	P292xxx / 225666	
				
				
£388447 \$437504 €461532	£317413 \$357466 €376492	£35 \$52 €50	£55 \$81 €85	£198 \$267 €231
720g / 1.6lb	720g / 1.6lb	360g / 0.8lb	750g / 1.65lb	760g / 1.67lb
2 sizes 55-63cm 21.5-24.8"	1 sizes 53-63cm 20.8-24.8"	3 sizes 50-64cm/ 19.7-25.1"	4 sizes 51-59cm/ 20-23.2"	1 size 50-65cm/ 19.7-25.6"
BOA Ratchet dial	BOA Ratchet dial	Ratchet dial	Ratchet dial	2x Ratchet dials
QR & retainer	Fidlock magnetic buckle	QR & retainer	QR & chin-cup	QR & retainer
				
				
Lexan Polycarbonate	Lexan Polycarbonate	ABS plastic	ABS plastic	FR Thermoplastic
EPS/Zorbium foam +Marine-grade foam	EPS/Zorbium foam	EVA foam	EVA foam	replaceable
Nylon (waterproof)	Nylon	Nylon	Nylon	
		--	--	
  Half-or full visor	  Half-or full visor	--	--	-  lost goggle-or full visor
 	*  	 	  removable	 
optional stickers	optional stickers			optional stickers
				
MARITIME: As RESCUER but with water-sealed liner and straps	TACTICAL: As BACKCOUNTRY but metal MVG rails instead of PC rails.*optional vent covers	ooo	ooo	 =Luminous. Green decal shown can be silver. Water rescue enhanced version of PAB MP1
teamwendy.com	teamwendy.com	typhoon-int.co.uk	typhoon-int.co.uk	wrsinternational.com

SURFACE DRYSUITS

INTRODUCTION

This Guide is focused on rescue drysuits that are suitable for use out of and in-water but distinct from purely dive suits which will be a separate Guide. There are some dive suits included here that are used for surface rescue and there are some dedicated ice rescue suits that would be too bulky and hot for general surface rescue work so they have separate category rows in our tables. It's quite difficult to get consensus on the true history of drysuit development because there was much experimentation in the 30's and 40's and hard to know when a suit truly kept the body dry. Everyone over the age of 30 will be familiar with the term 'frogman' which was combat diving largely developed by a specialist Italian Navy team and subsequently taken up with gusto by British Commandos during WWII. Their 'Top-Secret' suits were primarily membrane rubber as distinct from thicker neoprene so in this respect they were certainly on their way to being drysuits. Sometime during the 40s and 50s suits evolved to provide a dry body and the ability to use thermal layering - so-called baggy suits rather than skin-tight wet suits. In the absence of the NASA invented dryzips original drysuits were rubber and had to be stretched over the head (in the case of an early *Pirelli* model) via an enlarged opening which was subsequently made watertight with a hood drape or a metal ring for a hood or the suit was accessed via an 'umbilical' tube that was then rolled up to create a watertight seal (in the case of a British *Seibe Gorman* model). Companies like *Viking* in Norway who were working on drysuits at the request of the Norwegian Navy and *Poseidon* in Sweden were producing viable drysuits in the 50's but it wasn't until the space race caused the development of an airtight zip for space suits that divers' drysuits truly evolved into the versatile, multi-agency tool that it is today. Some of the companies involved haven't changed much in the past few decades except that they now have several dozen competitors. This is mostly due to sports demands but there are also a lot of commercial dive suits and military models available. **We have only included companies actively producing RESCUE-oriented models.** So we haven't included otherwise worthwhile models from folk like *Gul*, *Holis*, *Kokotat*, *O'Three*, *Stohlquist*, *Seatec* in Australia or the aptly named '*Waterproof*' in Sweden. Even the companies we have included may have many more models that are worth a look. Often these only differ from a 'rescue' model by dint of high vis colours and some reflective tape but for the purposes of this GUIDE they will have been shown to be fit for the purpose of rescue.



Above: U.S. Coast Guard Ice Rescue training. photo by Petty Officer 2nd Class Lauren Jorgensen
Left: MFC-International Drysuit. Opposite: Mustang Survival's Sentinel D624

Inflatable boats, *Solent* still make wetsuits and associated products and *Nokia* presumably branched out big time into more lucrative areas.

You can see from early development that there was a time when drysuits were just for divers or at least for underwater use. Water rescue, as the traditional domain of beach lifeguards, helicopter PJs or rescue boat crews, meant wet suits. They're called 'wet' because the user relies on a layer of water warmed from being sandwiched between spongy neoprene and the skin, to maintain a functioning body temperature. The suit prevents heat being stripped from naked skin by cold water or cold air but also relies on a degree of self-heating through activity to work efficiently. Once the user becomes inactive or the water becomes more frigid this principle doesn't work so well and this is where drysuits capable of being used over thermal layers excel in rescue work.

In the past few decades drysuits have become more like the ultimate in waterproof overalls than a dive suit and in fact many aren't now even suitable or capable of being used under water or even for swimming and are simply a means of protecting the rescuer against the elements while on or near water and for simple wading in floods. They should keep you mostly dry should you fall in and then egress immediately but are not intended for in-water use. NB: Our row in the **USES** section of the tables headed **IMMERSION** indicates that the suit will keep you dry if you fall in or are completing an in-water task- **it does NOT mean immersion in the sense of long term in-water survival.** Equally a full dive suit is not generally the best thing to wear as a surface rescue suit. Aside from being more expensive it may be too restrictive with tighter seals and features like inflation and exhaust (purge) valves that just get in the way. 'Surface' suits are now a specialised and commonplace item in their own right. Rescuers are able to don them quickly at a water rescue incident and are provided with a good degree of thermal protection as well as counter-contamination. At their most bulky are the dedicated ice rescue suits like the Stearns DriFlex, Imperial IR1500 and Mustang Ice Commander with insulating neoprene and integral hoods and gloves. But many other suits are substantial enough to be used for ice

Of those not in our Guide, *Bell Avon* still exist as part of *Zodiac*



Wearing a DUI USCG drysuit a rescue swimmer deploys from a MH-65C Dolphin rescue helicopter U.S. Coast Guard photo by Petty Officer 2nd Class Levi Read



rescue providing they have enough room for insulating layers. At the other end of the spectrum, some drysuits are relatively thin waterproof nylon for short term use only, some are even disposable - small and light enough to be stored in a response bag or in the vehicle. An interesting long-duration variation on lightweight is the Survitec/Multifabs 601 a long duration drysuit light enough and comfortable enough to be worn all day beneath regular rescue clothing which opens up a number of possibilities

for use of specialist rescue clothing and equipment when exposed to the risk of cold-water immersion.

For swiftwater and flood rescuers something more substantial is called for because fast moving water requires more efficient seals and drysuits should have clean lines so that there is less possibility of snagging. Their water resistance capabilities and strength of outer fabric are often much higher than for a surface or disposable suit. Cordura or heavy gauge nylon are now as common as more traditional Butyl, rubber and neoprene though they are most often used as part of a layered fabric - Bi or Tri-Laminates. The other specialised drysuit that requires exemplary in-water performance is the pararescue or rescue swimmer suit. Used primarily by helicopter crews it may or may not have fire-retardant qualities but it is going to be amongst the best drysuits available because the PJ or winchman role can be unforgiving and would soon highlight any shortcomings in drysuit performance. Boat suits are not necessarily designed for regular in-water use but tend to have a tougher outer fabric like Cordura simply because it is regularly knocking against hard and rough surfaces; they're more of a working suit.

KEY to TABLES

COST

basic model. As always, expect lower cost for multiple purchases or reduced specifications. Prices INCLUDE VAT or local taxes. £\$€ in Orange are a CURRENCY CONVERSION ONLY and do not include import tax, shipping etc.

ORIGIN: Not necessarily where the suit is made. It refers to the

company's country of origin and even this may be misleading if the company is a subsidiary. For instance Mustang Survival would normally be listed as Canadian but is now owned by US group, Safariland.

USES

SURFACE ◆

IMMERSION ◆

SWIFTWATER ◆

FLOOD ◆

CONTAMINANTS ◆

DIVE ◆

BOAT CREW ◆

AVIATION ◆

ICE/EXTREME COLD ◆

TACTICAL ◆

FEMALE FIT OPTION ◆: With apologies for the stereotypical pink but it stands out well in the tables! All membrane suits are going to be far more forgiving of shape than a skin-tight neoprene suit so female sized versions aren't necessarily vital for all facets of rescue work. Nevertheless, some manufacturers do offer an off-the-peg female fit with appropriate relief zip (if fitted) while the rest should at least be looking at an option for the 51% of the population that need a properly fitting suit as well! .

MATERIALS: Traditionally drysuits have fallen into two types of construction, **MEMBRANE** which is baggy and **NEOPRENE** which is a tighter fit. Most rescue suits are 'membrane suits' and utilise a wide range of materials. Simple nylon or Cordura which can be lightweight, inexpensive and used in temporary use or 'disposable' suits. Or it can be thicker and tougher and a more durable option. Either way it is non-breathable.

In combination with other materials or multiple layers, nylon becomes a far more durable suit though still not breathable which is the domain of GoreTex or similar specialist materials. Breathable suits are particularly suited to surface or out-of-water use when overheating could be an issue. Some that are quoted as breathable may only be breathable on the top section. The vast majority of drysuits in this list are Bi or Tri-Laminate where two or three materials are sandwiched together. Often this will be Nylon, Butyl or to a lesser extent neoprene and a more complex material like Goretex with a comfortable liner or facing material which aids in wicking moisture away from the body. Goretex may also be used in conjunction with Nomex for fire retardancy in drysuits used in aviation. High tenacity Nylon and Cordura tend to offer the best protection from wear while Butyl, Neoprene and similar rubber compounds offer good insulation as well as a better degree of wear resistance than *GoreTex* and breathable materials alone. More complex suits, usually intended for diving, may incorporate a special inner suit to provide better fit, comfort and warmth than the outer alone. This is donned as a single, integrated drysuit for example Whites Fusion as distinct from the more usual separate drysuit and undersuit. This article is large enough as it is so we haven't been able to go into too much detail on the individual materials but it's worth you doing some extra research in this regard once you've narrowed down your selection.

REINFORCED AREAS: As distinct from 'Padded Areas' this refers to the addition of extra layers or a more robust material in areas of high wear. Mostly this is in the contact areas of the knees, elbows and seat (buttocks) but may also be on the shoulders and around the waist where the rescuer's suit is in contact with load-bearing harness straps and scuba, SCBA or CABA tanks.

PADDED AREAS: Usually applies to the knees where thickened 'comfort' padding is used in addition to reinforcement to alleviate wear and abrasion. Padded areas provide comfort on hard, sharp and angular surfaces as well as resistance to penetration. They will often have drainage built in so that the suit doesn't retain excess water on land or when hoisted out of water. Some provide external pads that can be inserted into knee and/or elbow auto-draining pouches.

ENTRY: Once waterproof zips were invented, dive suits followed the space suit initiative with a horizontal zip across the shoulders. This kept a vital component away from any frontal assault but it wasn't long before those less concerned with underwater zip integrity looked at easier and quicker ways to don a drysuit. A front zip was found to be easiest with most being diagonal but there are also shoulder to shoulder (yoke) and 'J' configurations as well as a full spiral such as on the Multifabs 106.

SIZE ADJUST: Usually just a fabric extension of the outer material at the wrist, ankle and/or neck and often intended to be seal protection but with velcro they enable you to tighten the material. This lessens your profile and makes the seals more efficient while allowing you to slacken off for comfort when out of water. Necks and ankles may also be adjusted by zip or elasticated cord and toggles.

SEALS: what used to be rubber is now more often than not latex but can also be silicone which tends to be more expensive or it may be neoprene which many find more comfortable. Either way, with tight rubber-like seals at the neck, wrist and ankle water is prevented from entering the suit. In many cases there will be an integral hood protecting the head and sealing on the face. There will also be either waterproof seals at the ankle or integral socks, booties or boots. Booties shown as  in our tables, are usually a cross between a flexible sock and the sole of a boot. Socks or an ankle seal enables the wearer to use any suitable boot they wish. Swiftwater rescuers in particular like to have a more tactile boot to provide better traction and mobility on rocks and as can be seen from our title shot, studded boots are much better on ice than standard sole boots. Where integrated boots are offered they tend to be tough and steel toe capped and/or rubber wellingtons particularly for boat suits. Drysuits with dive capability and especially in contaminated water may have fixed rings at the wrist to enable connection of gloves to keep the hands dry. At the neck things have changed in recent years with an adjustable neck seal option providing very improved levels of comfort for the surface rescuer and rescue swimmers. The great Jim Segerstrom used a Mustang suit with this feature for swiftwater rescue and swore by it. I too have this excellent

drysuit but keep miscalculating how tight to draw in the neck to withstand immersion. If your face is not red, it isn't tight enough!

POCKETS Most suits can have pockets custom-fitted but standard fittings vary. Generally speaking swiftwater oriented suits will not have pockets as standard because they may be a snag hazard. In aviation suits there may be low profile pockets on the top of the thighs and for more general purpose rescue and USAR there may be bellows style cargo pockets. Some have shoulder pockets with pen holders and some have D-rings or even lanyards which enable you to secure items on a length of cord or elastic so that they can be used but safely retained. Lash Tabs also known as Matrix Base Plates offer a means of attaching pockets or accessories using webbing.

REFLECTIVE: Counter to the interests of tactical operators but reflective tape is a feature of most rescue drysuits, usually on the wrists and/or arms but may also be in the form of piping which is less obvious until a light is shone near it.

BRACES/SUSPENDERS: Are mounted internally and help to improve fit so that the legs don't sag in relation to the torso -especially useful for shorter individuals wearing a standard fit suit. Also used to keep up the legs when the top part of the suit is unhinged when on a break (away from the water).

ADJUSTABLE WAIST: to lessen that Pooh Bear look and give a firmer fit around the waist. Negated to some extent by those wearing a PFD. Some suits have a telescoping torso which allows good height adjustment.

RELIEF ZIP: If you are used to a wet suit don't forget that you've switched to a drysuit or there could be some unsavoury sealed in liquids and odours. A relief zip is a great feature if you're likely to be in a suit for long periods without the option to disrobe for a latrine break. Our table indicates the male option but some offer a zipped drop-down seat option for females. Dive oriented companies also offer a urine valve.

PURGE/INFLATE VALVE: A necessity for dive suits along with an inflation port so the presence of a valve usually discerns dive from the surface suits BUT air purge is a great feature on any drysuit even if you don't dive because it allows rapid release of pent up air without having to perform the neck-pull-squat while inflate allows a big increase in buoyancy.

COLOURS: We've listed combination colours with a forward slash/. Similar proportion colours begin with a capital letter and minority colours with a lower case letter. Most, though not all, suits have some element of black and this is often from the waist down while the top half is in a higher visibility colour like red, yellow or orange. Obviously, most tactical-oriented suits stick to all black or dark blue and lack reflective tape which is counter-productive when trying to avoid snipers or sentries!

Images NOT to Scale COST: Approx, <u>INC</u> local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ● = partial feature&/or OK but not ideal □□□ = Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve						
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION						
MANUFACTURER		AQUATEK	AQUATEK	AQUATEK	COLLINSNET	COLLINSNET
MODEL VARIANT		X480R	X350R	S200R	First Responder	Rescue
PRODUCT CODE						
ORIGIN						
COST		£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
USES		◆ ◆	NO	◆	◆ ◆	NO
SIZES to fit HEIGHT CHEST						
MATERIALS	TOP /BREATHABLE	00	00	00	00	00
	LEGS/ BREATHABLE	00	00	00	00	00
	REINFORCEMENT	00	00	00	00	00
	AREAS	00	00	00	00	00
FEATURES	SEALS NECK/WRIST	00			00	
	SOCKS BOOTS SEALS	■			■ □	
	ZIP ENTRY					
	INTEGRAL SIZE ADJ					
	POCKETS					
	REFLECTIVE SOLAS					
	INTERNAL BRACES					
	ELASTIC ADJUST WAIST					
	PURGE INFLATE VALVE	--	--	--	--	--
OTHER COLOURS				■ ■ ■	■ ■ ■ ■ ■	
NOTES						
WEBSITE		aquatekdrysuits.co.uk	aquatekdrysuits.co.uk	aquatekdrysuits.co.uk	collinsnet.co.uk	collinsnet.co.uk

Images NOT to Scale COST: Approx, _INC local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ●= partial feature&/or OK but not ideal □□□= Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve							
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION							
MANUFACTURER		COLLINS NET	COLLINS NET	CREWSAVER (SURVITEC)	DUI	DUI	DUI
MODEL VARIANT		Technical Rescue	Patrol	Atacama Pro	--	--	--
PRODUCT CODE							
ORIGIN							
COST		£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
USES		◆	◆	◆◆●◆◆◆◆			◆
SIZES to fit HEIGHT CHEST				5 sizes 168-198cm 5'6"-6'6" 86-122cm 34-48"			
MATERIALS	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	00 00 00 00	00 00 00 00	TriLaminate ■ Cordura PU Knees/Seat	00 00 00 00	00 00 00 00	00 00 00 00
	SEALS NECK/WRIST SOCKS BOOTS SEALS			Neoprene □ ■			
FEATURES	ZIP ENTRY			Front Diag			
	INTEGRAL SIZE ADJ			Wrists			
	POCKETS			1 leg			
	REFLECTIVE SOLAS			■			
	INTERNAL BRACES			■			
	ELASTICADJUSTWAIST			■			
	PURGEINFLATEVALVE	--	--	--			
	STORAGE BAG			■			
OTHER COLOURS					    		
NOTES				Integral wellingtons have steel toe and mid-shank			
WEBSITE		collinsnet.co.uk	collinsnet.co.uk	crewsaver	dui-online	dui-online	dui-online

						
FIRST WATCH	HAMMOND DRYSUITS	HAMMOND DRYSUITS	HAMMOND DRYSUITS	HANSEN PROTECTION	HANSEN PROTECTION	HANSEN PROTECTION
Ice Rescue	--	--	--	SEARESCUE TAC-TICAL	SEARESCUE II	SEARESCUE III
RS10021005-HV-U			SR4B			
						
£00 \$780 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00			
5'-6'4" 4'6"-5'8"						
00 00 00 Knee/Elbow				00 00 00 00	00 00 00 00	00 00 00 00
Front Vertical				Front Diagonal	Front Diagonal	Front Diagonal
2x Ice Awl						
■						
--				--		--
■						
				Survitech Company	Survitech Company	
firstwatchgear				hansenprotection.no	hansenprotection.no	hansenprotection.no

Images NOT to Scale COST: Approx, INC local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ●= partial feature&/or OK but not ideal □□□= Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve							
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION							
MANUFACTURER		HANSEN PROTECTION	HANSEN PROTECTION	HIKO	ICE RESCUE SYSTEMS	IMPERIAL	MFC INTERNATIONAL
MODEL VARIANT		SEASWIM MSAD III	SEARESCUE NE-OPRENE	RESCUE-	HYBRID -	ICE RESCUER	--
PRODUCT CODE						IR1500	
ORIGIN							
COST				£00 \$00 €911	£00 \$890 €00	£00 \$1300 €00	£00 \$00 €00
USES		◆◆◆	◆◆	◆	◆●◆◆◆◆		◆◆◆◆◆
SIZES to fit			XS,S,M,L,XL,XXL		S,M-L,XL	5 sizes 168-198cm 5'6"-6'6" 86-122cm 34-48"	5 sizes 168-198cm 5'6"-6'6" 86-122cm 34-48"
MATERIALS	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	00 00 00 Seat (option)	5mm Neoprene 5mm Neoprene PU Knees	00 00 00 00	200D Nylon ■ Cordura 1000D Nylon Thigh/Seat/Wrist	TriLaminate ■ Cordura PU Knees/Seat	TriLaminate ■ Cordura PU Knees/Seat
	SEALS NECK/WRIST SOCKS BOOTS SEALS	/	Neoprene ■/■		Neoprene/Latex ■	Neoprene □ ■	Neoprene □ ■
FEATURES	ZIP ENTRY	Front Diagonal	Front Diagonal	Front Diagonal	Front Diagonal	Front Diagonal	Front Diagonal
	INTEGRAL SIZE ADJ				-	Wrists	Wrists
	POCKETS		Chest,pen,radio		Ice Awl	1 leg	1 leg
	REFLECTIVE SOLAS		■		■	■Wrists	■Wrists
	INTERNAL BRACES				■	■	■
	ELASTICADJUSTWAIST				-	■	■
	PURGEINFLATEVALVE	--	■	--	--	--	--
	STORAGE BAG				-	■	■
OTHER COLOURS					■ ■ ■		
NOTES		Adjustable Neck	Detachable hood & gloves		Sizes termed Universal Large and Oversize. Also Custom. WT: 16lb	Survitech Company	Integral wellingtons steel toe and mid-s
WEBSITE		hansenprotection.no	hansenprotection.no		icerescuesystems		mfc-international

BUYERSGUIDES Water Rescue Equipment

Images NOT to Scale COST: Approx, INC local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ● = partial feature&/or OK but not ideal □□□ = Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve							
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION							
MANUFACTURER		MUSTANG SURVIVAL	NDIVER RESCUE	NDIVER RESCUE	NDIVER RESCUE	NDIVER RESCUE	NDIVER RESCUE
MODEL VARIANT		Sentinel Aviation	Responder MOD2	STORM FORCE	ARCTIC SURVIVOR	FEM	VOY
PRODUCT CODE		MSD697					
ORIGIN							
COST		£00 \$00 €00	£360 \$475 €420	£725 \$00 €00	£675 \$00 €00	£Custom \$00 €00	£ \$ €
USES		◆◆◆◆◆◆◆◆◆◆	◆◆◆◆◆				
SIZES to fit	HEIGHT	25 sizes 145-198cm 57-78"	6 sizes				
	CHEST	89-152cm 35-60"					
MATERIALS	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	tri laminate tri-laminate ballistic nylon seat/knee/elbow	coated nylon coated nylon heavy duty latex knee,shin/seat	00 00 00 00	00 00 00 00	00 00 00 00	
	SEALS NECK/WRIST SOCKS BOOTS SEALS	Latex ■	Latex ■				
	ZIP ENTRY	front zipper	front & rear zipper				
FEATURES	INTEGRAL SIZE ADJ	waist adjust					
	POCKETS	2arm,2thigh,2calf	left arm				
	REFLECTIVE SOLAS	--	■				
	INTERNAL BRACES	■					
	ELASTICADJUSTWAIST	■					
	PURGEINFLATEVALVE	--	--	--	--	--	
	STORAGE BAG	■	■				
OTHER COLOURS			■				
NOTES		0 years -	0 years -	0 years -	0 years -	0 years -	0
WEBSITE		pro.mustangsurvival	ndiver-rescue	ndiver-rescue	ndiver-rescue	ndiver-rescue	ndiver

NRS
RESCUE

SWIFTWATER RESCUE EQUIPMENT
Dry suits • Life Jackets • Footwear • Gloves • Helmets
Rafts • Rescue hardware and more...

nrs.com/rescue | rescue@nrs.com



Images NOT to Scale COST: Approx, <u>INC</u> local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ●= partial feature&/or OK but not ideal □□□= Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve							
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION							
MANUFACTURER		NRS RESCUE	NRS RESCUE	NRS RESCUE	OS SYSTEMS	OS SYSTEMS	OS SYSTEMS
MODEL VARIANT		EXTREMESAR GTX	EXTREME RESCUE	ASCENT SAR GTX	SPLB SROB	SPLB SRBEC	SPLB SROB
PRODUCT CODE		22560.02	22550.01	22562.02			
ORIGIN							
COST		£1430 \$1695 €1695	£1175 \$1395 €1285	£1345 \$1595 €1470	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
USES		◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆			◆
SIZES to fit HEIGHT CHEST		8 sizes 5'6"-6'6" 34"-63"	8 sizes 5'6"-6'6" 34"-63"	8 sizes 5'6"-6'6" 34"-63"			
MATERIALS	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	TriLaminate GTX TriLaminate GTX Knees, Elbows Ankles, Seat	triton triton seat/elbows/knees	gore tex pro ppe gore tex pro ppe cordura elbows/knee/seat	00 00 00 00	00 00 00 00	00 00 00 00
	SEALS NECK/WRIST SOCKS BOOTS SEALS	Neoprene/Latex ■	Latex ■	Neoprene ■			
FEATURES	ZIP ENTRY	Front Diag	front diag	over shoulder zipper			
	INTEGRAL SIZE ADJ	■	suspenders	insuspenders			
	POCKETS	1	1thigh	2thigh			
	REFLECTIVE SOLAS	■	■	■			
	INTERNAL BRACES						
	ELASTIC ADJUST WAIST						
	PURGE INFLATE VALVE	■					
STORAGE BAG		--	■ ■	--		--	--
OTHER COLOURS		■		■			■
NOTES		0 years -	HD SAR suit; TriTon™ = NRS's non-GORE-TEX rescue shell; latex gaskets; Cordura rein- forcements	0 years PFAS-free GORE-TEX ePE; recycled textiles; articulated socks; Cor- dura reinforcements	0 years -	0 years -	0 years -
WEBSITE		nrs	nrs	nrs	osystems.com	osystems.com	osystems.com

							
MS	OS SYSTEMS	PALM EQUIPMENT	PALM EQUIPMENT	POSSESS SEA IND CO	POSSESS SEA IND CO	POSSESS SEA IND CO	
D	SPLB SREC	RESCUE	RESCUE WOMAN	RESCUE	RESCUE	RESCUE	
		12137	13745	082101	082102	082103	
							
	£00 \$00 €00	£800 \$1081 €931	£830 \$1121 €965				
		◆◆◆◆◆	◆◆◆◆◆◆				
		7 sizes 5,4-6,2" 65-74 " 78-126cm	6 sizes 5,1-5,8" 62-70" 82-102cm				
	00 00 00 00						
		latex 	latex 				
		front diag	front diag				
		intern braces	intern braces				
		1 thigh	1 thigh				
		■	■				
		■	■				
		-	-				
		-	-				
	- -	-	-				
		■	■				
	0 years -	0 years -	0 years -	0 years -	0 years -	0 years -	
om	ossystems.com	palmequipment.pro	palmequipment.pro	en.drysuit.cn	en.drysuit.cn	en.drysuit.cn	

Images NOT to Scale COST: Approx, INC local tax/ VAT. £\$€=currency conversion only USES/ FEATURES: ● = partial feature&/or OK but not ideal □□□ = Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve							
◆ SURFACE ◆ IMMERSION ◆ SWIFTWATER ◆ FLOOD ◆ CONTAMINANTS ◆ DIVE ◆ BOAT CREW ◆ HELO/AVIATION ◆ ICE/EXTREME COLD ◆ TACTICAL ◆ FEMALE FIT/ZIP OPTION							
MANUFACTURER		SANTI ONDUTY	SANTI ONDUTY	SEASKIN	STEARNS	SURVITEC	SURVIT
MODEL VARIANT		RESCUE 201	RESCUE 219				
PRODUCT CODE							
ORIGIN							
COST				£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
USES							
SIZES to fit							
HEIGHT							
CHEST							
MATERIALS	TOP /BREATHABLE			00			00
	LEGS/ BREATHABLE			00			00
FEATURES	REINFORCEMENT			00			00
	AREAS			Knees			00
SEALS NECK/WRIST	SOCKS						
	BOOTS						
ZIP ENTRY	INTEGRAL SIZE ADJ						
	POCKETS						
REFLECTIVE SOLAS	INTERNAL BRACES						
	ELASTICADJUSTWAIST						
PURGEINFLATEVALVE	STORAGE BAG			--	--	--	--
	OTHER COLOURS						
NOTES		0 years	0 years	0 years	0 years	0 years	0 years
WEBSITE							



TEC	TYPHOON	TYPHOON	TYPHOON
			
	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
	00 00 00 00	00 00 00 00	00 00 00 00
	--	--	--
			
s	0 years -	0 years -	0 years -
	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk



Images NOT to Scale
COST: Approx, INC local tax/
 VAT. £\$€=currency conversion
 only
USES/ FEATURES:
 ● = partial feature&/or OK
 but not ideal
 □ □ □ = Option
 N/A = Info Not Available
VALVES PRV=Pressure Relief
 Valve



- ◆ SURFACE
- ◆ IMMERSION
- ◆ SWIFTWATER
- ◆ FLOOD
- ◆ CONTAMINANTS
- ◆ DIVE
- ◆ BOAT CREW
- ◆ HELO/AVIATION
- ◆ ICE/EXTREME COLD
- ◆ TACTICAL
- ◆ FEMALE FIT/ZIP OPTION

MANUFACTURER		TYPHOON	TYPHOON	TYPHOON	TYPHOON	TYPHOON	TYPHOON
MODEL VARIANT							
PRODUCT CODE							
ORIGIN							
COST		£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
USES							
SIZES to fit							
MATERIALS	HEIGHT CHEST						
	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00
FEATURES	SEALS NECK/WRIST SOCKS BOOTS SEALS						
	ZIP ENTRY						
	INTEGRAL SIZE ADJ						
	POCKETS						
	REFLECTIVE SOLAS						
	INTERNAL BRACES						
	ELASTICADJUSTWAIST						
	PURGEINFLATEVALVE	--	--	--	--	--	--
STORAGE BAG							
OTHER COLOURS		□	□	□	□	□	□
NOTES		0 years -	0 years -	0 years -	0 years -	0 years -	0 years -
WEBSITE		typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk

uk

Images NOT to Scale COST: Approx, INC, local tax/VAT. £/\$/€=currency conversion only USES/ FEATURES: ● = partial feature&/or OK but not ideal □ □ □ = Option N/A = Info Not Available VALVES PRV=Pressure Relief Valve						
MANUFACTURER		VIKING YOUSAFE	WRSi	WRSi	WRSi	YAK
MODEL VARIANT		TWIST	LEVEN	KERN	KERN UNI	HORIZON
PRODUCT CODE			MDS2	MDS2	MDS2	MDS2
ORIGIN						
COST		£00 \$00 €00	£1081 \$00 €00	£1081 \$00 €00	£1081 \$00 €00	£00 \$00 €00
USES	SURFACE 					
	IMMERSION 					
	SWIFTWATER 					
	FLOOD 					
	CONTAMINANTS 					
	DIVE 					
	BOAT CREW 					
	AVIATION 					
	ICE/EXTREME COLD 					
	TACTICAL 					
	FEMALE FIT OPTION 					
SIZES to fit			XS+, S, M, M+, L, L+, XL, XL+,XXL	S, M, M+, L, L+, XL, XL+,XXL	XS, S, M, L	M,M+,L,L+,XL, XL+,XXL
MATERIALS	TOP /BREATHABLE LEGS/ BREATHABLE REINFORCEMENT AREAS	00 00 00 00	NylonTriLaminate  NylonTriLaminate  Knees	NylonTriLaminate  NylonTriLaminate  Knees	Vapour Pro IV 210D Nylon Twill 4-Lyr  Vapour Pro IV 210D Nylon Twill 4-Lyr  Nylon Dbl at Knees	NylonTriLaminate  NylonTriLaminate  Knees
	SEALS NECK/WRIST SOCKS BOOTS SEALS		4-way Neoprene 	4-way Neoprene 	4-way Neoprene 	Latex 
FEATURES	ZIP ENTRY		Front YKK	Front YKK	Front YKK	Front YKK
	INTEGRAL SIZE ADJ					
	POCKETS		2	2	1x Arm	2
	REFLECTIVE SOLAS					
	INTERNAL BRACES					
	ELASTIC ADJUST WAIST					
	RELIEF ZIP FEMALE				 	
	PURGE INFLATE VALVE	--	--	--	--	--
	STORAGE BAG					
OTHER COLOURS						
WARRANTY		0 years	3 years	3 years	3 years	2 years
NOTES		-			-	
WEBSITE		viking-life.com	wrsinternational.com	wrsinternational.com	wrsinternational.com	



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Braided HMPE fiber core with
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RESCUER PFDs

PERSONAL FLOTATION DEVICES

INTRODUCTION

Personal Floatation differs from a 'Life-Jacket' in that it uses foam to provide permanent flotation rather than a water or person-activated inflatable vest. A PFD is much bulkier to wear and therefore tends to be worn by rescuers with a much higher likelihood of entering the water whereas a lifejacket is a precaution should the wearer enter water unexpectedly. All PFDs offer the added advantage during cold or rough weather of being an insulating layer though conversely, not so good when it's hot! There are also some hybrids which provide a less bulky degree of flotation which is subsequently enhanced on entry to the water by an inflatable chamber or two but hybrids tend not to be active rescuer PFDs once the chambers are inflated - once this occurs the PFDs are effectively passive flotation aimed at keeping the wearer afloat and would not be inflated during an active swimming rescue.

Of the permanent flotation models there are broadly four designs of PFD worn by rescuers -

1) ■ the **Kayak style** like the *SRE/NDiver Evo* left which tends to be shorter in the body, cut-away at the shoulders and often donned over-the-head. Usually for use in a kayak but may also be for smaller watercraft like inflatable rafts that will be paddles/rowed where the open shoulders allows good freedom of arm movement for paddling



2) ■ the first of four full torso jackets, is for **rescue boat/ship crew** or Coastguard/

military on board larger ships/cutters. Such crew are 'facilitators' of rescue rather than active, in-water rescuers. This will be very plain and simply fitted out like the well-known US Coastguard Vests from *Mustang Survival* right.



3) ■ Used by ground/shore-based rescuers in support of water rescue ops - for searching and setting up rescue systems for instance but, like the Boat Crew vests, not intended to be used in-water. Simpler than a Water Rescuer vest but has attachments points for radios, throw-bags, whistles etc. like this *Force6 Ground Ops* vest



4) ■ The commonest **Water rescuer** PFD used by **swiftwater/flood rescuers** working along the shores, in 'wet' water craft or during water entry. is a full torso vest often quite heavily adorned with pockets, pouches, accessory eyes, lanyards and closures like the *Force 6* models or



the *Palm 800* right.

Both 2) & 3) - full-cut versions may have leg straps to ensure the vest stays down on water-entry rather than trying to float off over the wearer's head if it is worn too loosely. Which brings us to ...

5) ■ **Rescue Swimmer/AST**

vests exemplified by US Coastguard AST's or Aviation Survival Technicians (which used to be known as Parajumpers) needing to swim in strong currents and/or rough seas and therefore needing a full range of motion without the drag of too many extraneous pockets and fittings. A more slimline cut

worn very tight to the body like the *Force 6 Ops* vest in the title picture or *Mustang's MRV170* right. These still have provision for the attachment of kit and accessories (and helo winch attachment in the case of the *Force 6*) but is otherwise less inhibited for active swimming.

BUOYANCY

Ranges from 50 to 275Newtons for the most



basic to the largest inflatable but in rescue is generally around 100N and sometimes quoted with the water displacement equivalent which we've listed as CAPACITY and given as a weight. 100N for instance is equivalent to around 10kgs of water displacement because, remember, a body is relatively buoyant by itself so throwing a 90kg.200lb person into water is not the same as throwing in a 90kg lump of metal! As a guide though, a 70N PFD would support up to 100kg/220lb person. Much larger/heavier rescuers might need to consider this but again, body mass does not necessarily equate to flotation - muscle for instance is denser and heavier than fat so a rotund individual weighting 200lb will probably float more readily than a slim person with strong muscle definition. It is therefore more about the physical size that the PFD will comfortably fit around.

FEATURES

Most of our images show the de-cluttered PFD with no kit attached but once fully loaded these can look completely different. It's best to strike a balance between having as few extraneous snag hazards as possible but enough kit to do the job you need or get you out of trouble. Each manufacturer has their own idea of what type of and number of storage and attachment points there should be. Often, the non-standard features will be a result of a field incident or a customer's experience. Swifwater legend Jim Lavalley at Force 6 is perhaps the best known proponent still standing in the rescue industry so anything they come up with is always worth a look. Above is the *Force6 R3* vest with side-mounted tandem throw bag attachments while his *Tec3* vest has them mounted across the lumbar area. Jim's vest here shows two chem lightsticks, personal and unit/team ID, radio and the all-important extrication leash for victim-rescue (not to be confused with a cowstail on regular swifwater PFDs used for self-tethering rather than victim recovery).

BUCKLES/FASTENING

Most PFDs have a front zip and these are often overlaid by rows of webbing and buckles. If the PFD has a **Quick Release Belt** this will have a large camming buckle on the front often with a red ball and cord attached so that it can be easily released in the event of being snagged. This is not an orchestrated front fastening - that's just a side effect of it being where it is - when tightened it can end up being the main thing that's tensioning your fit. The actual devices for tightening are the buckles, overwhelmingly plastic but some of the military/aero PFDs have metal (eg. Cobra clips). There are broadly two types;

1) **Fastex Style Fast-clips (Side-Release)** buckles requiring two fingers to push in either side and release the 'male' end from the receiver. These are either for 25mm/1" webbing, 38mm/1.5" or 50mm/2" webbing and usually (but not always) allow one end of the webbing to be pulled through to tighten.

WRSi and *Palm* models use this larger version with one red side release.

2) **Ladder-lock:** A variation of a 3-bar buckle but with angled 'bars' or an end



sides so as to minimise snag-hazards.

Note that simple 3-bar or slider 'buckles' are not for securing, they are simply adjusters, usually for the webbing tails.



that restrains the webbing that is doubled back on itself when the buckle is flat but can be released when the buckle is pulled up - they often have a curved extension to facilitate. Because of the low bulk these are often the adjustment methods at the shoulders and on the

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FEATURED BRANDS:



KEY to TABLES

USES:

◆ **Kayak/watercraft:** Kayaks, canoes, raft and sleds - freedom of arm movement for paddling. Must have QRS for self and casualty rescuer/belay

◆ **Boat/Ship Crew:** A generally less featured garment, with minimal snag hazards and comfortable to wear for very long periods. Must have leg loops in case of jump-water entry from height.

◆ **Shore-based Rescuer:** Can be clean to unencumber or well kitted with attachment points and pouches for rigging, throw grapples (Reach) etc. Rescuer not intended to enter water except in an emergency.

◆ **Swiftwater Rescuer:** A jack of all trades, for shore, watercraft paddling and water entry (as a last resort)

◆ **Rescue swimmer/AST:** Low-profile, figure-hugging fit with minimal snag hazards and clear shoulder holes to allow swimming (front-crawl) action. This is NOT the same as simply being able to swim in a PFD - most PFDs have large arm-holes to allow this but not protracted swimming.

BUOYANCY: A person in water is roughly neutrally buoyant unless carrying additional weight or particularly heavy clothing and needs only around 25N of additional buoyancy to safely stay afloat. Buoyancy is the amount of extra, upward 'thrust' provided by the flotation device so 7.3kg or 16lb of buoyancy is equivalent to 70 Newtons which will easily support a lightly clothed 100kg/220lb person (CAPACITY). This does not directly correlate to the weight of person it can support - it varies by manufacturers' intended use and by the size of PFD - smaller sizes give less buoyancy so you usually see a range for any given level of buoyancy eg. 70N= 60-110kg/132-242lb. However, **ISO certification** does give a specific weight range but remember that, while ISO 12402 stipulates that a 50N PFD will support a 30-50kg person (youth or small person) it will actually support a large adult, just not with the same degree of buoyancy as a higher Newton PFD. Rescuers use 50-<70N as lower profile, low bulk PFDs.

EN ISO 12402 DEFINED USER WEIGHTS CLASSES

50 N	30–50 kg
60 N	40–60 kg
70 N	60–110 kg
100 N	30–110 kg
150 N	40–150 kg
275 N	40–150 kg + heavy gear

WEIGHT: Dry weight of the PFD without accessories or optional pouches/straps.

COST: basic model. As always, expect lower cost for multiple purchases or reduced specifications. Prices INCLUDE VAT or local taxes. £\$€ in Orange are a CURRENCY CONVERSION ONLY and do not include import tax, shipping etc.

ORIGIN: Not necessarily where the PFD is made. It refers to the company's country of origin and even this may be misleading if the company is a subsidiary. For instance *Mustang Survival* is Canadian but is now owned by US group, *Safariland*.

SIZES: All companies give a size range from XXS to XXXL but these do not translate across all PFDs so we have given the exact measurements and the number of CHEST size options that they span eg. 3 sizes from 78-129cm/31-51"

MATERIALS: The outer jacket and inner foam materials. Mostly Cordura in various grades and all have EVA foam for flotation - some are listed as more environmentally friendly foams than others and some hybrids have additional air inflation chambers

FASTEN : How the PFD is donned and secured. Normally a front zip often with additional webbing tightened with **Fastex-style** thumb&finger -quick release buckle

ADJUST (Fast-Clip 3-Bar) (exc QR belt) : How the PFD is tightened (and untightened) not including the **Quick Release Belt** buckle shown below with an orange square ■ but this too can be tightened and will need to be released for donning/doffing. **Fast-Clip** are Fastex-style buckles requiring both sides of the bckle to be depressed to unclip and normally used centrally down the front and at the hip but this can also have simpler **3-Bar** or ladder-style buckles that require webbing to be fed through slots and jam when loaded.

LEGLOOPS/CROTCH STRAP: provision for direct attachment of a simple crotch strap to stop the PFD coming off over the head or more substantial leg loops for more security and comfort. if it is an optional extra is shown as an outline square □

QUICK RELEASE BELT/RING: a webbing belt with large cam-lock plastic buckle and a red ball to allow easy and quick access when disorientated to release the attached tow or throwline if snagged or in danger of being pinned/dragged/held underwater etc.

POCKETS: closable storage pockets (excluding large cowstail or throwline stow pouch which is usually on the rear and should be left clear for rapid deployment of cowstail/throwline). Pockets like this Palm version may have additional pockets or loops inside for keys etc. this one comes with the PFD but can be purchased as an extra pocket that attached=s via MOLLE webbing. **HANDWARMER:** a double sided opening, sometime lined and positioned mid-chest - for temporary warming of the hands or may have a pocket warmer in it

ADD POCKETS OPTIONS: This manufacturer provides optional pouches to use with this PFD but may also fit any PFD if it has universal fixing like this Molle equipped pocket.

LASH PADS: a square of material with slots that allow attachment of accesories/knife. pouches / **MOLLE:** multiple attach-



ment eyes created by intertwined webbing as shown above . carabiners or webbing can be threaded anywhere along the length of Molle.

RINGS (exc **QR belt**): Attachment points for accessories (often for stowing cowstail carabiners)not including the ring on the QR belt. May be metal but more usually plastic. **SEWN EYES**: simple open gaps in webbing that allow a carabiner or web strap to be threaded in for attachment of light accessories. May also be smaller eyes intended to thread accessory cord not large enough for a carabiner/hook.

WHISTLE GRAB HANDLE: a load bearing loop or handle in the shoulder region which allows the user to be dragged out of the water or over an edge or along the ground! Not load bearing in the sense that you could perform a vertical haul from it - if this is the case we indicate it in the NOTES.

COWSTAIL: Short length of rope/webbing with a carabiner/ hook on the end for connection from the wearer's QRS belt to an anchor/buddy/boat or casualty. **STOW POUCH**: In addition to other pockets, this is usually the largest pouch and stored on the rear at shoulder height. Can be for Cowstails or smaller throwbags/lines although these are also often stowed on the front 'gunslinger' style.

KNIFE RADIO POUCH: In addition to closeable pockets a pouch intende to store a knife or a radio for quick and easy access. These can of course also be stored in a closable pocket

FOAM RESCUE PFDs

but they are not then easily to hand.

CHEMLIGHT STROBE POUCH: Chemlight or Cyalume sticks are light so can be easily held in elasticated loops (which me also be shown as the sewn eyes but are intended for light sticks. **Strobe** pouches are larger and may also be an elastacted strap or a a more substantial half pouch.

REFLECTIVE: REFLECTIVE/SOLAS: As with drysuits, this is counter to the interests of tactical operators but reflective tape is a feature of most rescue PFDs, usually on the shoulders and some more than others which we have indicated with a ● for a limited amount of reflective material.

ID FLAP/POUCH: can be a clear plastic pocket but usually a velcro strip on the front breast and/or across the back to allow attachment of service identification - often reflective but not included in the above integral reflective indication.

STANDARDS/APPROVALS

IMPORTANT: Make sure you select the correct PFD Certification (UL if you live in the US, ULC if you live in Canada). A ULC life vest is not certified for use in the US. A UL life vest is not certified for use in Canada.

OTHER COLOURS: Colours **OTHER** than the PFD shown. As always in our Guides, a secondary or trim colour will be indicated by a black or coloured border to the square.



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□ □ □ □ □ = OPTION

USES:

◆ Kayak/watercraft

◆ Boat/Ship Crew

◆ Shore-based Rescuer

◆ Water Rescuer

◆ Rescue swimmer/AST

● ● ● ● ● = Partial/minimal or OK but not ideal

FAST-CLIP = two finger release - Fastex-style plastic buckle

3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)



MANUFACTURER	ASTRAL	ASTRAL	ASTRAL	BALTIC
MODEL VARIANT	GREENJACKET RESCUE	INDUS	YTV 2.0	SAR
PRODUCT CODE				000
ORIGIN				
INTENDED USES	◆ ◆ ◆	◆ ◆ ◆	● ◆	◆ ◆ ◆
BUOYANCY	7.5kg/16.5lb 73N	10.1kg/22.3lb 99N	5.1kg/11.2lb 50N	5.1kg/11.2lb 50N
COST inc 10%state tax/20%VAT	- \$395 -	£00 \$420 €00	£00 \$165 €00	£175 \$00 €00
WEIGHT	1315g /2.9lb	1365g /3.1lb	590g /1.3lb	00kg /00lb
SIZES	3 sizes 79-130cm 31-51"	3 sizes 79-130cm 31-51"	3 sizes 79-130cm 31-51"	Universal
MATERIALS	500D Cordura PVC-free Gaia Foam	500D Cordura PVC-free Gaia Foam	300D PE ripstop.200D Nylon liner. PVC-free Gaia Foam	
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	OVERHEAD Shoulders via mid-front, 2xSide - ■	OVERHEAD Shoulders via mid-front, 2xSide - ■	OVERHEAD Shoulders via mid-front, 2xSide - -	FRONT ZIP xx ■ ■
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	3 - - ■ 1 - 9 1	3 - - ■ 1 - 9 1	2 +1 padded phone pkt - - ■ 1 - --	-- - - --
WHISTLE GRAB HANDLE(s)	--	--	--	■ -
COWSTAIL / STOW POUCH	□ -	□ -	--	■ ■
QR KNIFE RADIO POUCH	■ ■	■ ■	--	■ ■
CHEMLIGHT STROBE POUCH	■	■	--	■
REFLECTIVE ID FLAP/VELCRO	■ ■	■ ■	■ ■	■ -
STANDARDS/APPROVALS	USCG Type V	USCG Type V	USCG Type V	OO
OTHER COLOURS	■ ■	■ ■	■ ■ ■	■
NOTES <i>italics=Manufacturer comments</i>	Only available in USA/Canada. Recycled shell & liner materials	Astral have 2 other whitewater models but these three models are specifically listed in their rescue catalogue. Recycled shell & liner materials	Lightweight/low profile but lacks QRS. In Astral Rescue cat but we would otherwise not have includ- ed this model. Recycled shell & liner materials	OO
WEBSITE	astraldesigns.com	astraldesigns.com	astraldesigns.com	OO.com



BALTIC	BALTIC	CREWSAVER/ SURVITEC	CREWSAVER/ SURVITEC	FORCE6
HYBRID	00	PRO 50N EX	SWR	MARINE FIRE
000	000	pro-50N-ex	8673	000
5.1kg/11.2lb 50N	5.1kg/11.2lb 50N	5.1kg/11.2lb 50N	8.2kg/18lb 80N	5.1kg/11.2lb 50N
£175 \$00 €00	£00 \$00 €00	£00 \$00 €00	£250 \$00 €00	£83 \$00 €00
00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb
Universal	Universal	4 sizes	Universal	Universal
		Polyester		400D Nylon
FRONT ZIP 	FRONT ZIP 	FRONT ZIP 2xSide 	SIDE ZIP/FRONT BUCKLE 1xFront, 2xSide 	FRONT ZIP/BUCKLES Hips, Hips, 2xFront, 2xSide, Shoulders
-- -- -- --	-- -- -- --	1 2 --	4 2 4	-- -- -- --
		-- -- --		-- -- --
		-- --		
00	00	ISO	ISO	00
Hybrid air inflation and permanent foam	Hybrid air inflation and permanent foam	Side flaps for impact protection which can also be folded to stop build up of heat	Side flaps for impact protection which can also be folded to stop build up of heat	00
00.com	00.com	survitecgroup.com	survitecgroup.com	force6.com

IMAGES NOT to SCALE COST: £\$€= Currency conversion only, no duty, shipping etc. ~ = Approximate ☐ ☐ ☐ ☐ ☐ = OPTION USES: ◆ Kayak/watercraft ◆ Boat/Ship Crew ◆ Shore-based Rescuer ◆ Water Rescuer ◆ Rescue swimmer/AST ● ● ● ● ● = Partial/minimal or OK but not ideal FAST-CLIP = two finger release - Fastex-style plastic buckle 3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)				
				
MANUFACTURER	FORCE6	FORCE6	FORCE6	FORCE6
MODEL VARIANT	GROUND SUPPORT	TEC 2	RESCUE OPS	HARS 2
PRODUCT CODE	000	000	000	000
ORIGIN				
INTENDED USES	◆ ◆	◆ ◆ ◆	◆ ◆ ◆ ◆ ◆	◆ ◆ ◆
BUOYANCY	5.1kg/11.2lb 50N	11.8kg/26lb 115N	11.8kg/26lb 115N	9kg/20lb 90N
COST inc 10%state tax/20%VAT	£83 \$00 €00	£306 \$00 €00	£231 \$00 €00	£1385 \$00 €00
WEIGHT	00kg /00lb	00kg /00lb	00kg /3.5lb	00kg /00lb
SIZES	Universal	S/M, L/XL	Universal	Universal
MATERIALS	400D Nylon	420D Nylon	500D Cordura	1050D Nylon
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT ZIP Hips, 2xSide, Shldr - 	FRONT xx  	FRONT xx  	SIDE xx  
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	- -  - - -	2 Yes -  1 -	2 Yes -  1 -	- Yes -  2 -
WHISTLE GRAB HANDLE(s)	 -	 	 	- 
COWSTAIL / STOW POUCH	 			
QR KNIFE RADIO POUCH	 	 	 	 
CHEMLIGHT STROBE POUCH				
REFLECTIVE ID FLAP/VELCRO	 	 	 	 
STANDARDS/APPROVALS	USCG Tyte III	USCG Type V	USCG Type V	
OTHER COLOURS		  	    	
NOTES <i>italics=Manufacturer comments</i>	OO	Replaced RESCUETEC	OO	OO
WEBSITE	force6.com	force6.com	force6.com	force6.com

7

IMAGES NOT to SCALE

COST: £\$€= Currency conversion only, no duty, shipping etc.

~ = Approximate

□ □ □ □ □ = OPTION

USES:

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◆ Boat/Ship Crew

◆ Shore-based Rescuer

◆ Water Rescuer

◆ Rescue swimmer/AST

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FAST-CLIP = two finger release - Fastex-style plastic buckle

3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)



MANUFACTURER	HIKO	HIKO	HIKO	HIKO
MODEL VARIANT	CINCH HARNESS	SAFETY PRO	SAFETY RENT	X-TREME PRO
PRODUCT CODE	11911	11400	10801	10700
ORIGIN				
INTENDED USES		 	 	
BUOYANCY	5.6-7.1kg/12.3-15.7lb 55-70N	8.2-10kg/18-22lb 80-100N	8.2-10kg/18-22lb 80-100N	8.2-10kg/18-22lb 80-100N
COST inc 10%state tax/20%VAT	£155 \$00 €00	£215 \$00 €00	£126 \$00 €00	£231 \$00 €00
WEIGHT	00kg /00lb	00kg /00lb	00kg /00lb	00kg /0lb
SIZES	3 sizes	3 sizes	3 sizes	3 sizes
MATERIALS			Nylon	500D Cordura
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT xx - 	FRONT xx 	FRONT ZIP/BUCKLES Hip, 3x Front, 2x Side - -	FRONT ZIP/BUCKLES xx
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	4 YES - 2 -	2 - YES - 2 -	0 - - - 0 -	4 - YES - 2 -
WHISTLE GRAB HANDLE(s)		-	- -	
COWSTAIL / STOW POUCH				
QR KNIFE RADIO POUCH			- -	
CHEMLIGHT STROBE POUCH	-	-	- -	-
REFLECTIVE ID FLAP/VELCRO	-	-	-	
STANDARDS/APPROVALS	ISO	ISO	ISO	ISO
OTHER COLOURS				
NOTES	00	00	00	00
<i>italics=Manufacturer comments</i>				
WEBSITE	hikosport.com	hikosport.com	hikosport.com	hikosport.com



HIKO	HIKO	HIKO	IONIC	IONIC
X-TREME RAFT	X-TREME RENT HARNESS	X-TREME RENT	PRO MATRIX	RESCUE PRO
10500	10911	10900	SAF30055	SAF30012
8.2-10kg/18-22lb 80-100N	3.6-9kg/7.9-20lb 35-90N	3.6-9kg/7.9-20lb 35-90N	9-16kg/20-35.5lb 88-158N	9-14.3kg/20-31.5lb 90-140N
£99 \$00 €00	£125 \$00 €00	£118 \$00 €00	£190 \$00 €00	£145 \$00 €00
00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb
4 sizes	3 sizes	3 sizes	4 sizes 75-147cm/30-58"	4 sizes 80-150cm/32-58"
Nylon	Nylon		500D Cordura	600D Cordura
FRONT ZIP/BUCKLES xx 	FRONT ZIP/BUCKLES xx 	FRONT ZIP/BUCKLES xx 	FRONT BUCKLES 3x Front, 2x Side, shoulders 	FRONT 3x Front, Hips 2x Side, shoulders
0 - YES - 2 -	0 - - - 1 -	0 - - - 3 -	4+1 removable rear pouch - YES 3 - 6 -	2 - YES- - 3 - 4 -
	- -	-	-	x2 -
		-		
- -	- -	- -	x2	
- -	- -	- -	-	-
-	-	-		
ISO 	ISO 	ISO 	ISO 	ISO
00		00	hidden carabiner stow pouch	Carabiner park & release system
hikosport.com	hikosport.com	hikosport.com	ionicrescue.com	ionicrescue.com

IMAGES NOT to SCALE

COST: £\$€= Currency conversion only, no duty, shipping etc.

~ = Approximate

□ □ □ □ □ = OPTION

USES:

◆ Kayak/watercraft

◆ Boat/Ship Crew

◆ Shore-based Rescuer

◆ Water Rescuer

◆ Rescue swimmer/AST

● ● ● ● ● = Partial/minimal or OK but not ideal

FAST-CLIP = two finger release - Fastex-style plastic buckle

3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)



MANUFACTURER	KENT SAFETY	KENT SAFETY	KENT SAFETY	KENT SAFETY
MODEL VARIANT	Universal	Mesh Classic	Elite Dual Sized	Mesh DeLuxe
PRODUCT CODE	000	000	000	000
ORIGIN				
INTENDED USES	■	■	■	■
BUOYANCY	7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N
COST inc 10%state tax/20%VAT	£35 \$45 €41	£63 \$80 €74	£63 \$80 €74	£70 \$90 €83
WEIGHT	000kg /00lb	000kg /00lb	000kg /00lb	000kg /00lb
SIZES	universal size	6 sizes	8 sizes	7 sizes
MATERIALS	Nylon	Nylon	Nylon	Nylon
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT ZIP/BUCKLES 3xFront - -	FRONT ZIP/BUCKLES 2xFront - -	FRONT ZIP/BUCKLES Hips, 1xFront - -	FRONT ZIP/BUCKLES 2xFront - -
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	- - - - - - - -	1 Yes - - - -	4 - - - 2 -	2 - - - 1 -
WHISTLE GRAB HANDLE(s)	- -	- -	- -	■ -
COWSTAIL / STOW POUCH	- -	- -	- -	- -
QR KNIFE RADIO POUCH	- -	- ■	■ ■	- -
CHEMLIGHT STROBE POUCH	-	-	■	-
REFLECTIVE ID FLAP/VELCRO	■ -	■ -	■ ■	■ -
STANDARDS/APPROVALS	USCG	USCG	OO	OO
OTHER COLOURS				
NOTES <i>italics=Manufacturer comments</i>	OO	OO	OO	OO
WEBSITE	kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com

				
				
KENT SAFETY	KENT SAFETY	KENT SAFETY	KENT SAFETY	KENT SAFETY
Hi-Vis Mesh Deluxe	Law Enforcement	First Responder	Mesh SAR	SAR
000	000	000	000	000
				
				
7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N
£141 \$180 €165	£78 \$100 €92	£78 \$100 €92	£86 \$110 €101	£86 \$110 €101
000kg /00lb	000kg /00lb	000kg /00lb	000kg /00lb	000kg /00lb
6 sizes	6 sizes	6 sizes	6 sizes	6 sizes
Nylon	Nylon	Nylon	Nylon	Nylon
FRONT ZIP/BUCKLES 2xFront	FRONT ZIP xx	FRONT ZIP 2xFront	FRONT ZIP/BUCKLES 3xFront	FRONT ZIP/BUCKLES 3xFront
- -	- -	- -	- -	- -
- - - - - -	2 Yes - 1 -	0 - 1 - 1 -	2 - - - 2 -	4 - - - 2 -
- -	■ -	- -	■ -	■ -
■ ■	- -	- -	■ -	■ -
■ ■	- -	- -	- -	■ ■
■	-	-	-	■
■ -	- -	■ -	■ -	■ -
ANSI c12, USCG CANCG	OO	OO	OO	OO
OO	OO	OO	OO	OO
kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com

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3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)



MANUFACTURER	KENT SAFETY	KENT SAFETY	KOKATAT	KOKATAT
MODEL VARIANT	HI-VIS AIR SPAN	SWIFTWATER RESCUE	GUIDE RESCUE	HUSTLER RESCUE
PRODUCT CODE	-	#151300-410-XXX-17	-	-
ORIGIN				
INTENDED USES				
BUOYANCY	7kg/15.5lb 70N	10kg/22lb 100N	7-9kg/15.5-20lb 70N-90N	7kg/16lb 71N
COST inc 10%state tax/20%VAT	£00 \$90 €00	£00 \$290 €00	£00 \$289 €00	£00 \$300 €00
WEIGHT	000kg /00lb	000kg /00lb	1.2kg /2.10lb	1.2kg /2.10lb
SIZES	S/M, L/XL, XXL	universal	S/M, L/XL, XXL	XS/S, M/L, XL/XXL
MATERIALS	Nylon	500D Cordura 400D Nylon		500D Cordura
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT ZIP Shoulders, 2xSide - 	OFFSET ZIP Shoulders, 2xSide 	FRONT ZIP Shoulders,Hips,Hips, 2xSide - 	OVER-HEAD Shoulder, Hips,Hips, 2xSide -
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	2 - - --	1 - 2 - 4 -	2 - 2 - 1 -	1 - -- 1 -
WHISTLE GRAB HANDLE(s)	--	-	--	--
COWSTAIL / STOW POUCH	--	- -		
QR KNIFE RADIO POUCH	- -			-
CHEMLIGHT STROBE POUCH	-			- -
REFLECTIVE ID FLAP/VELCRO	SOLAS	SOLAS		- -
STANDARDS/APPROVALS	OO	OO	OO	USCG TypeV (not Canada)
OTHER COLOURS				
NOTES <i>italics=Manufacturer comments</i>	OO	OO	3 colourway options	OO
WEBSITE	kentsafetyproducts.com	kentsafetyproducts.com	kokatat.com	kokatat.com

				
				
MUSTANG SURVIVAL	MUSTANG SURVIVAL	MUSTANG SURVIVAL	MUSTANG SURVIVAL	MUSTANG SURVIVAL
CLASSIC INDUSTRIAL	HI-VIZ INDUSTRIAL MESH VEST	4-POCKET FLOTATION VEST USCG/AUX	USN MK1 FLIGHT DECK	INDUSTRIAL MESH VEST USCG/AUX
MV3196T2	MV1254 T3	MV3128..T2...22	MD3040	MV1254.. T1...22...34
				
				
7kg/15.5lb 70N	7kg/15.5lb 70N	7kg/15.5lb 70N	9.5kg/21lb 98N	7kg/15.5lb 70N
£00 \$92 €00	£00 \$110 €00	£00 \$101 €00	£250 \$478 €00	£00 \$110 €00
0.59kg /1.3lb	0.64kg /1.4lb	0.59kg /1.4lb	1.8kg /4lb	0.64kg /1.4lb
S/M, L/XL, XXL/7XL	S/M, L/XL, XXL,XXXL	S/M, L/XL, XXL	one size	S/M, L/XL, XXL
	mesh and pfd foam		codura shell/reinforced stitching	
FRONT ZIP 2xSide - NO	FRONT ZIP xx - NO	FRONT ZIP 2xSide □ NO	FRONT ZIP/VELCRO xx ■ NO	FRONT ZIP 2xSide - NO
- - - - - -	- - - - - -	4 - ■ - -	2 - - - - -	2 - - - - -
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
■ -	■	■ -	■ ■	■ -
OO	TC Marine CAN/CGSB 65.11 –	industry/work approval	OO	OO
■	■	■	■ ■ ■ ■ ■ ■	■
OO	Maximum visibility Cooling mesh shoulders Large armholes for mobility Strength-tested to 50 MPH	Four large pockets for tools, radios, or equipment Large armholes for mobility Designed for commercial and industrial marine use	Designed for Aircraft Carrier deck crew allows full range of arm motion.	OO
pro.mustangs survival.com	pro.mustangs survival.com	pro.mustangs survival.com	pro.mustangs survival.com	pro.mustangs survival.com

IMAGES NOT to SCALE

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USES:

◆ Kayak/watercraft

◆ Boat/Ship Crew

◆ Shore-based Rescuer

◆ Water Rescuer

◆ Rescue swimmer/AST

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MANUFACTURER	MUSTANG SURVIVAL	MUSTANG SURVIVAL	MUSTANG SURVIVAL	MUSTANG SURVIVAL
MODEL VARIANT	OPS SUPPORT WATER RESCUE VEST	SAR VEST	UNIVERSAL	RESCUE SWIMMER
PRODUCT CODE	MRV050WR	MV5606	MRV150 02	MRV170
ORIGIN				
INTENDED USES	◆ ◆	◆ ◆ ◆	◆ ◆ ◆	◆ ◆
CAPACITY BUOYANCY	7kg/15.5lb 70N	9.5kg/21lb 98N	11.3kg/25lb 111N	00kg/00lb 00N
COST inc 10%state tax/20%VAT	£00 \$160 €00	£00 \$195 €00	£00 \$294 €00	£00 \$00 €00
WEIGHT	00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb
SIZES	S/M, L/XL, XXL	S/M, L/XL, XXL,XXXL	S/M, L/XL, XXL 30-58" chest	S/M, L/XL, XXL
MATERIALS		cordura shell,layered foam	500D Cordura	
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT ZIP xx ■ NO	FRONT ZIP/BUCKLES 3xFront - NO	FRONT ZIP/BUCKLES Shoulders, Hips, 2x Side - ■	OVERHEAD Shoulder, 2x - ■ NO
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	2 - - - - -	2 - - ■ - -	2 - - - 30	- - - ■ 46 via Molle
WHISTLE GRAB HANDLE(s)	- -	- ■	- ■	- ■
COWTAIL / STOW POUCH	- -	- -	- -	- -
QR KNIFE RADIO POUCH	- -	■ ■	■ ■	- -
CHEMLIGHT STROBE POUCH	-	-	■	-
REFLECTIVE ID FLAP/VELCRO	● -	■ -	■ -	- ■
STANDARDS/APPROVALS	00	00	NFPA, USCG V/III	00
OTHER COLOURS	■	■		■
NOTES <i>italics=Manufacturer comments</i>	00	00	00	00
WEBSITE	pro.mustangsuvival.com	pro.mustangsuvival.com	pro.mustangsuvival.com	pro.mustangsuvival.com

		
GENERAL	NORTHWATER	
TYPE OF VEST	STANDARD	
	20RES-37	
		
		
	9-15kg/20-34lb 89-151N	
	£276 \$376 €00	
	00kg /00lb	
SIZE	8 sizes 81--142cm 32-56"	
	420D Nylon	
FEATURES	FRONT ZIP Hips, 2x Side	
		
	2 -  - -  - -  - - 	 - -  - -  - - 
	 -	
	 	
	 	
		
	 	
	ULC, DOT Canada	
		
	Highly modular PFD with optional pouches, patches, Spare-Air Panel, etc	
WEBSITE	northwater.com	





SWIFTWATER RESCUE EQUIPMENT
Dry suits • Life Jackets • Footwear • Gloves • Helmets
Rafts • Rescue hardware and more...

nrs.com/rescue | rescue@nrs.com



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MANUFACTURER	NRS	NRS	NRS	NRS
MODEL VARIANT	BIG WATER GUIDE	NINJA PRO	RAPID RESPONDER	RAPID RESCUER
PRODUCT CODE	40014.xx	40141.xx	40107.xx	40025.xx
ORIGIN				
INTENDED USES	◆ ◆ ◆	◆ ◆ ◆	◆ ● ◆ ◆ ●	◆ ◆ ◆ ●
BUOYANCY	10.4kg/22.9lb 95N	7-7.6kg/15.5-16.75lb 70-75N	10.4kg/22.9lb 95N	10.4kg/22.9lb 95N
COST inc 10%state tax/20%VAT	£110 \$143 €131	£218 \$286 €263	£213 \$280 €260	£243 \$320 €290
WEIGHT	1kg /2.4lb	1kg /2.25lb	1.6kg /3.5lb	1.3kg /3.3lb
SIZES	2 sizes	3 sizes	1 size	1 size
MATERIALS	400D Nylon	420D Nylon	400D Ripstop Nylon	400D Ripstop Nylon
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT ZIP Hips,Shoulders, 2xSide □ NO	FRONT ZIP Hips, Shoulders, Side - ■	FRONT ZIP Hips, Hips,Shoulders, Front, 2xSide ■ ■	FRONT ZIP Hips, Hips, Shoulders, Front, 2xSide ■ ■
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	2 ■ ■ ■ 2 ■ - 2	2 ■ - ■ 1 - - 2	- - ■ - ■ - 1	2 - - ■ 3 - - 1
WHISTLE GRAB HANDLE(s)	■ -	■ -	■ -	■ -
COWSTAIL / STOW POUCH	■	■ ■	■ ■	■ ■
QR KNIFE RADIO POUCH	■ ■	■ ■	■ ■	■ ■
CHEMLIGHT STROBE POUCH	■ ■	■ ■	■ ■	■ ■
REFLECTIVE ID FLAP/VELCRO	■ -	● -	■ ■	■ ■
STANDARDS/APPROVALS	USCG Type III	USCG Type V	USCG Type V	USCG Type V
OTHER COLOURS	■ ■ ■ ■	■ ■	■ ■ ■	■ ■
NOTES <i>italics=Manufacturer comments</i>	Customizable accessory features high floatation for peace of mind in big water.	Upgraded version of Ninja (\$160). Compact design delivers superior mobility and comfort with dialed- in rescue essentials.	Designed for working in the most demanding environments provides unlimited customization	Built to the standards of rescue professionals, becomes a wearable tool during an emergency
WEBSITE	nrs.com/rescue	nrs.com/rescue	nrs.com/rescue	nrs.com/rescue

				
				
NRS	NRS	PALM EQUIPMENT	PALM EQUIPMENT	PALM EQUIPMENT
VECTOR with RECCO	VECTOR SAR with RECCO	UNIVERSAL	RESCUE 850	RESCUE HYBRID
40114.xx	40103.xx	12355	12597	12644
				
				
7-8.2kg/15.5-18lb 70-80N	7-8.2kg/15.5-18lb 70-80N	10kg/22lb 100N	7-9kg/15.5-20lb 70N-90N	7-9kg/15.5-20lb 70N-90N
£243 \$330 €300	£260 \$340 €315	£245 \$325 €290	£295 \$389 €348	£260 \$343 €307
1.1kg /2.5lb	1.1kg /2.5lb	2.01kg /4.42lb	1.162kg /4.75lb	1.95kg /4.3lb
3 sizes 76-142cm/30-56"	2 sizes 111-142cm/44-56"	1 size 80-150cm/32-59"	3 sizes 78-126cm/31-50"	3 sizes 78-126cm/31-50"
recycled 420D Nylon	recycled 420D Nylon	500D Cordura PVC-free Gaia Foam	500D Cordura PVC-free Gaia Foam	500D Cordura PVC-free Gaia Foam
OVERHEAD Hips, Shoulders 2x Side	OVERHEAD Hips, Shoulders 2x Side	FRONT ZIP/BUCKLES 3xFront, Hips, Hips, Shoulders	FRONT BUCKLES 3xFront, Hips, Side, Shoulders	FRONT BUCKLES 3xFront, Hips, Side, Shoulders
				
3+  - 1  - 3 	3+  - 1  - 3 	2 1  - 2 	2 zipped  on rear velcro 2  4 9+ 4x cord eyelets 	0  2  2 2x cord eyelets 
 -        -	 -        	 -        	 -        	 -        
USCG Type V	USCG Type V	ISO	ISO	ISO
  				
First & only to incorporate 2 RECCO reflectors (requires rescuers to have the RECCO locator.)	Lower profile PFD optimised for missions that require ultimate mobility on land or water with Orbit-Fill™ technology	QR=UCLan clean release system. Shoulder straps tested to 3.2kN.	Updated 2025 version. QR=UCLan clean release system. Shoulder straps tested to 3.2kN.	Fully modular version of the Rescue 850 able to add pouches and attachments for everything or leave clean for swimming
nrs.com/rescue	nrs.com/rescue	palm.equipment	palm.equipment	palm.equipment

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◆ Kayak/watercraft

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MANUFACTURER	PALM EQUIPMENT	POSSESS SEA IND CO	POSSESS SEA IND CO	POSSESS SEA IND CO
MODEL VARIANT	RESCUE EXTREM	RESCUE PFD 1	RESCUE PFD 2	RESCUE PFD 3
PRODUCT CODE	12611			
ORIGIN				
INTENDED USES	◆ ◆ ◆ ◆			
BUOYANCY	6.1-7.6kg/13.5-16.75lb 60-75N	15.5kg/34lb 150N	15.5kg/34lb 150N	10kg/22lb 100N
COST inc 10%state tax/20%VAT	£260 \$00 €00	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00
WEIGHT	1.82kg /4lb	00kg /00lb	00kg /00lb	00kg /00lb
SIZES	3 sizes 78-126cm/31-50"	3 sizes	3 sizes	3 sizes
MATERIALS	500D Cordura PVC-free Gaia Foam	INVISTA 500D Cordura	1680D Nylon	INVISTA 500D Cordura
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	FRONT BUCKLES 2xSide*, Hips, Shoulders 			
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	1 2 - 2 3+4x cord eyelets	- - - -	- - - -	- - - -
WHISTLE GRAB HANDLE(s)	-	-	-	
COWSTAIL / STOW POUCH				
QR KNIFE RADIO POUCH				
CHEMLIGHT STROBE POUCH				
REFLECTIVE ID FLAP/VELCRO				
STANDARDS/APPROVALS	ISO	00	00	00
OTHER COLOURS				
NOTES <i>italics=Manufacturer comments</i>	*Non-adjustable QR=UCLan clean release system.	00	00	
WEBSITE	palm.equipment	en.drysuit.cn	en.drysuit.cn	en.drysuit.cn

		
		
IND CO	POSSESS SEA IND CO	SECUMAR
D 3	RESCUE PFD 4	Swift Pro
		
	 	 
	10kg/22lb 100N	5.1kg/11.2lb 50N
00	£00 \$00 €00	£202 \$00 €00
lb	00kg /00lb	00kg /00lb
	3 sizes	3 sizes
ordura	420D Nylon	Cordura
		Front Buckle  
	- - - - - - - -	2 - 2 - 1 - - -
		 
	00	00
cn	en.drysuit.cn	palm.equipment



Palm Rescue Hybrid PFD

 **WATER RESCUE**
WWW.PALMEQUIPMENT.PRO

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□ □ □ □ □ = OPTION

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3-BAR = Simple and/or Ladder-Lock buckle(lift and pull web thru)



MANUFACTURER	SRE (NDIVER)	SRE (NDIVER)	SRE (NDIVER)	SRE (NDIVER)
MODEL VARIANT	RESCUE 900	EVO X RESCUE	ARCTIC SURVIVOR EVO PRO 5	ARCTIC SURVIVOR EVO PRO 6
PRODUCT CODE				
ORIGIN	🇬🇧	🇬🇧	🇬🇧	🇬🇧
INTENDED USES	◆ ◆	◆	◆ ◆	◆ ◆
BUOYANCY	7-8.7kg/15.5-19.1lb 70-85N	7-8.7kg/15.5-19.1lb 70-85N	10-12.2kg/22-27lb 100/120N	10-12.2kg/22-27lb 100/120N
COST inc 10%state tax/20%VAT	£60 \$00 €00	£134 \$00 €00	£138 \$00 €00	£162 \$00 €00
WEIGHT	00kg /00lb	00kg /00lb	00kg /00lb	00kg /00lb
SIZES	3 sizes	3 sizes	3 sizes	3 sizes
MATERIALS	Cordura	400D Ripstop Nylon	400D Ripstop Nylon	300D Ripstop Nylon
FASTEN (Fast-Clip 3-bar) ADJUST (exc QR belt) LEGLOOPS/CROTCH STRAP QUICK RELEASE BELT/RING	Front Buckle ■ ■	Front Buckle/Velcro ■ ■	Front Buckle ■	Front Buckle/Velcro ■ ■
POCKETS /HANDWARMER ADD POCKETS OPTIONS LASH PADS / MOLLE RINGS (exc QR belt) SEWN EYES	2 - ■ 1 - 1 -	3 - ■ 2 - 2 -	2 - ■ 4 - 1 -	4 - ■ 1 - 4 -
WHISTLE GRAB HANDLE(s)		■ -	■ -	■ -
COWSTAIL / STOW POUCH				
QR KNIFE RADIO POUCH				
CHEMLIGHT STROBE POUCH				
REFLECTIVE ID FLAP/VELCRO	■	■ -	■ ■	■ ■
STANDARDS/APPROVALS	EN ISO	EN ISO	EN ISO	EN ISO
OTHER COLOURS	■			
NOTES <i>italics=Manufacturer comments</i>	00	00	00	00
WEBSITE	ndiver-rescue.com	ndiver-rescue.com	ndiver-rescue.com	ndiver-rescue.com

				
				
STEARNS	STOHLQUIST	SURVITEC/ HANSEN PRO	WRS International	
UNIVERSAL	DESCENT	NAVY-LIFE	RESCUE WRAP	
	11621	13807	W12REW	
				
				
00kg/00lb 00N	00kg/00lb 00N		9-11.2kg/20-24.6lb 90-110N	
£235 \$00 €00	£00 \$325 €00		£214 \$00 €00	
00kg /00lb	00kg /00lb		00kg /00lb	
3 sizes	3 sizes		3 sizes	
			500D Nylon	
00 	00 		SIDE BUCKLES 2xSide, Hips, 2xSide, Shoulders 	
- - - - - -	- - - - - -		4 - 2 - 1 -	
 -	 -		 -	
				
00	00		ISO	
				
STEARNS is MUSTANG but one or two products may still be branded as Stearns			In conjunction with Peak UK	
stearnsflotation.com	stohlquist.com		.com	



Water rescue boots are great for canyon and cave rescue but are a dilemma for multi-role agencies because the tasks they are expected to perform can be contradictory - lightweight, heavy duty, robust tread able to provide grip on slippery, wet surfaces- thin-and flexible enough for swimming fins, quick draining but don't let in too much sand/mud/grit, swim in them, walk on rocks, don't damage the inflatable rescue craft but be able to hike in to the incident scene, possibly from a very long distance. *Palm Equipment's* useful diagram on the right shows the general construction where the insole is always removable and usually cushioned and the midsole is the protective layer above the outsole which is the sole and any connected rand which we have listed as 'sole' and 'reinforcement' in our tables.

If you are a dedicated dive team or boat crew you are not so concerned about walking long distances and if you are a flood response team perhaps you're more concerned about walking through submerged debris and broken glass than swimming. Either way, we can divide these boots into four distinct types:

- **Flexible, enhanced rock/wet boots** which are a variation on dive 'rock' boots and watersport booties. **We have included some with the more robust soles** eg. *TDS & DUI* but *Apeks, Mares* etc. are in the updated version of this article in the **Water Rescue BUYERS GUIDE** which includes more dive and rock boots.
- **Military or mountain style high-leg service, walking or climbing boots** which



are stripped down from the usual full leather and stiffened insoles to become quick draining, ankle hugging and often quick-donning. One or two of the specialist water boots like *WRS* and *Bestard* are high leg but are closer in design to the next category than the military style boots...

- **Modified approach boots** - usually low cut boots or shoes with good soles for walking longer distances but without the usual *Goretex* or similar membrane designed to keep water out and let your foot breathe - instead, as with the high leg boots, they are the opposite of waterproof and have drain holes and fast draining materials and mesh that shed water once you're

out of water. These tend not to be quick donning as they lack zip-entry and are usually worn for the duration rather than be a shoe/boot you change into. Water sport companies like *Palm* and *Northern Diver* have such boots primarily aimed at boarders, rafters but entirely capable as general water rescue boots and there are many watersport and yachting boots from the likes of *Gul* but they are not included here. Canyoning with its mix of in water, hiking and climbing has been fertile ground for water rescue boot development because it is a mass-market driver to what would otherwise be a very small commercial market, that's why climbing legends *La Sportiva* have perhaps the coolest boot design with their *TX Canyon* (left) and *NorthernDiver* have their *Freestyle* renamed from *Canyon v2*. Further testament to this larger market driver is *Adidas* as worn



by rescuers in our title picture opposite, which is a very unusual brand for us to see in professional emergency service footwear though sport canyoneers and cavers will be familiar. Aside from their robust build (unusually non-draining), there is one very good reason why you might consider this boot above all other brands and that is the sizing. The majority of boots go up to UK14/

US15/EU48 some to EU50 but Adidas goes up to a whopping size UK18/US19/EU54%. I can tell you from personal experience that your chances of finding any size over EU48 on the shelf are minuscule but there is at least a chance you might get a size 49 or 50 and you know you can order a pair without incurring a custom-built charge.

• In its own category is the 'Mudder' which is more of an adjunct to your water rescue boot than a boot by itself but it can be used (as we can attest) in conjunction with your regular service boot to enable you to perform the small miracle of walking on mud rather than knee deep in it. Mud is a regular occurrence at a water rescue incident whether it be tidal, river bank or imported by flood water and the only difference then between a water rescue boot and a high-leg firefighting boot or even a pair of wellies is the speed with which they will drain and clean off once you're out of the mud.



WATER RESCUE BOOTS

Surface mud is the great leveller; no boot or shoe will do anything more than sink into mud without assistance from a load-spreader, in this case Mudders, but the swim style booties are unquestionably better for mixed mud and water environments as they are lighter within the Mudder, keep out fine particles and those tiny scratchy snails and quick to rinse off - something like the NRS ATB

Wetshoe or the OTB Abyss (above). The Mudder shown below was first produced in the US by AMAK in the 50s for hunters and bait diggers but Lyon Eqpt in the UK quickly saw their rescue applications and their usage increased in rescue but still not what they deserve.

Specially designed water rescue boots that we have mostly included here, are designed from the ground up to be a water rescue boot. The WRS, Ionic and Freestyle as distinct from the Haix Eagle for instance that is more of an athletic service boot that coincidentally had excellent features as a water boot or the Bestard SAR Pro which is an enhancement of its already very capable Guide boot. The WRS boot and Italian Cosmos Water Pro probably exemplifies best the design thought process when starting from scratch - they picked a sole that was coarse enough to give protection



WRS WATER RESCUE BOOT



The WRS Water Rescue Boot is designed to give the user both **confidence** and **protection** in this **difficult environment**.

- Synthetic leather and Neoprene upper
- Nitrile rubber sole for added grip on wet smooth surfaces
- Multi directional tread pattern for slippery terrain
- Boa Lace System for a secure and quick fit.
- Fibreglass safety toe cap.
- Anti-perforation midsole
- Drainage holes
- Oil resistant sole
- Bright colour for under water identification
- Reflective detail on tongue
- Certified: EN ISO 20345: 2011 S1P SRC
- Sizes 36- 48

CONTACT

Krommebeekstraat 44
8930 Menen, Belgium
+32 56 21 38 62
contact@wrsinternational.com
www.wrsinternational.com



from ingress of broken glass and sharp stones/rock etc. and good grip on wet rock or a boat hull but made it more flexible than a stiffened midsole safety or mountain boot. It retained a protective toe cap in case of rock movement or entrapment under water and added protective reinforcement to the toe, the heel and



the lower mid area in between like a shaped rand. They made the upper out of thermally cushioning neoprene with a gaiter-style cuff at the top that inhibits ingress of debris, grit and those pesky snails. Instead of laces the WRS adopted the modern BOA concept of fast-ratcheting lace/cord tightening while the Cosmos has a full length frontal zip which, together with a very wide opening tongue and flexible neoprene cuff make these a fast entry donning/doffing boots. The insoles were quick to remove to allow for the different foot sizes whether wearing hiking socks or a drysuit's wet-sock. Finally, since these are for rescuers

they are high vis colours, more visible underwater when looking to place your feet carefully as well as being a visible addition to the rest of your high visibility rescue ensemble. In this aspect the WRS just about trumps all others!

IN THE FOLLOWING TABLES.....

Guide to Water Rescue Boots in the **WATER RESCUE BUYERSGUIDE** for regular updates to this article.

Any use, feature, accessory or component that is inherent in the tool is shown as a solid coloured square ■■■■■■ If it's an option it is shown as an outline square □□□□□□ A circle ●●●●●● in the 'USE' row indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

A model variant is shown in cyan blue and any features or specifications that differ from the standard are also in cyan or will have a cyan outline to a black or orange square ■■■■.

USES: refers to the range of activities that the boot can be used for. Hardcore water rescue boots like the WRS and Freestyle are so specifically designed towards water rescue that they are of less use in activities like hiking in or working on a rubble pile. Conversely, those that are more utilitarian are probably not quite as proficient for pure water rescue but for cross-discipline teams - good enough!

■=Dive - for use with drysuits and fins underwater - fast draining

■=In/Around Water /Boat- for use walking through or swimming in water and on the bank or in a watercraft- eg. boat crew, swiftwater & canyoning, Fast draining.

■=On Land - walking or hiking longer distances

■=USAR - more rugged boots with safety toe and capable of withstanding work in and around concrete and building debris such as urban flooding or tsunamis.

■=Tactical - suitable for military use - able to walk longer distances and will be low viz/black.

ORIGIN: The company's home country, not necessarily the country of manufacture which is indicated by an inset flag or two equally sized flags if the tool is made in both countries.

COST: Prices in burnt orange colour £\$€ are a currency conversion only and may not include bulk shipping, import duty and taxes etc. Prices are a guide only & include local taxes/VAT. They vary with exchange rates, extra taxes etc. Usually rounded up to the nearest Pound£/US Dollar\$/Euro€. Cost is usually for a basic model.

WEIGHT: Is for ONE BOOT size EU 43/44 UK 9/10 USA10/11 this is therefore only a rough guide as the smallest size would be considerably lighter than the largest size.

SOLE: ALL WATER RESCUE BOOTS HAVE ANTI-SLIP SOLES (SRC) so we have not included that as a feature - it's a given!

SOLE MATERIAL: Usually a nitrile rubber but there are some variations on this, a better indication can be the.....

STYLE/BRAND: because there is no doubt that certain designs within well known brands like Vibram and Skywalk can be relied upon. They are not necessarily better than some of the in-house mouldings but until you have bought and used those own-brands you don't have much of an idea whereas the known brands will already be used on other boots that will have chosen that sole for a reason.

ANTI- OIL CHEMICAL STATIC: The sole will not decompose in the presence of hydrocarbons (oil/petrol) or chemicals and/or will not generate static electricity

ANKLE INGRESS SEAL: The Collar is the top of the boot and neoprene collars provide reasonable protection against ingress but a cuff is a closer fitting option and usually an addition to the boots collar.



PADDED ANKLE COLLAR: this refers to genuine auxillary padding such that the collar is noticeably 'puffy' not simpler a fatter section of neoprene or leather!

SHOCK ABSORBING: indicates an active shock absorbing element built into the sole of the boot (not simply the insole as this can be supplemented with off-the-shelf options). This can be a sorbothane or EVA insert, sometimes air bubbles.

METAL / COMPOSITE TOE: a protective toe cap that withstands impact to some degree - 200joules for alloy or 100joules for composite (see standards). Most also have a rubber or reinforced cover to a protective cap and some with no certified protection simply have extra rubber.

PULL ON TAB/ LOOP: A leather flap or a **sewn-in loop** to assist in pulling the boot on.

HI-VIS REFLECTIVE: Boots designed for rescue will have sections of trim that are highly coloured for visibility by others and for the wearer to spot foot placement in murky water. Some will have reflective panels for visibility to other searchers at night or in low light.

ENHANCED DRAINAGE: All of these boots will drain to some extent as the materials are porous not waterproof but most have additional holes, mesh or material placement that accelerates draining of water so that each foot lift does not weigh many times more than it has to. Neoprene or similar foot hugging materials 'booty' do this by restricting the available space for the water to collect. However, it is worth remembering that draining water is akin to draining body (foot) heat so not necessarily what you want in all conditions.

LACING/FASTENING/ZIP: Lacing systems are conventional or speed lacing where you pull on just the ends to tighten the entire stack rather than having to do each row individually.

Straps are virtually all Velcro/hook&loop but some are buckles. As always, Velcro with a capital 'V' is the proper brand. Non-branded hook & loop has a lower case 'v'. Becoming more common is the BOA system where thin 'laces' or cord runs into a ratchet hub that tightens the cord when rotated.

Zips are shown as a pink square

With boots that are designed to be submerged there is no need for a zip to the watertight but the better zips have large teeth that are not so prone to jamming up or 'de-railing' and should be backed by a neoprene or similar material strip that resists the ingress of sand/grit/mud.

STANDARDS / PROTECTION: The European norm most applied to water rescue footwear is **EN ISO 20345:2011** which is for safety footwear and nothing directly to do with being a water rescue boot.

SB: This would have a protective toe cap that withstands a 200joule impact or for a lesser figure of 110 joules/Newtons the label is **SBP S1 S2 & S3** are anti-static where the number is irrelevant for water rescue boots as it is the degree of water resistance/repellency! **SRC** indicates slip-resistance on a ceramic and steel surface with soap and glycerol.



Oceanid™
WATER RESCUE CRAFT

RDC@Oceanid.com
(208) 322-3600



IMAGES NOT TO SCALE

OTHER TOOLS IN RANGE:

-  DIVE
-  IN/AROUND WATER
-  LAND/WALKING-APPROACH
-  TACTICAL
-  USAR

    = Partial feature or OK but not ideal

   = Option

~ = approximate

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COMPANY		ADIDAS 2.0	ASTRAL	ASTRAL
MODEL		TERREX HYDRO LACE	RASSLER 2.0	HYAK
USES		 	 	
ORIGIN				
COST inc tax / VAT		£130 \$169 €124	£150 \$150 €140	£150 \$150 €140
WEIGHT - 1 boot size 43/44 9/10		680g / 1.5lb	273g / 9.6oz	275g / 9.6oz
MATERIALS	UPPER	HD Nylon laminate	Canvas	Canvas/1060D Cordura
	UPPER REINFORCEMENTS	Heel, Toe, Lower-mid, Ankle	Heel, Toe	Heel, Toe, Lower-mid
	MEMBRANE/LINING	Neoprene	3D Airmesh	3mm quilted spacer-mesh
	MIDSOLE/RESIST PENETRATION	-	flat-no arch EVA -	flat-no arch EVA -
	INSOLE REMOVABLE	AdiPrene Eva foam 	7mm EVA 	7mm EVA 
SOLE	SOLE			
	SOLE MATERIAL	no-mark Rubber	No Mark G-Rubber	No Mark G-Rubber
	STYLE/BRAND	'Stealth' Marathon	Astral GraniteGrip*	Astral Flexgrip
	ANTI- OIL CHEMICAL STATIC	-	-	-
COMFORT	SIZES UK US EU	4-18 5-19 36-54½	4-13 5-14* 36-49½	4-13 5-14* 36-49½
	ANKLE INGRESS SEAL	Neoprene cuff	-	-
	PADDED ANKLE COLLAR			
	SHOCK ABSORBING			
FEATURES	METAL / COMPOSITE TOE	Toe cap only	-	-
	PULL ON TAB/ LOOP			
	HI-VIS REFLECTIVE	 	-	-
	ENHANCED DRAINAGE	No	4 holes, mesh tongue/gusset	mesh tongue/gusset
	LACING/FASTENING ZIP	Speed Lace + velcro strap	Laces	Laces + Velcro strap
STANDARDS/PROTECTION		-	-	-
OTHER COLOURS			 	
NOTES		2025 Orange colour shown.	* Womans' sizes from W6 to W15. Men's = wider toe box * Granite-Grip = less flex more wear-resistance	* Womans' sizes from W6 to W15 Protective cover for laces. * Flex-Grip = more flex/grip less wear-resistance
WEBSITE		adidas-group.com	astraldesigns.com	astraldesigns.com

			
			
BAIZHOU/POSSESS SEA*	BESTARD	BESTARD	BESTARD
RESCUE 01	AQUA PRO	WILDWATER PRO	CANYON GUIDE SAR (PRO)
			
			
£204 \$00 €230	£167 \$217 €212	£167 \$217 €209	£191 \$248 €228
770g / 1.7lb	440g / 15.5lb	535g / 1.17lb	600g / 1.3lb
Synthetic leather	H2O Microtech / Cordura	H2O Microtech / Cordura	H2O Microtech / Cordura
Toe, Heel	Rubber toe, TPU Heel	Rubber toe, TPU Heel	TPU heel, toe, lower mid
4.5mm CR Neoprene	Hydro-mesh	Hydro-mesh	Hydro-mesh
Kevlar 	Thermoplastic -	Thermoplastic -	Thermoplastic/Ceramic 
	EVA/Cambrelle 	EVA/Cambrelle 	EVA/Cambrelle 
			
RUBBER	no-mark RUBBER + EVA	no-mark RUBBER + EVA	no-mark RUBBER + EVA
In-House	Vibram Best IdroGrip	Vibram Best IdroGrip	Vibram Best IdroGrip
	-	-	-
3-12 4-13 37-46	4-13 5-14 37-49½	3.5-14 4.5-15 36-48	3.5-14 4.5-15 36-48
Neoprene cuff	-	-	drawcord gaiter
-			
-			
Rubber	-	-	Liquid Thermo Plastic
			
 or 	 	 	 
2x Mesh panels	4 holes + mesh	4 holes + mesh	4 holes + mesh
BOA	Laces & stow pouch	Locking Laces & stow pouch	Locking Laces & stow pouch
-	-	-	-
	-	-	 *
*Possess Sea Ind.Co & Jiangsu- Baizhou co-produce this. Baizhou version has a metal grip cleat in the sole. Fin retaining heel.	*Including half sizes. Latin last (narrow fit). Stainless Steel eyes. Bulk order Customisation	*Including half sizes. Wide last/fit. Stainless steel eyes. Bulk order Customisation	Extra wide last. Stainless steel lace eyes. *Black-Canyon Guide (not SAR) *Including half sizes
jsbaizhoucn.com en.drysuit.cn	bestard.com	bestard.com	bestard.com

IMAGES NOT TO SCALE

OTHER TOOLS IN RANGE:

-  DIVE
-  IN/AROUND WATER
-  LAND/WALKING-APPROACH
-  TACTICAL
-  USAR

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COMPANY		DUI	HAIX	JOLLY SCARPE/COSMAS
MODEL		ROCKBOOT	BLACK EAGLE ATHLETIC 2.0 T ZIP	PRO 3/4 WATER
USES		  	  	  
ORIGIN		 		
COST inc tax / VAT		£152 \$140 €145	£160 \$210 €190	£105 \$136 €125
WEIGHT - 1 boot size 43/44 9/10		600g / 1.3lb	615g / 1.35lb	710g / 1.56lb
MATERIALS	UPPER	HD Nylon laminate	Micro-fibre/textile	Cordura, Neoprene
	UPPER REINFORCEMENTS	Toe, heel	Heel, Toe, Ankle	Heel, Toe, Lower-mid
	MEMBRANE/LINING	1.5mm Hyper-Compressed Neoprene	Mesh	Lycra/Neoprene
	MIDSOLE/RESIST PENETRATION	Flat, minimal arch 	Texon Polymer 	Cushioned PU 
SOLE	INSOLE REMOVABLE	EVA/Cambrelle 		
	SOLE			
	SOLE MATERIAL	RUBBER + EVA	non marking RUBBER	NITRILE RUBBER
	STYLE/BRAND	in-house	Haix	In-House
COMFORT	ANTI- OIL CHEMICAL STATIC	-		 
	SIZES UK US EU	3-14 4-15 36-48	3-15 m/w 4-16 m/w* 36-49 m/w	5-14 6-15 40-47
	ANKLE INGRESS SEAL	-	-	Neoprene Cuff
	PADDED ANKLE COLLAR			
FEATURES	SHOCK ABSORBING			 EVA heel
	METAL / COMPOSITE TOE	Rubber		
	PULL ON TAB/ LOOP	 *	 	-
	HI-VIS REFLECTIVE	-	-	
STANDARDS/PROTECTION	ENHANCED DRAINAGE	4 holes in Rand	mesh upper	Perforated lower-mid
	LACING/FASTENING ZIP	Laces & stow pouch	Laces + 	Speed laces, hook/elastic loop 
	STANDARDS/PROTECTION	-	EN ISO 20347	EN ISO 20347 01 PHIC HRO FO AN SRC
	OTHER COLOURS	-		-
NOTES		*Velcro loop designed to stow lace-ends. Wear with wet sock	*Medium or Wide fit. Not to be confused with the GTX version with no zip-not for water rescue!	Laces & padded ankle inside outer gaiter. Inc extra pr of laces. 21cm high inc sole
WEBSITE		divedui.com	haix.com Haixusa.com	jollyscarpe.com

	
	
LA SPORTIVA	MUDDER BOOT CO
TX CANYON	MUDDERS
	 * MUD
£180 \$234 €144	£236 \$158 €250
470g / 1lb	1.1kg / 2.4lb
Ariaprene TPU/foam laminate	Vulcanised rubber
Heel	-
EVA -	- 
	
RUBBER + EVA	VULCANISED RUBBER
Vibram IdroGrip	In-House
6-12 7-13 39-46	One Size Fits All
'Spyral' Neoprene Cuff	-
-	-
	-
Rubber	-
	-
	-
2 holes + upper perforation	fully drains on incline
Speed Lace + velcro Strap	2x buckled Straps
-	-
-	-
	Fits any boot and *allows progress on mud as the top flares like a webbed foot to provide large surface area
lasportiva.com	mudderboots.com



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SWIFTWATER RESCUE EQUIPMENT
 Dry suits • Life Jackets • Footwear • Gloves • Helmets
 Rafts • Rescue hardware and more...

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OTHER TOOLS IN RANGE:

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COMPANY		NORTHERN DIVER	NORTHERN DIVER	NORTHERN DIVER
MODEL		FREESTYLE/CANYON V2	PROSAFE V2	ROCK-SWIM
USES		  	  	   
ORIGIN				
COST inc tax / VAT		£94 \$122 €114	£101 \$132 €122	£68 \$89 €82
WEIGHT - 1 boot size 43/44 9/10		740kg / 1.6lb	730kg / 1.6lb	650kg / 1.4lb
MATERIALS	UPPER	Micro-Fibre	Micro-Fibre/Cordura	Synthetic Leather & Nylon
	UPPER REINFORCEMENTS	Heel, Toe, Lower-mid	Heel	Heel, Toe
	MEMBRANE/LINING	Mesh	Mesh	Neoprene & mesh
	MIDSOLE/RESIST PENETRATION	Composite	Composite	Flexi -
	INSOLE REMOVABLE	Neoprene 	PU foam 	- Neoprene
SOLE	SOLE			
	SOLE MATERIAL	RUBBER + EVA	RUBBER + EVA	RUBBER
	STYLE/BRAND	In-House	In-House	In-House
	ANTI- OIL CHEMICAL STATIC		 	 
COMFORT	SIZES UK US EU	3-14 4-15 36-48	3-14 4-15 36-48	6-12 7-13 39-46
	ANKLE INGRESS SEAL	-	-	Gusseted neoprene gaiter
	PADDED ANKLE COLLAR			-
	SHOCK ABSORBING	 EVA heel	 EVA heel	 EVA heel
FEATURES	METAL / COMPOSITE TOE			-
	PULL ON TAB/ LOOP			
	HI-VIS REFLECTIVE			-
	ENHANCED DRAINAGE	2 holes with mesh backing	4 holes with mesh backing	2 lg holes with mesh backing
	LACING/FASTENING ZIP	2x velcro Straps + 	BOA	Laces + velcro strap
	STANDARDS/PROTECTION	EN ISO 20345 SB S1 S2 S3 SRC	EN ISO 20345 SBP S1 S2 S3 SRC	-
OTHER COLOURS		-	-	-
NOTES				
WEBSITE		ndiver-rescue.com	ndiver-rescue.com	ndiver-rescue.com

			
			
NORTHERN DIVER	NRS	NRS	NRS
ROCK-SWIM SAFETY	STORM	WORKBOOT WETSHOE	ATB WETSHOE
			
			
£76 \$98 €92	£150 \$150 €165	£85 \$95 €79	£70 \$75 €70
800kg / 1.76lb	680g / 1.5lb	500g / 1.1lb	500g / 1.1lb
Synthetic Leather & Nylon	Polyuretane/Synth rubber	5mm Neoprene.Synth Leather	Micro-Fibre/Cordura
Heel, Toe, Lower-mid	Heel, Toe, Lower-mid upper ankle	Heel, Toe, Lower-mid	Heel
Neoprene & mesh	Polyester mesh	Micro-fibre/Mesh	Mesh
Composite 	EVA	Polymer 	Composite -
- Neoprene	Perforated 5mm 	- 7mm Neoprene	- PU foam
			
RUBBER	non-mark RUBBER	RUBBER EVA	RUBBER EVA
In-House	'Hypergrip'	In-House	In-House
	-		
6-13 7-14 39-47	4-14 5.5-15 38.5-48.5	3-14 4-15 36-48	3-14 4-15 36-48
Gusseted neoprene gaiter	-	-	-
-			
 EVA heel	 EVA heel	 EVA heel	 EVA heel
- 	Rubber -	-	-
			
-	-	-	-
2 lg holes with mesh backing	Mesh uppers	2 holes with mesh backing	4 holes with mesh backing
3x velcro Straps + 	Laces + 	Laces, velcro Strap + 	velcro Strap + 
EN ISO 20345	-	-	-
-	-	-	-
	Swim fin 'lip' on the heel. Zip=YKK Aquaguard	Swim fin 'lip' on the heel. Zip=YKK Aquaguard	Swim fin 'lip' on the heel. Zip=YKK Aquaguard
ndiver-rescue.com	nrs.com/rescue	nrs.com/rescue	nrs.com/rescue

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-  IN/AROUND WATER
-  LAND/WALKING-APPROACH
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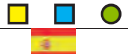
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COMPANY		OTB	PALM EQUIPMENT	SAFEQUIP
MODEL		ABYSS	GRADIENT 3.0	IONIC ROCKA
USES		   	 	 
ORIGIN				
COST inc tax / VAT		£154 \$200 €186	£150 \$195 €181	£107 \$190 €175
WEIGHT - 1 boot size 43/44 9/10		630g / 1.4lb	413g / 14.6oz	1kg / 2.2lb
MATERIALS	UPPER	Ballistic nylon, Thermo-polyurethane	3mm CR limestone neoprene/mesh	Synthetic Leather/Nylon
	UPPER REINFORCEMENTS	Heel, Toe	Heel, Toe, Lower-mid	Heel, Toe
	MEMBRANE/LINING	Ballistic nylon mesh	Mesh	Mesh
	MIDSOLE/RESIST PENETRATION	- -	Cushioned - EVA -	Kevlar 
	INSOLE REMOVABLE	'SEAL' Composite 	cushioned 	
SOLE	SOLE			
	SOLE MATERIAL	RUBBER	HYDRO GRIP RUBBER	RUBBER Compound
	STYLE/BRAND	Tactical Sole Tech	Vibram IdroGrip	Vibram
	ANTI- OIL CHEMICAL STATIC	 		
COMFORT	SIZES UK US EU	4-13 5-14 36-46	5-14 6-15 40-47	3-13 4-14 36-48
	ANKLE INGRESS SEAL	Neoprene Cuff	Neoprene Cuff	Neoprene Collar
	PADDED ANKLE COLLAR	-	-	-
	SHOCK ABSORBING		 EVA heel	
FEATURES	METAL / COMPOSITE TOE	-		PU
	PULL ON TAB/ LOOP			
	HI-VIS REFLECTIVE	-		
	ENHANCED DRAINAGE	2 lg mesh holes + perf Sole	-	Mesh upper & 6 panels
	LACING/FASTENING ZIP	Laces + closed neoprene cuff	Lace	BOA
	STANDARDS/PROTECTION	EN ISO 20345	-	EN ISO 20345:2011
OTHER COLOURS		-		-
NOTES			 Lace storage pouch in tongue. Inc extra pr of laces.	 Alternate Vibram sole
WEBSITE		OTBboots.com	palm.equipment	ionicrescue.com

			
			
TDS Technical Dive System	TDS Technical Dive System	VOLKL	WRS/ROCKFALL
OMAHA XTREM 2.1	STRONG	AQUASAFE	WATER RESCUE BOOT
			
£74 \$94 €89	£57 \$75 €64	£142 \$184 €170	£170 \$265 €205
n/a	n/a	550g / 1.2lb	750g / 1.6lb
Synthetic/Nylon mesh	6.5mm neoprene	1.8-2mm PU/Leather/Cordura	Synth Leather/Neoprene
Heel, Toe	Heel, Toe	Heel, Toe	Heel, Toe, Lower-mid, Ankle
Mesh	-	Textile mesh	-
-	-	Kevlar-composite 	Kevlar-composite 
			EVA 
			
Perforated PU	Perforated PU	Injected RUBBER/PU	NITRILE RUBBER
In-house	In-house	non-mark	Rockfall
-	-		
6-13 7-14 39-47*	3-14 4-15 36-48	4-15 5-16 38-50	3-15 4-16 36-50
Neoprene Collar	Neoprene Collar	-	Neoprene Cuff
-	-		-
			
Rubber	Rubber	200j	
	-		
-	-		
Reinforced Mesh upper	-	-	4+ Mesh Gusset in Tongue
toggled Lace + velcro strap	velcro flap + 	Strap with cam-lock buckle	BOA
-	-	EN ISO 20345:2007 S1P SRC	EN ISO 20345 S1P SRC
-	-	-	-
* sizing in two-size increments eg. 40/41, 46/47 etc. Fin restraint 'lip'	Heavier duty version of 6mm Strong	Quick release buckles.	
tdsdive.com	tdsdive.com	voelkl-professional.com	wrsinternational.com

INFLATABLE PONTOOONS& PATHS

images not to scale

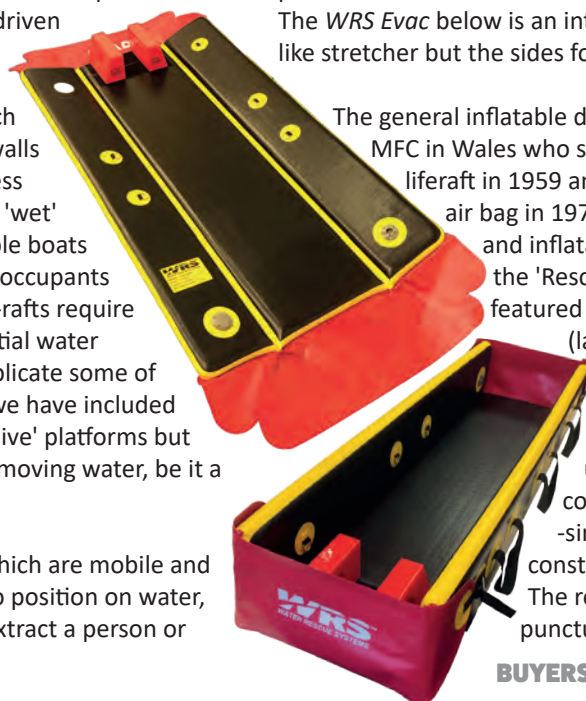


This GUIDE to inflatable platforms could be divided into what we will call 'passive' and 'dynamic' products.

The next guide is 'dynamic' inflatables which are open-backed sleds designed to be powered or paddle driven through water or they can be pushed, towed or 'punted' over ice/mud/sand in order to reach a person in difficulties. Such craft have an inflatable gunwale or side-walls and an open back that allows easier ingress into or egress out of the water. These are 'wet' craft and not to be confused with inflatable boats and rafts which are designed to keep the occupants dry-ish. Inflatable sleds and open backed-rafts require the occupants to be fully kitted for potential water entry. Sleds and even tow-boards can duplicate some of the work of the paths in this GUIDE and we have included some flat sleds that function well as 'passive' platforms but they are primarily intended for rescue in moving water, be it a broad flood or complex swiftwater.

This GUIDE concerns passive platforms which are mobile and can be pushed, pulled or leapfrogged into position on water, ice, mud or sand in order to access and extract a person or

animal in difficulties. Other than one or two that have a raised 'lip' these platforms are flat mats which can be walkways across water and unstable surfaces and/or work platforms from which to perform the rescue. Some of these models are not the same flat surface on the bottom as they are on the top - some have a catamaran style base. We haven't included inflatable stretchers unless they are flat top and can be used as an impromptu work platform or access method over water and unstable surfaces. The *WRS Evac* below is an interesting oddity because it's a box-like stretcher but the sides fold down to create a flat platform.



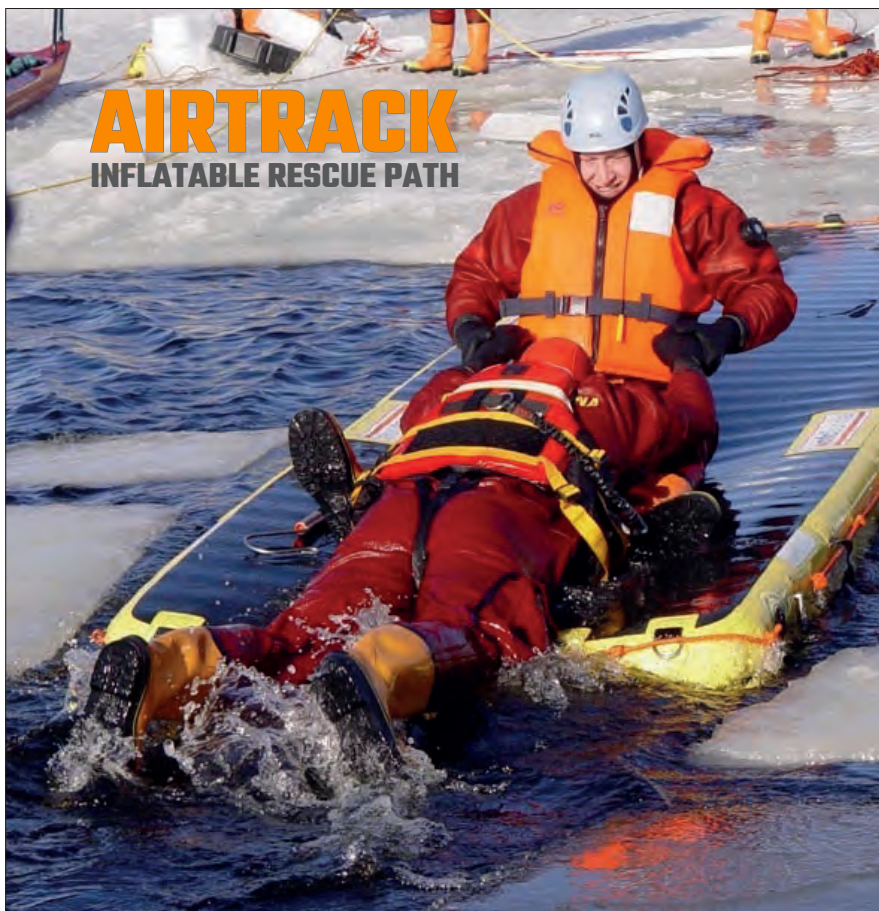
The general inflatable design we see now, originated with MFC in Wales who started in rescue with lifejackets and liferaft in 1959 and went on to invent the pneumatic air bag in 1971. The technology for both airbags and inflatable platforms is quite similar so the 'Rescue Path' was born in the 80's. This featured a very tough rubber and neoprene (later Hyperlon) outer fabric, reinforced internally with a fabric mesh and held flat, rather than ballooning into a ball, by judicious use of retaining string or cords connecting the top to the bottom -similar to mattress springs, this construction they called 'drop-stitch'. The result is a very tough, virtually puncture-proof (but we'll call it puncture-

INFLATABLE PONTOONS & PATHS

resistant) mat a few inches thick that can be transported in a back-pack-sized package and inflated in minutes on-scene using compressed air or in dozens of minutes using a hand or foot pump. Having the option of both is most useful to ensure that you are not wholly reliant on a properly charged compressed air cylinder that hasn't been quietly leaking air all the way to the incident.

One amazing feature of this class of rescue products is that manufacturing hasn't strayed much outside of the UK with only one made in North America. *MFC* are still the granddaddy of inflatables though they have some younger competitors to contend with these days so the UK still produces most models of inflatable platforms - from the original *MFC* to *WRS* (Water Rescue Systems) and *SIT Ltd* (Specialist Inflatable Technology) and latterly *Northern Diver* as well as the other Brit, *Checkmate Flexible Engineering* (making the *IC.Brindle* models) *WRS* have actually now relocated to Belgium as *WRS International*. We then saw *Savatech* in Slovakia (although they are now hard to find and may have been discontinued under *Trelleborg*) and *VETTER* in Germany expanding into inflatable paths because they, like *MFC*, were already producing pneumatic air bags. In fact *VETTER* took things a step further and are the only commercial rescue producer of high-fall air bags - giant inflatables that can save a person falling from height. Another company in Slovakia that we weren't familiar with is *Nexis* which has a single 5.1m/11' path in a fetching white with red trim and is almost certainly rebadged from a *Duletai* product.

We saw a lot of Chinese inflatable platforms while researching this GUIDE but only *Duletai* with their *Durainflate* series seemed to be aimed at the professional market and indeed imported into Europe and the US by a number of reputable companies. We always hesitate to include Chinese products in our GUIDES, not because they are poor products - we always say that the Chinese can produce to whatever quality they are asked including the very best, but because so many products are counterfeit copies. We can't say that of *Duletai* because their range is unlike the others. They have incorporated a double air chamber where a smaller safety chamber of 30-50% of total air capacity is surrounded and protected by the main



AIRTRACK
INFLATABLE RESCUE PATH



MFCInternational
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ENGINEERED INFLATABLE PRODUCT SOLUTIONS

- Catamaran design with twin sponsons for water, mud and ice rescues
- Excellent stability
- Lengths from 2 to 15m
- Available in Hypalon or TPU materials
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chamber. Should the main chamber develop a serious leak you still have a useful degree of floatation. We can't say for sure that this makes them fit for purpose having not used them but the design, materials and spec look promising, they even quote a DIN-compliant figure for tenacity and cohesion strength of the fabric and laminate bonding of the top surface and the sidewall of, respectively: 2600x5000 (+/-150) Newtons per 5cm, 150x150 (+/-10) Newtons per 5cm & 3000x3000 (+/-200) Newtons per 5cm, 100x100 (+/-10) Newtons per 5cm. We haven't seen these kinds of figures quoted by others so *Duletai* are obviously keen to be transparent assuming the figures are accurate.

It's interesting to note that some designs have tried to address one problem that can occur with a broad, flat surface in contact with wet mud and sand - suction. It can be difficult to lift and move these mats so a number of designs have a catamaran-style base mentioned earlier and shown in this *IONIC RESCUE* model that lifts the mat clear of the surface to negate that suction. Being much higher they also afford a little more protection in water but of course that height can make loading on board the platform more difficult than mats that are only a few inches high. *WRS* took a different approach and have incorporated a forced curve to their mats (shown here in the original colourway) such that it lays flat when there is weight on it but is curved to sit only on its longer outer edges when empty- genius!

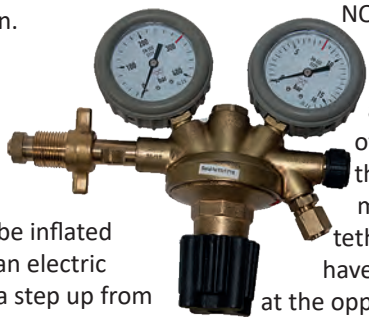


HYPALON VS PVC *Hypalon* is a *DuPont* tradename though, like *Hoover*, it seems to have become a more generic term for the tougher, more UV, abrasion and chemical-resistant material of the two. Consequently, it's heavier, more expensive and with less colour options. *Hypalon* is also more resilient in extreme cold and heat but as a rough guide both materials can operate in temperatures from around -25 to +60°C (-13 to 140°F) but should be stored in cool dark places around 15 degrees give or take 10 degrees either way and obviously never in direct sunlight or adjacent any solvents or chemicals. These things are basically modified lifting air-bags with a drop-stitch construction where a thread, cord or fabric ties the upper and lower surfaces together to stop then path becoming a balloon.

FEATURES of INFLATABLE PATHS

INFLATION & VALVES

All of these rescue-oriented models are inflated by BA style compressed air cylinders which suits fire services nicely. Most can also be inflated by high capacity hand or foot pumps or even an electric inflation pump - preferably something that is a step up from those cigarette lighter lilo inflators or you'll be there for quite some time. Compressed Air (CABA) inflation is the preferred option for speed because it inflates in seconds to a few minutes rather than several minutes. Most companies can provide the most compatible pressure reducer and hoses for your services



air cylinders. Over-pressure is not an issue since they all have a safety valve that will purge air (SAFETY PRV). Pressures need to be high to provide the rigid surface capable of taking around 100kg/220lb per square metre of path. In some cases there is a separate 'dump' or purge valves for rapid deflation often doubling as the safety valve. A speedy deflation can also be achieved by using a suction pump on the inflation point. Once inflated, these things are rock-hard and tough as old boots but they don't have a limitless capacity for being squashed - under high load they will deflect and maybe crease in water but on a harder, more resistant surface like mud or sand they would either rupture or, in most cases the safety or over-pressure valve would save the day and expel air rather than rupture a seam. Typical load capacities are around 100kg per square metre give or take several kg so with most paths being about a metre wide you can gauge their capacity by the length - a 3m path will take 3 or 4 people or one horse, a 10 metre might take a dozen people or a small herd of sheep but good luck keeping any live and frisky animal on-board. For animal rescue, platforms can be useful for physically hauling and sliding an animal out of mud or water but they tend to be used more for the human rescuers to carry out a rescue around a trapped animal (or human) - frequently in mud, sometimes sand where the platform either allows easy access and deployment of air lances

to free a mud-entrapment or can be used as a base for a lifting tripod being careful NOT to exceed the per square metre or foot load rating.

'LOAD-BEARING' EYES

Virtually all designs have towing or connection eyes, either as metal rings or webbing eyes on the ends or close to the ends on the top. These can be used to connect paths together and create much larger working areas or to tow the paths into position/ back from a rescue; the UK Coastguard Mud Rescue Teams have provision for a powered winch to drag their rescue sled back to dry land after a rescue but this principle can extend to paths that have strong enough towing eyes. Such attachment points can also be used as tether points for holding position in flowing water but NONE are intended as vertical lift eyes for hoisting with weight on the platform. Only the inflatable stretchers are properly equipped for hoisting as noted in the

NOTES section of one or two in this list. Some models have different sizes of D-rings and while there are no figures given it is likely that the smaller D-Rings are intended to have less load applied - these are often around the circumference or side walls with the perimeter cord running through so load is shared more equally between them that the larger towing/ tethering eyes. One or two, like the *Checkmate* models have connection hooks on one end and connecting eyes

at the opposite end.

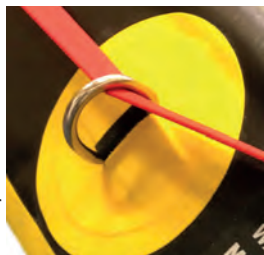
HANDLES

There are carry handles on most models, these are intended for transport and positioning NOT for lifting stretcher style though that is possible with one or two of the paths with a

high 'freeboard', the *SIT* models for example are nearly double the height of the *Vetter* paths. Some handles are bespoke, ergonomic grips while others may simply be the perimeter cord with a smaller gap between anchor points.

PERIMETER CORD

There is cord or webbing running around the top surface or all the way around the sides of most paths. This tends to be on the rectangular models which are long and thin rather than the smaller square models. Cord is fastened to the top surface or the sidewalls of the path at intervals and can be used to aid positioning of the path, for in-water casualties that won't fit on top to hold onto or to fasten equipment or throwbags etc. anywhere along the path's length and ensure you don't lose anything during the rescue mêlée. On longer models this can add a kilo to the weight as it tends to be 7 to 10 mm in diameter for easier grasping.



MFC's Animal Rescue Path seems to be the original Rescue Path that we used to deploy for just about everything from mud and ice to quicksand and even trench rescue but is now re-purposed as an animal rescue platform. It's still a great and probably more cost-effective, general option for mud/ice/sand rescue but with less frills and a slicker surface. In the image below, the sheer scale of effort required to rescue a cow from mud can be seen, plus the necessity for a slick surface in sliding the cow out. Here it's all hands to the pump in Hampshire, UK as the Animal Rescue Team, Water Rescue Team, local fire crew, farmer and vet all get involved. The slick surface, as distinct from the now more common tactile surface, enables rescuers to drag the animal out and is made easier in dry weather with liberal application of a bucket of water.



NON-SLIP TOP SURFACE

A slick rubber surface might be good for sliding animals on but it is something of a liability for anyone stood on it or trying to walk across it so most have some form of extra grip - this can be a textured or dimpled surface across its entirety like EVA foam or it may be a series of ribs. Most use a tactile surface like this *NDiver* model (right) which is noticeably matt and grippy in appearance but some have a surface that is not immediately distinct from a non-textured surface yet still flat and grippy. There are times when a tactile surface is more of hindrance than a help - trying to slide a trapped animal onto the platform for instance and when it comes to cleaning/decontamination but on the whole - greater traction is more useful to rescuers.

INFLATABLE PONTOONS & PATHS

IN THE FOLLOWING TABLES.....

Any use, feature, accessory or component that is inherent in the product is shown as a solid coloured square ■■■■

If it's an option it is shown as an outline square □□□□

A circle ● in the 'USE' columns indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture indicated by an inset flag.

COST: a rough guide only - includes local taxes/VAT. Varies with exchange rates, extra taxes etc. Like our other GUIDE in this issue, hardly anyone is prepared to give a price, WRS, Northern Diver and IC Brindle have no problem passing on prices so you can get a rough idea from these of the cost of similar sized paths from other manufacturers. We usually round up to the nearest Pound\$/US Dollar\$/Euro€. We have started to quote a US\$ figure in orange which is simply a currency conversion to give an idea of price, it is not the selling price in the US which may have import duties etc to add.

TOTAL LOAD CAPACITY or kg/sqm: Most companies will quote a maximum figure which is much lower than its true capabilities - the Animal path in the picture below-left is quoted as having a max total load of 200kg but that cow looks a little heavier than that! If in doubt, work on 100kg per square metre or 67.2 pounds per square foot.

DIMENSIONS: Length by width by depth/height from ground.

The stored dimensions may be the bag rather than the rolled or folded platform but close enough.

AIR CAPACITY: The volume of air needed to fill the path to working pressure. This doesn't necessarily correlate to the dimensions (which are external measurements) and vary with different thicknesses of material, resistance, internal components etc.

MAX WORKING PRESSURE: the pressure at which the path is pumped up and workable, exceeding of which will purge via the safety valve.

INFLATION TIME: Mostly via compressed air which is two or three times quicker than an electric pump which, in turn may be twice as fast as hand or foot inflation. All of these times are approximate and depend on the temperature and how well the path has been unpacked/unrolled. One or two of the figures given here seem mightily optimistic.

TOW/CONNECT EYES: metal D-rings and/or web straps and sometime hooks. This can be tricky because some components can easily do the job of both but generally speaking the connecting eyes can be weaker than towing eyes but neither is designed to hold a loaded path in suspension.

SAFETY PRV/DUMP VALVE: The safety valve or purge valve allows excess air to vent as a result of over-inflation or an excessive compressive load. Dump valve refers to the ability to empty air quickly or even to actively suck air out with a pump.

COLOUR: Primary colour of shell/frame with an outline secondary colour to indicate trim colour.



images NOT to Scale

□□□ = Option

● = Partial Feature &/or OK but not ideal

COST: Approx, INC local tax/VAT

£ US\$ € = currency conversions only

INFLATION: Hand Pump/ Electric Pump

Compressed Air

VALVES PRV=Pressure Relief Valve

MODEL Product Code	COMPANY	ORIGIN	COST inc 10% State tax or 20%VAT	WEIGHT	LOAD CAPACITY &/or Kg/Sq M lb/Sq Ft	DIMENSIONS L x W x H EXTERNAL PACKED
2M RESCUE WALKWAY 520017	DULETAI		N/A	14kg 30.8lb	800kg 1760lb	2 x 1.37 x 0.2m 6.5' x 54" x 8" 0.82 x 0.35 x 0.45m 32.2 x 13.7 x 17.7"
5M RESCUE WALKWAY 520018	DULETAI		N/A	27kg 59.4lb	800kg 1760lb	5 x 1.37 x 0.2m 16.4' x 542 x 8" 1.15 x 0.35 x 0.45m <45.2 x 13.8 x 17.7"
10M RESCUE WALKWAY 520019	DULETAI		N/A	55kg 121lb	1300kg 2860lb	10 x 1.37 x 0.2m 32.8' x 54" x 8" 115 x 35 x 45m 45.2 x 13.8 x 17.7"
15M RESCUE WALKWAY 520020	DULETAI		N/A	90kg 198lb	3000kg 6600lb	15 x 1.37 x 0.2m 49.2' x 54" x 8" 1.8 x 1 x 0.85m 70.8 x 40 x 33.4"
2M FAST PATH	IC BRINDLE		~£1980 \$2600 €2335	23kg 50.6lb	250kg 550lb	2 x 1.3 x 0.3m 6.5' x 51" x 12" 1.7 x 0.5 x 0.3m 67 x 19.7 x 13.7"
5M FAST PATH	IC BRINDLE		~£3100 \$4070 €3655	35kg 77lb	625kg 1375lb	5 x 1.3 x 0.3m 16.4' x 51" x 12" 1.7 x 0.5 x 0.35m 67 x 19.7 x 13.7"
10M FAST PATH	IC BRINDLE		~£5200 \$6820 €6130	45kg 99lb	1250kg 2750lb	10 x 1.3 x 0.3m 32.8' x 51" x 12" 170 x 50 x 40m 67 x 19.7 x 15.7"
2m RESCUE TRACK SAF38062	IONICRESCUE		£3100 \$4500 €3660	12kg 26.4lb	200kg 440lb	2 x 1.4 x 0.25m 6.5' x 55" x 10" 0.8 x 0.5 x 0.25m 31 x 20 x 10"
3m RESCUE TRACK SAF38065	IONICRESCUE		£3600 \$5230 €4250	16kg 35.2lb	300kg 660lb	3 x 1.4 x 0.25m 9.8' x 55" x 10" 0.9 x 0.35 x 0.3m 35 x 14 x 12"
5m RESCUE TRACK SAF38061	IONICRESCUE		£4600 \$6770 €5430	25kg 55lb	500kg 1100lb	5 x 1.4 x 0.25m 16.4' x 55" x 10" 0.9 x 0.5 x 0.3m 35 x 20 x 12"
10m RESCUE TRACK SAF38063	IONICRESCUE		~£5600 \$8130 €6610	50kg 110lb	1000kg 2200lb	10 x 1.4 x 0.25m 32.8' x 55" x 10" 0.9 x 0.75 x 0.5m 35x 30 x 20"
2m RESCUE PATH SAF38050	IONICRESCUE		£2400 \$3485 €2835	18kg 40lb	200kg 440lb	2 x 1.4 x 0.15m 6.5' x 55" x 6" 0.8 x 0.3 x 0.3m 31 x 12 x 12"
3m RESCUE PATH SAF38051	IONICRESCUE		£2800 \$4070 €3305	22kg 48.4lb	300kg 660lb	3 x 1.4 x 0.15m 9.8' x 55" x 6" 0.8 x 0.4 x 0.4m 31 x 16 x 16"
5m RESCUE PATH SAF38002	IONICRESCUE		£3300 \$4790 €3895	32kg 70.4lb	500kg 1100lb	5 x 1.4 x 0.15m 16.4' x 55" x 6" 0.6 x 0.5 x 0.5m 24 x 20 x 20"

AIR CAPACITY	MAX PRESSURE	INFLATION OPTIONS & TIMES HAND ELECTRIC HP/CABA	MATERIALS	TOP SURFACE GRIP	INFLATION CHAMBERS	REGULATOR / HOSE	SAFETY PRV/ DUMP VALVE	HANDLES / GRAB CORD	TOW / CONNECT EYES	REPAIR KIT / POCKETS	CARRY BAG/VALISE	REFLECTIVE	COLOUR OPTIONS	NOTES	WWW.
800 L 28.25cuft	0.5 BAR 7.25 psi	■ 40 sec □	PVC coated Polyester. EVA foam upper	■	2	- -	- ■	■ 0	20 0	□ ■	■ ■	■ ■	■ □		durainflate.com
1600 L 56.5cuft	0.5 BAR 7.25 psi	■ 1min □	PVC coated Polyester. EVA foam upper	■	2	- -	- ■	■ 0	20 0	□ ■	■ ■	■ ■	■ □		durainflate.com
3200 L 113cuft	0.5 BAR 7.25 psi	■ 4mins □	PVC coated Polyester. EVA foam upper	■	2	- -	- ■	■ 6	24 0	□ ■	■ ■	■ ■	■ □		durainflate.com
5570 L 196.7cuft	0.5 BAR 7.25 psi	■ 6mins □	PVC coated Polyester. EVA foam upper	■	2	- -	- ■	■ 10	30 0	□ ■	■ ■	■ ■	■ □		durainflate.com
*840 L 29.7cuft	0.55 BAR 8 PSI	■ □ □	PVC	■	3	□ □	■ ■	■ 0		□ ■	□ ■	■ ■	■ ■	* approximate figures catamaran style base	icbrindle.com
*1700 L 60cuft	0.55 BAR 8 PSI	■ □ □	PVC	■	3	□ □	■ ■	■ 0		□ ■	□ ■	■ ■	■ ■	* approximate figures catamaran style base	icbrindle.com
*3500 L 123.6cuft	0.55 BAR 8 PSI	■ □ □	PVC	■	3	□ □	■ ■	■ 0		□ ■	□ ■	■ ■	■ ■	* approximate figures catamaran style base	icbrindle.com
650 L 22.95cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	3	□ □	■ ■	■ 0		■ ■	■ ■	■ ■		Catamaran style base or invert for flat base	ionicrescue.com
1000 L 35.31cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	3	□ □	■ ■	■ 0		■ ■	■ ■	■ ■		Catamaran style base or invert for flat base	ionicrescue.com
1600 L 56.5cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	3	□ □	■ ■	■ 0		■ ■	■ ■	■ ■		Catamaran style base or invert for flat base	ionicrescue.com
3000 L 81.22cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	3	□ □	■ ■	■ 0		■ ■	■ ■	■ ■		Catamaran style base or invert for flat base	ionicrescue.com
450 L 15.9cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	1	□ □	■ ■	■ 4	12 4	- ■	■ ■	■ ■		Flat base but concave when inflated for improved movement over mud	ionicrescue.com
680 L 24cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	1	□ □	■ ■	■ 6	12 4	- ■	■ ■	■ ■		Flat base but concave when inflated for improved movement over mud	ionicrescue.com
1150 L 40.6cuft	0.4 BAR 6 Psi	■ □ □	Hypalon coated Orca drop-thread	■	1	□ □	■ ■	■ 6	12 4	- ■	■ ■	■ ■		Flat base but concave when inflated for improved movement over mud	ionicrescue.com

images NOT to Scale

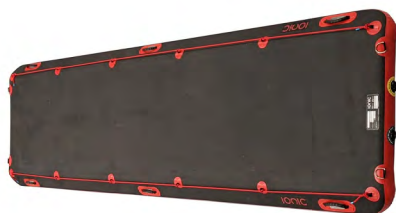
□□□ = Option

● = Partial Feature &/or OK but not ideal

COST: Approx. INC local tax/VAT

£ US\$ € = currency conversions only

INFLATION: Hand Pump/ Electric Pump



MODEL Product Code	COMPANY	ORIGIN	COST inc 10% State tax or 20%VAT	WEIGHT	LOAD CAPACITY &/or Kg/Sq M lb/Sq Ft	DIMENSIONS L x W x H EXTERNAL PACKED
10m RESCUE PATH SAF38xxx	IONICRESCUE		~£4400 \$6390 €5195	65kg 143lb	1000kg 2200lb	10 x 1.4 x 0.15m 32.8' x 55" x 6" 0.8 x 0.8 x 0.8m 31 x 31x 31"
2M AIRTRACK RESCUE PATH WR0011 WRW0011/01	MFC INTERNATIONAL		£4380 £3040 \$5475 \$3800 €5110 €3550	12kg 26.4lb	200kg 440lb	2 x 1.4 x 0.25m 6.5 x 54" x 00" 0.82 x 0.48 x 0.24m 32 x 19 x 9"
3M AIRTRACK RESCUE PATH WR0012 WRW0012/01	MFC INTERNATIONAL		N/A	17kg 37.4lb	300kg 660lb	3 x 1.4 x 0.25m 9.8' x 54" x 00" 0.87 x 0.48 x 0.28m 34 x 19 x 11"
4M AIRTRACK RESCUE PATH WR0013 WRW0013/01	MFC INTERNATIONAL		N/A	22kg 48.4lb	400kg 880lb	4 x 1.4 x 0.25m 13' x 54" x 00" 0.87 x 0.48x0.32m 34 x 19 x 13"
5m Airtrack Rescue Path WR0014 WRW0014/01	MFC INTERNATIONAL		~£3600 \$4900 €4200	28kg 61.6lb	500kg 1100lb	5 x 1.4 x 0.25m 16.4' x 54" x 9.8" 0.87 x 0.48 x 0.35m 34.2 x 19 x 13.8"
10m Airtrack Rescue Path WR0015 WRW0015/01	MFC INTERNATIONAL		N/A	55kg 121lb	1000kg 2200lb	10 x 1.4 x 0.25m 32.8' x 54" x 9.8" 0.89 x 0.73 x 0.5m 35 x 28.7 x 19.7"
15m Airtrack Rescue Path WR0016 WRW0016/01	MFC INTERNATIONAL		£12150 \$15500 €14350	00kg 00lb	2000kg 4400 lb	15 x 1.4 x 0.25m 49.2' x 54" x 9.8" 0.91 x 0.73 x 0.5m 36 x 28.7 x 19.7"
5m Animal Rescue Path WR0195 WRW0195	MFC INTERNATIONAL		N/A	15.5kg 34.1lb	600kg 1320 lb 200kg	5 x 1.3 x 0.67m 16.4' x 53" x 2.6" 0.66 x 0.34 x 0.25m 26 x 13.4 x 9.8"
10m Animal Rescue Path WR0197 WRW0197	MFC INTERNATIONAL		N/A	40kg 88 lb	1200kg 2640 lb	10 x 1.3 x 0.67m 32.8' x 53" x 2.6" 0.7 x 0.45 x 0.3m 27.6 x 17.7 x 12"
Inflatable Stretcher WR0196 WRW0196	MFC INTERNATIONAL		N/A	7kg 15.4lb 6kg 13.2lb	150kg 330 lb	2.04 x 0.66 x 0.67m 6.7' x 26" x 2.6" 0.35 x 0.35 x 0.18m 13.8 x 13.8 x 7"
RPH Lifeline	NIXUS		N/A	28.5kg 62.7lb	800kg 1760lb	5.1 x 1.37 x 0.16m 16.5' x 54" x 6.3" <1.15 x 0.35 x 0.45m <45.2x13.8x17.7"
1m Air Track	NORTHERN DIVER		£186 \$245 €220	5kg 11lb	60kg 132lb	1 x 1 x 0.8m 3.3' x 39" x 3.15" 1.10 x 0.35 x 0.1m 43.3 x 35 x 4"
2m Air Track	NORTHERN DIVER		£388 \$510 €460	10.5kg 23.1lb	120kg 264lb	2 x 1 x 0.8m 6.5' x 39" x 3.15" 110 x 35 x 15m 43.3 x 13.8 x 6"

AIR CAPACITY	MAX PRESSURE	INFLATION OPTIONS & TIMES HAND ELECTRIC HP/CABA	MATERIALS	TOP SURFACE GRIP	INFLATION CHAMBERS	REGULATOR / HOSE	SAFETY PRV/ DUMP VALVE	HANDLES / GRAB CORD	TOW / CONNECT EYES	REPAIR KIT / POCKETS	CARRY BAG/VALISE	REFLECTIVE	COLOUR OPTIONS	NOTES	WWW.
2300 L 81.2cuft	0.4 BAR 6 Psi			■	1	□	■	■	12 10	4	■	■	■	Flat base but concave when inflated for improved movement over mud	ionicrescue.com
640 L 22.6cuft	0.7 BAR 10 Psi	□ 1min □	Hypalon Neoprene/TPU	■	3	■	-	■	8 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
960 L 33.9 L	0.7 BAR 10 Psi	□ □ □	Hypalon Neoprene/TPU	■	3	■	-	■	8 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
1280 L 45.2cuft	0.7 BAR 10 Psi	□ 3mins □	Hypalon Neoprene/TPU	■	3	■	-	■	8 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
1600 L 56.5cuft	0.7 BAR 10 Psi	□ 3-4mins □	Hypalon Neoprene/TPU	■	3	■	■	■	8 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
3200 L 113cuft	0.7 BAR 10 Psi	□ 6-7mins □	Hypalon Neoprene/TPU	■	3	■	■	■	12 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
4800 L 169cuft	0.7 BAR 10 Psi	□ 8-10mins □	Hypalon Neoprene/TPU	■	3	■	■	■	16 0	2 4	■	■	■	comes with throwline with rubber quoit. catamaran style base	mfc-international.com
455 L 16cuft	0.2 BAR 3 Psi	□ 30sec □	Hypalon Neoprene/TPU	NO	1	■	■	■	0 6	- 0	■	NO	■	Hypalon version in Yellow/Black, TPU version in Orange/black	mfc-international.com
910 L 32.1cuft	0.2 BAR 3 Psi	□ 2mins □	Hypalon Neoprene/TPU	NO	1	■	■	■	0 6	- 0	■	NO	■	Hypalon version in Yellow/Black, TPU version in Orange/black	mfc-international.com
100 L 3.5cuft	0.2 BAR 3 Psi	□ 30secs □	Hypalon Neoprene/TPU	NO	1	■	■	NO 6	0 0	- 0	■	NO	■		mfc-international.com
1600 L 56.5cuft	0.5 BAR 7.25 psi	□ 2mins □	PVC coated Polyester. EVA foam upper	■	2	-	-	■	20 0	□ 0	■	■	□		nixus2protect.com
80 L 2.8cuft	0.7 BAR 10 Psi	□ 23secs □	DWF/PVC	■	1	□	-	□	□ 2	- □	■	■	■	*Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
160 L 5.6cuft 54secs	0.7 BAR 10 Psi	□ □ □	DWF/PVC	■	1	□	-	□	□ 2	- □	■	■	■	*Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com

images NOT to Scale

□□□ = Option

● = Partial Feature &/or OK but not ideal

COST: Approx, INC local tax/VAT

£ US\$ € = currency conversions only

INFLATION: Hand Pump/ Electric Pump

Compressed Air

VALVES PRV=Pressure Relief Valve

	MODEL Product Code	COMPANY	ORIGIN	COST inc 10% State tax or 20%VAT	WEIGHT	LOAD CAPACITY &/or Kg/Sq M lb/Sq Ft	DIMENSIONS L x W x H EXTERNAL PACKED
	5m Air Track	NORTHERN DIVER		£1376 \$1810 €1635	35.5kg 78.1lb	420kg 924lb	5 x 1 x 0.8m 16.4' x 39" x 3.15" 1.4 x 0.35 x 0.3m 55 x 13.8 x 12"
	8m Air Track	NORTHERN DIVER		£1746 \$2290 €2055	46kg 101.2lb	672kg 1478lb	8 x 1 x 0.8m 31.5 x 39" x 3.15" 1.4 x 0.35 x 0.35m 55 x 13.8 x 13.8"
	10m Air Track	NORTHERN DIVER		£2012 \$2640 €2370	41kg 90.2lb	840kg 1848lb	10 x 1 x 0.8m 32.8' x 39" x 3.15" 1.4 x 0.35 x 0.38m 55 x 13.8 x 13.8"
	2m Walkway	NORTHERN DIVER		£1003 \$1315 €1185	300kg 660lb	250kg 550lb	2 x 1.2 x 0.3m 6.5' x 47.2" x 12" <1.4 x 0.5 x 0.35m <55 x 19.7 x 13.8"
	3M WALKWAY	NORTHERN DIVER		£1384 \$1820 €1645	35kg 77lb	450kg 990lb	3 x 1.2 x 0.3m 9.8' x 47.2" x 12" <1.4 x 0.5 x 0.35m <55 x 19.7 x 13.8"
	5M WALKWAY	NORTHERN DIVER		£2189 \$2870 €2580	42kg 92.4lb	750kg 1650lb	5 x 1.2 x 0.30m 16.4' x 47.2" x 12" 140 x 50 x 35cm <55 x 19.7 x 13.8"
	10M WALKWAY	NORTHERN DIVER		£4067 \$5330 €4795	85kg 187lb	1500kg 3300lb	10 x 1.2 x 0.3m 32.8' x 47.2" x 12" 140 x 60 x 40cm
	RR2	NORTHERN DIVER		£970 \$1270 €1145	23.7kg 52.1lb	300kg 660lb	3 x 1 x 0.15m 9.8' x 39" x 4" 0 x 0 x 0m 0 x 0 x 0"
	5M RESCUE WALKWAY ATP5	SAVATECH (TRELLEBORG)		N/A	34kg 74.8lb	1000kg 2200lb 200kg 440lb	5 x 1.65 x 0.15m 16.4' x 65" x 6" n/a
	10M RESCUE WALKWAY ATP10	SAVATECH (TRELLEBORG)		N/A	66kg 145.2lb	2000kg 2205lb 200kg 440lb	10 x 1.65 x 0.15m 32.8' x 65" x 6" n/a
	15M RESCUE WALKWAY ATP15	SAVATECH (TRELLEBORG)		N/A	100kg 220lb	3000kg 4409lb 200kg 440lb	15 x 1.65 x 0.15m 49.2' x 65" x 6" n/a
	RESQ PATH 3000 SIT38050	SIT Ltd		N/A	15kg 33lb	350kg 770lb	3 x 1.45 x 15m 9.8' x 57" x 4" 70 x 40 x 40cm 27.5 x 15.7 x 15.7"
	RESQ PATH 5000 SIT38050	SIT Ltd		£0000 \$6397 €6074	25kg 55lb	650kg 1430lb	5 x 1.45 x 15m 16.4' x 57" x 4" 70 x 44 x 40cm 27.5 x 17.3 x 15.7"
	RESQ PATH 10000 SIT38050	SIT Ltd		£0000 \$8718 €8278	45kg 99lb	1200kg 2640lb	10 x 1.45 x 0.15m 32.8' x 57" x 4" 70 x 70 x 70cm 27.5 x 27.5 x 27.5"

AIR CAPACITY	MAX PRESSURE	INFLATION OPTIONS & TIMES HAND ELECTRIC HP/CABA	MATERIALS	TOP SURFACE GRIP	INFLATION CHAMBERS	REGULATOR / HOSE	SAFETY PRV/ DUMP VALVE	HANDLES / GRAB CORD	TOW / CONNECT EYES	REPAIR KIT / POCKETS	CARRY BAG/VALISE	REFLECTIVE	COLOUR OPTIONS	NOTES	WWW.
560 L 19.8cuft 3.1mins	0.7 BAR 10 Psi	☐ ☐ ☐	DWF/PVC	☒	1	☐ ☐	- ☒	☒ 4	4 ☐	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
896 L 31.6cuft 5mins	0.7 BAR 10 Psi	☐ ☐ ☐	DWF/PVC	☒	1	☐ ☐	- ☒	☒ 4	4 ☐	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
1120 L 39.6cuft 6.2mins	0.7 BAR 10 Psi	☐ ☐ ☐	DWF/PVC	☒	1	☐ ☐	- ☒	☒ 4	4 ☐	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
360 L 12.7cuft 2mins*	0.7 BAR 10 Psi	☒ ☐ ☐	DWF/PVC	☒	3	☐ ☐	- ☒	☒ 4	4 12	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute Catamaran style base	ndiver-rescue.com
540 L 19cuft 3mins*	0.7 BAR 10 Psi	☒ ☐ ☐	DWF/PVC	☒	3	☐ ☐	- ☒	☒ 4	4 12	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute Catamaran style base	ndiver-rescue.com
900 L 31.8cuft 5mins*	0.7 BAR 10 Psi	☒ ☐ ☐	DWF/PVC	☒	3	☐ ☐	- ☒	☒ 4	4 12	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute Catamaran style base	ndiver-rescue.com
1800 L 63.6cuft 10mins*	0.7 BAR 10 Psi	☒ ☐ ☐	DWF/PVC	☒	3	☐ ☐	- ☒	☒ 4	4 12	- ☒	☒	☐	☒ ☐	*Inflation time calculated at 50 pump strokes per minute Catamaran style base	ndiver-rescue.com
310 L 11cuft <1min	0.7 BAR 10 Psi	☒ ☐ ☐	DWF/PVC	☒	1	☐ ☐	- ☒	☒ 11	5 14	- ☒	☒	☐	☒ ☐	Primarily a sled so comes with twin-blade paddle	ndiver-rescue.com
1860 L 66cuft 1min	0.5 BAR 7.25 psi	☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ *	14 0	- ☐	☒	☐	☐ ☐	May be discontinued *Perimeter cord provides the carrying handles	trelleborgslovenija.com
3720 L 131cuft 1.4min	0.5 BAR 7.25 psi	☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ *	24 0	- ☐	☒	☐	☐ ☐	May be discontinued *Perimeter cord provides the carrying handles	trelleborgslovenija.com
5570 L 197cuft 10+min	0.5 BAR 7.25 psi	☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ *	34 0	- ☐	☒	☐	☐ ☐	May be discontinued *Perimeter cord provides the carrying handles	trelleborgslovenija.com
650 L 23cuft 1min	0.5 BAR 7.25 psi	☒ ☐ ☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ 4*	4* 4*	- ☒	☐	☐	☒ ☐	2m version discontinued. *All fitments subject to change due to series redesign/update. Concave base when inflated	sitltd.co.uk
1080 L 38.1cuft 2mins	0.5 BAR 7.25 psi	☒ ☐ ☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ 6*	4* 4*	- ☒	☐	☐	☒ ☐	*All fitments subject to change due to series redesign/update. Concave base when inflated	sitltd.co.uk
2160 L 76.3cuft 4mins	0.5 BAR 7.25 psi	☒ ☐ ☐	Hypalon	☒	1	☐ ☐	☒ ☒	☒ 10*	4* 4*	- ☒	☐	☐	☒ ☐	*All fitments subject to change due to series redesign/update. Concave base when inflated	sitltd.co.uk

images NOT to Scale

☐☐☐ = Option

● = Partial Feature &/or OK but not ideal

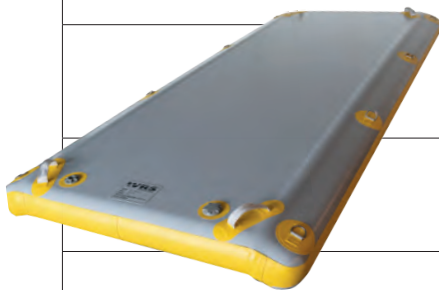
COST: Approx, INC, local tax/VAT

£ US\$ € = currency conversions only

INFLATION: Hand Pump/ Electric Pump

Compressed Air

VALVES PRV=Pressure Relief Valve



	MODEL Product Code	COMPANY	ORIGIN	COST inc 10% State tax or 20%VAT	WEIGHT	LOAD CAPACITY &/or Kg/Sq M lb/Sq Ft	DIMENSIONS L x W x H EXTERNAL PACKED
	LIFERAMP 10' 6601-10	TULMAR SAFETY		£4620 \$6075 €6000	12.7kg 28lb	499kg 1100lb 145kg 30 lb	3.1 x 1.2 x 0.2m 10 x 38" x 0.7' 1.2 x 0.46 x 0.3m 4 x 1.5 x 1'
	LIFERAMP 15' 6601-15	TULMAR SAFETY		£5280 \$6945 €6390	19.1kg 42lb	762kg 1679lb 145kg 30 lb	4.5 x 1.2 x 0.2m 15 x 38" x 0.7' 1.2 x 0.46 x 0.3m 4 x 1.5 x 1'
	LIFERAMP 30' 6601-30	TULMAR SAFETY		£7010 \$9220 €8450	35.4kg 78lb	1543kg 3400lb 145kg 30 lb	9.1 x 1.2 x 0.2m 30 x 38" x 0.7' 1.2 x 0.61 x 0.46m 4 x 2 x 1.5'
	LIFERAMP 50' 6601-50	TULMAR SAFETY		£10210 \$13430 €12360	40.9kg 90lb	2586kg 5700lb 145kg 30 lb	15.5 x 1.2 x 0.2m 50 x 38" x 0.7' 1.2 x 0.91 x 0.76m 4 x 3 x 2.5'
	LIFERAMP 80' 6601-80	TULMAR SAFETY		£15000 \$19680 €18110	86.2kg 190lb	4151kg 9150lb 145kg 30 lb	24.8 x 1.2 x 0.2m 80' x 38" x 0.7' 1.2 x 1.1 x 1.1m 4 x 3.5 x 3.5'
	6M WALKWAY 1530008502	VETTER		N/A	25kg 77.2lb	800kg 1760 lb 95kg 2255 lb	6 x 1.4 x 0.1m 19.6' x 55" x 4" 1.65 x 0.35 x 0.25m 65 x 14 x 10"
	10M WALKWAY 1530008602	VETTER		N/A	57.5kg 126.8lb	1330kg 2926 lb 95kg 2255 lb	10 x 1.4 x 0.1m 32.8' x 55" x 4" 1.65 x 0.45 x 0.3m 65 x 14 x 10"
	15M WALKWAY 1530008702	VETTER		N/A	81.5kg 179.7lb	1995kg 4390 lb 95kg 2255 lb	15 x 1.4 x 0.1m 49.2' x 55" x 4" 1.65 x 0.6 x 0.45m 65 x 14 x 10"
	2M RESCUE PATHWAY	WRS INTERNATIONAL		£2270 \$2950 €2670	7.4kg 16.3lb	220kg 484lb	2 x 1 x 0.15m 6.5' x 39" x 6" 0 x 0 x 0m 0 x 0 x 0"
	3M RESCUE PATHWAY	WRS INTERNATIONAL		£2285 \$3050 €2685	13.3kg 29.3lb	390kg 858lb	3 x 1.4 x 0.15m 9.8' x 55 x 6" 0 x 0 x 0m 0 x 0 x 0"
	5M RESCUE PATHWAY	WRS INTERNATIONAL		£2770 \$3670 €3255	23kg 50.6lb	650kg 1430lb	5 x 1.4 x 0.15m 16.4' x 55 x 6" 0 x 0 x 0m 0 x 0 x 0"
	EVAC SLED	WRS INTERNATIONAL		£2285 \$2960 €2685	8.5kg 18.7lb	160kg 352lb	3 x 1.4 x 0.15m 9.8' x 55" x 6" 0 x 0 x 0m 0 x 0 x 0"

AIR CAPACITY	MAX PRESSURE	INFLATION OPTIONS & TIMES HAND ELECTRIC HP/CABA	MATERIALS	TOP SURFACE GRIP	INFLATION CHAMBERS	REGULATOR / HOSE	SAFETY PRV/ DUMP VALVE	HANDLES / GRAB CORD	TOW / CONNECT EYES	REPAIR KIT / POCKETS	CARRY BAG/VALISE	REFLECTIVE	COLOUR OPTIONS	NOTES	WWW.
<1min	0.2 BAR 3 psi	☐ ☐ ☐	Neoprene/ PVC	NO	2	☐ ☐	- ☐	☐ -	2 0	☐ ☐	☐ ☐	NO			tulmar.com
<1min	0.2 BAR 3 psi	☐ ☐ ☐	Neoprene/PVC	NO	2	☐ ☐	- ☐	☐ -	2 0	☐ ☐	☐ ☐	NO			tulmar.com
<1min	0.2 BAR 3 psi	☐ ☐ ☐	Neoprene/PVC	NO	2	☐ ☐	- ☐	☐ -	2 0	☐ ☐	☐ ☐	NO			tulmar.com
	0.2 BAR 3 psi	☐ ☐ ☐ <1min	Neoprene/PVC	NO	2	☐ ☐	- ☐	☐ -	2 0	☐ ☐	☐ ☐	NO			tulmar.com
	0.2 BAR 3 psi	☐ ☐ ☐ 2-3mins	Neoprene/PVC	NO	2	☐ ☐	- ☐	☐ -	2 0	☐ ☐	☐ ☐	NO			tulmar.com
1321 L 47cuft	0.5 BAR 7.25 psi	☐ ☐ 2.9mins	PVC	☒ *	1	☐ ☐	☐ ☐	☐ 6	4 4	- -	☐ ☐	☐ ☐	☐ ☐	* Grip provides by strips at intervals along the top	vetter.de
2196 L 78cuft	0.5 BAR 7.25 psi	☐ ☐ 4.9mins	PVC	☒ *	1	☐ ☐	☐ ☐	☐ 8	4 4	- -	☐ ☐	☐ ☐	☐ ☐	* Grip provides by strips at intervals along the top	vetter.de
3360 L 119cuft 7.4mins	0.5 BAR 7.25 psi	☐ ☐	PVC	☒ *	1	☐ ☐	☐ ☐	☐ 10	4 4	- -	☐ ☐	☐ ☐	☐ ☐	* Grip provides by strips at intervals along the top	vetter.de
450 L 15.9cuft <1min	0.7 BAR 10 Psi	☐ ☐	PVC	NO	1	☐ ☐	- ☐	NO ☐	☐ ☐	- ☐	☐ ☐	☐ ☐	☐ ☐	concave base when inflated	wrsinternational.com
650 L 23cuft 1-2mins	0.7 BAR 10 Psi	☐ ☐	TPU	NO	1	☐ ☐	- ☐	☐ 4	8 -	- ☐	☐ ☐	☐ ☐	☐ ☐	concave base when inflated	wrsinternational.com
1000 L 32.5cuft >2mins	0.7 BAR 10 Psi	☐ ☐	TPU	NO	1	☐ ☐	- ☐	☐ 4	12 -	- ☐	☐ ☐	☐ ☐	☐ ☐	concave base when inflated	wrsinternational.com
350 L 12.4cuft 1min	0.7 BAR 10 Psi	☐ ☐	TPU	NO	1	☐ ☐	- ☐	NO 6	- -	- ☐	☐ ☐	☐ ☐	☐ ☐	Folds flat to create a platform for easy loading	wrsinternational.com

INFLATABLE OPEN-ENDED SLEDS & WATERCRAFT

Oceanid RDC. Invented in 1996 in Washington State in response to a request for a specialist ice-rescue craft, the Oceanid RDC has lately spawned many copies. This image shows the optional transom for mounting an outboard which a number of larger sleds/rafts also offer.



This GUIDE covers the more 'dynamic' rescue sleds, and open-transom rafts. Some of these are described as 'sleds' some as 'rafts' but in all cases they will have an open ended stern or water-entry opening in the case of the *Oceanid RDC* style rafts. These can be powered though that generally requires some modification like the *RDC* above since the stern is open on all the models in this GUIDE. More often they are paddled as with the *MFC Sled* on the left or pushed/towed/'punted' over water, ice, mud or sand in order to reach a person in difficulties. Such craft have inflatable sponsons or side-walls and an open back that allows easier ingress into or egress out of the water. These are 'wet' craft and not to be confused with inflatable boats or rafts which are designed to keep the occupants dry-ish. Inflatable sleds and open backed-rafts require the occupants to be fully kitted for potential water entry. Materials were discussed in part 1 and these sleds/rafts are the same materials and construction - incredibly robust welded PVC/TPU or glued Hypalon, often as a Double Wall Fabric (DWF) and drop stitched on the most robust part of these craft, the floor/hull. Given the abuse these things get from ice, gravel, flooded wire fences and brick walls etc. some have extra reinforcing strip along the underside of sponsons like the *NRS* craft. Failing that, all craft come with a repair kit. As with most things in life, you get what you pay for, so consider the materials, construction warranty and pedigree of the manufacturer and craft before committing to a purchase.



The point of the open stern of these sleds is to enable easy loading of a rescuer and/or a casualty and human kick-power if necessary so there is some duplication of the work of the paths we featured in the last GUIDE especially in the larger sizes which are more appropriate for flood evacuation than they are swiftwater. However, unlike flat platforms, sleds have a degree of occupant protection from their sponsons and are designed to be used in fast moving flood water, broad slow-moving flood water and /or complex swiftwater and most can negotiate quite narrow channels. This style of craft may sit between the passive platforms and inflatable boats but it actually evolved last and as a consequence

of adding a protective sponson like a RIB collar to an inflatable base and in most cases, raising the bow profile slightly. In its simplest form, you can see that this *CheckRaft* has a 3-sided sponson ratcheted to the deck of the same platform we listed in last issue's GUIDE. Indeed a market leader that rarely gets a mention outside of the manufacturers boardrooms is *Henshaw Inflatables*, which is yet another UK pioneer that, since the 70's had been making rib collars/sponsons rather than entire boats. *Henshaw* either supply their collars or assist in conjoining the two products but you won't see an entire *Henshaw* boat or craft. They are however, now part of the *Wing Group*, *Bill Wing's* inflatable raft company and they certainly DO make water craft.

images in this article
not to scale

www.rescuemagazines.com



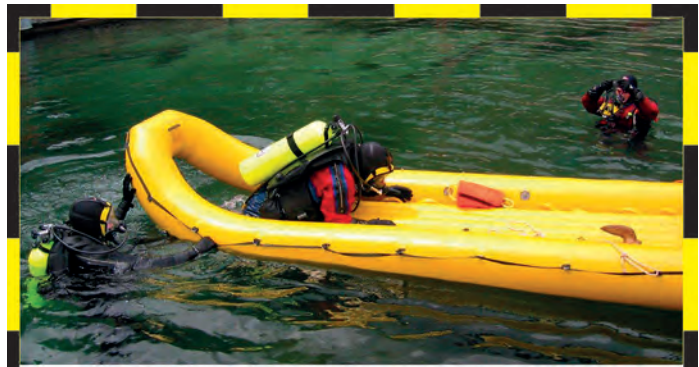
ABOVE: The IRB-style WRS Mega Sled

The two original and distinctly different boat designs in this Guide evolved on opposite sides of the Atlantic - *MFC* in Wales evolved their open-stern Sleds from their inflatable paths while Kris Walker at *Oceanid* in Washington State modified the classic whitewater raft to create the narrow, double-ended *RDC* much lauded by our old mate, the late, great, co-founder of *Rescue3* and water rescue oracle Jim Segerstrom. Having been unopposed in the market for at least 15 of its 25 year history, the *RDC* is now copied by most of the major players in inflatables - high praise indeed although Chinese company Yushan Yijia using the trade name *EJIA* have some nerve in not only copying and calling their own model an *RDC* they even use *Oceanid*'s traditional sunburst advert template and other manufacturer's photos implying it's their product! We haven't included *EJIA* craft but their range is represented by some companies here and as always, Chinese, Taiwanese and Vietnamese manufacture can be as good as any, they just need to cut out the blatant copying. *RDC*-Style craft are on p48/49.

The red *WRS* model above demonstrates the most obvious hybrid between a platform and an inflatable rescue boat with sponsons/gunwales that are much larger than the *MFC sleds* and with a bow tapered like a boat - contrast this with *CheckRaft's* and *Sit Ltd's ResQRaft's* rather less hydrodynamic square 'bow' and you can tell which craft is designed for faster flowing water and which are flat-water evacuation craft. Because the sponsons are quite sizeable on all these craft the inner working space is severely restricted in comparison to the uncluttered surface of a platform so the 51"/120cm width of a 2Tinga *RIT* for instance equates to only 20"/51cm of working deck width. The narrower beam sleds like the pioneering *MFC Rescue Sled* and the *WRS X-Sled* opposite not only work well in fast moving rivers they are excellent in flooded urban streets and alleyways.

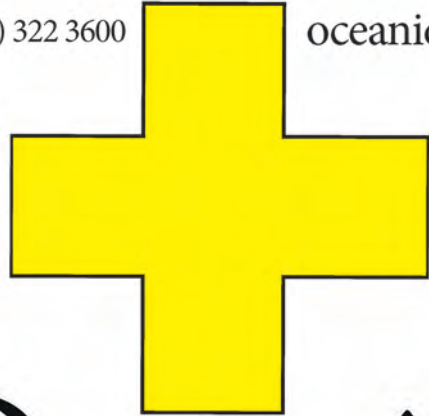


The last style of craft to note is the *Tip-Board* (overleaf) which we have included in the *RDC*-style craft table because it can be tipped to approach the casualty as all *RDC*-style craft can and especially for ice rescue. The *TipBoard* could be said to be a true water 'sled' because it has hybridised a flat platform with an *IRB* sponsons which are sharply angled at the stern to create what, on snow, would be sled/akja push handles or, if driving a



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oceanid.com



Oceanid™

WATER RESCUE CRAFT





Honor TipBoard



dog sled team, handles with which to hang on for dear life. During the rescue of an incapacitated or severely weakened in-water victim, the stern can be tipped backward over the head and shoulders to facilitate easier loading while the rescuer has handy foot recesses from which to perform the lift. As the casualty comes out of the water the rescuer can simply 'fall' back into the craft with the levelling of the craft acting like a lever to assist with the lift or in this case, on ice or mud, a colleague can assist by levering down the bow to help pull the casualty inboard. We see a lot of these rescue design concepts by technical students in particular but they don't often seem

to reach it to market so it's good to that Dutch safety company *Honor* have taken this on. Of course in this case, the casualty extraction process is very similar to the Oceanid *RDC* albeit that the bow is not often fully tipped during loading. Most sled loading is like a seal or penguin getting onto an ice flow only without their degree of momentum. The casualty can assist by swim-kicking at the same time as the rescue hauls them on-board.

The shallow rake we see on sleds helps deal with waves but the higher rake we see on craft like the *RDC*, the *ASR155* on the left and the *Tip-Board* above can also allow the craft to negotiate fast flowing water without having tons of water washing over the bow but that's obviously not the case with the open bow beneath the raked bow of the *RDC* designed to allow water through and rescuers to position over an in-water casualty or to slip more easily into the water direct from the floor of craft. The rake also allows the craft to be pushed up against obstacles and in the image below the face of a low-head dam/weir can be searched for an entrapment and the open bow decreases the pressure trying to force the craft away as it instead washes over the craft's floor. High-rake craft will also 'bend' a little at the change of angle to provide an extra few inches of proximity

to the target and in the absence of a hole with which to funnel an in-water casualty, the raked solid bow is less inclined to smash an



NRS ASR 155



NRS ASR 155



in-water casualty in the head as the two approach each other, possibly closing at speed in a high flow.

VALVES

All of these craft inflate through a valve which may only allow air flow inwards (inlet check valve) so you don't lose air pressure should the valve cap not be in place or the pump/cylinder hose come off during inflation. We have differentiated four types in our tables: Safety or Pressure Relief Valves, 1-Way, 2-Way and Dump valves but for this GUIDE they are mostly 2-Way and PR Valves. Safety or **Pressure Relief Valves** like the Leafield A6 refers to its ability to purge air should you OVER-inflate (*Northern Diver* 2-Way and PR Valves shown in the image above). This can be the case particularly with compressed air cylinders so



the safety valve will allow air to force its way out of the valve rather than bursting the seams of the craft. A **2-way** valve allows inflation and deflation - as in the valve on the left in the image above. Some, like the Leafield A/B/C7 and Halkey-Roberts valve, have a cap and then an interior sleeve that you rotate a quarter or half turn to alternate between inflate and deflate while others have a second screw-off collar beneath a non-return inflation section. When unscrewed, this allows air to exit freely. Deflation needs to be fast so that the craft can be rolled and stowed or moved ASAP ready for the next task so these 2-way valves are doubling as Dump or rapid air expulsion valves which tend not to be present on most sleds, boats and rafts. True dump valves, in the diving sense, can of course be a push button affair but this is obviously not the case for inflatable craft where they are regular screw-top release if they are present at all. Bear in mind that most craft

have more than one chamber so deflation can be a more time consuming process than inflation. Craft like the *Polar75*, *2Tinga* and *Wing Ice Skiff* have one-way baffles between chambers that means a single inflation point inflates all chambers. Many craft have both sets of valves sometimes next to each as with the *TIPBoard* and *WRS* and sometimes separate as with the *MFC Sleds* and *2Tinga* Craft where the inflate-deflate valves are located on the ends of each sponson and on the floor of the

INFLATABLE OPEN-ENDED SLEDS/WATERCRAFT



Most valves are designed to use manual pumps and BA cylinders, but some, and especially the dump valves are large enough to use a powered blower or even a vacuum cleaner in reverse. Professional battery blowers are an excellent idea because they have numerous other uses including cleaning/drying the craft. They are also unlikely to inflate beyond the pressure limit of the seams because they will struggle to push against over-pressure resistance. Basic dump valves can be used for large-bore pipe/hose inflation but air will escape while you try to screw the cap back on. 2Tinga's accessory pack shown above, includes a repair kit but also a pressure valve so that you can check the air pressure of your craft exactly and a very useful trigger-gun adapter for a BA line. This goes over the inflation valve and provides very precise start-stop during inflation rather than the more imprecise screwing/unscrewing of a cylinder valve.

LOAD CAPACITIES

Typical load capacities are the same as flat platforms at around 100kg/220lb per square metre on water (more on ice/mud) so for craft about a metre wide you can again gauge their capacity by the length - a 3m sled will take approximately 3 or 4 people. Bear in mind that some have a deeper floor; 6" drop thread instead of 4" and this provides greater capacity per floor area. Also remember that any craft will carry less in rough water than it will in calm water, maybe half the weight/persons. One of these models, the ITD from German company Water Rescue, is designed to be used as a dock for a PWC/RWC/Jet-Bike. The deck is two-thirds the length of the craft so the RWC is simply driven in on onto the deck for safe storage. The craft itself can also operate as an open-backed rescue craft capable of supporting up to 10-persons in calm water.



'LOAD-BEARING' EYES

Virtually all designs have connection rings that vary in size and strength of attachment depending on their purpose. One or two, like the TipBoard, have high strength LIFTING eyes (shown in green in our tables) that enable the entire sled with casualty to be lifted vertically. In some cases handles rather than rings can serve the same purposes. Most craft have medium-size/strength eyes that can be used for towing or positioning of the craft (shown as an orange number) and most have ancillary eyes that are intended for smaller loads such as connecting two craft or attaching equipment. The tow-strength eyes can also be used as tether points for holding position in flowing water.

The WRS X-Sled (right) was the first to introduce a 'stacked' bow where the rake of the sponsons sit above the solid floor providing enhanced protection from water over the bow while increasing protection of the hull in this vulnerable area. WRS are among two or three to have increased deck height from 4 to 6" but they also managed to decrease weight over similar models by 'fusing' rather than glueing the layers.

GRAB / LIFT HANDLES

There are lift or carry handles on most of these models (shown in orange in our tables), these are intended for transport and positioning while the craft is empty rather than for lifting stretcher style though that is possible with one or two of these sleds like the Oceanid RDC and we have indicated this in the NOTES. Unlike the RDC-style rafts, most of the sleds have bespoke handles as distinct from perimeter cord doubling as a handle. Some handles are flat tape, some have solid tubes of ergonomic rubber-like material. Inboard handles (shown in black in our tables) on the floor are to assist in getting on board or for human outboard propulsion as with the MFC Sled on the title page.

FLIP TAB/GRAB CORD

Rather than a solid handle some sleds and most RDC-Style rafts have a cord, rope or webbing that runs around the sponson or, in the case of SIT's ResQRaft, down the length of the floor. Cord or webbing is fastened at intervals to provide a something to grab or attach equipment to during the rescue mêlée. On longer models this can add a kg or more to the weight as it tends to be 7 to 10 mm in diameter for better grip and is heavier when wet. A **Flip Tab** is a section of webbing or a handle on the underside of the craft to enable it to be more easily righted should it capsize. This tends to be on the broader craft where the sponsons would be out of reach of rescuers in the water but this slimmer RR4 Sled by Northern Diver also has one.

We removed the 'Tactile surface' column that we had for inflatable platforms, not because the sled versions don't have tactile surfaces but because we wanted to expand upon the valves for this GUIDE and sleds tend not to be walked on in the same way as a platform although rescuers still may need to stand up to pull a casualty on-board. Sleds tend to be paddled Canadian-style, knelt down. The tactile surface of most flat platforms provides grip when standing up and to lessen the chance of people and things sliding off the top. Sleds are more of a mixture because, while standing and pulling requires better traction it tends to be by wedging your feet against the sponson than by traction so some have slick surfaces to make it easier to slide a casualty onto the craft.

It is important to reference the key on the next page in order to fully understand the categories and symbols used in the following tables.



KEY to ALL INFLATABLE CRAFT TABLES.....

Any use, feature, accessory or component that is **inherent** in the product is shown as a **solid coloured square** ■■■■

If it's an **OPTION** it is shown as an **outline square** □□□□

A circle ● in the 'USE' columns indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture, If we know it's made in a different country there will be a smaller inset flag eg. these three for Vietnam, South Africa and Taiwan



COST: a rough guide only - **includes** local taxes/VAT. Varies with exchange rates, extra taxes etc. Unlike our other GUIDE in this issue, most companies here have given a rough price but in the current economic climate (2022) with so many factors affecting product costs, these prices may be subject to quite radical changes. We usually round up to the nearest Pound£/US Dollar\$/Euro€. We have started to quote a US\$ figure in orange which is simply a currency conversion to give an idea of price, it is not the selling price in the US which may have import duties etc. to add.

LOAD CAPACITY: Often quoted as a person load where 4 persons is roughly 750lb but a quite imprecise way to describe load. Most companies will quote a maximum figure which is much lower than its true capabilities especially if used on mud or ice. If you work on 100kg per square metre or 67.2 pounds per square foot you won't tax any of these models. [Note that some don't give a load capacity or indeed air capacity or inflation time citing differences in user expertise, pumps etc. Since even a vague figure would be a useful guide to readers we have included some approximate Volume figures for comparative purposes in italics].

DIMENSIONS: Length by external width by depth/height from ground. This does not include the kick of an angled bow or stern. Height is often the width of sponson tube as many floors are suspended rather than having the tube sat on top. **Internal/Usable Width** is the floor width available to use. The **PACKED** dimensions may be size of the bag rather than the rolled or folded sled but it's close enough.

AIR CAPACITY: The volume of air needed to fill the path to working pressure. This doesn't necessarily correlate to the dimensions (which are external measurements) and vary with different thicknesses of material, resistance, internal components and in particular, temperature. *Figures in italics are our own approximation and could be out by a few hundred Liters.*

MAX WORKING PRESSURE: the pressure at which the path is pumped up and workable, exceeding of which will purge via the safety valve or burst the seams! The base tends to be a higher pressure (avge 5-10psi) compared to the tubes at 2-4psi.

INFLATION TIME: The quickest time is via **compressed air** and where chambers are linked so can inflate from one valve. **CA** is 2-3 times quicker than **electric pump** which may be twice as fast as **hand/foot inflation**. All times are approximate and depend on the temp and how well the path has been packed/unrolled. Times in *italics* are our own estimate based on volume

MATERIALS: Mostly trade names which are variants of treated polyester, PVC and/or Polyurethane in a range of construction layering. Imperial figures showing oz is per square foot eg. 44 and 66oz materials.

CA INFLATION CHAMBERS: Whether the craft can be inflated using Compressed Air cylinder and the total number of separate inflation chambers **including the floor**. If the floor is NOT inflatable this will be indicated in the NOTES.

THWARTS or BOLSTERS are tubular seats, supports or partitions separately inflated and not included in the number of chambers figure above. Note that thwarts can increase the outside width of a raft by a few inches as it pushes out from the inside.

GRAB/LIFT HANDLES: **LIFT** Handles shown in **Orange** are on the sponsons and for lifting/shifting as well as holding onto. **GRAB** Handles are in-board and are to self-assisted boarding or for in-water swim propulsion.

FLIP TAB/HANDLE GRAB CORD/WEB FLIP tab or cord to help with righting a capsized craft. **GRAB CORD** is perimeter webbing or more commonly cord or lengths of cord for holding on to or attaching equipment and may be pre-installed or self-tied.

HD-TOW/LT DUTY EYES: metal D-rings and/or web straps and sometime hooks. **LT DUTY** eyes are D-Rings we described in previous GUIDES as 'Link'; eyes which are used to clip in gear, connect rafts together or for threading grab lines etc. but some are easily strong enough for control lines and maybe towing but generally the **LIGHT (LT) DUTY** or connecting eyes are weaker than **TOWing** eyes. **HEAVY DUTY-TOW** eyes can be used for towing, positioning in high-flows and lifting the **EMPTY** craft if positioned appropriately. For any live-load lifting, these are best used with a sling passing through the side-mounted rings and beneath the hull of the raft but this would be a rare event because of the risk of buckling if not sufficiently supported along the hull/floor. Double check the manufacturer's definition of 'lift' when referring to rings and handles; most actually mean lifting an **EMPTY** craft into water, for instance off a dock, before starting the rescue.

PRESSURE RELIEF VALVE: (PRV) This safety, pressure relief or auto-purge valve allows excess air to vent as a result of over-inflation or an excessive compressive load. You may have initially inflated the craft to its limit and then have a temperature or load increase that could rupture the seams if air could not escape

1-WAY CHECK /2-WAY: A one way inlet valve that doesn't allow air to escape. A **2-way** valve is a joint inflation-deflation valve like the Leafield C7 and D7 valves. Usually requiring a twist or unscrewing of a top section to switch between inflation and deflation. A 'wrench' is often required (and supplied) in preference to being able to open by hand.

ACC = ACCESSORIES

CARRY BAG: All of these come with a carry or storage bag but one or two like the WRS can have an enhanced 'pro' bag.

PADDLES - self explanatory!

WARRANTY: Not really an accessory! Shown as manufacturer's warranty but fabric warranty may be separate and approx 5yrs. Shown in YEARS and usually subject to conditions. Some raft suppliers have shorter warranty for commercial users as distinct from recreational users. This is aimed at commercial rafting using rafts day in day out and shouldn't really apply to rescue - worth asking for a retail warranty.

SELF BAILING: any water that enters the raft will drain away through holes or gaps in the floor or between the floor and the tubes/sponsons. **VIZ =VISUAL ATTRIBUTES**

CUSTOM: Customised Team/Service/Dept decals or printing

REFLECTIVE: As standard ■, or as an option □

OTHER COLOURS: Primary colour of shell/frame with an outline secondary colour to indicate trim colour.

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images NOT to Scale ☐☐☐ = Option ● = Partial Feature &/or OK but not ideal COST: Approx, INC local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL Product Code	COMPANY	ORIGIN	COST inc tax / VAT	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	RIT Craft	2-TINGA		\$3600	27.3kg 60lb	682kg 1500lb	3.7 x 1.2 x 0.48m 144 x 48 x 19" 0.51m 20"	46 x 36 x 50 18 x 14 x 20
	Craft-Boat Conversion	CHECKMATE FLEXIBLE ENGINEERING		N/A	28kg 61.6lb	500kg 1100lb >100kg >67.2lb	5 x 1.4 x 0.25m 197 x 55 x 10" 1.06m 55"	90 x 42/50 35cm 35.4 x 19.7 13.7"
	EXTREME SLED	IONIC RESCUE		£1700 \$2380 €2040	23.8kg 52.4lb	650kg 1430lb	3 x 1.2 x 0.35m 118 x 47 x 14" 0.7m 27.6"	90 x 30 x 30 35.4 x 12 x 12
	TITAN SLED SAF38070	IONIC RESCUE		£2160 \$3025 €2590	25kg 55lb	500kg 1100lb	3.7*x 1.2 x 0.35m 146 x 47 x 14" 0.7m 27.6"	95 x 30 x 30 37.4 x 12 x 12
	TITAN XL SLED SAF38080	IONIC RESCUE		£4100 \$0000 €0000	39kg 55lb	8 800kg 1100lb	3.7* x 1.9 x 0.345m 146 x 75 x 14" 1 x 3.3m 0.3 x 10.8'	90 x 80 x 50 35.4 x 31.4 x 20
	XCEL X-RAFT	IONIC RESCUE		£3600 \$5040 €4320	42kg 92.4lb	1000kg 2200lb	3.2 x 2.2 x 0.38m 126 x 87 x 15" 1.44m 57"	100 x 70 x 40 39 x 27.6 x 16
	Rescue Sled RS3 WRW0001/01	MFC INTERNATIONAL		>£1350 >£999 >\$1755 >\$1300	15/17kg 33/ 37.4lb	240kg 528lb	2.16 x 1.17 x 0.4m 101 x 46 x 16" 0.7m 28"	88 x 35 x 30 36 x 14 x 12
	Rescue Sled RS5 WRW0002/01	MFC INTERNATIONAL		>£1699 >£1100 >\$2210 >\$1430	17.5/ 19.5kg 38.6/ 43lb	400kg 882lb	3.31 x 1.17 x 0.4m 130 x 46 x 16" 0.7m 28"	88 x 48 x 32 35 x 14 x 12
	Rescue Sled RS6 WRW0169/01	MFC INTERNATIONAL		>£1900 >£1300 >\$2470 >\$1690	18.5/ 20.5kg 38.6/ 45.1lb	480kg 1056lb	3.97 x 1.17 x 0.4m 156 x 46 x 16" 0.7m 28"	88 x 48 x 35 35 x 14 x 14
	Rescue Sled RS10 WRW0003/01	MFC INTERNATIONAL		>£3800 >\$2500 >\$5000 >\$3250	31/ 35kg 38.6/ 68.2lb	800kg 1764lb	4 x 1.9 x 0.56m 158 x 47/75 x 22" 1.2m 47"	88 x 55 x 35 35 x 22 x 14

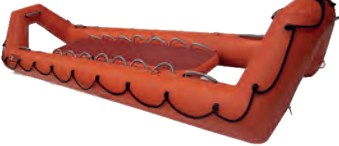
INFLATABLE OPEN-ENDED SLEDS/WATERCRAFT

	approx. AIR CAPACITY			INFLATION			LOADING		VALVES		EXTRAS	VIZ					
	INFLATION TIME (Hand) (Powered or CA)	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	CA INFLATION CHAMBERS	REGULATOR / HOSE	MANUAL/ POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	TOW/HD-LIFT/ LINK EYES	SAFETY PRV / DUMP	1-WAY / 2-WAY	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM	COLOUR OPTIONS		
5cm 12"	1132 L 40cuft 1-3mins	0.2 BAR 3 PSI	PVC. drop-stitch deck	3 ■	■ ■	- ■	8 0	■ -	2 4 3	- -	■ -	■ ■	10 ■	■ -	- -	Note 2Tinga have a flat platform called a RIT-Sled but is not a 'sled' as defined in this article. DISCONTINUED March 2026	2tinga.ca
0 x 7 x	1700 L 60cuft 3-4mins	0.55 BAR 8 PSI	Neoprene coated nylon. drop-thread deck	3 ■	□ □	□ □	0 0	- -	6 - 4	- ■	■ -	□ ■	N/A ■	■ ■	- ■	DISCONTINUED * 6 of these eyes are for joining to another raft or platform NOT towing	checkmateflex.com
0cm 12"	860 L 30.4cuft <1min	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon 6" drop-thread deck	3 ■	□ □	□ □	7 4	■ -	4 - 5	- ■	■ -	■ ■	5 ■	■ ■	■ ■	Leaffield valves. Height does not include angled bow	safequip.co.uk
0cm 12"	920 L 34.5cuft <2mins	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon 6" drop-thread deck	3 ■	□ □	□ □	10 4	■ -	4 - 5	- ■	■ -	■ ■	5 ■	■ ■	■ ■	* length inc 45cm/18" deck extension. Leaffield valves. Height does not include angled bow	safequip.co.uk
0cm 20"	920 L 34.5cuft <2mins	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon 6" drop-thread deck	5 ■	□ □	□ □	10 4	■ -	4 - 5	- ■	■ -	■ ■	5 ■	■ ■	■ ■	* length inc 45cm/18" deck extension. Leaffield valves. Height does not include angled bow	safequip.co.uk
5cm 18"	1550 L 54.7cuft <2mins	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon 6" drop-thread deck	5 ■	□ □	□ □	8 2	■ 8*	2 - 8*	- ■	■ -	■ ■	5 ■	■ ■	■ ■	Leaffield valves. 6" Deck. * D-Ring under deck can provide flip tab	safequip.co.uk
0cm 2"	530 L 18.7cuft 2-3mins	0.2 & 0.4 BAR 3.25 & 6 PSI	Hypalon TPU drop-thread deck	2 ■	■ □	□ □	5 6	■ -	8 - 4	- ■	■ -	2 ■	2 ■	■ ■	■ ■	comes with throwline with rubber quoit. Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
2cm 2"	670 L 23.7cuft 3mins	0.2 & 0.4 BAR 3.25 & 6 PSI	Hypalon TPU drop-thread deck	2 ■	■ □	□ □	5 6	■ ■	8 - 4	- ■	■ -	2 ■	2 ■	■ ■	■ ■	comes with throwline with rubber quoit. Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
5cm 4"	710 L 25cuft 3mins	0.2 & 0.4 BAR 3.25 & 6 PSI	Hypalon TPU drop-thread deck	2 ■	■ □	□ □	5 6	■ ■	8 - 4	- ■	■ -	2 ■	2 ■	■ ■	■ ■	comes with throwline with rubber quoit. Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
5cm 4"	2000 L 70.6cuft 3mins	0.2 & 0.4 BAR 3.25 & 6 PSI	Hypalon TPU drop-thread deck	5 ■	■ □	□ □	5 12	■ ■	8 - 4	- ■	■ -	2 ■	2 ■	■ ■	■ ■	comes with throwline with rubber quoit. Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com

images NOT to Scale Option Partial Feature &/or OK but not ideal COST: Approx. <u>INC</u> local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	Rescue Sled RS15 WRW0005/01	MFC INTERNATIONAL		>£4200 >£2900 >\$5500 >\$3780 >€5000 >€3425	45/ 50kg 99/ 110lb	1200kg 2646lb	5 x 2.31 x 0.77m 197 x 63/91 x 30" 1.6m 63"	88 x 70 x 52 35 x 28 x 2
	RR3	NORTHERN DIVER		£1070 £1490 \$1560 \$2170 €1700 €2120	22kg 48.4lb	650kg 1430lb	3 x 1.16 x 0.3m 118 x 28/46 x 12" 0.7m 28"	90 x 40 x 30 35.4 x 15.8 x
	RR4	NORTHERN DIVER		£1100 £1800 \$1600 \$2620 €1890 €2125	31kg 68.2lb	750kg 1650lb	3.6 x 1.16 x 0.38m 142 x 46 x 15" 0.7m 28"	95 x 50 x 50 37.4 x 19.7 19.7"
	RR MAX RAFT	NORTHERN DIVER		£1840 £2680 €2326	37kg 81.4lb	1000kg 2200lb	3 x 2 x 0.38m 118 x 51/79 x 15" 1.3m 51"	130 x 60 x 4 51 x 23.6 x 1
	X-SLED 115	NRS		£1900 \$2500 €2300	30.5kg 67lb	480kg 1056lb	3.66 x 1.22 x 0.36m 144 x 48 x 14" 0.71m 28"	85 x 35 x 30 33.5 x 13.8 x
	RESQSLED 3 RESQSLED5 RESQSLED10	SIT Ltd		N/A	23.8kg 52.4lb	650kg 1430lb	3. x 1.2 x 0.35m 118 x 47 x 14" 0.7m 27.6"	90 x 30 x 30 35.4 x 12 x 3
	RESQRAFT10 RESQRAFT15	SIT Ltd		N/A	42kg 92.4lb	1000kg 2200lb	3.2 x 2.2 x 0.38m 126 x 87 x 15" 1.2m 47"	90 x 30 x 30 35.4 x 12 x 3
	ITD (PWC Dock)	WATER RESCUE		£000 \$000 €000	65kg 143lb	2+ 8cas 800kg 1760lb	5.3 x 2.15 x 0.5m 208 x 84.6 x 19.6" 00m 00"	100 x 70 x 5 40 x 28 x 19
	Mega Sled	WRS INTERNATIONAL		£2285 \$3095 €2667	32-38kg 70-84lb	6-10* 220kg 484lb	2 x 1 x 0.35m 79 x 39 x 14" 00m 00"	120 x 60 x 3 47 x 23.6 x 3
	X Sled	WRS INTERNATIONAL		£2147 \$2300 €2553	20kg 44lb	2+1-3cas* 350-580kg 770- 1276lb	3.55 x 1.2 x 0.24m 118 x 55 x 6" 00m 00"	100 x 50 x 4 39.4 x 19.7 x

INFLATABLE OPEN-ENDED SLEDS/WATERCRAFT

	approx. AIR CAPACITY	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATION			LOADING			VALVES		EXTRAS		VIZ		NOTES	WWW.
				CA INFLATION CHAMBERS	REGULATOR / HOSE	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	TOW/HD-LIFT/LINK EYES	SAFETY PRV / DUMP	1-WAY / 2-WAY	CARRY BAG / PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE / CUSTOM	COLOUR OPTIONS		
2cm 1"	3800 L 134.2cuft 3mins	0.2 & 0.4 BAR 3.25 & 6 PSI	Hypalon TPU drop-thread deck	5 ■	■	■	5 ■	16 ■	8 - 4	■	■	2 ■	2 ■	■	■	comes with throwline with rubber quoit. Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
0cm 12"	approx 630 L 22.2cuft 1 - 3mins*	0.35 & 0.7 BAR 5 & 10 PSI	1.2mm PVC or Orca Hypalon drop-stitch deck	3 ■	■	■	4 ■	6 ■	4 - 7	■	■	■	2 ■	■	■	*Power pump to Hand Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
0cm x	approx 800 L 28.3cuft 1- 3-4mins*	0.35 & 0.7 BAR 5 & 10 PSI	1.2mm PVC or Orca Hypalon drop-stitch deck	3 ■	■	■	4 ■	9 ■	4 - 15	■	■	■	2 ■	■	■	* Power pump to Hand Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
0cm 5.8"	1550 L 54.7cuft 1.5-5min	0.35 & 0.7 BAR 5 & 10 PSI	1.2mm PVC drop-thread deck	4 ■	■	■	5 ■	4 ■	13 - ?	■	■	■	1 ■	■	■	*Power pump to Hand Inflation time calculated at 50 pump strokes per minute	ndiver-rescue.com
0cm 12"	710 L 25 cuft <2mins	0.3 & 0.7 BAR 4 & 10 Psi	PVC drop-stitch deck	3 ■	■	■	- ■	- ■	- 5	■	■	■	3 ■	■	■	Design being changed. Armoured underside to sponsons. Leaffield valves. * Height does not include 20" rise of the angled bow	nrs.com
0cm 12"	860 L 30.4cuft <1min	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon Neoprene-coated 6" drop-thread deck	3 ■	■	■	7 ■	4 ■	4 - 5	■	■	■	2 ■	■	■	Leaffield valves	sitltd.co.uk
0cm 12"	1550 L 54.7cuft >2mins	0.2 & 0.4BAR 3 & 6 psi	'Orca' Hypalon 6" drop-thread deck	5 ■	■	■	8 ■	2 ■	2 - 8*	■	■	■	2 ■	■	■	Leaffield valves. * D-Ring under deck can provide flip tab. Inboard stowage loops	sitltd.co.uk
0cm 7"	000 L 00cuft 0min	00 & 00 BAR 00 & 0 psi	PVC. 6" drop-stitch deck	5 ■	■	■	- ■	24 ■	28 - 1	■	■	■	1 ■	■	■	Multi-functional craft but intended to be used as a floating dock for an RWC/PWC hence shorter deck	waterrescue.de
5cm 14"	450 L 15.9cuft <1min	0.3 & 0.6BAR 3.6 & 9 psi	PVC. 6" drop-stitch deck	3 ■	■	■	2 ■	2 ■	11 - 9	■	■	■	1 ■	■	■	Leaffield valves. Flap at stern can be lifted to form a 'transom' style water barrier. 8x Velcro loop stow points *10=calm water	wrsinternational.com
0cm 16"	700 L 24.7cuft >2mins	0.25 & 0.6BAR 3.6 & 9 psi	PVC. 6" drop-stitch deck	3 ■	■	■	- ■	15 ■	0 - 5	■	■	■	1 ■	■	■	* Height does not include 54cm/21" rise of the angled bow. Leaffield valves. EVA floor friction pads . *3=calm water	wrsinternational.com

images NOT to Scale = Option ●= Partial Feature &/or OK but not ideal COST: Approx, <u>INC</u> local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	RESCUE TIP BOARD	HONOR- SAFETY		N/A	22kg 48.4lb	500kg 1100lb	2.7 x 1.3 x 0.7m 106 x 57 x 15.7" 0.55m 20"	90 x 50 x 40 35.4 x 19.7 x 15.7
	LIFEBOAT	LANCO		?	25kg 55lb	900kg 1980lb	4.67 x 1.12 x 0.00m 00 x 00 x 00" 00m 00"	70 x 70 x 40 28 x 28 x 15.7
	RSW RESCUE SLED WR0244	MFC INTERNATIONAL		£2500 \$3250 €2950	31.5kg 69.3lb	850kg 1870lb	5 x 1.2 x 0.45m 197 x 47 x 17.7" 0.75m 30"	80 x 40 x 30 31.5 x 15.7 x 11.8
	POLAR 75	NAUTIC&ART (CHARGEKInc)		£5930 \$7800 €7180	32kg 70.4lb	1045kg 2299lb	4.4 x 1.3 x 0.36m 173 x 51 x 14" 0.58m 23"	152 x 152 152cm 60 x 60 x 60
	RR5	NORTHERN DIVER		£1621 \$3000 €1920	42kg 92.6lb	850kg 1873lb	4.7 x 1.4 x 0.35m 105 x 55 x 13.8" 0.7m 28"	110 x 60 x 40 43x24x15.7
	ASR 155	NRS		£2280 \$2995 €2760	39.5kg 87lb	850kg 1873lb	4 x 1.25 x 0.3m 185 x 49 x 12*" 0.64m 25"	122 x 78 x 30 48 x 31 x 11.8
	RDC RAPID DEPLOYMENT CRAFT	OCEANID		£3725 \$4900 €4510	22.7kg 50lb	>909kg >2000lb	4.68 x 1.22 x 0.3m 184 x 48 x 12" 0.56m 22"	91.2 x 61 x 30 36 x 24 x 11.8
	IONIC EXPLORER SLED	SAFEQUIP		£2250 \$3150 €2700	22kg 48.4lb	>500kg >1100lb	4.6 x 1.42 x 0.3m 181 x 56 x 12" 0.82m 32"	80x40x25 31.5x16x11.8
	RESQSLED ENDURANCE SIT38042	SIT Ltd		N/A	20kg 44lb	>500kg >1100lb	4.6 x 1.42 x 0.3m 181 x 56 x 12" 0.82m 32"	80x40x25 31.5x16x11.8
	SKF-ICE	WING INFLATABLES		£7600 \$10000 €9200	27.3kg 60lb	909kg 2000lb	4.72 x 1.22 x 0.3m 186 x 48 x 12*" 0.61m 24"	81 x 38 x 40 32x15x11.8

INFLATABLE OPEN-ENDED RDC-STYLE RAFTS

	approx. AIR CAPACITY	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATION			LOADING		VALVES		EXTRAS		VIZ		NOTES	WWW.	
				CA INFLATION CHAMBERS	REGULATOR / HOSE	MANUAL/POWER PUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	TOW/HD-LIFT/LINK EYES	SAFETY PRV / DUMP	1-WAY / 2-WAY	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM			COLOUR OPTIONS
0cm 15.7"	570 L 20cuft 15-30sec	N/A	N/A drop-stitch deck	 	 	 	11 0	 	4 - 1	- 	- 	 	 	 	-	Can be purchased with an electric SeaBob hand-held waterjet * with BA cylinder	honor-safety.com
0cm .7"	?	?	PVC-coated polyester	 	 	 	40 0*	 	21 - 4	 	 	 	 	 	-	*20 external grab handles (via rope) can be used as lift ponts	lanco.eu
5cm 14"	2000 L 70.6cuft 3mins	0.2 & 0.4 BAR 3.25 & 6 Psi	Hypalon TPU drop-thread deck	 	 	 	10 8	 	8 - 4	- 	 	2 	2 	 		comes with throwline with rubber quoit. Leaffield Valves	mfc-international.com
x 0"	1100 L 40cuft 20sec*	0.24 & 0.8BAR 3.5 & 12 Psi	40oz Hypalon. drop-thread deck	 	 	 	6 14	 	- 4 6	-  	 	 	5 	 	-	opening=81x46cm *Single inflation point. Height does not include 73° rake	nacorp.ca
0cm 7"	1000 L 35cuft 1- 3-4mins*	0.35 & 0.7 BAR 5 & 10 Psi	DWF/PVC drop-stitch deck	 	 	 	6 12	 	- - 6	- 	 	 	1 	 	-*	*Power pump to Hand Inflation time calculated at 50 pump strokes per minute. *Custom colours	ndiver-rescue.com
3cm 3"	960 L 34cuft 1-2mins	0.3 & 0.7 BAR 4 & 10 Psi	PVC drop-stitch deck	 	 	 	32 -	 	16 4 6	- 	 	 	3 	 	-	* Height does not include 24" rise of the angled bow and stern. Armoured underside to sponsons. Can be hoisted under load. Leaffield valves	nrs.com
0cm 2"	1133 L 40cuft <1min	0.2 BAR 3 Psi	35 oz. PU/PVC coated Polyester (Dacron). Drop-thread deck	 	 	 	0* 18	 	26 4 -	- 	 	 	12 	 	-	Halkey Roberts & Incept PR Valves. Can be suspended/hoisted while loaded. *Perimeter cord 'handles' load= >2500lb/1136kg access hole = 22x40"	oceanid.com
cm 0"	860 L 30cuft >1min	0.2 & 0.6BAR 3 & 9 psi	'Orca' Hypalon 6" drop-thread deck	 	 	 	12 8	 	14 - 4	- 	 	 	2 	 	  	Leaffield valves	safequip.co.uk
cm 0"	860 L 30cuft >1min	0.2 & 0.6BAR 3 & 9 psi	'Orca' Hypalon. 6" drop-thread deck	 	 	 	12 8	 	14 - 4	- 	 	 	2 	 	  	Leaffield valves	sitltd.co.uk
1cm 5"	950 L 33.5cuft >1min	0.3 BAR 4.5 psi	33oz polyester scrim Polyurethane. drop-thread deck	 	 	 	0 2*	 	- - 22	- 	 	 	5 	 	-	Price includes Motor transom. *rise of bow/stern =30". Chambers linked to Inflate as 1 *Grab cord rigged to act as lift and shift handles. Custom colours	inflatable-solutions.com

Inflatable NON-POWERED RAFTS

MAIN PIC: Mustang Survival's MRR130 raft made by specialist raft company Wing Inflatables. This is a craft specifically made for rescue from a swiftwater rafting origin unlike most of the UK models (like the MFC sled below which forms the basis of their fully enclosed raft) are much more 'work-boat' oriented and redesigned for rescue from that perspective. Unlike North America the UK doesn't have a huge swiftwater rafting community or indeed the vast lengths of whitewater rapids to support it. It does however, have masses of much narrower, fast moving channels that can and do become raging torrents in the blink of an eye during storms.



After covering the open-backed/stern sleds and rafts this Guide to non-powered rafts evolved with wilderness teams working true swiftwater on their patch. 'Evolved' is not the correct word because the craft in use are very close to the recreational models aside from reinforcements and extra handles and rings and it's more accurate to say that the open-ended sleds (as exemplified by the MFC model in the picture on the right) and *Oceanid*-style rafts (and WRS craft in the ad far right) evolved out of these 'puffier' swiftwater-style rafts. While the majority of rescue agencies have moved towards the sled and *Oceanid* styles, there is still a big place for conventional rafts in a rescue inventory either because there are swiftwater risks in or near your response area or because they are used for casualty rescue and evacuation in the event of flooding. This is because rafts, with larger sponsons completely surrounding the deck, provide better protection for the raft occupants. We have only listed models that are marketed to or used by rescue agencies and that do not have an inherent ability to mount an outboard because those will be included in our GUIDE to Powered IRBs. However, those GUIDES will not include rafts and catarafts

that can be *retrofitted* with a frame capable of mounting an engine - there would be just too many to mention. Back to the sponsons on swiftwater rafts and while they provide greater protection than open ended craft, they won't necessarily keep everyone bone-dry because many, especially if they have an I-beam rather than drop-thread or drop-stitch floor, are self

baling which means that water can enter and drain through gaps around the union between the floor and the sponsons.

Any craft in this GUIDE not shown as self-bailing are better suited to slow moving flood or still water rather than swift or rough water. Indeed,

Safequip in the UK actually call theirs an 'urban' evacuation raft indicating its true design purpose and while 'urban' is perhaps too limiting for some of the non-self-bailing models, particularly from UK companies, they are certainly designed for a different role to the North American models that can be dealing with epic whitewater conditions as well as general flooding.

One of the differences between true swiftwater and broader

RAFT VS SMALL OPEN-STERN SLED/RAFT

- Both Self bail,
- Raft has more stability so better for bigger water,
- Raft with larger tubes is more forgiving so less training to keep upright.
- Raft has larger carrying capacity,
- Sled is lighter to carry in,
- Sled easier to self rescue after capsize,
- Sled easier to load victim from water into boat,
- Sled can be paddled solo so less rescuers at risk.



MFC Rescue Sled RS3 (small)

RAFT VS LARGER OPEN-STERN RAFT

- Raft heavier than equivalent open-stern version,
- Rafts offer more rear protection from falling out so more suitable for bigger or higher risk water where you don't want people falling out at all!
- Both offer good stability (raft would be slightly more stable due to added weight, but marginal)
- Open-Stern better for wading wide spread floods and getting on & off the boat
- Raft are generally self-bailing so contaminated water will enter the raft through the floor. (This is a Flood Rescue Consideration)
- Open Stern Raft offers easier water victim access
- Open-Stern easier to climb into after capsize.

remit rescue is that hardcore whitewater rafts tend to have the softer and deeper I-beam inflatable floor but rescue tends more towards a drop-thread floor because it is generally tougher, thinner and more stable to work on bearing in mind that such craft tend to be used more in flood than whitewater.

These rafts are the same materials and construction as the platforms and sleds ie. - incredibly robust welded PVC/TPU or *Hypalon*, often as a Double Wall Fabric (DWF) and either drop stitched or I-beam on the most robust part of these craft, the floor/hull. Drop-stitch floors are stiffer, with generally better performance under load and more responsive while I-beam floors are simpler and cheaper with a slightly softer ride - this is the more traditional construction but both even though drop-stitch is lighter, the additional layers and higher pressure mean they weigh roughly the same. Welded is more resilient than glued seams and all inflatables have pressure differentials due to heat increases that can test the seams if over-inflated and overloaded. Some, like *WRS* and *Rocky Mountain Rafts* offer drop-stitch or I-beam floors. Given the abuse these things get from ice, gravel, flooded wire fences and brick walls etc. some have extra reinforcing strips along the underside of sponsons like the *NRS* craft. Failing that, most craft come with a repair kit. As with most things in life, you get what you pay for, so consider the materials, construction warranty and pedigree of the manufacturer and craft before committing to a purchase. The *Mustang/Wing MRR130* model in the title image demonstrates the most obvious difference between a conventional 'whitewater' style raft and the open-ended sleds/rafts like the yellow *MFC* sled opposite.... the sponsons extend all the way around the craft and because they are quite large the inner working space is more restricted in comparison to the uncluttered surface of a platform or narrow-sponson sled. It's clear that the specialist rescue rafts like the South African *ARK* range that have been developed from whitewater rafts rather than actually being a whitewater raft with extras, are much narrower. Most of the sleds designed to be used in fast moving water (as well as flooded urban streets and alleyways) were also narrow beamed and it seems that this profile suits many rescue agencies since the *ARK* range for instance has been designed in conjunction with the Queensland Fire Service in Australia.

The shallow rake we see on sleds helps deal with waves but the higher rake we see on fully enclosed -size rafts like the *NRS* raft below, allows the craft to negotiate fast flowing water without having tons of water washing over the bow. The rake also allows the craft to be pushed up against obstacles such as mid-stream boulders and low-head dam/weir faces which can be more easily search or a stranded taken on board because high-rake craft 'bend' a little at the change of angle to provide an extra few inches of proximity to the target. In the absence of an opening in the bow (as per the *Oceanid*-style craft) with which to funnel an in-water casualty, the raked, solid



WRS[®]
INTERNATIONAL

High Volume Bow and Rocker - With a raised bow height the X-Sled is able to handle tethers in swift water whilst reducing the risk of the bow diving when loaded. The increased volume maintains stability when occupied by a casualty or rescuer.

WRS[®]
INTERNATIONAL

Water Rescue X-Sled
The original and best since 2014, designed in the UK.

www.wrsinternational.com

A CHECKLIST to BUYING AN APPROPRIATE RAFT

by **Mike Croslin**

In discussing boat handling in the rescue environment, the rescuer must first examine the types of boats to be utilized in river rescues and should closely examine the maneuvers those boats can perform in contrast to the total number of river rescue methods for which all river rescue boats are capable of.

Consider all of the pointers below in order to arrive at the most economically feasible and the most efficient type of rescue craft for your specific locality, type and number of incidents and ability to attain and maintain training for your craft in your conditions. It has been observed that manufacturers across the world have, in the past, marketed various kinds of craft as the "ultimate ** answer for river rescue. River teams and individuals should be cautious when considering such claims and perhaps consult other teams that may have similar conditions in their response area.

Generally there are 3 boats teams may have in their cache:

- River Rescue Boats, inflatable.
- IRB style with transom motorized
- Cataract IRB with transom. Motorized

Motor-capable IRBs are the workhorse of flood and disaster response, flood evacuations, wide flooding areas with no road access, can ascend against the current to approach from downstream, bridge abutments, rocks, trees, can function in waves, strong currents and obstacles with expert training. Can be Zodiac/Avon style or cataracts. Full spectrum, rigid-hull rescue boats are too heavy to surf in choppy, stout currents and have limited capability in class3 and above or inside tree lines at flood stage. Crews must train for motor failure and must carry paddles to R2. Registered swiftwater teams generally have one or two IRBs or motorized cataracts/oar combos in cache in the USA and operators require extensive training annually to stay competent and build experience. Such craft are not useful in remote canyons or rocky, shallow rivers and have significant risk of engine failure, or swamping in big volume or steep gradient rivers. Excellent for wide, flood plain deployment and up to class 3. Again, a great flood evacuation workhorse.

Non-motorized, human powered inflatables

1. The self-bailing "basket" boats. A new variation on the commercial recreational market that have lashed in inflatable floors allowing immediate draining of water and enhanced performance downriver in up to class 5. Medium weight, 100-150lbs or more. Tube size varies depending upon CFS navigating, a Grand Canyon NPS boat will have larger tubes than a Yosemite cataract based on size of waves, hydraulics etc. A USFS river patrol ranger would on the Tuolumne would run

a SOTAR downriver or a Wing as a choice based on support for operations and loads carrying duty, but they are not the best in rescue mode that may require surfing under technical rope control,

2. Framed cataract oar powered or a frameless cataract R2 paddle. If you choose to train and expand boat operators skillsets beyond your local watersheds in the standard R2 paddle format, the frameless cataracts that have immediate rapid floor flush meet the essential high performance criteria in terms of weight, portability, speed, side stability, to both perform as a rescue boat with R2 as a chase boat, or pickoff boat launched with experienced R2 paddlers that are capable of broaching, crossing powerful stout channels to pull victims into a soft protected compartment and exit downriver safely. Some teams use framed cataracts of various sizes, if they have the talent base to row. Many do and this is important on many technical rivers and they make excellent platforms, but they have frames and large oars, which prevent dynamic pickoffs safely and can be traumatic if flipped onto inexperienced passengers or victims...only an issue if experience is lacking.. So for lightness and speed of deployment and downriver chase boat and pickoff capability and maneuverability, the frameless cataracts are superior for rescue crews training in paddle power only...which is faster performance in these excellent maneuvering and forgiving boats.

Because most teams lack the training to safely use a motorized or non-motorized inflatable at the scene of a significant flood or swiftwater event with rescuers on board it is essential that rope based control systems be learned and practiced with the best performing inflatable under shore control with ropes. If its an evac off a car roof in a flooded creek with slight gradient, and the channel has trees and wood galore within range of a short unexpected swim, this is a major event, for even the most experienced operators. These technical rope based systems we use are capable of placing a boat precisely where it is needed safely, with or without rescuers on board, and if you choose to use rescuers, whomever goes is a function of experience and strong swimmer status, not paper/scissors/rock. The rescuer on the boat is in charge of the controllers. He can feel the boat, and guide it better, and I hope at this point we can collectively agree that if he was trained well he or she would choose the lightest, most stable, self bailing platform to control from shore AND to navigate to safety should it be necessary. By my logic and experience this is the most important purchase decision a top tier team will make. It HAS to be the lightest but toughest, boat that is best across all formats of control and is fast under R-2 paddle for chase function safety as well, and in boat pickoff, broaching, grabbing victims into a central closed, self bailing compartment with instant drainage mesh, or lashed inflatable flooring..These criteria will insure best protection for rescuers and if delivering an empty evacuation boat in high risk flows, the best chance of bringing those trapped to safety. My best advice is to use a high performing design that is light, frameless and selfbailing with a reputation for running class 4-5, then add handles and attachments to carry or hold onto into the interior, including foot braces. Make team members study

R2 paddle techniques and practice regularly even if its just in a swimming pool, this alone is the minimal standard for R2 rescuers being sent, they must be drown-proofed and capable of navigating the boat to safety on their own. If a boat can be placed precisely and victims are capable of putting on a PFD, and exiting onto a stable platform, they should be allowed to do so, especially if competent control of the boat in an emergency exit is in question.

COMPARISONS AND CONTRASTS

Once the river rescue team has discovered all of the various types of boats capable of performing river rescues, they then have to make some comparisons between the ability of these boats to perform in their local environment. The river rescue team first has to analyze and determine which kind of boat will be suitable for their particular situation. They must ask themselves the following questions:

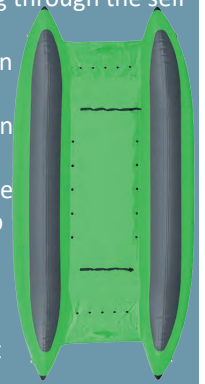
1. Are you working in a flat river or waves, currents and rapids?
2. Is your river averaging fairly deep water or shallow areas?
3. Is your river wide or narrow?
4. What is the immediate access to the river.
5. Are there numerous boat launches or are you going to be forced to put their boat into the water through brush, walls, fences and other obstacles?
6. Are there a number of in-water hazards such as strainers, low head dams/weirs, class 3 or above rapids in your response area?
7. What is the ease or difficulty of operation of the type of rescue craft that you are choosing and how well can you train and maintain training of personnel?
8. What is the potential for flipping, broaching, or otherwise turning the boat over within the rescue environment?
9. What types of rescues are usually undertaken on your stretch of river?
10. Will the boat be used for other purposes besides rescue, aka dive platform, body recoveries?
11. Will the boat be suitable for deployment to other areas?
12. What is the available budget?
13. Which of the following rescue maneuvers will the boat be capable of:
 - Pick up rescuers in current
 - Pick up victims entrapped on top of rocks, houses, vehicles, caught in class 3 flood-stage water or higher
 - Effectively maneuver downstream to broach onto an object in order to pick up victims
 - Light enough to be suspended on a rope rescue system in the middle of the river
 - Move upstream through class 3 water or better
 - Make effective crossing in current
 - Carry several victims, extremely stable

Mitch Sasser says...

A recent successful rescue from a mid-stream vehicle using a non-powered raft by the Santa Barbara Fire Dept with inflatable raft highlighted the need to ensure your craft is properly inflated, in the rush to deploy to a casualty in difficulties it is all too easy to cut corners leaving you open to swamping and buckling if the casualty numbers or conditions change during the rescue.

Self Bailers are the design to go with BUT....for whitewater and fast flowing/rough water, the self bailing should be via holes all the way around the floor. Some designs only have drain holes punched through the floor material along both sides with the floor being glued to the outer tubes in these designs. I prefer a floor that is laced in and provides drainage 360 degrees around the boat. Without this you risk sudden weight change when taking on water flushing through the self bailing system and without drainage in the bow and/or stern the water accumulation can cause overloading, snapping control lines or ripping lines out of rescuers grip. Having drain holes around the entire raft also helps in self rescue if a flip occurs. Naturally, the larger the tube diameter the more difficult it is to climb on top and right the raft again.

Those who have experience with flips and recovery will note the hand hold and grab options that a laced-in floor provides even at the bow and stern for the rescuer to quickly get up on top of the upside down boat. Some teams may be using pre-rigged flip lines to avoid having to climb up on top of the craft for correcting it. In summary, if the floor and tubes/sponsons are properly inflated with weight properly distributed and with full circumference self bailers, the boats will plane better. My choice in fast-moving water is a cataraft first option, then raft as a second option.



bow is less inclined to smash an in-water casualty in the head as the two approach each other, possibly closing at speed in a high flow. Also notice that the larger-diameter tubes/sponsons on the whitewater-style rafts mean that the deck may be suspended clear of the water as it is in most catarafts which improves speed and manoeuvrability.

VALVES

All of these craft inflate through a valve which may only allow air flow inwards (inlet check valve) so you don't lose air pressure should the valve cap not be in place or the pump/cylinder hose come off during inflation. We have differentiated three types in our tables: Safety or Pressure Relief Valves, 1-Way, 2-Way and Dump valves but for this GUIDE they are mostly 2-Way and Pressure relief valves. **Pressure Relief Valves** refers to its ability to purge air should you OVER-inflate. This can be the case particularly with compressed air cylinders so the safety valve will allow air to force its way out of the valve rather than bursting the seams of the craft. A **2-way** valve allows inflation and deflation. Some, like the Leaffield A/B/C and now D7 (pic above) and Halkey-Roberts





valve, have a cap and then an interior sleeve that you rotate a quarter or half turn to alternate between inflate and deflate while others have a second screw-off collar beneath a non-return inflation section. When unscrewed, this allows air to exit freely. Deflation needs to be fast so that the craft can be rolled and stowed or moved ASAP ready for the next task so these 2-way valves are doubling as Dump or rapid air expulsion valves which tend not to be present on most sleds, boats and rafts. True dump valves, in the diving sense, can of course be a push button affair but this is obviously not the case for inflatable craft where they are regular screw-top release if they are present at all. Bear in mind that most craft have more than one chamber so deflation can be a more time consuming process than inflation. Some raft have one-way baffles between chambers that means a single inflation point inflates all chambers which is much faster to inflate and deflate than inflating/deflating chambers one after the other - this is more the case with specialist rescue craft than it is with purist swiftwater rafts. Many craft have both sets of valves sometimes next to each other as with the WRS and sometimes separated as with MFC and ARK Craft where the inflate-deflate valves are located on the ends of each sponson and on the floor. Most valves are designed to use manual pumps and BA cylinders, but some are large enough to use a powered blower or even a vacuum cleaner in reverse. Professional battery blowers are an excellent idea because they have numerous other uses including cleaning/drying the craft. They are also unlikely to inflate beyond the pressure limit of the seams because they will struggle to push against over-pressure resistance. Basic dump valves can use large-bore pipe/hose inflation but air will escape while you try to screw the cap back on.



THWARTS/ BOLSTERS/SEATS

The narrower raft can be paddled Canadian-style, knelt down but conventional, wider models are paddled from each side, usually while sitting on one of the soft, inflatable thwarts or bolsters that act as seats as well as increasing buoyancy. In some models, these are detachable and can be used as makeshift in-water buoyancy aids in the event of a person-overboard situation. The 'fatter' tubes on rafts enable paddlers/rescuers to wedge feet into the deck-union to gain purchase and help in maintaining balance and integrity within the raft.

At least one craft, the Wing Inflatable at the top of this page has augmented the inflatable floor chamber with an additional 'flat' chamber for kneeling, this not only reinforces the deck it enhances comfort when paddling for long periods. Two of the craft in this

GUIDE, the ARK Croc-Rescue

(right) and the German RTB1 have flat seating.

The Ark has a vinyl strip which can also act as

a forward restraint when leant against during kneeled paddling while the RTB1 has wooden seats indicating tasking aimed at flood evacuation in slow-moving water rather than swiftwater or waves.



FOOT CUPS



A useful feature of some whitewater rafts that crosses over well into rescue rafts is the incorporation of low profile foot restrain cups attached to the deck. These are a flap of material that will sit flat when not in use or with a person/kit sat on them. In some cases these might double as paddle stowage but the more overt models like the NRS above are large enough to insert a good portion of booted foot and help keep you in the boat in

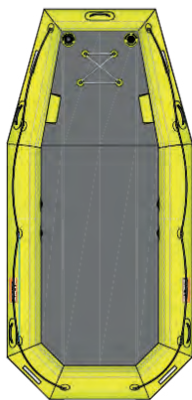


rough water as well as providing purchase from which to gain more paddling power going forwards and more reach when leaning back to help steering in strong current. Some thwarts also allow feet to be wedged beneath for extra purchase in rough water/waves.

NON-STANDARD DESIGNS

Another design much favoured in the North America is the cataraft, a twin sponson hull, invariably 'pointed' at the ends and joined by a two or three transverse sponsons that, in a standard raft would be separately inflated thwarts or bolsters. Our own swiftwater rescue co-editor Mitch Sasser swears by them because of their manoeuvrability, speed and stability but they offer far less floor space so clearly not so much use in flood evacuations and very much a tool for the specialists. Nevertheless, in the right hands these are a potent swiftwater rescue craft. There aren't as many in this GUIDE as you might expect because many are equipped with a rigid transom to take a motor and will therefore be in the separate Powered Craft GUIDES. *Rapid Approach Rescue's* cataraft (above) can also be retrofitted for a motor with an aluminium frame costing around \$275 and is one of only two in this particular GUIDE but there are a number of comparable craft that would suit rescue agencies that are not currently used or marketed as such. This *RAR* model incorporates a reinforced ramp on one end to ease hauling casualties on board - in this case up to 4 plus two rescuers. We've included the German *KAT* series by *Spreu Boote* because they are some tough, perhaps under-utilised models, but they don't have inflatable thwarts and are instead two separate sponsons separately joined by a platform and/or seating.

MFC's RS8ER (right) is typical of some rescue-specific models that have been born out of rescue and not rafting. Theirs is basically the same as their sled (and platform) but with sponsons all around that are narrower than their swiftwater counterparts. They are not self-bailing and are intended for evacuation and searching on relatively flat water and slower moving flood water. Such craft are perfectly capable in faster moving water but without self bailing, water coming in adds to the weight and discomfort so is best avoided. You can also see two inside pouches for throw cord or strobe etc and a tied-down panel to safely stow equipment or extra PPE. Some raft have internal paddle stowage points.



Finally a word about the *Mustang MRR130* model in the title picture which has been custom built by *Wing Inflatables* so you know it will be good. It's a dedicated rescue craft with enhanced features like ultra high visibility and more D-rings than you could possibly find uses for but it's one of only a handful that offers this range of rescue specificity in a true raft design. **IMPORTANT: REFER to KEY to TABLES on page 86**

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images NOT to Scale Option Partial Feature &/or OK but not ideal COST: Approx, INC, local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump Electric Pump/CA=Compressed Air VALVES: PRV=Pressure Relief Valve HEIGHT: unlike an IRB, height is generally the diameter of tube/sponson	MODEL	COMPANY	ORIGIN	COST	WEIGHT	LOAD CAPACITY	DIMENSIONS	PACKED SIZE
	Product Code			inc tax / VAT		PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	
	CROC RESCUE CRR 375	ARK		£592 \$706 €662	23kg 50.6lb	170kg 375lb	3.75 x 1.05 x 0.36m 12.3 x 3.4 x 1.16' 0.33m 13"	75 x 50 x 5 30 x 20 x 2
	ARK ANGEL ARR 420	ARK		£1424 \$1697 €1593	28kg 110lb	350kg 750lb	4.2 x 1.18 x 0.37m 13.75 x 3.9 x 1.2' 0.44m 17"	95 x 50 x 5 37.4 x 20 x 2
	NILE KN365	ARK		£1797 \$2142 €2010	35kg 68.2lb	425kg 937lb	3.65 x 1.75 x 0.52m 11.9 x 5.75 x 1.7' 0.71m 28"	98 x 56 x 5 38.6 x 22 x 2
	RES-Q-RAFT 400	CPI Rescue Products		N/A	50kg 44lb	950kg 2090lb	3.02 x 2.31 x 0.56m 9.9 x 7.6 x 1.8' 1.2m 478"	N/A
	PERSONAL PADDLE BOAT PPB12	DEMAREE (D.I.B.)		N/A	28kg 60lb	272kg 600lb	3.48 x 1.52 x 0.48m 11.4 x 5 x 1.6' 1.2m 478"	1.10 x 55 x 4 43 x 22 x 1
	RAPID RESPONSE BOAT RRB-160	DEMAREE (D.I.B.)		N/A	40.9kg 90lb	454kg** 1000lb	3.7 x 1.8 x 0.6m 12 x 6 x 2' 1.2m 478"	71 x 45.7 x 35 28 x 18 x 1
	OUTFITTER MINI-ME 00	HYSIDE INFLATABLES		£2565 \$3375 €3105	24.5kg 54lb	400kg 882lb	00 x 00 x 00m 9' x 5'2" x 18" 0.66m 26"	100 x 86 x 6 40 x 34 x 2
	OUTFITTER MINI-MAX 00	HYSIDE INFLATABLES		£3020 \$3970 €3655	26kg 57.2lb	820kg 1804lb	3.5 x 1.9 x 0.56*m 137 x 75 x 22" 1.34m 52.7"	88 x 50 x 3 35 x 19.7 x 1
	OUTFITTER RS10ER WR0214	HYSIDE INFLATABLES		N/A	35kg 77lb	950kg 2090lb	4 x 2.3 x 0.56*m 158 x 91 x 22" 1.9m 75"	88 x 55 x 3 35 x 22 x 1
	OUTFITTER RS10ER WR0214	HYSIDE INFLATABLES		N/A	35kg 77lb	950kg 2090lb	4 x 2.3 x 0.56*m 158 x 91 x 22" 1.9m 75"	88 x 55 x 3 35 x 22 x 1

INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATE		LOADING			VALVES		ACC		VIZ		NOTES	WWW.
				SELF-BAILING	CHAMBERS / THWARTS	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW/ LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM		
0cm 20"	600 L 21.2cuft 8-12mins	0.24-0.28BAR 3.5-4.5 Psi * BAR * Psi	1055g PVC closed-cell foam floor	■ *	2	□ 2	2 6	■ -	6 4	-	■ -	□ ■	3 ■	□ ■	*No bolsters, seating is a PVC strip. *Floor is solid foam (not inflatable). *Via bailing sock which can be closed.	arkinfloatables.com
0cm 20"	1200 L 42.4cuft 12-15mins	0.24-0.28BAR 3.5-4.5 Psi 0.55 BAR 8 Psi	1450g PVC 8cm/3" drop- thread deck	■	2 4	□ □	12 8	■ -	8 15	-	■ -	□ ■	3 ■	□ ■	60cm bow & stern kick. Additional rear PVC band seat.	arkinfloatables.com
0cm 20"	1648 L 58.2cuft 12-15mins	0.24-0.28BAR 3.5-4.5 Psi 0.17 BAR 2.5 Psi	1450g PVC I-beam deck	■	2 5	□ □	8 0	■ -	10 10	-	■ -	□ ■	3 ■	□ ■	70cm bow & stern kick	arkinfloatables.com
	1900 L 67 cuft 4-10mins	N/A	32oz PVC 40oz Evaloy- drop-thread deck	■	0 ?	□ ■	0 10	■ -	14 6	■	■ -	■ ■	1 □	□ □	This raft being updated or discontinued. Removable inflatable floor	cpiwaterresqproducts.com
45cm 18"	1300 L 46 cuft <2->10mins	0.24 BAR 3.5 Psi 0.14 BAR 2 Psi	30oz vulcanized/ neoprene-coated fabric. Mil-C-17415 type 9A	■	* 3	□ ■	6 0*	■ -	2 6	■	■ -	■ ■	1 □	□ □	*+2x Foot stirrups **design load = 272kg 600lb. *No bolsters, fore and aft transverse sponsons act as thwarts.Custom Colours	dibboats.com
5.5cm 14"	1700 L 53 cuft <3->12mins	0.24 BAR 3.5 Psi 0.14 BAR 2 Psi	30oz vulcanized/ neoprene-coated fabric. Mil-C-17415 type 9A	■	* 4	□ ■	6 0*	■ -	2 6	■	■ -	■ ■	1 □	□ □	*+4x Foot stirrups Inflatable transom will take 10HP outboard. *No bolsters, fore and aft transverse sponsons act as thwarts. Custom Colours	dibboats.com
50cm 24"	1600 L 56.5 cuft <15mins	0.17 BAR 2.5 Psi 0.17 BAR 2.5 Psi	Hypalon Coated 1680D Nylon Urethane bottom	■	1 4	□ ■	0 2	■ -	8 0	■	■ -	- -	5- 10	■ ■	25" bow kick Leaffield Valves.	hyside.com
3cm 13"	1815 L 64cuft 3mins	0.2 BAR 3.25 Psi 0.4 BAR 6 Psi	Hypalon Coated 1680D Nylon Urethane bottom	■	2 5	□ □	0 2	■ -	8 0	■	■ -	2 ■	2 ■	□ ■	25" bow kick Leaffield Valves.	hyside.com
5cm 14"	2000 L 70.6cuft 3mins	0.2 BAR 3.25 Psi 0.4 BAR 6 Psi	Hypalon TPU 12cm/5" drop- thread deck	■	- 3	□ □	4 0	■ -	0 3	■	■ -	2 ■	2 ■	□ ■	25" bow kick Leaffield Valves.	hyside.com
5cm 14"	2000 L 70.6cuft 3mins	0.2 BAR 3.25 Psi 0.4 BAR 6 Psi	Hypalon TPU 12cm/5" drop- thread deck	■	- 3	□ □	4 0	■ -	0 3	■	■ -	2 ■	2 ■	□ ■	25" bow kick Leaffield Valves.	hyside.com

images NOT to Scale ■ ■ ■ = Option ● = Partial Feature &/or OK but not ideal COST: Approx, <u>INC</u> local tax/VAT <u>£</u> <u>US\$</u> <u>€</u> = currency conversions only INFLATION: <u>Hand Pump</u> <u>Electric Pump/CA=Compressed Air</u> VALVES: PRV=Pressure Relief Valve HEIGHT: unlike an IRB, height is generally the diameter of tube/sponson								
	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	430RR RESCUE RAFT	INMAR		£3000 \$3500* €3200	72.7kg 160lb	1023kg 2250lb	4.27x 1.98 x 0.51m 168 x 78 x 20" 1.47m 58"	140 x 84 x 6 55 x 33 x 2
	URBAN RAFT	IONIC		£5300 \$7155 €6254	42kg 92.4lb	1000kg 2200lb	3.2 x 2.2 x 0.38m 126 x 87 x 15" 1.44m 57"	100 x 70 x 4 39 x 27.6 x 1
	FAT BOY	JPW inc		£4100 \$4444 €4300	32.7kg 72lb	400kg 882lb	3.05 x 1.65 x 0.50m 120x 65x 19.5" 0.66m 26"	100 x 86 x 6 40 x 34 x 2
	RESCUE RAFT RS8ER WR0212	MFC INTERNATIONAL		N/A	26kg 57.2lb	820kg 1804lb	3.5 x 1.9 x 0.56*m 137 x 75 x 22" 1.34m 52.7"	88 x 50 x 3 35 x 19.7 x 1
	RESCUE RAFT RS10ER WR0214	MFC INTERNATIONAL		N/A	35kg 77lb	950kg 2090lb	4 x 2.3 x 0.56*m 158 x 91 x 22" 1.9m 75"	88 x 55 x 3 35 x 22 x 1
	MRR130	MUSTANG SURVIVAL (WING INFLATABLES)		N/A	50kg 110lb	909kg 2000lb	3.96 x 1.96 x 0.53cm 156 x 77 x 21" 0.89m 35"	96.5 x 11.1 125cm 38 x 45 x 4
	2.4M RAFT	NORTHERN DIVER		£606 \$800 €700	25kg 55.1lb	400kg 882lb	2.4 x 1.3 x 0.35m 94.5 x 55 x 14" 0.6m 23"	92 x 67 x 2 36.2 x 26.4 x 1
	CBS6	NORTHERN DIVER		£1260 \$1600 €1550	62kg 136.7lb	700kg 1543lb	3.8 x 1.7 x 0.45m 150 x 67 x 17.7" 0.8m 31.5"	120 x 60 x 4 47 x 24 x 1
	CBS8	NORTHERN DIVER		£1460 \$1850 €1750	70kg 154.3lb	900kg 1984lb	4.2 x 2 x 0.5m 165 x 78 x 19.7" 1m 39"	135 x 68 x 4 53 x 27 x 1

INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATE		LOADING			VALVES		ACC		VIZ		NOTES	WWW.
				SELF-BAILING	CHAMBERS / THWARTS	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW/ LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM		
51cm 24"	2400 L 85 cuft 10-15mins	0.16-0.2 BAR 2.8-3 Psi 0.6-0.7 BAR 9-10 Psi	1.2mm Hypertex, polyester, dual coated	■	2 5	□ ■	6 0	■ -	6 4	■	■ -	6 ■	1/ 3 ■	□ ■	*Rescue Agencies=\$2995	inmarboats.com
15cm 18"	1550 L 54.7cuft <2/>10mins	0.2BAR 3 Psi 0.4BAR 6 Psi	'Orca' Hypalon. 6" drop-thread deck	NO	1 5	□ □	8 2	■ ■	2 8*	■	■ -	■ ■	5 ■	□ ■	Leaffield valves. 6" Deck. * D-Ring under deck can provide flip tab	safequip.co.uk
50cm 24"	1600 L 56.5 cuft <15mins	0.17 BAR 2.5 Psi 0.17 BAR 2.5 Psi	32/42oz PVC coated Polyester drop-thread deck	■	2 8	□ ■	0 2	- -	4 0	■	■ -	- -	5- 10 ■	- -	10" bow kick. Removable drop-stitch floor. Foot thwarts. Rescue Celubra is power - capable so will be in the powered craft GUIDE	jpwinco.com
3cm 13"	1815 L 64cuft 3mins	0.2 BAR 3.25 Psi 0.4 BAR 6 Psi	Hypalon TPU 12cm/5" drop- thread deck	NO	- 3	□ □	7 0	■ -	0 3	■	■ -	2 ■	2 ■	□ ■	*Height is not tube diameter hence low volume Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
5cm 14"	2000 L 70.6cuft 3mins	0.2 BAR 3.25 Psi 0.4 BAR 6 Psi	Hypalon TPU 12cm/5" drop- thread deck	NO	- 3	□ □	4 0	■ -	0 3	■	■ -	2 ■	2 ■	□ ■	*Height is not tube diameter hence low volume Leaffield Valves. Optional rear bolster and storage pockets	mfc-international.com
4 x 9"	2350 L 83 cuft <2/>5mins	0.24 BAR 3.5Psi 0.31 BAR 4.5 Psi	33oz PU-coated Polyester. I-beam floor	■	2 5	- □	6 0	■ ■	32 2* 16	■	■ ■	□ ■	1 ■	- ■	Federal Aviation specification reflective panels 10" bow kick *2x3" Tow Eyes + 16x2" eyes. Flip cord/web housed in internal pouches	mustangsurvival.com
5cm x 9.8"	692 L 24.4 cuft <1 - 3.8mins*	0.35 BAR 5Psi 0.7 BAR 10 Psi	1.2mm PVC 8cm/3" drop- thread DWF/PVC Floor	NO	- 3	□ ■	0 6	■ -	0 0	■	■ -	2 ■	2 ■	□ ■	*Power pump to Hand Inflation time calculated at 50 pump strokes/min. NB the 2.7 and 3.3 raft are power-capable so will be in the powered craft GUIDE	ndiver-rescue.com
40cm 16"	1753 L 62cuft 1-10mins*	0.35 BAR 5Psi 0.7 BAR 10 Psi	1.2mm PVC 8cm/3" drop- thread DWF/PVC Floor	NO	0 5	□ ■	8 0	■ -	0 12	■	■ -	■ ■	2 ■	□ ■	UK DEFRA/Flood Approved * Power pump to Hand Inflation time calculated at 50 pump strokes/minute. NB the 2.7 and 3.3 raft are power-capable so will be in the next GUIDE	ndiver-rescue.com
45cm 18"	2397 L 85cuft 2- 13mins*	0.35 BAR 5Psi 0.7 BAR 10 Psi	1.2mm PVC 8cm/3" drop- thread DWF/PVC Floor	NO	0 5	□ ■	8 0	■ -	0 12	■	■ -	■ ■	2 ■	□ ■	UK DEFRA/Flood Approved * Power pump to Hand Inflation time calculated at 50 pump strokes/minute. NB the 2.7 and 3.3 raft are power-capable so will be in the next GUIDE	ndiver-rescue.com
																expansion row

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● = Partial Feature &/or OK but not ideal

COST: Approx, INC local tax/VAT

£ US\$ € = currency conversions only

INFLATION: Hand Pump

Electric Pump/CA=Compressed Air

VALVES: PRV=Pressure Relief Valve

HEIGHT: unlike an IRB, height is generally the diameter of tube/sponson

	MODEL Product Code	COMPANY	ORIGIN	COST inc tax / VAT	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	R120	NRS		£2550 \$3095 €3250	54.5kg 120lb	N/A	3.7 x 0.7/1.6 x 0.46m 146 x 40/76 x 18" 00m 00	114 x 66 x 3 45 x 26 x 1
	R130	NRS		£2800 \$3395 €3550	60.5kg 133lb	N/A	4 x 0.7/1.6 x 0.46m 156 x 40/76 x 18" 00m 00"	125 x 66 x 3 49 x 26 x 1
	R140	NRS		£3500 \$3695 €3850	76kg 167lb	N/A	4.3 x 1.1/2.2 x 0.56m 169 x 43/87 x 22" 00m 00	125 x 66 x 6 49 x 26 x 1
	SLICE XL CATARAFT	NRS/STAR		£1950 \$2195 €1766	30- 36kg 66-79lb	900kg 1980lb	3.6 x 0.66/1.8 x 0.56m 142 x 26/70 x 22" 00m 00	152 x 76 60 x 30



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FEATURED BRANDS:



INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATE		LOADING			VALVES		ACC	VIZ		NOTES	WWW.		
				SELF-BAILING	CHAMBERS /THWARTS	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW/ LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG/ PADDLES	REPAIR KIT/WARRANTY			REFLECTIVE/ CUSTOM	OTHER COLOURS
8cm 15"	1600 L 56.5cuft 1- <5mins	0.28 BAR 4Psi 0.55- 0.7 BAR 8-10 Psi	2000D PVC 10cm/4"drop- thread deck	■	2 5	□ ■	6 6	- □	0 16	■	■ -	□ ■	3 ■	□ ■	■	Foot retention pouches on deck +3 toe-holds under each thwart. Armoured underside to sponsons & hull. Leafield C7 & D7 valves. * Height does not include 29" kick of the angled bow	nrs.com
10cm 14"	1800 L 63.6cuft 1- <6mins	0.28 BAR 4Psi 0.55- 0.7 BAR 8-10 Psi	2000D PVC 10cm/4"drop- thread deck	■	2 5	□ ■	8 6	- □	0 18	■	■ -	□ ■	3 ■	□ ■	■	Foot retention pouches on deck +3 toe-holds under each thwart. Armoured underside to sponsons & hull. Leafield C7 & D7 valves. 30" bow kick	nrs.com
56cm 16"	2700 L 95cuft >2/ >15mins	0.28 BAR 4Psi 0.55- 0.7 BAR 8-10 Psi	2000D PVC 10cm/4"drop- thread deck	■	3 5	□ ■	8 8	- □	0 22	■	■ -	□ ■	3 ■	□ ■	■	Foot retention pouches on deck +3 toe-holds under each thwart. Armoured underside to sponsons & hull. Leafield C7 & D7 valves. * Height does not include 30" kick of the angled bow	nrs.com
cm 1"	2300 L 81cuft <2/ >10mins	0.2 BAR 3 Psi 0.55 BAR 8 Psi	44oz/1000D PVC 8cm/3" Drop- thread deck	■	1* 5	□ □	0 8	- □	10 0	■	■ -	□ ■	3/ 5	□ ■	■ ■	* 1x detachable bolster + two integral, transverse bolsters/ chambers. 2x Self-draining zipped compartments.+2 toe-holds under each thwart.Leafield C7 & D7 valves. 30" Bow/stern kick	nrs.com

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	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	RESCUE CAT	RAPID APPROACH RESCUE		£2000 \$2150 €2100	34kg 75lb	900kg 1980lb	3.6 x 1.7 x 0.56m 141 x 68 x 22" 0.6m 24"	115 x 81 x 6 45 x 32 x 1
	12'RESCUE RAFT SELF BAILING SB120	ROCKY MOUNTAIN RAFTS		£2600 \$3150 €2750	54.5kg 120lb	>800kg >1760lb	3.66 x 1.58 x 0.46m 144 x 62 x 18" 0.66m 26"	117 x 76 x 3 46 x 30 x 1
	16'RESCUE RAFT SB1600	ROCKY MOUNTAIN RAFTS		£3300 \$3800 €3550	88.6kg 195lb	>1350kg >3000lb	4.88 x 2.34 x 0.56m 192 x 92 x 22" 1.22m 48"	152 x 76 x 4 60 x 30 x 1
	16'RESCUE DROP-STITCH DECK RAFT SB1600DS	ROCKY MOUNTAIN RAFTS		£3780 \$4550 €4110	88.6kg 195lb	>1350kg >3000lb	4.88 x 2.34 x 0.56m 192 x 92 x 22" 1.22m 48"	152 x 76 x 4 60 x 30 x 1
	PHAT CAT PC120	ROCKY MOUNTAIN RAFTS		£1500 \$1650 €1750	23-29kg 51-63lb	>180kg >400lb	3.58 x 1.73 x 0.56m 141 x 68 x 22" 0.61m 24"	76 x 56 x 3 30 x 22 x 1
	WWR3700 SIT38040	SIT Ltd		N/A	37kg 81.4lb	300kg 660lb	3.7 x 1.75 x 0.45m 146 x 69 x 18" 0.85m 33.5"	80 x 80 x 5 31.5 x 31.5 x 1
	WWR4300 SIT38006	SIT Ltd		N/A	60kg 132lb	450kg 990lb	4.3 x 2 x 0.5m 169 x 79 x 19.5" 1m 39.4"	90 x 90 x 5 35.4 x 35.4 x 1

INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATE		LOADING			VALVES		ACC		VIZ		NOTES	WWW.
				SELF-BAILING	CHAMBERS / THWARTS	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW// LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM		
56cm 16"	2250 L 79cuft <2/ >10mins	0.2 BAR 3 Psi 0.2 BAR 3 Psi	2000 Denier - 44 oz PVC 60oz Deck	■	* 4	□ □	0 6	- -	4 10	■	■ -	□ □	5 ■	□ ■	*2 of the 4 chambers are integrated transverse 'thwarts'. Transom frame available. Leaffield D7 valves	rapidapproachrescue.com
34cm 14"	1650 L 58cuft 1/ <5mins	0.17 BAR 2.5 Psi 0.14 BAR 2 Psi	44oz/3000 Denier Rockshield PVC. 66oz drop-stitch floor	□	3 5	□ ■	6 0	■ -	0 12	■	■ -	■ ■	2/ 6	□ □	Also 13 and 14' models. Leaffield D7 valves. *Also non-'rescue' colours: green, grey, Blue, Torquoise, Beige, purple. Also Self-bailing with I-beam deck 27" Bow rise	rockymountainrafts.com
41cm 16"	3200 L 113cuft >15mins	0.17 BAR 2.5 Psi 0.14 BAR 2 Psi	44oz/3000-denier RockShield PVC. 66oz PVC I-Beam lace-in floor	■	2-4 5	□ □	8 0	- -	2-4 12-14	■	■ -	□ ■	3/ 5	□ □	Also 13 and 14' models. Leaffield D7 valves. Also non-'rescue' colours: Green, Grey, Blue, Torquoise, Beige, Purple. 31" bow rise	rockymountainrafts.com
41cm 16"	3200 L 113cuft >15mins	0.17 BAR 2.5 Psi 0.14 BAR 2 Psi	44oz/3000-denier RockShield PVC. Drop Stitch	NO	2-4 5	□ □	8 0	- -	2-4 12-14	■	■ -	□ ■	3/ 5	□ □	Also 13 and 14' models. Leaffield D7 valves. Also non-'rescue' colours: Green, Grey, Blue, Torquoise, Beige, Purple. 31" bow rise	rockymountainrafts.com
6cm 14"	2300 L 81cuft >10mins	0.17 BAR 2.5 Psi 0.14 BAR 2 Psi	44oz/2000-denier RockShield PVC. 66oz PVC floor	■	0* 4	□ □	0 0	- -	12 8	■	■ -	□ ■	3/ 6	□ □	*two integral, transverse bolsters/chambers. Leaffield D7 valves. Also non-'rescue' colours: Green, Grey, Blue, Torquoise, Beige, Purple. Splash net & foot cups	rockymountainrafts.com
0cm 19.7"	1740 L 61.4cuft <1/<8m	0.2BAR 3 Psi 0.4BAR 6 Psi	Neoprene-coated Hypalon. 6" drop-thread deck	■	2 5	□ □	7 4	- ■	4 5	■	■ -	2 ■	2 ■	□ ■	Leaffield valves	sitltd.co.uk
0cm 19.7"	2480 L 87.6cuft >2/ >10mins	0.2BAR 3 Psi 0.4BAR 6 Psi	Neoprene-coated Hypalon. 6" drop-thread deck	■	3 5-6	□ □	8 2	■ ■	0 14	■	■ -	2 ■	2 ■	□ ■	Larger WWR5000 also available. Leaffield valves.	sitltd.co.uk
															expansion row	
															expansion row	
															expansion row	

images NOT to Scale = Option ● = Partial Feature &/or OK but not ideal COST: Approx, <u>INC</u> local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump Electric Pump/CA=Compressed Air VALVES: PRV=Pressure Relief Valve HEIGHT: unlike an IRB, height is generally the diameter of tube/sponson								
	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	KAT-400	SPREU BOOTE		£0000 \$0000 €0000	16kg 35lb	690kg 000lb	4 x 00 x 0.54m 000 x 00 x 00" 0m 00"	
	KAT-550	SPREU BOOTE		£0000 \$0000 €0000	19kg 42lb	1600kg 000lb	5.5 x 00 x 0.62m 000 x 00 x 00" 0m 00"	
	KAT-650	SPREU BOOTE		£0000 \$0000 €0000	22kg 48lb	1810kg 000lb	6.5 x 00 x 0.62m 000 x 00 x 00" 0m 00"	
	MAMBA	SPREU BOOTE		£0000 \$0000 €0000	26kg 57lb	3	3.5 x 1.14 x 0.38m 137x 45 x 15" 0m 00"	
	OTTER 430	SPREU BOOTE		£0000 \$0000 €0000	26kg 57lb	3	4.3 x 1.14 x 0.5m 170 x 45 x 20" 0m 00"	
	OTTER 460	SPREU BOOTE		£0000 \$0000 €0000	29kg 64lb	4	4.6 x 1.9 x 0.5m 181 x 75 x 20" 0m 00"	
	HIPPO 5SB	SPREU BOOTE		£0000 \$0000 €0000	45kg 99lb	5	3.45 x 1.72 x 0.00m 135 x 67 x 00" 0m 00"	
	HIPPO 8SB	SPREU BOOTE		£0000 \$0000 €3785	55kg 121lb	8	3.95 x 1.93 x 0.5m 155 x 76 x 20" 0m 00"	

INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	SELF-BAILING	INFLATE		LOADING			VALVES		ACC		VIZ		NOTES	WWW.
					CHAMBERS / THWARTS	MANUAL/ POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW/ LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG / PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM	OTHER COLOURS		
																	expansion row
			1100 dtex CSM		0 2			☐ 4 ☐ -								Leaffield D7 valves	spreu-boote.de
			1100 dtex CSM		0 3			☐ 6 ☐ -								Leaffield D7 valves	spreu-boote.de
			1100 dtex CSM		0 3			☐ 8 ☐ -								Leaffield D7 valves	spreu-boote.de
			Neoprene-coated Hypalon		2 1												spreu-boote.de
			Neoprene-coated Hypalon														spreu-boote.de
			Neoprene-coated Hypalon														spreu-boote.de
			Neoprene-coated Hypalon		4 2 1		4										spreu-boote.de
			Neoprene-coated Hypalon		4 2 1		4										spreu-boote.de
																	expansion row

images NOT to Scale

☐☐☐= Option

●= Partial Feature &/or OK but not ideal

COST: Approx. INC local tax/VAT

£ US\$ € = currency conversions only

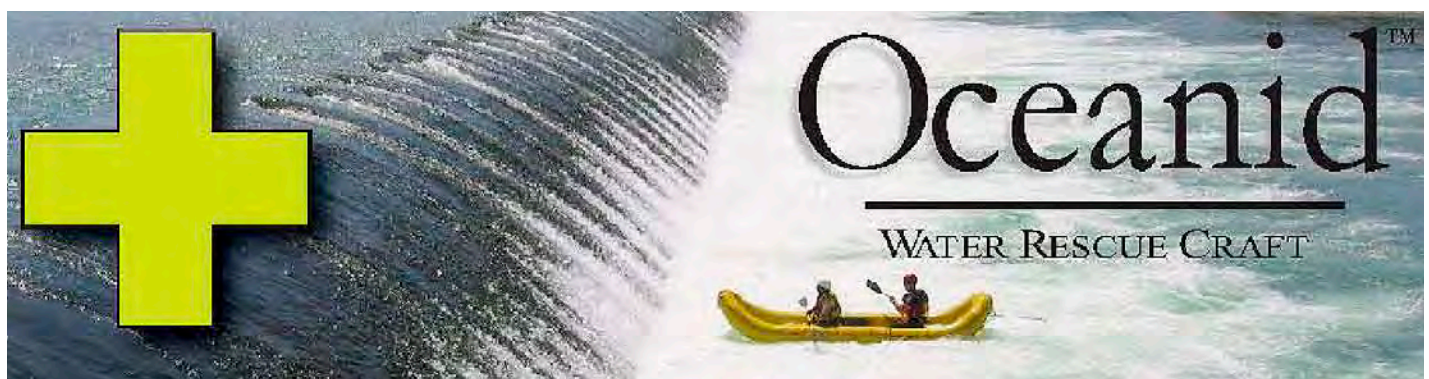
INFLATION: Hand Pump

Electric Pump/CA=Compressed Air

VALVES: PRV=Pressure Relief Valve

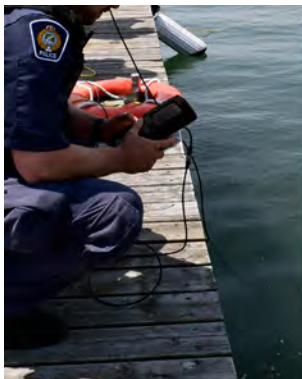
HEIGHT: unlike an IRB, height is generally the diameter of tube/sponson

	MODEL Product Code	COMPANY	ORIGIN	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x Height/Tube EXTERNAL INTERNAL/USABLE WIDTH	PACKED SIZE
	RTB1	SURVITEC/ DSB		£3995 \$0000 €4550	43kg 94.6lb	600kg 1320lb	3 x 1.2 x 0.4m 118 x 47 x 15.8" 0.4m 15.8"	105 x 50 x 3 41.3 x 19.7 x 11.8"
	RTB1 SEB	SURVITEC/ DSB		£0000 \$0000 €0000	43kg 94.6lb	600kg 1320lb	3 x 1.2 x 0.4m 118 x 47 x 15.8" 0.4m 15.8"	105 x 50 x 3 41.3 x 19.7 x 11.8"
	IBS	WING INFLATABLES		£0000 \$13000 €0000	49kg 108lb	612kg 1350lb	3.66 x 1.65 x 0.43m 144 x 65 x 17" 0.79m 31"	117 x 86 x 6 46 x 34 x 20"
	LIFERAMP 6601-10/15	TULMAR SAFETY		£0000 \$6073 €0000	12.7kg 28lb 19.1kg 42lb	499kg 1100lb	3.14.6 x 0.00 x 0.00m 1015 x 0.00 x 0.00" 0.00m 00"	120 x 50 x 3 47 x 20 x 11.8"
	3.6M RAFT	WRS INTERNATIONAL		£3900 \$5000 €4366	55kg 122lb	700kg 1544lb	3.6 x 1.8 x 0.48m 142 x 71 x 18.9" 0.84m 33"	120 x 60 x 6 47.2 x 23.6 x 23.6"
	4M RAFT	WRS INTERNATIONAL		£5210 \$6500 €5900	60kg 122lb	1000kg 2200lb	4 x 1.85 x 0.52m 157.5 x 73 x 20.5" 0.8m 31.5"	100 x 100 x 39 39 x 39 x 20"



INFLATABLE NON-POWERED RAFTS

	approx. AIR CAPACITY INFLATION TIME Manual pump Power or CA	MAX WORKING PRESSURE FLOOR/DECK	MATERIALS: TUBES/SPONSONS FLOOR/DECK	INFLATE		LOADING			VALVES		ACC		VIZ		NOTES	WWW.
				SELF-BAILING	CHAMBERS / THWARTS	MANUAL/POWERPUMP	GRAB/LIFT HANDLES	FLIP TAB / GRAB CORD	HD-TOW/ LT DUTY EYES	PRESSURE RELIEF VALVE	1-WAY / 2-WAY VALVE	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM		
38cm x 14"	1000 L 35.3cuft <1/<4mins	0.2BAR 3 Psi 0.4BAR 6 Psi	Hypalon/Neoprene coated polyester. 6" drop-thread deck	NO	0* 4	☐	0 0	☐	4 8	☐	☐	2 4	☐	☐	* 2x Wooden seats	survitec.com
38cm x 14"	1000 L 35.3cuft <1/<4mins	0.2BAR 3 Psi 0.4BAR 6 Psi	Hypalon/Neoprene coated polyester. 6" drop-thread deck	NO	0* 4	☐	0 0	☐	4 8	☐	☐	2 4	☐	☐	* 2x Wooden seats SEB=quick inflation version with CA cylinder	survitec.com
51cm x 24"	1415 L 50cuft 3-10mins	0.31 BAR 4.5Psi 0.31 BAR 4.5 Psi	40oz Polyurethane. drop-thread deck	NO	2 6	☐	0 *	☐	0 0	☐	☐	☐	5 5	☐	*Perimeter cord acts as lift/grab handles	inflatableolutions.com
30cm x 12"	? <1/<6mins	0.21BAR 3 Psi	PU coated Nylon PU Nylon anti slip deck	NO	0 2	☐	0 0	☐	18 4	☐	☐	3 3	☐	☐	For longer lengths 30,50&80ft see Paths/Walkways Guide	tulmar.com
50cm x 6 x	1900 L 67cuft <2/>8min	0.3 BAR 3.6 Psi 0.1 BAR 1.5 Psi	PVC/PU. 15cm I-Beam deck*	☐	2 5	☐	6 0	☐	0 12	☐	☐	3 3	☐	☐	Leaffield C7 7 A6 valves. *Available as non-self bailing with drop-thread deck.	wrsinternational.com
60cm x 3.6"	2200 L 78cuft <2/>10min	0.3 BAR 3.6 Psi 0.1 BAR 1.5 Psi	PVC/PU. 15cm I-Beam deck	☐	3 5	☐	6 4	☐	0 5	☐	☐	3 3	☐	☐	Leaffield C7 7 A6 valves. 6 x Foot retaining cups/loops.	wrsinternational.com
																expansion row



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Inflatable Rescue Boats or IRBs can be fully deflated and rolled up for compact storage/transport so this guide does not include any rigid-hull versions and also does not include inflatable craft that need to be retro-fitted with a transom or frame in order to use a motor. Many white water rafts and catarafts including the WING IBS, Oceanids WRC and RDC, RAR's Rescue Cat etc. can all accommodate an outboard engine with modification of the basic craft making them extremely versatile craft. This GUIDE is concerned only with straight-out-of-the bag inflatable rescue boats with a transom on which to mount an outboard as exemplified by the original Zodiac and Avon ERBs (Avon now owned by Zodiac).

Such craft pre-date the specialist open-ended inflatable craft we looked at in our first 'boats' GUIDE but have developed alongside the white-water style rafts. These IRBs are the kind of boats long-favoured by beach rescue and lifeguard teams, in Australia affectionately called rubber duckies, by inshore rescue teams and coastguards operating in near-coastal and inland waters and by fire-rescue departments operating on inland waterways and in floods. They are typically a U or V shape with two side sponsons/tubes terminated by a cone or dome cap and then joined across the stern by a transom which keeps the water out and provides a solid mount for an outboard engine. They are the smaller sized rescue boats, less than 4.5 metres/13-15 feet able to manoeuvre in small spaces and with a shallow draft that can drive easily onto a beach or shoreline and operate in shallow water (remembering to lift the outboard where necessary. The smaller boats are easier and faster to deploy or from a package or roll and can fit more easily into a rescue truck compartment or even the back of 4WD or pick-up.

Our cut-off for the length of craft is largely dictated by the manufacturers but whether a 4.2 is considered a good size for a rescue boat but a 4.7m is too long is arbitrary so we didn't limit length for this Guide - just went with models that are either designated by the manufacturer as suitable for rescue or are

being used by a rescue agency. The names of the craft often incorporate the length hence the MFC4500 (4.5m) or AIRMAR Rescue 360 (3.6m) etc.

www.rescuemagazines.com

POWERED INFLATABLE RESCUE BOATS

Matt Carlin of Australia's **Surf Life-Saving Tasmania** gives some background to the types of usage and specific differences between Rescue Boats and swiftwater rafts:

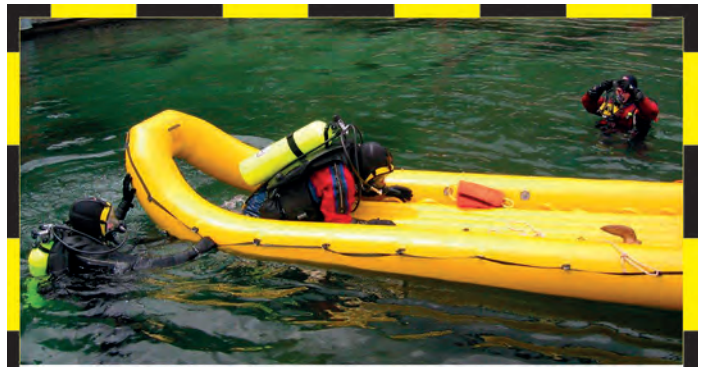
Rescue services worldwide have adapted techniques from various disciplines, continually modifying and improving methods to enhance outcomes for both rescuers and victims. Flood and swiftwater rescue techniques integrate marine, cliff, fire, and whitewater rafting and kayaking industry practices. Over the last 50 years, advancements in rescue techniques, equipment, personal protective equipment, and training have significantly reduced fatalities for both victims and rescuers. This chapter highlights the evolution of these techniques and equipment, primarily derived from the commercial whitewater rafting industry and surf rescue services, and how continuous learning and adaptation from different industries are crucial to providing the best outcomes in flood and swiftwater environments.

HISTORICAL PERSPECTIVE

Humans have been rescuing victims from floodwaters for hundreds of years, initially using simple tools and methods such as throwing something to hold onto and trying to pull the victim to safe ground. Techniques have evolved, equipment has been designed to suit specific purposes, and some form of training has been conducted within organisations or communities. Fast forward to the twentieth century, with urbanisation, vehicles, infrastructure, increased and concentrated populations, altering of natural watercourses, and intensified rainfall, all resulting in water behaving very differently and impacting larger areas and populations. With greater impact on our communities, governments have attempted to solve this problem by identifying organisations to take responsibility, funding them to provide rescue services, and educating the public on how to avoid the dangers.

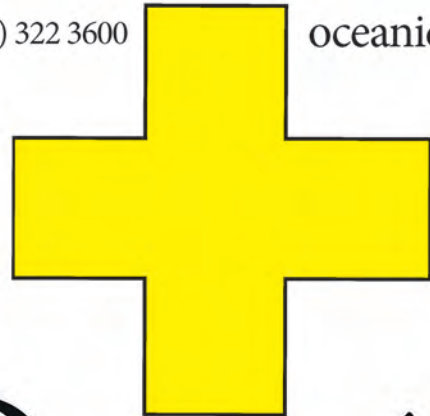
Formalised rescue services bring together a broad range of people to train and develop techniques that improve the safety of rescuers and increase the success of rescuing victims. However, "you don't know what you don't know." Looking outside your lived experiences, organisation, industry, or country will help you learn and improve on what you do. Surf Life Saving Tasmania (Australia)

In 2016, Tasmania experienced some of the worst flooding in living memory. Whole communities and towns were flooded and cut off. Emergency services requested the assistance of Surf Life Saving Tasmania (SLST) in using surf rescue inflatable rescue boats (IRBs) to access flood victims and assist with welfare checks, evacuations, and rescue of people impacted by floodwaters. Volunteers from many surf clubs mobilised and assisted using and adapting boats and equipment throughout the rescue efforts over a couple of weeks. Upon reflection, SLST undertook a review of the rescue efforts, examining what worked, what didn't work, and what should be done next time. The first step was to look at other organisations in other states of Australia, followed by reaching out to the international life-saving community. Surf Life Saving Great Britain (SLSGB)



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WATER RESCUE CRAFT



had been involved in flood and swiftwater rescue for more than ten years, learning from international organisations and incorporating those lessons into their operations. This informed SLST on risk management, operational procedures, rescue equipment, rescue techniques, structures of rescue training, rescue teams, and effective personal protective equipment (PPE) for rescuers (2). SLST continues to work closely with SLSGB, adopting similar learnings into their operational framework and now sharing this knowledge with other states in Australia through the Centre of Excellence: Flood and Swiftwater Rescue and Surf Life Saving Australia.

PHASES OF FLOODING

Flooding occurs through four phases:

1. **Preparation:** Monitoring weather forecasts, utilising prediction models, and ensuring rescue workers and volunteers are prepared to respond if the rainfall event is extreme enough to result in flooding.
2. **Flash Flooding:** Heavy rainfall in a localised area resulting in increased speeds and volume of water in natural waterways and channels that cannot handle the volume of water (stormwater channels, roads, canals). This phase is sudden and can put lives at risk in a very short period.
3. **Broadwater Flooding:** The overtopping of river channels, dams, lakes, and the expansion of water into open territory, inundating towns, farmland, roads, and transport networks. This phase can last for an extended period, usually trapping people, cutting off towns and cities, and disrupting services such as power, water, sewage, and communications.
4. **Recovery:** The receding of floodwaters, clean-up, rehousing of affected people, reinstating services, and supporting affected communities with transport, accommodation, food, water, clothing, and other basic needs.

Flood and swiftwater rescue operates in all four phases but primarily in Phases 2 and 3. During Phase 2: Flash Flooding, rescuers help people who may be trapped by rapidly rising water. People often underestimate the forces of water when attempting to cross a swollen waterway, resulting in trouble and an inability to get out of the water. Phase 3: Broadwater Flooding inundates communities for weeks, cutting people off from basic needs. Large numbers of volunteers (surge capacity) are needed to support those communities, conducting welfare checks, supplying food and water, or evacuating people to alternative accommodation. This usually involves the use of boats to access people as roads become impassable.

ADAPTATION AND TRAINING

Surf Life Saving has become involved in flood rescue through

extensive experience in the use of IRBs. The organisation can mobilise hundreds of IRBs, drivers, and crew to assist in broadwater flooding disasters. Standard surf rescue IRBs are currently suitable for broadwater flooding environments, and with targeted training and suitable PPE, volunteers are well equipped to handle the demands of broadwater flood response.

The use of IRBs in swiftwater is an emerging area of flood rescue. Organisations worldwide use modified IRBs in swiftwater to rescue victims in various situations. Surf Life Saving Tasmania has been training with SLSGB for over six years, developing skills, training courses and materials, rescue equipment, risk management, and operational procedures

around IRBs in swiftwater. More recently, SLST has been working with several organisations in Australia that use IRBs in swiftwater rescues. One of the challenges of adapting to a new rescue environment is ensuring the equipment is fit for the task. Current IRB manufacturers in Australia produce craft similar to those used in surf rescue or the military. Manufacturers often only make modifications based on feedback from users. If rescue organisations do not look beyond their organisation, state, or country, they may miss advancements in techniques, equipment, and training that

could inform necessary modifications to IRBs.

SLST recently examined the commercial whitewater rafting industry and IRB manufacturers in Great Britain and the United States. A guideline in the commercial whitewater rafting industry is that there should be no ropes, lines, or equipment on a raft that could entrap a person's limbs. Perimeter lines are tight, bow and stern lines are coiled and secured to the boat with small loops, and equipment tied onto a raft has no loose straps, loops, or holes (1). Unfortunately, these lessons were learned through client and guide deaths during the 1970s and 1980s when the industry was emerging.

Standard surf rescue IRBs have loose perimeter lines, loosely coiled tow ropes inside the boat, a rescue tube strapped inside the boat with potential loops that could entrap a person, a fuel line running from the bow to the stern with only three attachment points (leaving loops on the boat floor), the motor secured to the transom with a wire safety cable (3) (which cannot be cut and released if the motor comes off the transom), and paddles that are not rated for swiftwater. While these guidelines suit the surf zone, they are unsuitable for swiftwater. Swiftwater is continuous and forceful, pushing people and boats into objects that can entrap them and quickly carry them into more danger. The nature of the water and potential hazards should dictate the design modifications to

rescue equipment.

Several IRB manufacturers worldwide have addressed some of these safety issues, such as tight perimeter ropes, stern-mounted fuel cells (no long, loose fuel lines), and rated rescue rings positioned around the outside for rope-tethered rescue systems. However, rescue organisations must ensure that other equipment on these IRBs meets minimum standards, is tested in different situations, and is included in training courses to ensure rescuers know how and why something is attached a particular way and how to access it quickly. Rescue organisations need to continually ask the "what if" questions:

- What if the boat overturns?
- What if the motor is disabled?
- What if the IRB is pushed against a bridge pylon/car/rock and overturned?

The next series of questions revolves around what equipment on board can assist the crew to respond effectively (rollover rope easily accessible, strong paddles, no limb entrapment points, knives on life jackets to cut rope, motor that can be cut away if wedged in a strainer). Training of rescuers must include drills using these techniques to ensure quick responses in emergencies.

CONCLUSION

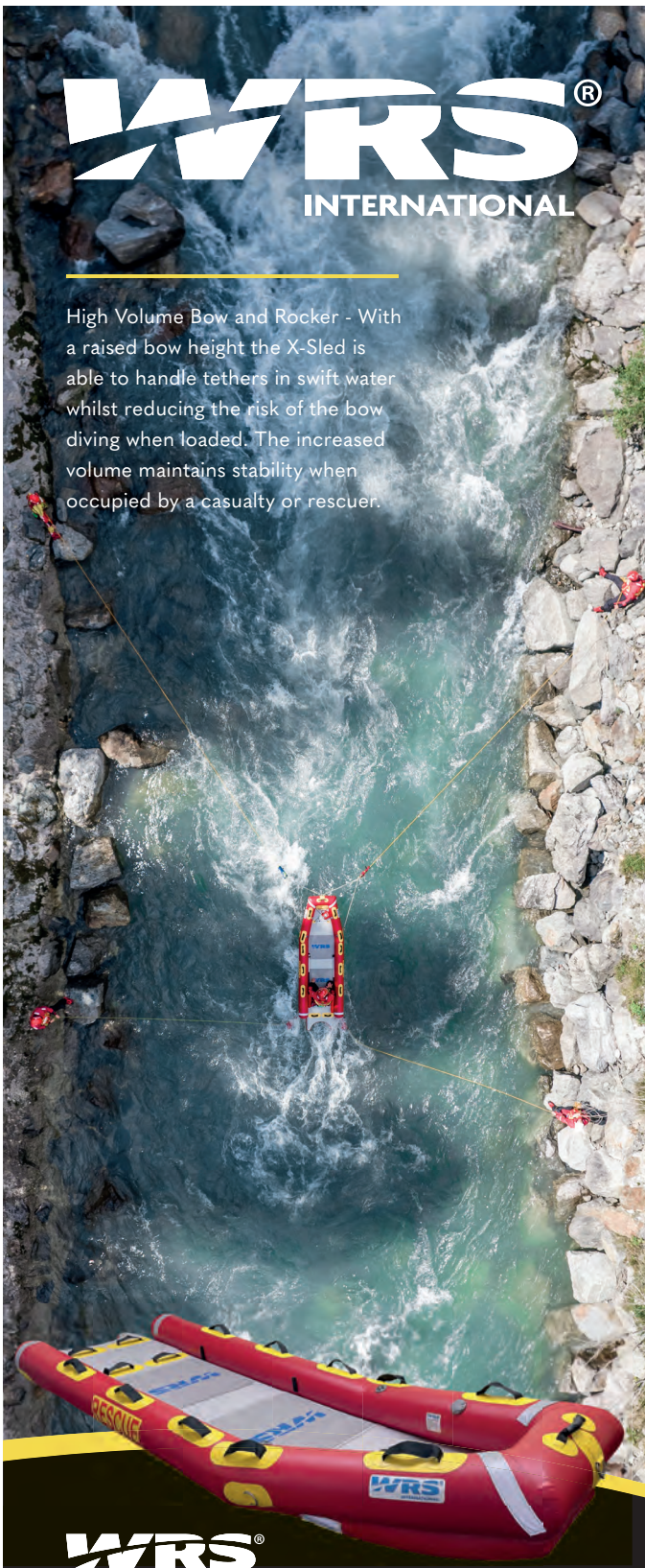
Rescue agencies worldwide are being asked by governments to respond to new rescue challenges. When an agency decides to tackle a new challenge or a different form of rescue (fire to water), it faces many new challenges and costs. Sometimes, budget constraints can lead to shortcuts in equipment, training, and professional development of rescuers. However, you are not the first—there is another organisation that has done this, made mistakes, learned, evolved, and continues to modify and train to ensure the safety of rescuers and victims. Reach out to similar organisations nationally and internationally. Research how other countries set up their operating standards, rescue team typing, PPE standards for operating in contaminated floodwaters (International Life Saving Federation standards), and training programs. Consult with people and organisations with experience in similar fields. The broader you search, the more people you consult, and the more you involve in the research stage, the greater the diversity of ideas generated.

REFERENCES

1. Worksafe New Zealand. White Water Rafting: Guidance for Commercial Rafting Operators. Published June 2020. ISBN: 978-1-98-856768-6. Worksafe NZ
2. International Life Saving Federation. Lifesaving Position Statement – LPS 23: Flood Disaster Rescuer Responder Personal Protection Equipment (PPE). 2023.
3. International Life Saving Federation. Equipment Specification Inflatable Rescue Boat (IRB). 2015.

Abbreviations:

- SLST: Surf Life Saving Tasmania
- SLSGB: Surf Life Saving Great Britain
- PPE: Personal Protective Equipment
- IRB: Inflatable Rescue Boat
- ILS: International Life Saving Federation



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IN THE FOLLOWING TABLES:

USES:

INSHORE 

OFFSHORE 

SWIFTWATER 

FLOOD 

SURF 

ICE/MUD 

TACTICAL 

Use common data notes from the GUIDE to RAFTS on page 86.

These are the IRB-unique definitions.....

In the previous inflatable guides we referenced the inflation methods as hand pump, electric pump or CABA for compressed air. In IRBs this latter may be described as HPP for High Pressure Air and may be a different model to the same craft inflated by hand or electric pump Zodiac for example offer the ERB models as either a fully rigid craft, a roll-up which inflates with hand or electric pump or HPP which is permanently inflated or inflated on-scene with high pressure compressed air.

LOAD CAPACITY kg/lb Kg/Sq Metre lb/Sq Foot

DIMENSIONS: L x W x H x Tube INTERNAL SPACE PACKED

MAX ENGINE HP: The recommended Horsepower for an outboard. If there are two figures, the first is the recommended for best performance of the craft. The second figure is the maximum power that should be used, may not provide optimum performance despite being more powerful and may risk damaging the transom.

SHAFT

FLOOR: Unlike a RIB, an inflatable Rescue Boat or IRB can be fully rolled even though it may have a solid deck/floor because this comes in sections which can be dismantled if wooden or aluminium. There are four types of floor or deck in an IRB:

=AIR

=FOAM

=RIGID

=ALUMINIUM

INFLATION

REGULATOR / HOSE

MANUAL/POWERPUMP

SAFETY PRV / DUMP

INFLATABLE/ HARD DECK

HANDLES FLIP TAB / GRAB CORD

TOW/HD/LT DUTY EYES

POUCHES / BOW BAG

CARRY BAG/ PADDLES

REPAIR KIT/ WARRANTY

REFLECTIVE/ CUSTOM

SPEED/PERFORMANCE TUBES

are additional lines of narrow tubing that run along the bottom of the side-sponsons and effectively carve a line through the water and limit the resistance of the wider sponsons:

POWERED INFLATABLE RESCUE BOATS





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Rescue Vest



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COST: £\$€ Approx, inc local tax/VAT
£\$€=currency conversion only
INFLATION: Hand Pump/ Electric Pump
 Compressed Air
VALVES PRV=Pressure Relief Valve
 INSHORE
 OFFSHORE
 SWIFTWATER
 FLOOD
 SURF
 ICE/MUD
 TACTICAL

	MODEL	COMPANY	ORIGIN	USES	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H x Tube INTERNAL SPACE PACKED
	RESCUE 330 501642	ARIMAR		      	£ \$ €	00kg 00lb	4 00kg 00lb 00kg/m 00lb/ft	3.3 2.3 x 0.86/1.7 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	COMMANDO 3	BOMBARD (Zodiac Nautic)		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	00 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	COMMANDO 4	BOMBARD (Zodiac Nautic)		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	00 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	COMMANDO 5	BOMBARD (Zodiac Nautic)		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	00 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	000 000	CPI RESCUE PRODUCTS			£ \$ €	50kg 44lb	00 950kg 00lb 00kg/m 00lb/ft	0 x 0/0 x 0m 119 x 47/91 x 22" 0 x 0 x 0cm 0 x 0 x 0"
	000 000				£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	00 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"

POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION					LOADING		EXTRAS			VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY			REFLECTIVE/ CUSTOM
? BAR ? Psi 15Hp Short		PVC		- -	- -	- -	- -	- -		- -	- -	- -		- -	- -	- -		arimar.pro
? BAR ? Psi 30-50Hp Short		0000		- -	- -	- -	- -	- -		- -	- -	- -		- -	- -	- -		bombard.com
? BAR ? Psi 30-50Hp Short		0000		- -	- -	- -	- -	- -		- -	- -	- -		- -	- -	- -		bombard.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -	- -		- -	- -	- -		bombard.com
? BAR ? Psi		32oz PVC 40oz Evaloy-drop-thread deck		0 -	 	 	- -	- 10		14 - 6			 	1 	 			cpiwaterresqproducts.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -	- -		- -	- -	- -		oo.com

Images NOT to Scale  = Option
 = Partial Feature/ OK but not ideal
COST: £\$€ Approx, inc local tax/VAT
£\$€=currency conversion only
INFLATION: Hand Pump/ Electric Pump
 Compressed Air
VALVES PRV=Pressure Relief Valve
 INSHORE
 OFFSHORE
 SWIFTWATER
 FLOOD
 SURF
 ICE/MUD
 TACTICAL

	MODEL	COMPANY	ORIGIN	USES	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H x Tube INTERNAL SPACE PACKED
	EV320 RESCUE 000	EUROVINIL		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	3.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	EV360 RESCUE 000	EUROVINIL		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	3.6 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	EV400 RESCUE 000	EUROVINIL		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	EV420 RESCUE 000	EUROVINIL		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	RU250 000	HIGHFIELD		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	2.5 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	RU280 000	HIGHFIELD		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	2.8 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	RU320 000	HIGHFIELD		      	£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	3.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	RANGER 470 SAF38016	IONIC			£14000 \$0000 €0000	42kg 92.4lb	1000kg 2200lb	320 x 144/220 x 38cm 126 x 57/87 x 15" 100 x 70 x 45cm 39 x 27.6 x 18"
							00 00kg 00lb 00kg/m 00lb/ft	

POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION					LOADING		EXTRAS				VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM			COLOUR OPTIONS
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		oo.com
0.2 & 0.4BAR 3 & 6 psi OHP	1550 L 54.7cuft <2mins	'Orca' Hypalon 6" drop-thread deck		5 			- 		8 2		2 - 8*				5 			Leaffield valves. 6" Deck. * D-Ring under deck can provide flip tab	safequip.co.uk
				- -	- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		

Images NOT to Scale  = Option
 = Partial Feature/ OK but not ideal
COST: £\$€ Approx, inc local tax/VAT
£\$€=currency conversion only
INFLATION: Hand Pump/ Electric Pump
 Compressed Air
VALVES PRV=Pressure Relief Valve
 INSHORE
 OFFSHORE
 SWIFTWATER
 FLOOD
 SURF
 ICE/MUD
 TACTICAL

	MODEL	COMPANY	ORIGIN	USES	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H x Tube INTERNAL SPACE PACKED
	320-SAR-HD 320-SAR-HYP	INMAR			£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	00 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	380-SAR-HD 380-SAR-HYP	INMAR			£ \$3696 \$6996 €	kg 185lb	kg 1750lb	0 x 0/0 x 0cm 150 x 37/77 x 20" 0 x 0 x 0cm 52 x 34 x 20"
	420-SAR-HD 420-SR-HYP	INMAR			£ \$3896 \$7996 €	kg 195lb	3kg 0lb	0 x 0/0 x 0cm 150 x 37/77 x 20" 0 x 0 x 0cm 55 x 33 x 24"
	470-SAR-HD 470-SAR-HYP	INMAR			£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	380-PRO	INMAR			£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	420-PRO	INMAR			£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	470-PRO	INMAR			£ \$ €	00kg 00lb	00 00kg 00lb 00kg/m 00lb/ft	4.2 x 00/00 x 00m 00 x 00/00 x 00" 0 x 0 x 0cm 0 x 0 x 0"
	000 000	JPW inc			£ \$4444 €	32.7kg 72lb	400kg 882lb	0 x 0/0 x 0cm 120x65 x 19.5" 0 x 0 x 0cm 0 x 0 x 0"
	RC4000 WR0209	MFC INTERNATIONAL		      	£ \$ €	53kg 00lb	10 800kg 00lb	400x0/200 x 84cm 0 x 0/0 x 0" 140 x 50 x 35cm 0 x 0 x 0"

POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION					LOADING			EXTRAS			VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY	REFLECTIVE/ CUSTOM			COLOUR OPTIONS
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -		  	- -	- -	- -			inmarboats.com
? BAR ? Psi		1.2mm Mehler, Orca Hypalon Welded seams Fiberglass		0 5	4 5	 	 -	6 -	 	11 4		 	  	 	1* 	 		Shown with inflatable floor/deck	inmarboats.com
? BAR ? Psi		1.2mm Mehler, Orca Hypalon Welded seams Fiberglass		0 5	 	 	 -	 -	 	11 4	 -	 	 	 	1* 	 		Shown with fold-up Aluminium Floor/deck	inmarboats.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -		  	- -	- -	- -			inmarboats.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -		  	- -	- -	- -			inmarboats.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -		  	- -	- -	- -			inmarboats.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -		- -	- -		  	- -	- -	- -			inmarboats.com
? BAR ? Psi		32/42oz PVC coated Polyester drop-thread deck		? ?	? ?	 	 -	- 2		4 -				- -	10 	- -	  		jpwinc.com
0.2 & 0.4 BAR 3.25 & 6 Psi		Hypalon TPU drop-thread deck		? ?	? ?	 	 -	4 -		- 3				2 	2 	 	 		mfc-international.com



REALISTIC WATER RESCUE TRAINING



FTCC

Fayetteville Technical Community College
2201 Hull Rd,
Fayetteville, NC 28303
Tel +1 (910) 678-8400
www.faytechcc.edu



POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION					LOADING		EXTRAS			VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HB/LT DUTY EYES	POUCHES / BOW BAG	FLOOR FLOOR RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY			REFLECTIVE/ CUSTOM
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		mfc-international.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		mfc-international.com
? BAR ? Psi		0000		- -	- -	- -	- -	- -	- -	- -	- -		- -	- -	- -	- -		mfc-international.com

TRAIN IN SAFETY AT THE NEWEST FACILITY IN THE USA

In an increasingly flood-prone world, swift water rescue training is critically important for first responders. Specialized training can often be difficult and dangerous to arrange in natural outdoor settings.

In spring 2023, Fayetteville Technical Community College (FTCC), already known for its educational and training services to Fort Bragg, will open the only indoor swift water rescue training facility on the east coast of the United States.

An 88,000-gallon indoor tank allows for a variety of training scenarios, including different weather, water temperatures, obstacles, and rescue challenges, including simulated rescues at night. Located on FTCC's 30-acre state-of-the-art Fire & Rescue Training Complex on Tom Starling Road in Fayetteville, North Carolina.

Learn more <https://www.faytechcc.edu>

Images NOT to Scale = Option  = Partial Feature/ OK but not ideal COST: £\$€ Approx, <u>inc</u> local tax/VAT £\$€=currency conversion only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES PRV=Pressure Relief Valve  INSHORE  OFFSHORE  SWIFTWATER  FLOOD  SURF  ICE/MUD  TACTICAL	MODEL	COMPANY	ORIGIN	USES	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H x Tube INTERNAL SPACE PACKED
	DS320 AIR	NORTHERN DIVER		      	£1330	48kg 105lb	5 527kg 1162lb 00kg/m 00lb/ft	320 x 70 /151 x 42cm 104 x 27.6 /50 x 16.5" 000 x 00 x 00cm 0 x 0 x 0"
	DS320 ALU	NORTHERN DIVER		      	£1350	52kg 114lb	5 527kg 1162lb 00kg/m 00lb/ft	320 x 70 /151 x 42cm 104 x 27.6 /50 x 16.5" 000 x 00 x 00cm 0 x 0 x 0"
	DS360 AIR	NORTHERN DIVER		      	£1835	48kg 105lb	6 647kg 1426lb 00kg/m 00lb/ft	360 x 80 /170 x 45cm 118 x 31.5 /56 x 17.7" 000 x 00 x 00cm 0 x 0 x 0"
	DS360 ALU	NORTHERN DIVER		      	£1480	58kg 127lb	6 647kg 1426lb 00kg/m 00lb/ft	360 x 80 /170 x 45cm 118 x 31.5 /56 x 17.7" 000 x 00 x 00cm 0 x 0 x 0"
	DS380 ALU	NORTHERN DIVER		      	£1530	67kg 147lb	6 727kg 1603lb 00kg/m 00lb/ft	380 x 80 /170 x 45cm 125 x 31.5 /56 x 17.7" 120 x 60 x 40cm 0 x 0 x 0"
	DS400 ALU	NORTHERN DIVER		      	£1850	62kg 136lb	700kg 1543lb	380 x 80/170 x 45cm 0 x 0/0 x 0" 120 x 60 x 40cm 0 x 0 x 0"
	DS420 AIR	NORTHERN DIVER		      	£2100	71kg 156lb	7 841kg 1854lb 00kg/m 00lb/ft	420 x 94 /190 x 48cm 138 x 37 /62 x 18.9" 120 x 60 x 40cm 0 x 0 x 0"
	DS420 ALU	NORTHERN DIVER		      	£1850 \$ €	84kg 185lb	7 841kg 1854lb 00kg/m 00lb/ft	420 x 94 /190 x 48cm 138 x 37 /62 x 18.9" 120 x 60 x 40cm 0 x 0 x 0"
	DS460 ALU	NORTHERN DIVER		    	£1960	95kg 209lb	6 929kg 2048lb 00kg/m 00lb/ft	420 x 94 /190 x 48cm 138 x 37 /62 x 18.9" 120 x 60 x 40cm 0 x 0 x 0"

POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION				LOADING			EXTRAS			VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY			REFLECTIVE/ CUSTOM
0.35 BAR 5 Psi 15HP		pvc,hypalon							6 2 2				■					
0.35 BAR 5 Psi 15HP													■					
0.35 BAR 5 Psi 20HP		PVC, Hypalon							6 2 2				■				3+1(floor)+1 (keel) chamber	
0.35 BAR 5 Psi 20HP									6 2 2				■				High quality, commercial grade PVC Marine plywood benches x2 Life lines x2 Stainless steel D-rings Oar locking system Grab handles x6	
0.35 BAR 5 Psi 30 hp		1.2mm PVC 8cm drop-stitch DWF/PVC Floor		? ?	? ?	□ ■	■ -	8 -	- 12	- -			■ ■	■ ■	2 ■	□ □	■ ■	floor = 24kg ndiver-rescue.com
0.35 BAR 5 Psi	1- 3 & 4mins*	1.2mm PVC 8cm drop-stitch DWF/PVC Floor		? ?	? ?	□ ■	■ ■	8 -	- 12	- -			■ ■ ■	■ ■ ■	2 ■	□ □	■ ■	discontinued? ndiver-rescue.com
0.35 BAR 5 Psi 30hp	1- 3 & 4mins*	1.2mm PVC 8cm drop-stitch DWF/PVC Floor		? ?	? ?	□ ■	■ -	8 -	- 12	- -			■ ■	■ ■	2 ■	□ □	■ ■	ndiver-rescue.com
0.35 BAR 5 Psi 30hpi		oooo		- -	- -	- -	- -	8 -	- -	- -	- -		■ -	- -	- -	- -	■ ■	ndiver-rescue.com
0.35 BAR 5 Psi 50hp	1- 3 & 4mins*	1.2mm PVC 8cm drop-stitch DWF/PVC Floor		0 5	■ □	□ ■	■ -	8 -	- 12	- -			■ ■	■ ■	2 ■	□ □	■ ■	ndiver-rescue.com

Images NOT to Scale = Option ●● = Partial Feature/ OK but not ideal COST: £\$€ Approx, <u>inc</u> local tax/VAT £\$€=currency conversion only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES PRV=Pressure Relief Valve ◆ INSHORE ◆ OFFSHORE ◆ SWIFTWATER ◆ FLOOD ◆ SURF ◆ ICE/MUD ◆ TACTICAL		MODEL	COMPANY	ORIGIN	USES	COST <u>inc tax /</u> <u>VAT</u>	WEIGHT	LOAD CAPACITY PERSONS kg/lb Kg/Sq Metre lb/Sq Foot	DIMENSIONS L x W x H x Tube INTERNAL SPACE PACKED
		DS520	NORTHERN DIVER		◆ ◆ ◆ ◆ ◆ ◆ ◆	£3203	120kg 264lb	10 1160kg 2557lb	520 x 102/202 x 50cm 170 x 40/66 x 19.7" 120 x 60 x 40cm 47 x 23.6 x 15.75"
		ResQCraft3800 SIT38040	SIT Ltd			£ \$ €6074	70kg 154lb	6 700kg 1543lb	380 x 00/180x00cm 150 x00/71 x 00" 120 x 60 x 50cm 47 x 23.6 x 20"
		ResQCraft4000 SIT38006	SIT Ltd			£ \$ €	75kg 00lb	9 870kg 00lb	400 x 00/220 x 00cm 000 x 00/00 x 00" 150 x 65 x50cm 00 x 00 x 00"



SERIOUS PRODUCTS. Serious Users

Swift Water Rescue Dry Suit PRO

Designed to meet the technical and environmental challenges posed to rescuers in extreme environments. The suit features a robust design that combines the comfort needed for constant wear, the close fit essential for mobility during aggressive swimming and the durability to stand up to the most technical and hazardous operations.

MSD577 SR

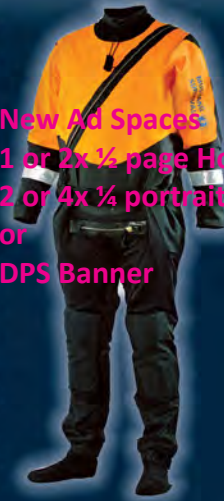
Sizes: S – XXXL Color: Yellow / Black
Patents: US 6,668,386
CDN 2,381,720 & Patents Pending

Water Rescue Dry Suit

Provides the protection required for challenging water rescue conditions. A durable dry suit with the comfort needed for extended rescue missions featuring Kevlar® nylon abrasion patches on the hip, knees, arms and cuffs to protect where needed most.

MSD575 WR

Sizes: S – XXXL Color: Yellow / Black
Patents: US 6,668,386
CDN 2,381,720 & Patents Pending




New Ad Spaces:
1 or 2x ¼ page Horizontal
2 or 4x ¼ portrait
or
DPS Banner

For More Product Information: mustangsurvival.com | usaservices.com

WE SAVE LIVES FOR A LIVING

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION					LOADING			EXTRAS		VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY			REFLECTIVE/ CUSTOM
0.35 BAR 5 Psi 50hp	? L ?cuft 1- 3 & 4mins* ■ ■	1.2mm PVC 8cm drop-stitch DWF/PVC Floor		??	? ?	□ ■	■ -	8 -		12 -			■	■ ■	2 □	□ ■		ndiver-rescue.com
0.2 & 0.4BAR 3 & 6 psi 30HP	860 L 30.4cuft <1min ■ ■	'Orca' Hypalon Neoprene-coated 6" drop-thread deck		3	□ □	□ □	- ■		7 4	■ ■	4 - 5	■ -		■ ■	2 ■	□ ■ ■	■ ■ ■	Leafield valves sitltd.co.uk
0.2 & 0.4BAR 3 & 6 psi 40HP	1715 L 54.7cuft >2mins ■ ■	'Orca' Hypalon 6" drop-thread deck		5	□ □	□ □	- ■		8 2	■ ■	2 - 8*	■ -		■ ■	2 ■	□ ■ ■	■ ■ ■ ■	Leafield valves. * D-Ring under deck can provide flip tab. Inboard stowage loops sitltd.co.uk

New Ad Spaces
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2 or 4x ¼ portrait
or
DPS Banner

136 **BUYERSGUIDES** Water Rescue Equipment

POWERED INFLATABLE RESCUE BOATS

MAX PRESSURE MAX ENGINE HP SHAFT	approx. AIR CAPACITY INFLATION TIME (Hand) (Powered or CA)	MATERIALS TRANSOM	STANDARDS	INFLATION				LOADING			EXTRAS			VIZ		NOTES	WWW.		
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES	REPAIR KIT/ WARRANTY			REFLECTIVE/CUSTOM	COLOUR OPTIONS
00BAR 00psi 30HP																	icbrindle.com		
00BAR 00psi 30HP																	icbrindle.com		
00BAR 00psi 30HP																	icbrindle.com		
00BAR 00psi 50HP		Polyurethane. drop-thread deck. Composite		3			- 		4 -		- 3				- 			also available with composite hard deck	inflatable-solutions.com
00BAR 00psi 30HP		Polyurethane. drop-thread deck. Composite		3			- 		4 -		- 3				- 			also available with composite hard deck	inflatable-solutions.com
00BAR 00psi 30HP		Polyurethane. drop-thread deck. Composite		3			- 		4 -		- 3				- 			also available with composite hard deck	inflatable-solutions.com
00BAR 00psi 30HP		Polyurethane. drop-thread deck. Composite		3			- 		4 -		- 3				- 			also available with composite hard deck	inflatable-solutions.com
																		expansion row	
																		expansion row	

138 **BUYERSGUIDES** Water Rescue Equipment

POWERED INFLATABLE RESCUE BOATS

AIR CAPACITY INFLATION TIME	MAX PRESSURE MAX ENGINE HP	INFLATION OPTIONS & TIMES HAND ELECTRIC CABA	MATERIALS TRANSON	INFLATION					LOADING		EXTRAS		VIZ		NOTES	WWW.	
				CHAMBERS (inc Deck)	REGULATOR / HOSE	MANUAL/POWERPUMP	SAFETY PRV / DUMP	INFLATABLE/ HARD DECK	HANDLES	FLIP TAB / GRAB CORD	TOW/HD/LT DUTY EYES	POUCHES / BOW BAG	FLOOR AIR FOAM RIGID ALU	CARRY BAG/ PADDLES			REPAIR KIT/ WARRANTY
0 L 00cuft 00>min	00BAR 00psi 30HP		V Polyurethane. drop-thread deck. Composite														zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 10HP															Also available with rigid floor	zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 10HP															Also available with rigid floor	zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 30HP															Also available with rigid floor	zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 30HP															Also available with rigid floor	zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 30HP															Also available with rigid floor	zodiacmilpro.com
0 L 00cuft 00>min	00BAR 00psi 40HP															Also available with rigid floor	zodiacmilpro.com
																	expansion row
																	expansion row

INFLATABLE & SOLID 'SHORT' RESCUE BOARDS

'Short' as distinct from the numerous long boards and basically modified surf boogie or body boards. These short boards are often called 'sleds' in North America because they are huge compared to a standard sport body board. Most derive from the surf community but in rescue terms it is probably the Carlson Board from the 80's that steered the entire water rescue and swiftwater community towards use of short boards for water entry rescue (as distinct from towing). High-speed towing is now where you see most short boards - on the

back of a PWC/RWCs both as a rescue measure in surf, flood and swiftwater and for general transport of a surfer to or from the hairy wave face on a surf beach. Be aware though that just because a board/sled has forward-mounted D-rings, doesn't mean it can be towed by an RWC - these exert a degree of force through acceleration that surfers long ago realised needed to be mitigated by additional elastic connections or strengthened fixings. Of course you could bypass the RWC altogether and power the board itself which is what the *ASAP 156* jet-board on the right does. With an average 50minute run-time this is an exciting, if rather more expensive option! The *156* does have a forward towing option but more for recovery than deployment. Swiftwater rescue boards either have no tow eyes because they're intended for swimmers or the eyes are more for control lines and hauling, neither of which involves fast acceleration. True surf-oriented boards are also more able to cope with large waves that can bend or snap boards not designed for that environment. Some, like the Peruvian *Suntech* boards are reinforced - in their case with a longitudinal aluminium I-beam. One board that stands out is the *Double D Rescue* sled (pic right) by Dane DeBoer in California. This has an actual modified winch mounted on its upper surface to provide a means to pay out and take in on a long line. The winch is a bespoke construction and is literally a giant, modified fishing reel - specifically a



multiplier on its side, using 100m of 12 strand spectra cord with an 'add-on' 100m to give huge downstream reach.

Another offshoot for rescue boards has been ice rescue which has spawned a few quite odd designs like the *Angel-Guard* but in principle the main players like *Ice Rescue Systems RTS* and *MARSARS sled* below-left, are modified boards, longer than most RWC boards but not quite a lifeguard's long board. They are however, considerably more complex than simply a flotation aid. Both are rectangular with numerous integrated slings and the *MARSARS* sled has a 4:1 hauling mechanism built into the centre of the board that helps haul an in-water victim on board the sled via a set of forearm straps- there are even two rollers in the end to facilitate easier victim movement onto the sled.

We see a definite difference between boards with a US surf background like

Extractor, *P2P* and *Lifesled* (better known in surf circles as *Wahoo International*) and those from a European water rescue background like *WRSMFC*, *WRSi* and *NDiver*. These latter boards and indeed most inflatable short boards are better suited to 'flat' or flood water (and ice or mud) than they are to rough water like surf or swiftwater. They can however be deflated and stored in a considerably smaller space than a solid board although deployment times are also considerably longer. In general, the inflatable boards are the domain of multi-discipline rescue agencies not necessarily using them on every call or

with simply no more space on the truck for any more kit. We have dealt with the specifics of inflatable craft in the previous guides to watercraft so no need to discuss that further here - the same rules apply, the materials are the same, the valves are the same only the sheer size and volume and therefore the time to inflate (a couple of minutes even with



a hand pump) are different. Beach rescue and standby rescue teams are more likely to go for a solid board and for some boards storage as a flat- one piece can sometimes be easier to fit on or around a rescue vehicle than a plump bag of deflated board.

Something that all 'short' boards have in common is a plethora of handles and all go to great lengths to ensure that they are strongly fixed to the deck. In the case of inflatables it is exactly the same as all inflatable watercraft with glued or preferably welded seams having a considerable track record. Solid boards (which aren't necessarily solid as we'll see shortly) can be a bit trickier because the plastic or foam 'shell' that they have to be fixed into can have inherent localised weakness.

So most overcome this by spreading the load either by broadening the rivet bed as you can see on the *MARSARS* or by running the handles as a continuous length into and out of the body of the board as you see with the *Lifesleds*. *Extractor* mould the threaded receiver into the HDPE shell and claim a 7000lb/3181kg test pull which is quite impressive and likely one of the strongest options. The swiftwater specialised *Double D Rescue* sled mentioned earlier, has such a tough construction that it can have that modified winch mounted on its upper surface! P2P have neoprene covered solid rubber handles while NRS has low-profile flat straps. Some have a 'last-chance' handle right at the back and some even have a last chance sling/cord hanging off the back. Apart from the special purpose boards all of the towable boards have a curved 'stern' both in terms of smoothing off the roughly 4"/100mm side profile and the crescent shape which accommodates the shape of a 'casualty' who is hanging on for grim death more comfortably and safely than a square back edge. In the case of the picture above from *Lifesled* the rescuer is using the board as an in-water access tool and is knelt on it while assisting the casualty that has just been hot-loaded after having his hand grabbed by the RWC driver. He will then be swung back to the waiting rescuer who ensures he has a firm handhold for the journey

back to shore.

For inland swiftwater and floods the use of the not-so-short, short board was pioneered for rescue by Robert Carlson after using a regular surf boogie board for sport river-boarding or river sledging as its sometimes called since the early 70s. The Carlson Board (pics left) took the standard boogie design, added a slick, hardened plastic base and deep crescent curve to the rear as well as four handles, none of which had been seen on rescue boards before. These days the board's curved body channel has evolved into two 'limb' channels that retain the forearms better when grasping the handles. The boards still have their original vivid green base as well as a curved profile nose to tail.



NRS
RESCUE

SWIFTWATER RESCUE EQUIPMENT

• Dry suits • Wetsuits • Footwear • Gloves • Helmets
Life Jackets • Rescue hardware and more...

nrsrescue.com | rescue@nrs.com

The WRS Rapid D inflatable board



The NRS board in the titles, shows a textured, padded surface common to most boards that offers a tactile surface to help grip the body, ExtractorX Sled for instance has a 3/8" thick dimpled PVC layer while some like *Extractor* and *Carlson* have scallops in the top surface to better hug the body arms. In fast moving water and particularly on the back of a fast moving RWC any slight turn can make it hard to hang on and virtually impossible on a slick top-surface. This sideways skid at higher speeds is mitigated in some models like *Extractor's River X* and *JetRescue's Newk* by use of strakes or channels in the underside that keep the board in line - much as you see on RIBs. We mentioned earlier that the non-inflatable sleds are not necessarily 'solid', some like the *Extractor* range are expanded foam but have differing densities and are hollow. Some are solid 'polystyrene' but it may surprise some to learn that regular polystyrenes (EPS more-so than EPP) will absorb some water - perhaps up to 7% of total board volume. Talking of volumes, the

relative board sizes is not immediately apparent in our tables as the images are NOT to scale but the difference between a river board/body board compared to one intended to be towed by an RWC can be huge. The *Extractor River X Extreme* above middle is 4'8" long and approximately 130L in volume while the *WRS* on the left is 6'4" long and around 180L and the *N-Diver* on the right is 6'8" long and 280L. Make sure you read the dimensions and volumes to get an accurate idea of size.

KEY to TABLES.....

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture, If we know it's made in a different country there will be a smaller inset flag. 🇵🇪 = Peru 🇬🇷 = Greece

USES: ♦ **SURF/SWIFT** ♦ **FLOOD/FLAT WATER** ♦ **ICE/MUD**
Surf and swiftwater are not necessarily the same as you can get fast moving water with virtually no wave-forms. Here we mean operating in sea waves/surf and fast moving water *with* waves where point loading on the crest or in the dip of a wave can snap or fold if not designed for the purpose. Flat water is flood, lakes and mud where the load is evenly distributed but this can also be 'calmer' swiftwater. **ICE** Any board/sled can be used if you're careful but true ice design requires a flat base that spreads the load, a generally longer board, tougher materials (not usually inflatable) and provision for dragging, tow eyes/ice awls, etc.

An **OPTIONAL** feature is shown as an **outline square** □ □ □ □
A circle ● in the 'USE' columns indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

COST: a rough guide only - **includes** local taxes/VAT. Varies with exchange rates, extra taxes etc. We usually round up to the nearest Pound£/US Dollar\$/Euro€. We now give a **currency conversion** figure in orange £\$€ which is simply to give an idea of price, it is not the selling price which will have import duties and bulk shipping etc. to add.

LOAD BUOYANCY VOLUME: These are all linked but all manufacturers show it differently. **LOAD** capacity in terms of

the weight of person that the board is designed to carry or more importantly that the connecting D-Rings can cope with. **BUOYANCY** of the board, like a PFD or lifejacket is directly related to the weight it can carry whereas **VOLUME** is more an indication of the sheer size of the board usually correlating with load capacity - - the greater the volume the greater the load capacity. As with inflatable platforms, you can work on roughly 100kg per square metre or 67.2 pounds per square foot.

DIMENSIONS: Length by width by depth/thickness.

MATERIALS: (and type of construction) for the board itself, for the top surface and for the bottom which is often the same as the entire board if it is rotomoulded or a solid foam.

EPS=Expanded Polystyrene. EPP=Expanded Polypropylene

HANDLES TETHER POINTS: Tether points are the attachment D-Rings or in some cases simple thru-board holes that can be used for towing, hauling, securing and directional control but NOT NECESSARILY high speed towing by an RWC - see the next category for clarification.

RWC TOWING: whether or not the board can be towed at high speed by an RWC/PWC or similar high speed watercraft.

NOSEGUARD VALVE PLUG: **NOSEGUARD** or Bump protection - this can be a separate plastic or rubber nose, sometimes detachable as with the P2P Rescue Sled or it may be protection offered by a continuation up the side of a hull protection as with the WRS board. **VALVE** for inflatable boards - usually a combined inflate/deflate valve, some have an additional PRV or Pressure Release Valve in case of over-inflation. **PLUG** is present on some hollow boards as a drainage measure but can also be used to add ballast or extra floatation (expanded foam) .



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Everything you need for your next call out.



ICE-WATER-MUD



SNOW TOWING



PWC TOWING



MOTOR MOUNT



HD EXTREME



WERC BOAT

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Whether it's ice, water, snow or mud, successful rescues depend on the coordination and skill of first responders, as well as the availability of the right equipment to handle each situation. See the RDC in action, [visit our video gallery](#).

Easy-to-order parts and accessories

Our online form makes it easy to customize your order. Select from our six Rescue Packages, or update your current equipment with replacement parts and accessories. We'll review the details of your order and email you an invoice at the time we ship your product(s).

Exceptional quality and endurance

The RDC is built to withstand the stresses incurred in demanding, water-related rescue situations. Our products are proudly made in the USA and New Zealand and come with a **12-year warranty**, four times the coverage that is typical in the industry.

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Images NOT to Scale COSTS: £\$€ = currency conversions only- excludes shipping, import duty and tax USES/FEATURES: ◆ = Surf/Swiftwater ◆ = Flood/Flat water ◆ = Ice/Mud ● = PARTIAL FEATURE and/or OK BUT NOT IDEAL □□□ = Option EVA=Ethylene Vinyl Acetate HDPE= High Density Polyethylene HMPE= High Modulus Polyethylene PE=Polyethylene PP=Polypropylene INFLATION TIME: 300L= 1-2mins with manual/electric pump VALVES PRV=Pressure Relief					
					
MANUFACTURER	ASAP	AQUACENTER	CARLSON	DOUBLE D RESCUE	EXTRACTOR SLED
MODEL VARIANT	RESCUE 156	JET SKI RESCUE	CARLSON RIVER RESCUE	D+D RESCUE SLED	MEGA
ORIGIN					
INTENDED USE(s)	◆ ◆	◆ ◆	◆ ◆ ◆	◆ ◆ ◆	◆ ◆ ◆
COST	£7421 \$9040 €8600	£565 \$700 €650	£405 \$500 €470	£000 \$TBA €000	£1940 \$2400 €225
WEIGHT	30kg 66lb	13.6kg 30lb	5.7kg 12lb 9oz	00kg 00lb	31.8kg 70lb
INFLATABLE SOLID HOLLOW	■	■	■	■	■
LOAD BUOYANCY VOLUME	60kg 132lb 230L		75kg 165lb 120L	160kg 350lb 300L	270kg 600lb 310L
DIMENSIONS height x width x Depth	145 x 60 x 28cm 4'9" x 2' x 11"		142 x 61 x 10cm 4'8" x 2' x 4"	211 x 107 x 00cm 6'11 x 6" x 0"	206 x 104 x 14cm 6'9" x 3'6" x 5.5"
MATERIALS: CORE	HD EPP	Drop-Stitch PVC	Closed cell polyethylene foam	Closed cell PE foam	HDPE & 10-13mm LDPE inn
EXTERIOR - Top	?	UV-safe Mil-Rubber	-	PP skin + EVA deck pad	3/8" PVC deck pad
EXTERIOR - Bottom	?	hard plastic 'sheet'	hard plastic 'sheet'	PP skin	hard plastic 'sheet'
HANDLES TETHER POINTS	11+2* 3 (rear)	14 3	4 -	1113 3	10 3
RWC TOWABLE	NO	■	NO	□	■
NOSE-GUARD VALVES PLUG	- - -	- 1 -	- - -	□ -	■ - 1
OTHER COLOURS				■ □ ■	■ ■ ■
NOTES	A water-Jet-propelled board 16kmh/. Price includes battery charger. *2 'pilot' handles	Includes handpump and repair kit		Modified winch is integrated into the upper surface.	Range of RWC connection option packages
WEBSITE	asapwatercrafts.com	aquacenter.gr	carlsonriverboard.com	doubledrescue.com	extractorsled.com

'SHORT' RESCUE BOARDS/SLEDS

					
					
EXTRACTOR SLED	EXTRACTOR SLED	EXTRACTOR SLED	EXTRACTOR SLED	HSA	ICERESCUE SYSTEMS
PRO	RIVER X RESCUE	RWCID PRO	RWCID MEGA	STANDARD/TOW	RTS RAIPDTRANSIT-SLED (ICE)
					
◆ ◆	◆ ◆	◆ ◆	◆ ◆	◆ ◆	◆ ◆
£1724 \$2100 €1990	£905 \$1100 €1045	-	-	£1940 \$2400 €2250 \$2600	£2300 \$2800 €2660
27kg* 55lb*	8.2kg 18lb	11kg 24lb	16kg 35lb	11-18kg 25-35lb	12.7kg 28lb
■	■	■	■	■	■
180kg 397lb 160L	54.5kg 120lb 130L	approx 200L	>260L	114kg 250lb 200L 160kg 350lb 300L	310L
160-170 x 95 x 10cm 5'3"-5'7" x 3'1.5" x 4"	142 x 61 x 15cm 4'8" x 2' x 6"	185 x 107 x 10cm 6'1" x 3'6" x 4"	229 x 109 x 10cm 7'6" x 3'7" x 4"	173211x96107x13cm 5'8"6'11x3'26"x5"	158 x 127 x 15.4cm 5'2" x 4'2" x 6"
HDPE & 10-13mm LDPE inner 3/8" PVC deck pad HDPE	Rotomoulded PE 3/8" Textured PVC PE	Coated Drop-Stitch PVC Chemical welding Grooved PVC pad PE	Coated Drop-Stitch PVC Chemical welding Grooved PVC pad PE	Closed cell PE foam PP skin + EVA deck pad PP skin	HD Polyethylene Foam deck pad HD Polyethylene
8or10 3	6 7*	8 3	11-12 5	1113 3	6 4
■	NO	■	■	□	NO
□ - 1	□ - 1	■ HalkeyRoberts+PRV -	■ HalkeyRoberts+PRV -	□ -	- - -
■ ■ ■ ■ ■				■ ■ ■	
*Wt includes all optional extras. Tail buoyancy reduced for easier loading and inclined ride when towed. Optional Nose bumper	Elbow recesses in deck. Base-Pic shows optional HDPE ice rails	DISCONTINUED inc pump with pressure gauge &, bag. Optional Reflective strips	DISCONTINUED There was also a 16ft long 'TEAM' model to carry up to 10 people	PWC Mount kit NOT included. Also a larger 'Fish'-board with 180/400lb buoyancy.	Ice Awl pouches.
extractorsled.com	extractorsled.com	extractorsled.com	extractorsled.com	highsurfrescue.com	icerescuesystems.com

Images NOT to Scale COSTS: £\$€ = currency conversions only- excludes shipping, import duty and tax USES/FEATURES: ◆ = Surf/Swiftwater ◆ = Flood/Flat water ◆ = Ice/Mud ● = PARTIAL FEATURE and/or OK BUT NOT IDEAL □□□ = Option EVA=Ethylene Vinyl Acetate HDPE= High Density Polyethylene HMPE= High Modulus Polyethylene PE=Polyethylene PP=Polypropylene INFLATION TIME: 300L= 1-2mins with manual/electric pump VALVES PRV=Pressure Relief					
					
MANUFACTURER	JETRESCUE	LIFESLED WAHOO INTERNATIONAL	LIFESLED WAHOO INTERNATIONAL	LIFESLED WAHOO INTERNATIONAL	MARSARS
MODEL VARIANT	NEWKS SLSA	LS1	LS2	LS INFLATABLE	ICE RESCUE SLE
ORIGIN					
INTENDED USE(s)	◆ ◆	◆ ◆ ◆	◆ ◆ ◆	● ◆	◆ ◆
COST	£789 \$978 €915	£1700 \$2100 €1970	£2100 \$2600 €2440	£805 \$995 €935	?
WEIGHT	12kg 26.4lb	15.5kg 34lb	19kg 42lb	13.6kg 30lb	?
INFLATABLE SOLID HOLLOW	■	■	■	■	■
LOAD BUOYANCY VOLUME	approx 120L	approx 170L	approx 200 L	approx 160 L	240lb 350 L
DIMENSIONS height x width x Depth	150 x 90 x 9cm 4'11" x 3' x 3.5"	160 x 95 x 12cm 5'3" x 3'1" x 4"	188 x 104.1 x 10cm 6'2" x 3'5" x 4"	107 x 96 x 15.25cm 5'6" x 3'2" x 6"	195 x 104.1 x 18cm 6'5" x 2'3" x 7"
MATERIALS: CORE EXTERIOR - Top EXTERIOR - Bottom	Heat Laminated PE Soft Deck Pad Hard skin	Composite - -	Composite - -	V-Drop-Stitch UV-safe Mil-Rubber -	HD Polyethylene HD Polyethylene HD Polyethylene
HANDLES TETHER POINTS	10 3	10 3	12 3	12 3	8 3
RWC TOWABLE	■	■	■	■	NO
NOSE-GUARD VALVES PLUG	■ - -	■ - -	■ - -	■ 1 -	- - -
OTHER COLOURS	■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	-	
NOTES				Includes pump, transport bag & repair kit	integrated 4:1 haul system & rollers within the board pull victims on-board. Ice Awl pouches.
WEBSITE	jetrescue.com	lifesled.com	lifesled.com	lifesled.com	marsars.com

'SHORT' RESCUE BOARDS/SLEDS

					
					
MFC INTERNATIONAL	N DIVER	NRS	P2P RESCUE	P2P RESCUE	P2P RESCUE
JET-SKI BOARD WR0213/001	RESCUE LIFE BOARD V2 -	RESCUE BOARD	RESCUE SLED	INFLATABLE SLED	LG INFLATABLE SLED -
					
£2100 \$2700 €2500	£627 \$777 €728	£400 \$495 €465	£1780 \$2200 €2065	£767 \$950 €890	£805 \$995 €935
9kg 20lb	14kg 30.9lb	18.2kg 11lb	14.5kg 32lb	9kg 20lb	10.5kg 23lb
■	■	■	■	■	■
150kg/330lb 300L	200kg 441lb 280L	135L	100L	approx 160L	approx 200L
160 x 95 x 12.5cm 5'3" x 3'1" x 5"	185 x 105 x 15cm 6'1" x 3'5" x 5.9"	145x 63.5 x 10cm 4'9" x 2'1" x 4"	167.6 x 91.5 x 10cm 5'6" x 3' x 4"	167.6 x 91.4 x 10cm 5'6" x 3'3" x 4"	182.9 x106.7x10cm 6' x 3'6" x 4"
Glued Hypalon or Welded TPU - Double-Skin	PVC Drop Stitch or Hypalon Non-slip EVA PVC/EVA	PVC Drop Stitch - -	EPP High Density Plastic Multi-layer skin	- Neoprene Multi-layer skin	- Neoprene Multi-layer skin
10 3	12 7	6 2	9 3	12 5	14 3
■	■	■	■	■	■
- 1x Leaffield -	- 1x Leaffield -	- Leaffield1xD7 1xPRV -	■ - -	- 1 -	- 1 -
■			■ ■	■ ■ ■ ■	■ ■
Inflation Pressure=0.86Bar Includes Repair kit & Carry Bag	Inc Hand-pump, bag & repair kit.	Includes pump and repair kit	Replaceable Nose Cone	Includes pump, transport bag & repair kit	Includes pump, transport bag & repair kit
mfc-international.com	ndiver.com	nrs.com	p2prescue.com	p2prescue.com	p2prescue.com

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MANUFACTURER	P2P RESCUE	PPC FOILING	SUNTECH	SUNTECH	SUNTECH
MODEL VARIANT	RESPONDER		58/59" RESCUE SLED	62" RESCUE SLED	66" RESCUE SLED
ORIGIN					
INTENDED USE(s)	◆ ◆ ◆	◆ ◆ ◆	◆ ◆ ◆	◆ ◆ ◆	◆ ◆ ◆
COST	£2660 \$3295 €3090	£1010 \$1290 €1220	£735 \$909 €853	£760 \$939 €881	£810 \$999 €940
WEIGHT	18.2kg 40lb	0kg 0lb	9kg 20lb	10.8kg 23.8lb	13kg 28.6lb
INFLATABLE SOLID HOLLOW	■	■	■	■	■
LOAD BUOYANCY VOLUME	135 L	approx 200L	93/124L	131L	139L
DIMENSIONS height x width x Depth	213.3 x 86.3 x 10cm 7' x 34" x 4"	184 x 106 x 11cm 6'1" x 3'3" x 4.4"	148 x 89 x 11cm 4'10/11" x 2'11" x 4.4"	158 x 92 x 11cm 5'1" x 3' x 4.4"	168 x 92 x 11cm 5'6" x 3' x 4.4"
MATERIALS: CORE	EPS/Fibreglass	Moulded Foam	EPS & Alu stringers	EPS & Alu stringers	EPS & Alu stringers
EXTERIOR - Top	-	EVA traction top	non-slip. Anti-Delamination Vinyl	non-slip. Anti-Delamination Vinyl	non-slip. Anti-Delamination Vinyl
EXTERIOR - Bottom	-	triple layer PVC	0.6-0.9mm vinyl	0.6-0.9mm vinyl	0.6-0.9mm vinyl
HANDLES TETHER POINTS	11 3	8 3	14 3	14 3	14 3
RWC TOWABLE	■	■	■	■	■
NOSE-GUARD VALVES PLUG	■ - -	■ 1 -	■ - 1	■ - 1	■ - 1
OTHER COLOURS					
NOTES	Plastic protection nose-skid	Foam core is moulded not CNC cut.	Alu stringer is an H-profile aluminium bar running thru centre line	Alu stringer is an H-profile aluminium bar running thru centre line	Alu stringer is an H-profile aluminium bar running thru centre line
WEBSITE	p2prescue.com	ppcfoiling.com	suntechboard.com	suntechboard.com	suntechboard.com

						
						
	SUNTECH	TIKI FACTORY	TIKI FACTORY	TIKI FACTORY	TIKI FACTORY	WRS
D	72" RESCUE SLED	RESCUE ROCKET	RESCUE SWAMMER	RESCUE SLED	RESCUE PLAN 205*	RAPID D
						
	◆ ◆ ◆	◆ ◆	◆ ◆	◆ ◆ ◆	● ◆ ◆	◆ ◆
	£840 \$1039 €975	£80 \$100 €92	£140 \$171 €160	£560 \$700 €650	£1076 \$1335 €1250	£860 \$1120 €985
	0kg 0lb	2kg 4.4lb	3kg 6.6lb	8kg 17.6lb	7.5kg 15.5lb	13.5kg 30lb
	■	■	■	■	■	■
	162L	38L	70L	160L	150L	180L
	181 x 99 x 11cm 6'1" x 3'3" x 4.4"	98 x 43 x 10cm 3'2" x 1'5" x 4"	110 x 70 x 10cm 3'8" x 2'4" x 4"	168 x 99 x 10cm 5'6" x 3'3" x 4"	205 x 70 x 10cm 5'6" x 2'4" x 4"	160 x 95 x 12cm 6.3 x 3.7 x 4.7"
rs	EPS & Alu stringers non-slip. Anti- Delamination Vinyl 0.6-0.9mm vinyl	Drop-Stitch PVC Tactile EVA pad PVC	Drop-Stitch PVC Tactile EVA pad PVC	Drop-Stitch PVC Tactile EVA pad Extra PVC half layer	Drop-Stitch PVC Tactile EVA pad Extra PVC half layer	Drop-Stitch PVC Non-Slip EVA pad Polymer clad
	14 3	4 0	2 10	12 3	6 0	10 3
	■	NO	NO	■	NO	■
	■ - 1	- 1 -	- 1 -	- 1 -	- 1 -	■ 2x Leaffield -
file thru	Alu stringer is an H-profile aluminium bar running thru centre line	Alternative to the lifeguard can or torpedo. Inflation in <1min pack size 40x27x10cm	Inflation in 1min Optional, detachable stabilising fins (for hull) pack size 70x15x15cm	Inflation in 3mins or <1min with CO cylinder pack size 70x50x20cm	*also a 215cm version with inflatable side walls see WATER RESCUE BUYERS GUIDE Inflation in 3mins or <30sec with CO cylinder pack size 70x27x18cm	Pack size 100x55x15cm
n	suntechboard.com	rescue.tiki-factory.com	rescue.tiki-factory.com	rescue.tiki-factory.com	rescue.tiki-factory.com	wrsinternational.com

Powered, Water/Rescue Craft PWCs/RWCs

This is an unusually long introduction for a product category, indeed, longer than the actual product tables because there aren't that many. This is taken and updated from our original Market Guide intro way back in TECHNICAL RESCUE issue 58. That was over 15 years ago and was authored by the literal guru of rescue PWCs Shawn Alladio of K38. Her intro was pretty much a guide to choosing and using PWC and it is astonishing to find that, unlike the vast majority of rescue and indeed the world that has transitioned from petrol to electric, PWCs really haven't. There are now some all-electric craft of course but we might have expected in the intervening years for such small craft to have been taken over completely by electric power sources but there are just a handful and the vast majority of rescue agencies are still using petrol/gas RWCs with no immediate indications of a radical change other than more modern styling like the *Seadoo* in our titles and even that is from a few years ago. These craft now come under specific standards ISO13590 for PWC construction and ISO16386 for performance and handling - eg. off-throttle steering requirements.

BRIEF PWC BACKGROUND HISTORY

Clayton Jacobsen designed the first Personal Watercraft for BPR (Bombardier) Inc. in 1968. Sales of the new craft were not exceptional, and the licence for the product was terminated. Clayton went back to the drawing board and focused on a more 'personal use' type of craft with a handle pole that raised, and a rider who either knelt or stood on a rear platform. This style required a more 'active ride' by the operator. Kawasaki Motors Corporation stepped in and introduced this newer design under the trademark name 'Jet Ski' in 1974. In 1986, Kawasaki introduced the first two-person Jet Ski. The product line saw a significant sales increase in 1987 when sit-down watercraft were produced. This is the year that Yamaha entered, followed closely by several other manufacturers. From here, the Personal Watercraft Industry Association, with the efforts of the OEM



manufacturers, introduced the 'Law Loan Program' in the early 1990s, which loaned PWCs to public safety agencies in the United States for free for a period of one year, over 15,000 craft were loaned out under this programme. K38 (Shawn Alladio) began teaching these occupational users how to use these boats for rescue and patrol purposes.

The programme took off nationwide and was operating with support from Yamaha and Kawasaki. Today, whilst the loan scheme has finished, the Personal Watercraft Industry Association continues its broader safety and advocacy work for the PWC industry.

PIONEERS

Kawasaki loaned its stand-up watercraft in the late 1970s to east and west coast US-based lifeguard agencies. The pioneering agencies were Kill Devil Hills Lifeguard Beach Service in North Carolina and Taft-Delake-Nelson Fire District in Lincoln City, Oregon. Both east and west coast agencies are still using RWC today and have conducted hundreds of high-profile rescues in extreme ocean conditions, receiving high honours in water rescue. These two agencies have the longest-standing legacy in the RWC community and are the founding agencies, which started with the stand-up Jet Ski. The first generation of PWC 'rescuers' was created through the efforts of Brad Southworth and Ronny Kling, who started

the rescue application through the organizational efforts of Chuck Koontz. Known as the 'Godfathers of PWC Rescue', they utilised Jet Skis with the 'FunTech' Wedge, a moulded form that clipped into the bond line of the hull, making the stand-up craft a stable working platform. Forty years later, the rescue community is finally giving these unique boats their due, but

TERMS:

Personal Water Craft – PWC
Rescue Water Craft – RWC
Rescue Board – RB (towable litter)
Operator-Driver
Crew-Rescuer (commonly working on the rescue board)

PWC TRADEMARK NAMES:

Honda - Aquatrax (discontinued)
Yamaha - Waverunner
BPR (Bombardier) - Sea-Doo
Kawasaki - Jet Ski

TYPES OF RWC USAGE:

- Environmental Studies (marine life and inspections)
- Water Safety Management at aquatic events
- Surf Rescue (wave height safety limit due to location safety zones)
- Swiftwater and Flood Rescue (limited applications due to environmental risk)
- Surveillance
- Patrol
- Support Craft

it has come with the same price paid by the behaviour of the recreational community. There have been many mishaps during the learning curve of public safety agencies that did not understand the vessel profile and operational needs. Many agencies tried to operate them in a similar way to a RIB, and quickly found that high-speed driving does not work for these craft with passengers or dynamic conditions.

Unfortunately, most agencies leapt before they learned; nowadays the level of respect has shifted.

Current production models generally top out in the mid-to-high 60 mph range, with many mainstream PWCs still effectively in the 65–67 mph bracket, although Sea-Doo's latest RXP-X 325 is now being promoted as a roughly 70 mph top-end outlier. In practice, agencies commonly look to three-person, naturally aspirated platforms with stable hulls and good weight-carrying characteristics for rescue work; current examples often discussed in that context include the Kawasaki STX 160 series, Yamaha VX family and Sea-Doo GTI/GTX lines.

An RWC is not exclusively dependent upon the use of a rescue board for victim extrication, as is commonly believed. In fact, if you do not have a crewperson on board, extrication of an unconscious patient on the rescue board is not likely to be effective at all. Hence, training with and without an RB is essential to professional standards.

These boats need to be treated with respect. Even though RWCs have been in operation for several decades, their use has become far more widely accepted worldwide in recent years.

A quick search for PWC rescues now shows just how often recreational riders reach an incident before an occupational crew can arrive, particularly on rivers and lakes. Lifeguard agencies have narrowed that gap through the use of properly trained operators and crew, often working with a 'rescue board' towed from the stern transom of the RWC. It is advisable that agencies implement a 'two-boat patrol'. The saying goes, 'One is none'.

PROPULSION

Rescue Water Craft utilise an 'impeller-driven jet drive system'. This means that water is drawn into an intake screen located at the centerline of the hull's keel towards the aft section.

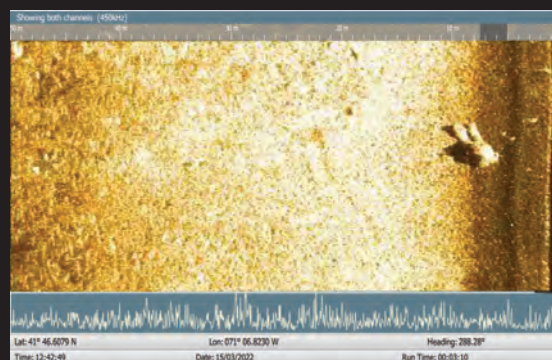
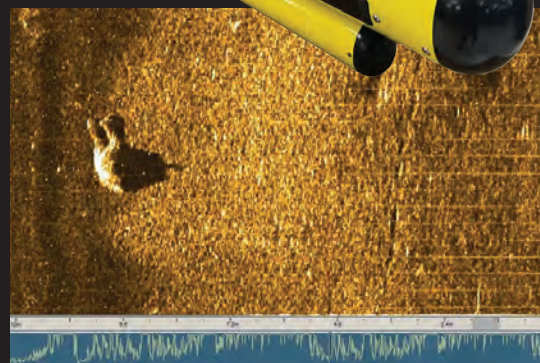
The water is drawn into an internally mounted jet pump housing with an encased 'impeller' spooled on a driveline that goes through the hull into the engine compartment and follows through to the crankcase of the engine. The jet pump is protected by a 'ride plate' covering. Depending upon how much throttle is applied, the vessel accelerates in either a planing (fast) or displacement (slow) forward movement. There are guide vanes at the end of the pump casing (behind the impeller) near the steering nozzle which slows down the directional swirl of water from the forward thrust applied. The 'steering nozzle' is affixed to the 'steering cable' and the helm for port or starboard turns. Ergonomics for passenger comfort change from a recreational need to a rescue response vessel. Our trim points and occupant movement is a bit different from the intended use of these craft. Understanding how your jet drive system functions, and the type of weight loads and waterway use involved, means you need to protect the pump and cooling system from debris or damage. The shallow draft makes it a good boat in some environments (but again, this is up to operator expertise), and is not limited by seasonal, tidal, water-level, or weather changes while underway. Any object that can pass through the water intake can damage components of the pump or wrap around the driveline.

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Understanding the sound waves, forward thrust (or loss of it), and vibration of the craft when debris has created a problem can help the operator ensure no further damage to the driveline assembly by timely shutting down and removal of debris. The craft must either be towed or placed back on a trailer, but should not be driven beyond its load limits.

K38 Operating Points – Effective Applications:

1. Helm and Throttle Control
2. Reading the water and the weather
3. Trim

GOT IGNITION?

Can you explain how your RWC functions in terms of the electrical system and throttle application? For example, a Kawasaki Ultra 260LX weighs in at 1,060 lbs without payload. It easily reaches 30 mph in 1.8 seconds in smooth-water and weight-load conditions, and its top speed surpassed the 65 mph mark in period testing. With 260 hp, 1,498cc dual overhead cam, four-cylinder, intercooled, supercharged power, do you know how that translates into ‘safe operations’? If you can’t define it, you can’t own it. Let’s start with the ‘key’, which is the lanyard. All models, in North America, Europe and some states in Aus/NZ, whether petrol/gas or electric, compulsorily incorporate the use of a dead-man kill-switch using a ‘lanyard’ and an ignition ‘key’ system. The lanyard engages in a slip tab on the helm station that engages the electrical system when the ignition start button is pushed. If the operator falls off or moves from the forward riding position, the lanyard will disengage, preventing the RWC from functioning, often referred to as a ‘cut-off switch’. Not all lanyards are interchangeable, even within the same product line. Some are digitally coded and must be reprogrammed if you replace them or have a second RWC.

Your agency should carry multiple lanyards or compatible engine cut-off devices per boat for safe operations. As current federal law also requires use of an engine cut-off switch link on covered recreational vessels when operating on plane or above displacement speed, agencies should ensure their procedures

and equipment reflect current legal requirements as well as practical redundancy. It’s a good idea for your ‘rescuer’ or ‘crew’ to have one as well. They also have a lifespan and may need to be replaced annually. Some offer lower MPH applications with a ‘learning key’ that is colour-coded.

Here are some examples used in association with a lanyard:

- Keyfob Remote – lock/unlock (Yamaha)
- Immobilizer Key (Kawasaki)
- Learning Keys (BPR - Bombardier)

Many agencies are adding additional electronics on board that require tapping into the stock electrical source. It is not recommended to overload the stock ignition/electrical system. If you are interested in adding lights or sirens, you should add an additional charging system. It is expensive to replace the stock system, and overloading will cause failure on newer models.

STEERING, STOPPING AND BRAKING

Two-stroke technology began phasing out in the USA around 2000–01 as fuel and exhaust-emission requirements tightened, while later federal EPA marine spark-ignition rules formalised exhaust standards for new personal watercraft engines beginning with the 2010 model year. Earlier concerns over emissions and operator behaviour also helped drive further design changes. Current California guidance explains that high-emission carbureted and some electronic-injection two-stroke engines are restricted on some waterways, but there is no statewide ban on all two-stroke engines, and direct-injection two-strokes may still be allowed in many areas depending on local rules.

At the turn of the century, the United States Coast Guard addressed PWC handling and collision-avoidance concerns through advisory and safety work, while current federal guidance continues to focus on operator responsibility, engine cut-off switches, required equipment and safe operation rather than a single modern federal ‘off-throttle steering’ standard. Modern federal recreational boating guidance is now reflected

POWERED WATER CRAFT PWC/RWC

more broadly through Coast Guard regulations and published boating-safety requirements, with manufacturers also working to current emissions and equipment rules. The size and weight increases of PWCs were shaped in part by these changes. In K38 training programmes, students and supporting agencies are encouraged to adapt to these ongoing changes so they can stay in step with current technology. Training, physical fitness and keeping things simple remain good measures for success. When referencing Personal Watercraft models, we need to identify the individual craft by the following:

1. Make (brand)
2. Model (style)
3. Year (production unit)

Each production model and year offers different features and functions. K38 has long updated its training approach to reflect industry safety changes. Failure to specify training, equipment and vessel needs can result in loss, damage or significant injuries to operators, rescuers or those they serve. Many agencies have not stayed in step with these design changes, leaving their programmes at risk because definitions, training and manuals are out of date. For instance, how many of you can define the application of 'off-throttle steering' and its operation effectively? Let's discuss this further:

All RWC now have 'Off-Throttle Steering' - what used to be called OTS, OTAS or OPAS depending on the brand. Older BPR/Sea-Doo lines used 'Off-Power Assisted Steering' (OPAS), a 'dual rudder' system that used pump pressure to raise the rudders out of the flow of water and springs to lower them as throttle

was released and the pump spooled down. Think your throttle link is sticking? Probably not — your off-throttle steering is engaging. This is a common assumption among operators, so know your craft. As of 2026, Yamaha calls its system 'Ride', BPR/Seadoo have 'iBR' and Kawasaki has 'KSRD'.

BPR introduced the iBR system in 2009, which stands for 'intelligent brake and reverse'. This computerised system briefly slows the jet stream and then redirects thrust in reverse when the operator squeezes the brake at the helm. A cast-aluminium gate drops to redirect the stream, and the onboard computer calculates how much reverse thrust is needed to safely counter the craft's forward momentum. The gate can descend beneath the hull to help counter the effects of stopping the craft. Stopping distances vary with rider weight, craft speed and environmental factors, and operators must always be prepared for the forces involved.

ADDITIONALS

In 2026 ALL PWC/RWC used at night must display navigation lights - this would be mandatory on RWC anyway but these are not necessarily factory installed as you might expect - they have to be specified as an after-market addition. Some models and makes offer cruise control, GPS systems, adjustable steering nozzles and helm positions, as well as the BPR (Bombardier) iS (Intelligent Suspension), which has a top deck that lifts from the bottom deck on suspension technology. The iS model is not recommended for SAR applications. Although it is an excellent product, the top deck does alter the centre of gravity for the type of trim needs involved in packaging patients.



WATER RESCUE

RWC
Rescue Water Craft

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SAFETY FOR YOUR LIFE!

Your cooling system can be clogged with silt, animal manure (lakes), sand, leaves or anything that can pass through a fingertip-size screen opening for water flow. The engine water-cooling jackets and hoses can clog. It is important to flush your cooling system whether operating in salt or fresh water. Follow all manufacturer recommendations for each craft by make, model and year of production. They are not all the same and should not be treated as such. Some craft have engine coolant systems that need to be maintained similarly to a vehicle.

Also, like a vehicle, your engine oil needs to be changed anywhere between 30–50 hours of use, followed by spark plugs and a possible oil filter. Four-stroke engines need to be dewatered immediately if water ingestion occurs, or you can expect a full loss on your engine. Use manufacturer-recommended marine-grade oil and high-octane fuel. Fuel injectors clog easily and do not like moisture, condensation, low-octane levels, oxygenated fuels or 'gunk'. Using a good rust-inhibitor spray that is recommended by your OEM is important whether operating in fresh or salt water.

If you drill any holes through the hull itself you can void the manufacturer warranty. It is not recommended to make any exterior alterations by adding cleats, eyelets, or anything that can create physical contact that results in an injury. Likewise, no fixed ropes should be wrapped around the handlebars (helm) or mirrors tethered to the bow cleat. No ropes or lines should be stored under the front forward cowling hatch (hood) that will break the seal, be pulled out by water action, friction or victim grappling, or cause fouling of your driveline.

Any gear you store on board should not exceed the weight-load limits for each compartment. Also, if not properly padded or stowed, it will be damaged or broken. Waterproof bags will create friction points, breaking their seal, and any electronics or weapons should not be stored on board without proper security considerations. If you lose your RWC in the water, a radio stowed on board will be useless, or worse yet, if you are dependent upon your communications systems, a damaged one is expensive to replace if broken or lost.

Reverse is not a brake! (Note: the iS technology is different.) If you are using your reverse-gate handle to 'brake' your boat, you should reconsider how you operate your craft. Reverse is simply for reversing your craft from a position, not to stop the boat from hitting an object or person.

CONSUMABLES

(depending upon hours of use and maintenance needs, not including PPE kits)

- Rust Inhibitor Spray
- Protective covers (do not use plastic)
- Spark Plugs
- Oil (marine-grade four-stroke oil x number of oil changes per hours of use or damage)
- Oil Filters
- Air Filter (if required)
- Engine Coolant (if applicable)
- Spare Parts Cache (inventory)
- Annual Repair fund for hull or engine damages (budget)



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- Spare Lanyards (minimum of 3 per boat)
- Trailer and/or tote needs
- Onboard emergency gear
- Salt Away (flushing cleansing agent or similar)
- Intake Clearing Tools
- Tow lines/rigging

- Electrical Accessory Needs (battery/LCD screen)
- Marine Grease (re-pack bearings in pump housing)
- Supercharger Maintenance program (replacement needs)
- Tools

STANDARDISED RWC FOR OCCUPATIONAL USE

In 2004, with the rapid insertion of PWC 'lifesaving application', K38 saw the need to review the standardisation for occupational use in the United States. The decision was drafted to separate the recreational and service-oriented application synonyms. The global standard was set along with skill sets and technical training applications through K38 Affiliates and government associate boating safety groups. Lifesaving typically fell under swim rescue standards, similar to swiftwater standards. The problem was that most groups did not realize they were including 'marine boat units' where none had existed prior. In the US, K38 worked directly with the boating groups who managed the laws and regulations for vessel operations and outsourced these programmes towards a lifesaving platform.

Specifically for the US, organisations such as the National Safe Boating Council, the National Association of State Boating Law Administrators, and the U.S. Coast Guard continue to shape boating safety guidance and training expectations, while NASBLA's BOAT Program now serves as a recognised national framework for maritime law-enforcement and emergency-response training.

Earlier references to the American Watercraft Association and H2O Responders reflect the period context of this article, but current readers should note that today's formal public-safety training landscape is better understood through agencies and frameworks such as NASBLA's BOAT Program and specialist providers such as K38.

OPERATIONAL CAPACITY

The RWC standard requires that a vessel be capable of carrying up to three persons or its total recommended weight-load capacity. This means that only production-model RWCs with mirrors should be utilised for personnel and passenger safety, together with a tow capability that follows applicable state boating law, where a spotter or an approved alternative such as a rear-view mirror may be required when towing a person on the water. Agencies should always verify the current rules in their own jurisdiction.

It is highly recommended that SAR programmes avoid turbo and supercharger models unless the agency adheres to strict pre- and post-operation checks and required hourly inspections. These are high-performance vessels and require a dedicated project-management policy for marine patrol applications.

This means scheduling maintenance checks and maintaining a budget that complements the replacement and repair needs of the craft for in-service use. Remember: effective RWC use is not dependent upon top-end high speed. Operator technical ability, reliability, function, weight-load distribution, and slow-speed loading and offloading are imperative. As agencies move into future production models they will need to adapt to higher-performance products, which means training modifications as well as mechanical ones.

This intro should not be used for training purposes, but rather as suggestions for RWC use. This outline does not cover all the necessary components to create an operational program. Take a Safe Boating Course from an accredited source and 'Boat Smart From the Start!'

In the following table, we have included only the models deemed most suitable for rescue, examples such as the *Kawasaki STX 160* series, *Yamaha VX* family, and *Sea-Doo GTI* and *GTX* platforms, all of which are often considered by agencies looking for stable three-person rescue-capable craft. The *HSR Benelli* range remains entirely untried for rescue, but is included here as a potential craft.

*Note: AquaTrax was discontinued after the 2009 series and by 2010 HONDA had discontinued PWC manufacture altogether..

ELECTRIC PWC AND BATTERY CONSIDERATIONS

Electric PWCs still feel like a glimpse of the next chapter rather than the settled present, but they are no longer a novelty. In the right setting, their quiet running, lack of exhaust fumes and low day-to-day maintenance make them genuinely attractive for short-range patrols and near-shore support work. The trade-off lies in the battery. For rescue agencies, the real question is not simply whether an electric craft is quick enough, but whether it can deliver dependable range under load, recharge fast enough between tasks and fit into an operation that may already be stretched for shore power, storage space and fire-safe charging procedures. Cold weather, repeated high-demand use and the logistics of lithium-ion battery management all weigh heavily in that calculation. Electric PWCs may well earn a place in rescue over time, but their success will depend as much on infrastructure and battery discipline as on speed, hull shape or handling.

Editor's note: Among the most relevant rescue-suitable PWC platforms to have appeared or significantly evolved since 2010 are the *Sea-Doo GTI* and *GTX* lines, the *Yamaha VX* family, and the *Kawasaki STX 160* series. These models are frequently considered because they offer three-person capacity, stable hulls, practical load-carrying ability, and the kind of predictable handling that agencies often look for in patrol and rescue applications.

A newer market development is the *Taiga Orca WX3*, a three-seat electric crossover PWC introduced for the 2026 line. It stands out for its extended hull, tow-sports capability, built-in mapping and geofencing features, and fast-charging electric platform. While it is not yet established as a mainstream rescue craft, there is also little clear evidence so far of widespread frontline rescue-agency adoption of electric PWCs. It is, however, a notable sign of how the wider PWC market is continuing to evolve.



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High Volume Bow and Rocker - With a raised bow height the X-Sled is able to handle tethers in swift water whilst reducing the risk of the bow diving when loaded. The increased volume maintains stability when occupied by a casualty or rescuer.

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RIDER CAPACITY



Weight capacity..... 650 lb / 295 kg



iTC / iBR / C

IN THE FOLLOWING TABLES:

- COST inc tax / VAT
- DRY WEIGHT
- LOAD CAPACITY PERSONS
- WEIGHT
- DIMENSIONS L x W
- HEIGHT
- DRAUGHT
- HULL MATERIALS+ SPONSONS/COLLAR
- ENGINE NOMINAL POWER
- ELECTRIC
- TOPSPEED
- FUEL
- TANK RANGE
- STANDARDS
- LIGHTS: FLOOD WARNING
- GPS / NAVIGATION
- CASUALTY HANDLES
- TOWING EYE
- ON-BOARD STORAGE
- WATER -TIGHT SECTIONS
- REFLECTIVE/ CUSTOM
- OTHER COLOURS



DUAL SPONSONS



RUNNING BOARDS



HEAVY-DUTY FRONT BUMPER



HULL PROTECTION COATING

images NOT to Scale ☐☐☐= Option ●= Partial Feature &/or OK but not ideal COST: Approx., INC. local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL	COMPANY	ORIGIN	COST	DRY	LOAD	DIMENSIONS	HULL
	Product Code			inc tax / VAT	WEIGHT	CAPACITY PERSONS WEIGHT	L x W HEIGHT DRAUGHT	MATERIALS
	RESCUE PWC 000	AQUACRAFT		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	BURASCA 000	BELASSI		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	STX-160 000	KAWASAKI		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	STX-160X 000	KAWASAKI		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	ULTRA LX/160 000	KAWASAKI		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	ELECTROJET GT95	NARKE		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	ELECORUNNER 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	FIRERUNNER 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	GRX 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000

+ SPONSORS/COLLAR	ENGINE	NOMINAL POWER ELECTRIC	TOP SPEED	FUEL TANK RANGE	STANDARDS	LIGHTS: FLOOD WARNING	GPS / NAVIGATION	CASUALTY HANDLES	TOWING EYE	ON-BOARD STORAGE	WATER -TIGHT SECTIONS	REFLECTIVE/ CUSTOM	OTHER COLOURS	NOTES	WWW.
	000	000cc 000kW		00L 0USGal	CE	☐	☐					☐	☐		0000.com
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	000	000cc 000kW		00L 0USGal	CE	☐	☐					☐	☐		safeatsea.se

images NOT to Scale ☐☐☐= Option ●= Partial Feature &/or OK but not ideal COST: Approx, <u>INC</u> local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL	COMPANY	ORIGIN	COST	DRY	LOAD	DIMENSIONS	HULL
	Product Code			inc tax / VAT	WEIGHT	CAPACITY PERSONS WEIGHT	L x W HEIGHT DRAUGHT	MATERIALS
	GUARDRUNNER 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RESCUERUNNER 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	SAFERUNNER 000	SAFE at SEA		£000 \$000 €00	325kg 00lb	000kg 005lb	3.5 x 1.6m 00 x 00' 1.2m 00' 0.3m 00'	000
	SEARANGER 000	SAFE at SEA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	GTI 130 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	GTI SE 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	GTR 230 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RXP-X 260 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RXT-X 300 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	SAR 000	SEADOO		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000

+ SPONSONS/COLLAR	ENGINE	NOMINAL POWER ELECTRIC	TOP SPEED	FUEL TANK RANGE	STANDARDS	LIGHTS: FLOOD WARNING	GPS / NAVIGATION	CASUALTY HANDLES	TOWING EYE	ON-BOARD STORAGE	WATER -TIGHT SECTIONS	REFLECTIVE/ CUSTOM	OTHER COLOURS	NOTES	WWW.
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	Yamaha Marine 3 cylinder, 4 stroke	1049cc 85kW	38kn 00mph 00kmh	70L 0 USGal 100Nm	CE	☐	☐	6				☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		oooo.com
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	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		oooo.com
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	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se

images NOT to Scale = Option ● = Partial Feature &/or OK but not ideal COST: Approx, INC local tax/VAT £ US\$ € = currency conversions only INFLATION: Hand Pump/ Electric Pump Compressed Air VALVES: PRV=Pressure Relief Valve	MODEL Product Code	COMPANY	ORIGIN	COST inc tax / VAT	DRY WEIGHT	LOAD CAPACITY PERSONS WEIGHT	DIMENSIONS L x W HEIGHT DRAUGHT	HULL MATERIALS
	SURF RESCUE 000	SLSA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	ORCA CARBON 000	TAIGA		£000 \$000 €00	325kg 00lb	000kg 005lb	3.5 x 1.6m 00 x 00' 1.2m 00' 0.3m 00'	000
	ORCA PERFORMANCE 000	TAIGA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	VX 000	YAMAHA		£000 \$000 €00	325kg 00lb	000kg 005lb	3.5 x 1.6m 00 x 00' 1.2m 00' 0.3m 00'	000
	VX HO 000	YAMAHA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	FX HO 000	YAMAHA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	FX CRUISER 000	YAMAHA		£000 \$000 €00	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RWC WR150 PRO 000	WATERRESCUE (GERMANY)		£000 \$000 €39,300	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RWC WR500 SAR 000	WATERRESCUE (GERMANY)		£000 \$000 €45,200	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000
	RWC WR190 SAR 000	WATERRESCUE (GERMANY)		£000 \$000 €50,000	00kg 00lb	000kg 005lb	00 x 00m 00 x 00' 00m 00' 00m 00'	000

+ SPONSONS/COLLAR	ENGINE	NOMINAL POWER ELECTRIC	TOP SPEED	FUEL TANK RANGE	STANDARDS	LIGHTS: FLOOD WARNING	GPS / NAVIGATION	CASUALTY HANDLES	TOWING EYE	ON-BOARD STORAGE	WATER - TIGHT SECTIONS	REFLECTIVE/ CUSTOM	OTHER COLOURS	NOTES	WWW.
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐	Custom built for Surf Life Saving Australia	oooo.com
	Yamaha Marine 3 cylinder, 4 stroke	1049cc 85kW	38kn 00mph 00kmh	70L 0 USGal 100Nm	CE	☐	☐	6				☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	Yamaha Marine 3 cylinder, 4 stroke	1049cc 85kW	38kn 00mph 00kmh	70L 0 USGal 100Nm	CE	☐	☐	6				☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐		safeatsea.se
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐	custom built Yamaha-base	oooo.com
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐	custom built Yamaha-base	oooo.com
	000	000cc 000kW		00L 0USGal	CE	☐						☐	☐	custom built Yamaha-base	oooo.com

UPDATED jul '26

4-13mm FLOATING

WATER RESCUE ROPES

This guide is for **FLOATING ROPES ONLY**. There are a good many canyoning & caving ropes in the separate Guide in our **ROPE RESCUE EQUIPMENT BUYERSGUIDE** that do not float but may be useful to water rescuers as they are designed to have low water absorption, be robust and of course are much stronger and can be used for descent/ascent. Floating ropes in smaller diameters are rarely stronger than 1000kg/2200lbs unless they contain HMPE/ *Spectra/Dyneema* etc because they don't need to be - the water is supporting the weight of the load. If we put aside canyoning ropes and utility uses such as raft grab lines and mooring rope, operational **WATER RESCUE ROPES** fall into two broad categories -

1) **THROWLINES**: ropes in diameters from 6 to 10mm (but can be as small as 4mm and as large as 11mm). These are carried in floating throwbags which are thrown to a person in need or indeed, from a rescuer in need. The idea being to create a means to either tow a person to safety or to create a fixed (light) ferry line that can be used to transport equipment, rescuer or strandee to and/or from a precarious in-water location such as a vehicle in-water or a mid stream rock. These will be floating, high visibility ropes, sometimes with reflective threads which shine brightly when a light is shone in its general direction. Throwlines are not necessarily short lengths in small bags, the title picture shows a bagged 200m length - this can be used for long ferry-lines or long pulley systems etc.

2) **RIGGING and TETHER LINES**. These are larger diameter ropes which are usually also floating but shore-based rigging require greater strength will often use regular (sinking) Nylon/polyester rescue ropes. Where the rigging is set up over and in-water dedicated water rescue ropes are used because they are designed NOT to absorb water and to float so that they won't be lost or snag during set-up and retain strength and handling in



the water. Some are strong enough to be used for abseiling/ rappelling and cross over into canyoning/ caving like *Beal's Water Pro* but we're generally talking more about a larger floating rope that can be used over and in water for hauling/highlines etc. and for stronger/larger tethers to water craft and rescue swimmers and for heavier-duty ferry lines.

CONSTRUCTION

Unlike regular rescue and access ropes, water rescue uses floating materials

and so replaces the usual polyester and nylon threads with polypropylene and HMPE which is High Modulus Polyethylene commonly seen as *Dyneema* and similar much higher strength fibres. Polypropylene is the very material we warn against in rope rescue because it has a very low melting point and doesn't stand up to high speed and heavily loaded descents. Many don't stand up to UV well either becoming brittle and weak after log exposure though some are UV-stabilised to improve this. It does, however, float and maintain strength when wet which both nylon and polyester fail to do as well. There are occasions when regular rescue ropes might be used in water rescue. This can be very high-load applications like stabilising an in-water vehicle, tethering a much larger water craft or when you need the rope or portions of the rope to sink in order to negotiate an obstacle such as fallen trees or surface contaminants like oil and possibly even burning oil! If you need it to float as well as take high loads there are very few options and *Beal's Pro Water* is a CE -type A rope. The other thing to note is that some ropes are purposely more 'knobbly' - ie. a bumpy rather than smooth outer surface - this is to improve grip when hauling especially since it's always going to be wet. Look for a lower weave/ strand/carrier count or an indication in the notes that this is an intended design feature.



BEAL'S PROWATER UNICORE

This is unique in our range of water rescue ropes in being the only floating rope that is also a fully certified two-person rescue rope. It has now been around for several years so has a proven track record but is still not as widely used as we would have expected. Our man of many talents and huge kit knowledge Paul Witheridge (of UK Mountain & Cave Rescue) was intimately familiar with the development of *Beal's Pro Water* and has this to say about it....

I think this is a massively underrated rope within the water rescue community possibly because not all water rescuers are involved in vertical rescue but there's no doubt that, within any water rescue scenario, full vertical loading could become a necessity. Not necessarily over huge distances, even a 6m/20ft dock wall would be beyond the capabilities of most regular water rescue ropes designed for horizontal loading. So many of the 'water' ropes are small diameter, low strength, low melting point and too often they get put into systems where the forces (and the attached rope devices operational working diameters and performance compatibility) are not fully considered.

PRO WATER is absolutely not a throwline. It is way too heavy and bulky for those single person snatch and grab tasks. Where it scores is everywhere else in water rescue.

Michel Beal worked hard on producing a EN 1891:1998 Type A kernmantle rope suitable for use in many of the typical progress capture devices found in rescue and rope access that could also float and help prevent user drag downs if entangled, prop wrap ups and underwater snags. It was not easy because the EN standard is pretty particular on what you can and cannot do materials and construction wise, and what strengths you need to achieve. Add in that it needs to handle well, be pretty robust, and deal with split second applied rescue load



forces through device cam squeezes and you begin to recognise the challenge.

Beal solved it with a clever 'inner core' of closed cell neoprene sufficient to give buoyancy, but small and flexible enough to squash to almost nothing when pinched by a device's cam. Glue the sheath to the core using the Beal UNICORE method and each element stays in place in regular use.

With this rope, a simple rescue that suddenly becomes complex and involves technical ropework for access and egress such as multi-point anchors, reeves, guided lines, or raft positioning can be accomplished with the same rope; and all those calculations you did when doing the same operations in urban or wilderness environments will hold true. No wondering how much you should de-rate your system when using skinny polyprop rope or if it will actually work in that bit of hardware.

WATER RESCUE ROPES

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High Volume Bow and Rocker - With a raised bow height the X-Sled is able to handle tethers in swift water whilst reducing the risk of the bow diving when loaded. The increased volume maintains stability when occupied by a casualty or rescuer.



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IN THE FOLLOWING TABLES.....

All of the ropes in this guide will float so the first column indicating with a black square, that the rope floats is somewhat superfluous. We have put it there to highlight the fact that most of these are intended only to be loaded by a floating person or craft.

ROPE DIAMETER: We really do need to talk about ditching inches as a measurement for rope diameters because they are so imprecise and complex that even US rescuers and companies usually refer to them in millimeters (mm) as a more precise measurement. Does anybody really get rope diameters in inches unless it's ½", ¼", ⅜ and maybe ⅝"? A 10mm rope for instance is ⅝" and 8mm is ⅜", why would you?

COST: Not all ropes are sold by the metre, many are intended to be replacement lengths for an associated throw bag so we've used a ratio of the shortest length sold and rounded up by 10%. This is the most expensive way to price rope so these may not be exact but they give you a rough idea. Prices are per metre with **per foot** also shown for US \$Dollars. All prices **EXCLUDE Splices/Sewn eyes** unless otherwise stated. We usually round the prices up but if it seems a little precise it will be a manufacturers stated retail cost. We also now show a straight currency conversion in **burnt-orange £\$€** - this is NOT an accurate cost because it precludes import duty and bulk shipping but it again gives you a rough idea for comparison.

WEIGHT - This is the WEIGHT or MASS per metre and per 100feet. We have made conversions based on a linear mass density conversion rounded to one decimal place (we occasionally sneak in two if it's .25 for a quarter).

MATERIALS Unlike life-safety/rescue ropes, polypropylene is the most common material in water rescue ropes simply because it is light, cheap and most importantly -because it floats. Most water rescue ropes are designed for lateral loading (pulling) through or across water NOT lifting or winching vertically out of the water. This is why Polypropylene can be used instead of (or in addition to) the usual nylon and polyester which would otherwise sink in water.

POLYPROPYLENE has a low melting point so cannot be used in camming hardware like descenders and ascenders where the contact pressure creates a lot of heat - it would simply melt and/or separate into two lengths of rope. Counter-intuitively for rope used almost exclusively outdoors including in salt water, Polypropylene doesn't resist UV well either, the fibres quickly become brittle and slough off if exposed to too much sunlight. Luckily, they spend most of their working lives housed inside a bag like the *Force 6* throwbag on the right.

Where throwlines 'progress' to vertical life safety ropes they incorporate one or more of the familiar, stronger and more resilient rope rescue fibres:

NYLON is referred to in Europe as *polyamide* because Nylon is Dupont's trade name and differentiated by some as such or as Nylon 66 or *Perlon*. Nylon has good strength to weight



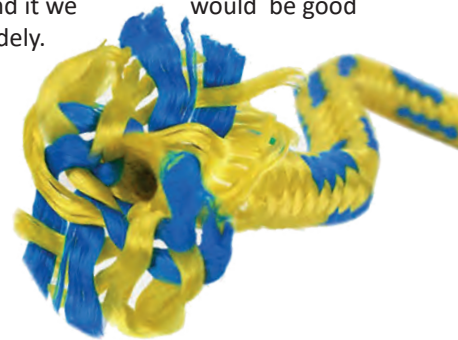
ratio and shock absorption, doesn't melt at too low a temperature (around 460° F or 238° C), can operate in wet and ice (albeit at reduced capacity) and is pretty robust when it comes to being dragged over rough edges. Nylon absorbs more water than Polyester but is stronger when wet and provides more elasticity so it's often used for the core material.

POLYESTER can withstand abuse from Nylon's nemesis acid which doesn't tend to be a consideration for wilderness rescuers or arborists but it's also a bit tougher than nylon, has a slightly higher melting point (around 480° F or 249° C) and retains more strength when wet.

There are some other specialist materials used in rope manufacture - principal amongst these is Aramid, Kevlar, *Technora* and *Dyneema*. These are much stronger and more abrasion resistant fibres than polypropylene and make the difference between a floating throwline for dragging a person or craft to safety and a rope that can be used with specialist hardware including cams and even fully fledged high angle abseiling/ascending/hauling. As we've mentioned in our other rope Guides you can't tell a polyester from a nylon from a polypropylene just by looking so some manufacturers like *PMI* use special marking to denote material - in *PMI's* case 'barber-pole' sheath runners denote nylon and a cross-pattern denotes polyester content, this is a simple idea that would transfer well to marking polypropylene and it would be good to see this adopted more widely.

MBL is Minimum Breaking

Load (or MBS -Minimum Breaking Strength if given in kiloNewtons (kN), The units of force are kN and lbf but they pretty much equate to the more recognisable kg and lb. These Minimum Breaking Load figures are based on a dry, brand new rope in a straight line with no bends in it. Breaking strength in a figure 8 knot can be up to 50% less depending on how well the knot is tied and a spliced rope will reduce by at least 10% .



ELONGATION/STRETCH

This is far more relevant to load-supporting life safety ropes than it is for water throwlines but we have included it because some are capable of being used for higher loads where the proportion of stretch versus load is useful. The first figure is the industry standard degree of stretch at **10% of the minimum breaking load**. This is some harsh treatment and would rarely concern a climbing rope unless you're huge, it's more for rigging ropes being subjected to high loads and, even worse, dynamic loads. **20% of the minimum breaking load** is listed as 30% in our other rope guides but we've shown specifically 20% here simply because it is the figure given by *Liros* and *HF Ropes* - we otherwise don't usually see this as a quoted metric.

The third figure is used mostly in Europe is for **Static Elongation at 50 to 150kg** loading over a set time period. The fourth figure



1/2" BW-HR3

Strong & durable hybrid
Polyester/Polypropylene design
5,000 lbf. @ 89 g/m



9.5mm NFPA Sure-Grip

Braided HMPE fiber core with
an innovative tactile sheath
4,923 lbf. @ 40 g/m



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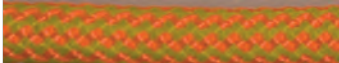
www.bluewaterropes.com

is the **US norm for stretch at 136kg/300lbs** and this is much more indicative of a climber's body mass. Finally we included the highest elongation figure, the industry/rescue driven **@1000lbs/454kg** as the highest of three figures (with the middle figure being @600lb). Make sure you check the heading and subtle colouring!

SHEATH CONSTRUCTION: This is expressed as the number of carriers/threads used to construct the outer 'jacket' or braid. Unlike arborist ropes that are universally described by the number of braids, kernmantle ropes are described by the carrier or thread count. The lower the number, the more flexible the rope will be. Kernmantle (**KM**) is technically any rope with a sheath over a separate core but is more usually a single 32 carrier (16 braid) or 48 carrier (24-braid) sheath over parallel core fibres with less stretch than traditional arb ropes. Double braid (**DB**) means the core package (comprised of multiple bundles of fibres) has its own woven sheath. The core bundles can be separate from each and parallel or twisted together in a plait or braid. Many water throwlines are Hollow

Braid (**HB**) which means that it is comprised of just a braided sheath with no separate core. The rope is not 'hollow' in terms of there being a gap through the middle during use but when it is not under load you can 'concertina' the rope together and see the outer strands separate and perhaps see daylight out the other side because there are no internal strands or core. Some ropes are a multiplait (**MP**) or **simple braided** plait (not quite a kernmantle) where a low thread-count sheath overlays or is braided to the core as one structure- not hollow but not double braid or kernmantle. We don't see multiplait in life safety ropes outside of water rescue.

SUITABLE FOR:: ALL of the ropes in this GUIDE can be used as a **THROWLINE** in some capacity albeit that lighter lines can be thrown further and with greater ease and longer lengths are more easily carried than a nylon kernmantle 11mm for instance. Some ropes are able to be used in pulleys and non-camming hardware even if they have relatively low strength and are all polypropylene construction. Only a few can be used for vertical (out of water) life support that would include camming devices

IMAGES NOT TO SCALE ~ = approximate COST: INCLUDES local taxes/VAT. £\$€=Currency Conversion only-no duty etc. If not sold by m/ft, price is shortest length x10% & rounded up. ●=Limited/OK but not ideal PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene KM=Kernmantle DB= Double Braid MP=Multiplait/Simple Braid HB = Hollow Braid	Ø mm Inches"	FLOATS	MODEL VARIANT Product Code	COMPANY	ORIGIN	COST per Metre /3.28ft per Foot	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
	11mm >3/8"	■	PRO WATER UNICORE 5034XX	BEAL		£4.02 \$5.40 \$1.70 €4.62	80g 5.4lb	Nylon Neoprene/Nylon
	6.5mm 1/4"	■	SUREGRIP 5046XX	BLUEWATER		£2.50 \$3.35 \$1.05 €3.15	23.7g 1.6lb	Polypropylene Polypropylene
	9.5mm <3/8"	■	SUREGRIP 502400	BLUEWATER		£4.30 \$5.75 \$1.77 €4.85	40.3g 2.7lb	Polypropylene HMPE(Dyneema)
	9mm >3/8"	■	SUREGRIP 5034XX	BLUEWATER		£2.20 \$2.95 \$0.92 €2.50	49.3g 3.3lb	Polypropylene Polypropylene
	11.5mm 7/16"	■	SUREGRIP 50246XX	BLUEWATER		£2.90 \$3.90 \$1.20 €3.30	56.7g 3.8lb	Polypropylene Polypropylene
	8mm 5/16"	■	R3 RIVER RESCUE 5068XX	BLUEWATER		£2.20 \$2.95 \$1.10 €2.50	34.4g 2.3lb	Polypropylene Polypropylene
	9mm 3/8"	■	R3 RIVER RESCUE 5068XX	BLUEWATER		£2.65 \$3.60 \$1.15 €3.05	64g 4.3lb	Polypropylene Polypropylene
	13mm 1/2"	■	R3 RIVER RESCUE 5068XX	BLUEWATER		£3.00 \$4.05 \$1.40 €3.45	82.4g 5.5lb	Polypropylene Polypropylene
	11mm 7/16"	■	HR3 HYBRID 5014XX	BLUEWATER		£2.85 \$3.75 \$1.15 €3.45	61g 4.1lb	Polyprop/PES Polypropylene
	12.7mm 1/2"	■	HR3 HYBRID 5019ADMINXX	BLUEWATER		£3.20 \$4.25 \$1.30 €3.90	88.9g 6lb	Polyprop/PES Polypropylene

LOW STRETCH ACCESS&RESCUE ROPES

- ascenders, descenders and belay devices. *Beal ProWater* and the Taiwanese '*Ropers*' water rescue have an MBS of 25kN so can function in all standard rope rescue applications as well as in water.

STANDARDS: Unusually for rope, or indeed any equipment used by rescuers, floating throw-ropes do not come under any specific European CE standards or compliance other than the very general 'General Product Safety Regulation' (GPSR 2023/988), which came into force in December 2024 and simply indicates that a product is fit for purpose. This is obviously not the case with all water rescue ropes since some can be used for vertical loading and/or are intended for other life-safety purposes and therefore meet the standards requirements for those disciplines but not specifically for water rescue applications. However, NFPA in the US, has stepped up and specifically covers requirements for throwlines including visibility, degree of/duration a line can float, strength of rope in terms of construction and if spliced/sewn. For instance,

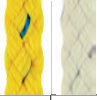
NFPA2500 requires that after a 24-hour immersion in water, the entire length of the throwline must float to the surface within one minute.

SHEATH %. This is the opposite to CORE percentage so we haven't bothered listing both - do the math(s). The higher the sheath percentage the stiffer the rope. It will therefore usually have a much higher initial resistance to abrasion over an edge or sheath creep under high loads from a camming device. Many throwropes are hollowbraid with no core so a 100% sheath!

SPECIFIC GRAVITY %. In terms of the rope's ability to float. Water's Specific Gravity is 1 (or 100%) so ropes less than that like Polypropylene at around 0.91 will float while Nylon at 1.14 and Polyester at 1.3 will sink unless countered by the buoyancy of enough neoprene or polypropylene like *Ropers Dolphin Max* at 1.34.

	CONSTRUCTION CARRIER/BRAID	STANDARDS	SPLICABLE PRE-SPICED PRE-SEWN	REFLECTIVE	THROWLINE	TECH HARDWARE USE	ABSEILING/ CAMS	MBL MINIMUM Break Load Spliced Sewn Knotted	@10% MBS @30% MBS @50-150 kg @300lb/136K @1000 lb/454kg	SPECIFIC GRAVITY SHEATH %	OTHER COLOURS	NOTES	WWW.
n	KM*	CE A	■	-	●	■	■	25.5kN 57lbf	3.6%	33% -		*Unicore= sheath and core are bonded to stop sheath slippage	beal-planet.com
	MP	-	■	-	■	●	-	4.4kN 1000lbf	00%	77.3% -		variable diameter sheath strands to enhance grip	bluewaterropes.com
a)	DB	NFPA	■	-	■	●	●	21.9kN 4918lbf	00%	62.6% -		variable diameter sheath strands to enhance grip	bluewaterropes.com
	MP	-	■	-	■	●	-	9.7kN 2200lbf	00%	57.8% -		variable diameter sheath strands to enhance grip	bluewaterropes.com
	MP	-	■	-	■	●	-	15.5kN 3500lbf	3.8% 1.3%	49% -			bluewaterropes.com
	MP	-	■	-	■	■	-	8.9kN 2000lbf	2.9% 9.6%	58% -		More substantial multi-role rope than <i>Suregrip</i>	bluewaterropes.com
	MP	-	■	-	■	■	-	15kN 3000lbf	3.1% 7.7%	58% -		More substantial multi-role rope than <i>Suregrip</i>	bluewaterropes.com
	MP	-	■	-	■	■	-	17.8kN 4000lbf	1.3% 9.1%	50% -		More substantial multi-role rope than <i>Suregrip</i>	bluewaterropes.com
	DB 16	-	■	-	■	■	●	15.5kN 5000lbf	1.3% 3.8%	50% -		'Hybrid' refers to the combination of Polyester and Polypropylene fibres in the sheath	bluewaterropes.com
	DB 16	-	■	-	■	■	●	22.2kN 5000lbf	1% 3.2%	50% -		'Hybrid' refers to the combination of Polyester and Polypropylene fibres in the sheath	bluewaterropes.com

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	mm Inches"		VARIANT Product Code			per Metre /3.28ft per Foot	g/m lb/100'	SHEATH CORE
	7.5mm ¼"	■	NFPA 293387	CMC		£3.90 \$5.20 \$1.59 €4.80	30g 2lb	Polypropylene Dyneema
	9.5mm ⅜"	■	SRT 292957	CMC		£3.50 \$4.65 \$1.43 €4.30	58.1g 3.9lb	Nylon Polypropylene
	11mm ⅞"	■	REDI-LINE 292763	CMC		£2.10 \$2.75 \$0.85 €2.55	34.3g 2.3lb	Polypropylene -
	11mm ⅞"	■	RIVER RESCUE 293220	CMC		£3.65 \$4.85 \$1.49 €4.20	74.6g 5lb	Nylon Polyolefin
COMING SOON		■	WATER RESCUE 000	CMC/WRS				
	4mm ⅛"	■	BEACH LINE PPAQBLB4	COURANT		n/a	~18g ~1.2lb	Polypropylene -
	8mm ⅝"	■	JET LINE PPJL80B0	COURANT		£2.10 \$2.80 \$0.85 €2.00	31g 2.1lb	Polypropylene Polypropylene
	10mm 25/64"	■	JET LINE PPJLA0C0	COURANT		£2.30 \$3.00 \$0.95 €2.20	45g 3lb	Polypropylene Polypropylene
	5mm 13/64"	■	PPM5 05819XXX	HF SAFETY		£0.70 \$0.65 \$0.25 €0.60	12g 0.8lb	Polypropylene -
	8.5mm 21/64"	■	PPM8 05820XXX	HF SAFETY		£1.20 \$1.20 \$0.40 €1.10	30g 2lb	Polypropylene -
	7.5mm 19/64"	■	KM7.5 05822XXX	HF SAFETY		£1.10 \$1.10 \$0.35 €1.00	21g 1.4lb	Polypropylene Polypropylene
	10mm 25/64"	■	KM10 05821XXX	HF SAFETY		£1.75 \$1.70 \$0.55 €1.60	45g 3lb	Polypropylene Polypropylene
	8mm 5/16"	■	SYNTEC 5823XXX	HF SAFETY		£4.60 \$4.95 \$1.50 €4.50	31g 2lb	Polypropylene Dyneema
	6mm ¼"	■	REFLECTA 02100-0600	LIROS		£1.20 \$1.60 \$0.50 €1.40	20g 1.4lb	Polypropylene -
	8mm 5/16"	■	REFLECTA 02100-0800	LIROS		£1.90 \$2.55 \$0.80 €2.20	30g 2lb	Polypropylene -
	8mm 5/16"	■	THROWLINE8 165230.91	LOMO		£0.60 \$0.80 \$0.25 €0.70	23g 1.55lb	Polypropylene -
	10mm 25/64"	■	THROWLINE10 165330.91	LOMO		£1.10 \$1.50 \$0.45 €1.30	33g 2.2lb	Polypropylene -

CONSTRUCTION CARRIER/BRAID	STANDARDS	SPICEABLE PRE-SPICED PRE-SEWN	REFLECTIVE	THROWLINE	TECH HARDWARE USE	ABSEILING/CAMS	MBL MINIMUM Break Load Spliced Sewn Knotted	@10% MBS @30% MBS @50-150 kg @300LB/136K @1000 lb/454kg	SPECIFIC GRAVITY SHEATH %	OTHER COLOURS	NOTES	WWW.
KM	NFPA	-	-	■	●	-	15kN* 3372lbf	-	~32% -		*3 sigma. Max length 731m/2400ft	cmcpro.com
KM	-	-	-	■	■	■	13kN* 2922lbf	-	00% -		*3 sigma. Max length 366m/1200ft	cmcpro.com
HB	-	■	-	■	-	-	10kN* 2248lbf	-	- -		*3 sigma. Max length 549m/1800ft	cmcpro.com
KM	-	■	-	■	■	■	16.45kN* 3700lbf	-	00% -		*3 sigma. Max length 746m/2448ft Originally a New England Rope continued by Teuf for CMC	cmcpro.com
											In collaboration with Water Rescue Systems International	cmcpro.com
HB 12	-	■	-	■	-	-	2kN 450lbf	-	- -		Available in 300m lengths for beach/coastal recovery operations	mycourant.com
KM 32	-	■	■	■	●	-	9kN 2023lbf	-	- -			mycourant.com
KM 32	-	■	■	■	■	-	12kN 2698lbf	-	- -			mycourant.com
MP 8	-	■	-	■	-	-	3.92kN 877450lbf	<10%	- 0.91		made by Liros	paddle-people.com
MP 8	-	■	-	■	-	-	115.5kN 24731237lbf	<10%	- 0.91		made by Liros	paddle-people.com
KM 16	-	-	-	■	-	-	8.44.9kN 18881102lbf	<8%	- 0.91		made by Liros	paddle-people.com
KM 16	-	-	-	■	●	-	137.6kN 29231709lbf	<8%	- 0.91		made by Liros Marketed by some canoe shops with all-red marker threads (4 bands)	paddle-people.com
KM 16	-	-	-	■	■	-	2410.7kN 53952406lbf	<1.5%	- <0.96		made by Liros	paddle-people.com
MP 8	-	-	□	■	-	-	5.5kN 1237lbf	<12%	- -			liros.com
MP 8	-	-	□	■	-	-	9kN 2023lbf	<12%	- -			liros.com
HB 16	-	■	-	■	-	-	8.5kN 1912lbf	-	- 0.91			lomo.co.uk
HB 16	-	■	-	■	-	-	9.9kN 2226lbf	-	- 0.91			lomo.co.uk

IMAGES NOT TO SCALE ~ = approximate COST: INCLUDES local taxes/VAT. £\$€=Currency Conversion only-no duty etc. If not sold by m/ft, price is shortest length x10% & rounded up. ●=Limited/OK but not ideal PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene KM=Kernmantle DB= Double Braid MP=Multiplait/Simple Braid HB = Hollow Braid		Ø mm Inches"	FLOATS	MODEL VARIANT Product Code	COMPANY	ORIGIN	COST per Metre /3.28ft per Foot	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
		6mm ¼"	■	MARSTRON JF00XX	MARLOW ROPES		£1.15 \$1.60 \$0.55 €1.35	17.6g 1.2lb	Polypropylene -
		8mm ⅝"	■	MARSTRON JF01XX	MARLOW ROPES		£1.90 \$2.55 \$0.85 €2.20	27g 1.8lb	Polypropylene -
		10mm ⅞"	■	MARSTRON JF018XX JF019XX	MARLOW ROPES		£2.75 \$3.75 \$1.20 €3.20	50g 3.4lb	Polypropylene -
		6mm ¼"	■	HERCULES -	NAMAH ROPES		£1.20 \$1.55 \$0.50 €1.40	23.5g 1.58lb	UHMWPE UHMWPE
		8mm ⅝"	■	HERCULES -	NAMAH ROPES		£1.55 \$2.00 \$0.65 €1.80	40g 2.7lb	UHMWPE UHMWPE
		10mm ⅞"	■	HERCULES -	NAMAH ROPES		£2.50 \$3.20 \$1.00 €2.90	58g 3.9lb	UHMWPE UHMWPE

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CONSTRUCTION CARRIER/BRAID	STANDARDS	SPICEABLE PRE-SPICED PRE-SEWN	REFLECTIVE	THROWLINE	TECH HARDWARE USE	ABSEILING/CAMS	MBL MINIMUM Break Load Spliced Sewn Knotted	@10% MBS @30% MBS @50-150 kg @300lb/136k @1000 lb/454kg	SPECIFIC GRAVITY SHEATH %	OTHER COLOURS	NOTES	WWW.
MP 8	-	■	-	■	●	-	3.9kN 877lbf	-	-		Also available as enhanced <i>Marstron Plus</i> and <i>Excel Marstron Plus</i> ropes	marlowropes.com
MP 8	-	■	-	■	●	-	6kN 1349lbf	-	-		Also available as enhanced <i>Marstron Plus</i> and <i>Excel Marstron Plus</i> ropes	marlowropes.com
MP 8	-	■	-	■	●	-	11.1kN 2495lbf	-	-		Also available as enhanced <i>Marstron Plus</i> and <i>Excel Marstron Plus</i> ropes	marlowropes.com
KM 16	-	-	-	■	●	-	24kN 5395lbf	-	44%			namahropes.com
KM 16	-	-	-	■	■	-	42kN 9442lbf	-	44%			namahropes.com
KM 16	-	-	-	■	■	-	65kN 14613lbf	-	44%			namahropes.com

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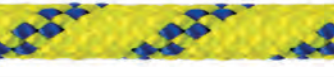
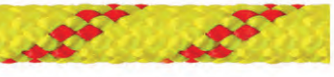
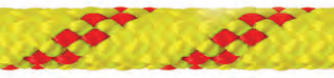
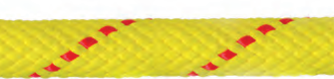
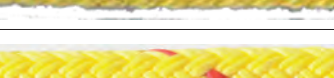
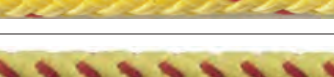
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		8mm 5/16"	■	THROWLINE AC106	NOOKIE		£2.20 \$2.95 \$0.90 €2.55w	26g 1.75lb	Polypropylene Polypropylene
		10mm 25/64"	■	THROWLINE AC100	NOOKIE		£2.50 \$3.35 \$1.00 €2.90	40g 2.69lb	Polypropylene Polypropylene
		6mm 1/4"	■	H2O SWIFTWATER 3Q-08X	PELICAN		~£1.50 ~\$2.00 ~\$0.60 ~€1.85	25.3g 1.7lb	Polypropylene Polyprop/Dyneer
		8mm 5/16"	■	H2O SWIFTWATER 3Q-10X	PELICAN		~£1.95 ~\$2.60 ~\$0.80 ~€2.25	34.2g 2.3lb	Polypropylene Polyprop/Dyneer
		9mm 3/8"	■	H2O SWIFTWATER 3Q-12X	PELICAN		~£2.10 ~\$2.80 ~\$0.85 ~€2.45	50.6g 3.4lb	Polypropylene Polyprop/Dyneer
		9mm 3/8"	■	NFPA H2O RESCUE 3PN-12X	PELICAN		~£2.55 ~\$3.35 ~\$1.00 ~€2.90	46.1g 3.1lb	Polypropylene Polypropylene/Nylon
		8mm 5/16"	■	WATER RESCUE 3PX-10X	PELICAN		~£1.60 ~\$2.10 ~\$0.65 ~€2.45	27.5g 1.85lb	Polypropylene Polypropylene
		9mm 3/8"	■	WATER RESCUE 3P-12X	PELICAN		~£1.80 ~\$2.40 ~\$0.80 ~€2.80	27.5g 3.4lb	Polypropylene Polypropylene
		11mm 7/16"	■	WATER RESCUE 3P-14X	PELICAN		~£2.20 ~\$2.90 ~\$0.95 ~€3.35	69.9g 4.7lb	Polypropylene Polypropylene
		7mm 9/32"	■	MFP THROWLINE -	TEUFELBERGER		£1.05 \$1.44 \$0.44 €1.30	27.1g 1.8lb	Polypropylene -
		8mm 5/16"	■	MFP THROWLINE -	TEUFELBERGER		£1.50 \$2.00 \$0.62 €1.80	28.2g 1.9lb	Polypropylene -
		7.5mm 19/64"	■	NFPA THROWLINE -	TEUFELBERGER /MAXIM		£3.75 \$5.00 \$1.54 €4.60	29.8g 2lb	Polypropylene HMPE (Dyneema)
		9mm 3/8"	■	POLYGRIP -	TEUFELBERGER		£2.55 \$3.40 \$1.05 €4.60	43.1g 2.9lb	Polypropylene Nylon
		11mm 7/16"	■	WATER RESCUE -	TEUFELBERGER		£0 \$4.30 \$1.32 €3.20	78.9g 5.3lb	Nylon Polypropylene
		10mm 25/64"	■	RESCUE THROWLINE -	WRS INTERNATIONAL		£1.45 \$1.95 \$0.60 €1.70	55g 3.7lb	Polypropylene Polypropylene
		8mm 1/4"	■	DOLPHIN MAX -	X-MONSTER		n/a	34.5g 2.3lb	Polypropylene UHMWPE
		9.5mm 1/4"	■	DOLPHIN MAX -	X-MONSTER		n/a	45.6g 3.1lb	Polypropylene UHMWPE

	CONSTRUCTION CARRIER/BRAID	STANDARDS	SPLICABLE PRE-SPICED PRE-SEWN	REFLECTIVE	THROWLINE	TECH HARDWARE USE	ABSEILING/CAMS	MBL MINIMUM Break Load Spliced Sewn Knotted	@10% MBS @30% MBS @50-150 kg @300LB/136K @1000 lb/454kg	SPECIFIC GRAVITY SHEATH %	OTHER COLOURS	NOTES	WWW.
	MP 12	-	■	-	■	-	-	9kN 2023lbf	4.5%	- -			nookie.co.uk
	MP 12	-	■	-	■	-	-	13kN 2915lbf	4.5%	- -			nookie.co.uk
ma	MP 16	NFPA	■	□	■	●	-	14.2kN 3200lbf	-	- -			pelicanrope.com
ma	MP 16	NFPA	■	□	■	■	-	15.1kN 3400lbf	-	- -			pelicanrope.com
ma	MP 16	NFPA	■	□	■	■	●	22kN 4950lbf	-	- -			pelicanrope.com
lon	KM 24	NFPA	■	□	■	■	●	16kN 3600lbf	-	- -			pelicanrope.com
	MP 16	NFPA	■	□	■	●	-	6.67kN 1500lbf	-	- -			pelicanrope.com
	MP 16	NFPA	■	□	■	●	-	13.3kN 3000lbf	-	- -			pelicanrope.com
	KM 24	NFPA	■	□	■	■	-	14.7kN 3300lbf	-	- -			pelicanrope.com
	HB 12	-	■	-	■	-	-	6kN 1350lbf	-	- -		MFP=Multi-Filament Polypropylene.	teufelberger.com
	HB 12	-	■	-	■	-	-	7.5kN 1700lbf	-	- -			teufelberger.com
a)	DB 16	NFPA	■	-	■	●	-	13kN 2922lbf	-	- -		NB: originally listed as 19kN but that was a 'nominal/average' figure from Teufelberger not MBS	teufelberger.com
	KM 16	NFPA		-	■	●	-	15kN 3372lbf	-	- -			teufelberger.com
	DB 20	CE A NFPA UIAA	■	-	■	■	-	16.46kN 3700lbf	-	- -			teufelberger.com
	KM 32	-	-	-	■	■	-	12kN 2698lbf	-	- -		Plus New Rope due soon in col- laboration with CMC Rescue.	wrsinternational.com
	KM	NFPA 2500	■	■	■	■	-	23.1kN 5192lbf	-	1.38 00%		Enhanced grip & higher strength core	xmonstersafety.com ropersrope.com
	KM	NFPA 2500	■	■	■	■	■	26.5kN 5957lbf	-	1.38 00%		Enhanced grip & higher strength core	xmonstersafety.com ropersrope.com

THROW BAGS

Most throwbags are designed to be floating throw-weights that deploy a floating rope as they fly and when they reach their intended target in the water, can be easily grabbed and subsequently towed back to shore/safety by the rescuer. It's a fine line between a professional water rescue throwbag and a sports throwbag designed to be lifesaving tools for canoeists/kayakers in particular. For our purposes, to whittle down the myriad of choices, we've gone for companies that manufacture products for professional rescue services so you know they have a decent pedigree. We have therefore excluded a number of sports models and sports companies (with the exception of *Hiko*) that produce bags that might easily cross over into professional rescue like *Astral*, *HF*, *Kokotat*, *PeakUK*, *NoName* and *Water Element* but these are in our continuously updating version of this article in the **WATER RESCUE BUYERSGUIDE**. While any throwbag can also be used to deploy a small diameter carrier line we have not included carrier-line-specific bags/kits.

Rope Diameters are mostly from 6 to 10mm in lengths from 15m/50feet to around 25m/80feet for general use but some will be considerably longer to allow for long downstream pendulums or ferry lines etc. and one, *RnR's Urban Micro* has 9m/30ft for close-quarter throws in congested areas. Some, which we'll mention later are designed like giant throwbags to carry throwlines up to 100m (often as a backpack) but these are for long ferry and downstream control etc. rather than throwing the actual bag. The thicker the rope, the easier it is to grip (the USCG bag uses 11mm/ $\frac{7}{16}$ ") but it will also be heavier and cannot be thrown so far as a small diameter rope but don't forget that skilled operators may be 'placing' the bag in flow that will then run down to the desired target area. Whatever you choose, it is imperative that any new bag & rope combination are practiced with first on dry land to ascertain their performance in flight and how freely the chosen rope deploys from the bag and then in water to discern how they both function and feel when saturated. Such rope will float for a considerable time but some will lose a degree of flotation the longer they are in the water and you may find some creeping towards neutral buoyancy. The combination of bag and rope is therefore quite important and most companies only offer their bags ready filled with a rope that they have decided provides best fill, flight and recovery characteristics. However, virtually all will sell you just the bag if want it. We have a separate guide to Water Rescue ropes, primarily throwlines, in our **WATER RESCUE BUYERSGUIDE**.



THROW-TECHNIQUE

Unless you're bypassing a physical throw by using a line-launcher or a drone to carry the rope/flotation-aid out to the casualty (both very valid options), you'll be flinging these things out with grace and accuracy. This will either be underarm or overarm whilst keeping firm hold of the shore-end of the rope. An underarm action grasping the cuff/collar like the *Yak* bag in the top picture or holding a handle like the *Force 6* on the right and the USCG

WATER RESCUE THROWBAGS

issued 237-P throwbag then uses a vertical pendulum sling-action which can also be a more horizontal side-arm throw. Those with a sporting background can get greater distance and/or accuracy with an overarm cricket or baseball throwing action but to the uninitiated these can be too aggressive - you don't want to hit the casualty in the face with a 30mph missile and knock them unconscious. Some may use the more unconventional windmill or cricket bowling action if that gives them greater accuracy but the aim is to throw the bag *beyond* the casualty NOT fall short which can be the case with an underarm or 'windmill' throw with too much height. Plenty of practice in open areas to achieve maximum throw distance and in more congested areas with trees and bushes to test your accuracy will hone your throwing skills and get you used to the dangers of strong winds and gusts and wind direction before hitting the river. In the *IONIC* picture below and the *Yak* and *WRS Int* pictures opposite you can see the cinched collar type of bag with an obvious drawcord/ toggle-cord or popped webbing formed waist - you grasp the bag above that waist when throwing. *NRS* below and the *Force6* bag opposite have a handle formed by connecting a *Fastex* buckle across from one side to the other. Another variation is *SRE (Northern Diver's) Pro* bag (right) which has a circular handle cut into the top



cuff which otherwise holds itself open for repacking the rope. The *Force6* bags also have two finger-loops that help you hold open the bag while re-stuffing. Repacking water rescue rope can be an urgent requirement if you've missed with your first throw and there are no backup throwers or bags. In the picture bottom left, running the rope over your shoulder means it will drop vertically into the back while you juggle holding the bag open with pulling/pushing rope into the bag. However, with non-mesh bags it may be possible to simply scoop up half a bag of water and use that to provide weight for a re-throw that doesn't involve repacking the rope.

THROWLINES

Throwlines may be braided in the larger diameters with a sheath and a core or hollowbraid in which the braided 'tube' of rope represents the whole diameters with no distinct core. Materials are either floating polypropylene which is otherwise a relatively weak fibre married to Dyneema or spectra in the more expensive ropes to add strength and restrict stretch but not too much because a degree of dynamic energy is vital in moving water operations. Some do use the more usual combinations of nylon or polyester for the sheath or core but these materials will sink unless there is also some form of polypropylene, polyolefin (neoprene) or polyethylene in the construction to provide floatation. Not all bags float when first purchased - some require a foam disc or similar adjunct to be added to the bag. Unlike water rescue ropes that are designed to be used with hardware like ascenders, pulleys and belay devices and will support a suspended bodyweight, throwlines are only dealing with the weight of a person or craft supported in water. Consequently the breaking load tend to range from 10 to 15kN rather than the 22 to 30kN of a typical abseil/ rappel rope. But some can do both and we show ropes capable of being used with camming hardware with a black diamond. **Don't forget that rope deteriorates from the moment you start using it so knots reduce the strength and wear & tear may half your viable loading within a couple of years.**

WAISTBELTS

QRS or Quick Release Belts are a common accessory if you are not attaching the bag directly to your pfd. Some throwbags have an integrated quick release belt or a detachable bag that comes with the bag like the *SRE/NDiver* and *Yak* bags (above) shown as a solid green square ■ in our tables but most have an optional belt in their range shown as a green outline square □. *WRS*, *NRS*, *WWTC* etc. have more expansive waist belts that provide a quick release housing for a separate throwbag - they're designed to fit their own bags obviously but this is a very fast and convenient way to swap out different rope lengths or rope strengths



BAG FEATURES

Aside from differing rope diameter and length, throwbags tend to be HD Nylon/Cordura or the smoother, lighter denier ripstop nylon or Packcloth and incorporate some of the following:

1) **HIGH VISIBILITY**, many with reflective bands some are even luminous so that they can more easily be seen in flight and in the water in full sun and low (or no) light. SOLAS is the current gold-standard with marine-grade, high reflectivity even when wet.

2) A **HANDLE/LOOP**, **GRAB-STRAP** or a **CINCHED COLLAR**

on the top for rescuers to carry and throw the bag. **We have not counted the rope tied through the base as a**

'handle' even though the bag can be carried and thrown via this loop as long as the rope is tied off (as it should be). Separate rescuers 'handle' may be a closed loop, webbing joined by a buckle so that it can also be used to stow the bag by clipping to your PFD or watercraft or it may be a circular cut-out in the top cuff like the aforementioned *SRE Pro* bag. The updated version of the 237-P bag (above) opted to remove the rope loop because of UV damage when stored outside on CoastGuard vessels and instead made the loop a larger, reinforced stitched webbing loop.

3) A **ROPE EYE with sewn reinforcement or a plastic/metal grommet** in the base through which the end of the rope is threaded and tied off with a handhold loop. Some grommets/eyes are mounted on the side so that the bag can stand on its base and some may have double eyes to create a rope loop without a bulky stopper knot on the outside as with the *Ionic* model on the right.

4) **TOP CLOSURE** to keep the rope in the bag.

Mostly a drawcord with toggle which you slacken off to allow easy release and repacking of the rope into the bag but some may be *Velcro* and even a zip though not in our selection. Some will have the additional webbing 'handle' with *Fastex*-buckle-style closure which can clip through the throw-rope loop to stop it reeling out accidentally.

5) **CLEAR LENGTH MARKING**. This can be colour-coding of bags within teams but it is best to have clear visual numbers to indicate the rope length unless all of your bags are the same!

6) **FAST DRAINING**. While extra water weight can assist with throw distance, it is, for the most part, more desirable to have rope drain out of the bag rapidly so that can dry quickly post-operational use. Some bags have a full mesh outer, most have large eyes but these can be mostly occluded by the rope itself being passed through to provide a grab-loop. The slightly more open weave on some, even if it's not immediately apparent, will also be more conducive to water draining out of the bag although this can be 'mitigated' by the use of a shiny inner surface coating or material that aids the fast exit of the rope from the bag.

OTHER FEATURES:

LASH TABS are square plastic panels with slots for webbing and these allow you to customise attachment options either to the bag or of the bag to a belt/larger bag/PFD etc. The *SRE* bag (pic-top) has a water-activated LED attached to its lash tab. Some bags may have a lightweight **CLIP** for attaching to a PFD, boat gunwale etc.

LIGHTING ATTACHMENT. Any form of lighting can be attached to most bags by some means but there are a few specific measures of which chemical light sticks are the commonest. Many bags have elastic loops, as on the *Ionic* model right and the



Force6 title shot. *North Water's Pro* wedge bags show a lightstick inside the bag but visible through the mesh - so it's certain not to fall off. One range - the *MARSARS Second Chance*

bag has a version with

a waterproof LED embedded in the base which seems like a good idea but hasn't really been adopted elsewhere although *SRE* has the optional V3 FlexiLight (above).

SPECIALS

SRE (*Northern Diver's* rescue range) have some much larger throwline bags; we could have mentioned virtually any water proof backpack or roll-top bag in this context but these are specifically designed to carry and deploy water rescue throwline but not by throwing the actual bag, though you undoubtedly could if push came to shove!

We have not included this type of bag in this article but they are in the **WATER RESCUE BUYERSGUIDE** version. The bag pictured above-right, carries 100m/320ft of rope and they have others housing 200m/660ft, and 60m/196ft.



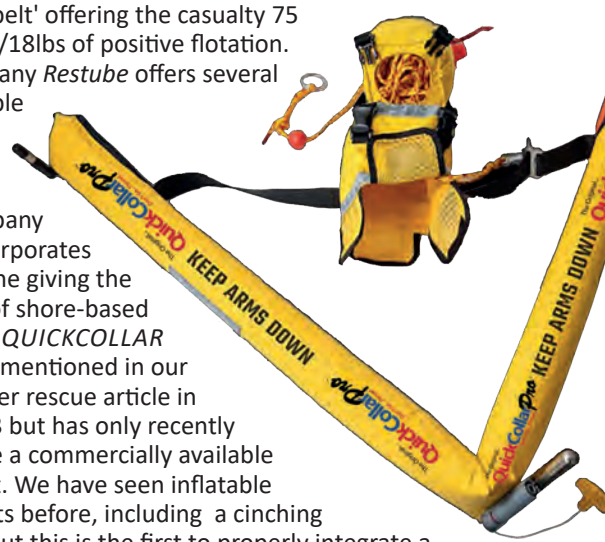
The *MARSARS Second Chance* bag (left) and one of the *RQ3* bags, includes a

floating ball that is intended to provide an immediate weighted re-throw option should the first attempt fail or fall short. Like the water-filled bag technique, this means you can rethrow without restuffing the bag.



Not all bags are simply bags of rope. Some have an active rescue measure in the form of a lightweight, self-inflating 'belt' offering the casualty 75 to 80Newtons/18lbs of positive flotation. German company *Restube* offers several rescue inflatable tubes mainly for in-water rescuers but only one company

(so far) incorporates a throwline giving the option of shore-based rescue. *QUICKCOLLAR PRO* was mentioned in our swiftwater rescue article in *WSAR13* but has only recently become a commercially available product. We have seen inflatable products before, including a cinching collar but this is the first to properly integrate a suitably sized floatation collar with a floating rope and throwbag as a complete package.



IN THE FOLLOWING TABLES:.....

COST: Approximate. Includes local taxes, generally rounded up to the nearest Pound£, US Dollar\$ or Euro€ £\$€=currency conversions only - no duty/shipping etc

ORIGIN: country of the company selling the item, not necessarily the same as the place it is made which is shown as an inset flag where we know.

ROPE CAPACITY: Throw bags are mostly relatively small and defined by the length of rope they can hold. This will obviously vary with the diameter if you opt for a smaller or larger diameter than that supplied or intended.

ROPE DIAMETER (& Type) The intended rope diameter as defined by the length of rope it will house. If the bag comes with a rope the materials will be shown as PA for Nylon, PES for polyester and PP for Polypropylene with the sheath in black and the **core in burnt orange**. **Knots will decrease load figures.**

WEIGHT: empty with no rope or **including rope** for the majority of models that are only available with the supplied rope

DIMENSIONS: Height and width, maybe depth front-to-back if the bag is not a cylindrical shape. These figures are for the body of the bag and do not include extraneous handles and loops

FLOTATION ■ : Integral foam or similar to keep the empty bag afloat. Those without integral flotation may have a foam disc added or the bag's material will have just enough flotation to stay visible because it will always have at least a short section of rope tied into it.

RING/EYEINSIDE: Attachment points for the rope end or webbing etc. on the outside or inside in grey. **CHEM-EYE ■** an elastic loop(s) intended for attaching a chem-stick marker light.

HANDLE ■ Not all have a handle, as previously mentioned the top of the bag may be cinched to create a 'skirt' of material to grasp for throwing. ■ A web strap with fastex-style buckles that works as a handle and a method of attachment to PFD etc.

BELT ■ Some bags come with a quick-release waist belt or this will be an option □. **BELT LOOP ■** obviously present on bags with a belt/ belt option but sewn loops that allow you to add your own web belt. Usually flush to the bag as distinct from a sewn eye intended as an outside carabiner/clip point.

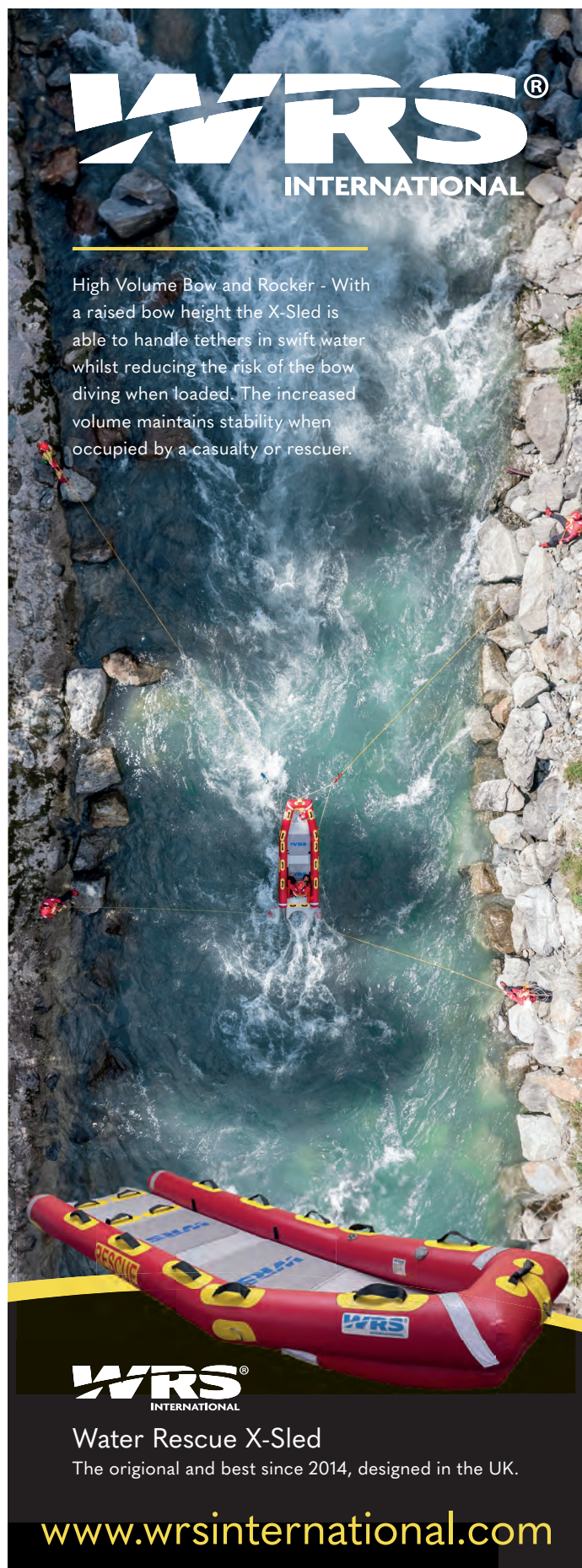
LASH TAB ■ A plastic, square panel with slots that enable you to insert webbing (with quick-release buckles) for securing the bag to PFD etc. or securing something to the bag.

CLOSURE: Mostly draw cord closures with a toggle but there are other options: Velcro (lower case velcro if unbranded), Press-stud/Popper, Zipped or Buckle. Sometimes the handle or attachment using Fastex plastic buckles (or lower case if unbranded) doubles as the bag closure. The bag needs to range from single-rope width to fully open for re-stuffing.

BASE ROPE EYE/GROMMET ■ An eye in the base of the bag through which the rope is passed to be tied off. If there are two eyes, an external loop can be formed and the rope tied off inside the bag.

REFLECTIVE: light reflective trim to provide high visibility. **SOLAS** is marine grade.

ROPE FOR USE WITH HARDWARE: means that the rope is strong enough to be used in z-rigs, highlines etc. with pulleys and rope grabs etc.



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High Volume Bow and Rocker - With a raised bow height the X-Sled is able to handle tethers in swift water whilst reducing the risk of the bow diving when loaded. The increased volume maintains stability when occupied by a casualty or rescuer.

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www.wrsinternational.com

Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●=Partial feature or OK but not ideal □□□□□= Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KIM=Kernmantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs						
MANUFACTURER	ALP DESIGN		ALP DESIGN		ASPLI SAFETY	BIGWATER
MODEL size (metres) VARIANT	MINI CHANCE+ 15 124R		MARMORE + 15 010R		THROWBAG 25 000801	COMPACT 20 9F8GFB E920
ORIGIN						
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£43 \$55 €50		£74 \$94 €85		£42 \$56 €48	£47 A\$95 \$62 €54
ROPE CAPACITY	15m/50'		15.5m/51'		25m/82'	20m/66'
ROPE DIA TYPE if sold as set- sheath/core	6mm ¼" PP ~3.9kN		8mm ⅝" PP 5.5kN		8mm ⅝" PP/PP DB 7.9kN	8mm ⅝" PP/PP DB 7.5kN
WEIGHT with specified rope BAG ONLY	246g 8.7oz		578g 8.7oz		~1.3g 2.9lb	600g 1.32lb
DIMENSIONS	11 x 10cm 4.3 x 3.9"		65 x 22cm 25.5 x 8.6"		50 x 10cm 19.7 x 3.9"	20 x 10cm 7.9 x 4"
FLOTATION RING/EYE INSIDE CHEM-EYE	---		1--		---	1--
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-		-		-- -	-- -- --
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord		toggle-cord x2			toggle-cord x2
BAG MATERIALS REFLECTIVE	PVC & Mesh		PVC/Cordura		nylon	nylon
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ♦ NOTES			Waist belt pouch included			
WEBSITE	alpdesign.it		alpdesign.it		aspli.com	bigwater.com.au
Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●=Partial feature or OK but not ideal □□□□□= Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KIM=Kernmantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs						
MANUFACTURER	BIGWATER		BIGWATER		BLUEWATER	BLUEWATER
MODEL size (metres) VARIANT	LARGE WAIST 15-20 93B0134D		QR WAIST 15-20 6E453347		¼"SM 15 598607	⅜"SM 15 598605
ORIGIN						
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£28 A\$55 \$36 €31		£45 A\$90 \$58 €51		£47 \$66 €53	£84 \$110 €95
ROPE CAPACITY	20m/66'		20m/66'		15m/50'	15m/50'
ROPE DIA TYPE if sold as set- sheath/core	9m ⅜"		9mm ⅜"		6.5mm ¼" PP 4.4kN	9.5mm ⅝" PA/Dyn 22kN
WEIGHT with specified rope BAG ONLY	170g 6oz		320g 11.3oz		0.7kg 1.54lb	680g 1.5lb
DIMENSIONS	30 x 12cm 11.8 x 4.7"		30 x 12cm 11.8 x 4.7"		24.1 x 14cm 9.5 x 5.5"	24.1 x 14cm 9.5 x 5.5"
FLOTATION RING/EYE INSIDE CHEM-EYE	-- *		-- *		--	--
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-- --		-- --		- --	- --
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord x2		toggle-cord x2		toggle-cord x2	toggle-cord x2
BAG MATERIALS REFLECTIVE	nylon SOLAS		nylon SOLAS		Cordura® nylon	Cordura® nylon
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ♦ NOTES	BAG ONLY 38mm web belt. *Luminous strip		BAG ONLY Quick-Release Waist instead of simple web belt. *Luminous strip		BW Suregrip	♦ NFPA BW Suregrip
WEBSITE	bigwater.com.au		bigwater.com.au		bluewaterropes.com	bluewaterropes.com

WATER RESCUE THROW BAGS

					
BIGWATER	BIGWATER	BIGWATER	BIGWATER	BIGWATER	BIGWATER
BOAT RESCUE 20 BB09CCB220	WAIST RESCUE 20 0085247B20	LARGE WAIST 15-20 93B0134D20	QR WAIST 15-20 6E45334720	COMPACT 20 9F86FBE9	BOAT WAIST RESCUE 20 B09CCB2 0085247B
					
£47 A\$95 \$62 €54	£50 A\$100 \$65 €56	£51 A\$103 \$67 €58	£68 A\$138 \$89 €78	£23 A\$45 \$29 €26	£24 A\$47 \$31 €27
20m/66'	20m/66'	20m/66'	20m/66'	20m/66'	20m/66'
8mm 5/16" PP/PP DB 7.5kN	8mm 5/16" PP/PP DB 7.5kN	9mm 3/8" PP 13kN	9mm 3/8" PP 13kN	8mm 5/16"	8mm 5/16"
650g 1.43lb	670g 1.43lb	850g 1.87lb	850g 1.87lb	75g 2.65oz	100135g 3.54.76oz
26 x 11cm 10.2 x 4.3"	26 x 11cm 10.2 x 4.3"	30 x 12cm 11.8 x 4.7"	30 x 12cm 11.8 x 4.7"	20 x 10cm 7.9 x 4"	26 x 11cm 10.2 x 4.3"
					
toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord ■ x2
nylon ■	nylon ■	nylon ■ SOLAS	nylon ■ SOLAS	nylon ■	nylon ■
		NFPA-rope. 38mm web belt. *Luminous strip	NFPA-rope. Quick-Release Waist instead of simple web belt. *Luminous strip	BAG ONLY ■	BAG ONLY ■ Boat= as Waist except top handle rather than waist belt
bigwater.com.au	bigwater.com.au	bigwater.com.au	bigwater.com.au	bigwater.com.au	bigwater.com.au
					
BLUEWATER	BLUEWATER	CMC	CMC	CMC	CMC
1/4" LG 22 598607	3/8" LG 22 598607	EZ-STUFF S 15 433574	SRT BAG 15 291275	SRT BAG 23 291250	SRT BAG 30 291100
					
£62 \$81 €70	£107 \$140 €121	£108 \$142 €122	£97 \$127 €110	£125 \$165 €143	£158 \$208 €180
22m/75'	22m/75'	15m/50'	15m/50'	23m/75'	30m/100'
6.5mm 1/4" PP 4.4kN	9.5mm 3/8" PA/Dyn 22kN	7.5mm 3/4" PP/Dyn 15kN	9.5mm 3/8" PA/PP 13kN	9.5mm 3/8" PA/PP 13kN	9.5mm 3/8" PA/PP 13kN
1.1kg 2.5lb	1.1kg 2.5lb	567g 1.4lb	907g 2lb	1.4kg 3.1lb	1.7kg 3.74lb
33 x 16.5cm 13 x 6.5"	33 x 16.5cm 13 x 6.5"	22 x 15.2cm 8.5 x 6"	25 x 15.2cm 10 x 6"	33 x 18cm 13 x 7"	39 x 17cm 15.5 x 6.5"
					
toggle-cord ■ x2	toggle-cord ■ x2	toggled cord *	toggled cord ■	toggled cord ■	toggled cord ■
Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■	Packcloth ■	Packcloth ■	PP Mesh ■
BW Suregrip	◆ NFPA BW Suregrip	* side-mounted grommet ◆ CMC NFPA Throwline 3-Sigma MBS. BAG-ONLY \$43	◆ CMC SRT Throwline 3-Sigma MBS	◆ CMC SRT Throwline 3-Sigma MBS	◆ CMC SRT Throwline 3-Sigma MBS
bluewaterropes.com	bluewaterropes.com	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com

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MANUFACTURER	CMC	CMC	CMC	CMC	
MODEL size (metres) VARIANT	NFPA BAG 15 291750	NFPA BAG 23 291775	REDI-LINE BAG 15 291350	REDI-LINE BAG 23 291375	T
ORIGIN					
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£99 \$130 €112	£132 \$173 €150	£77 \$102 €89	£93 \$122 €106	
ROPE CAPACITY	15m/50'	23m/75'	15m/50'	23m/75'	
ROPE DIA TYPE if sold as set- sheath/core	7.5mm ¹⁹ / ₆₄ " PP/Dyn 15kN	7.5mm ¹⁹ / ₆₄ " PP/Dyn 15kN	11mm ⁷ / ₁₆ " PP HB 10kN	11mm ⁷ / ₁₆ " PP HB 10kN	
WEIGHT with specified rope BAG ONLY	539g 1.2lb	765g 1.7lb	822g 1.8oz	1.2kg 2.64lb	
DIMENSIONS	20 x 15.2cm 8 x 6"	25 x 15.2cm 10 x 6"	25 x 15.2cm 10 x 6"	33 x 18cm 13 x 7"	
FLOTATION RING/EYE INSIDE CHEM-EYE					
HANDLE/FASTEX BELT BELT LOOP LASH TAB					
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggled cord 	toggled cord 	toggled cord 	toggled cord 	
BAG MATERIALS REFLECTIVE	Packcloth 	Packcloth 	Packcloth 	Packcloth 	
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE 	◆ CMC NFPA Throwline 3-Sigma MBS	◆ CMC NFPA Throwline 3-Sigma MBS	CMC Redi-Line	CMC Redi-Line	
WEBSITE	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	
Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●●●● = Partial feature or OK but not ideal □□□□□□ = Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KM=Kernmantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs					
					
MANUFACTURER	FORCE 6	FORCE 6	FORCE 6	FOX 40	
MODEL size (metres) VARIANT	COMPACT 23 B10X	STANDARD 23 B120 & B130	PRO NFPA 23 B125	RESCUE 15 7907-0102	
ORIGIN					
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£49 \$63 €56	£58 \$75 €67	£124 \$160 €141	£14 \$30 €26	
ROPE CAPACITY	23m/75'	23m/75'	23m/75'	15m/50'	
ROPE DIA TYPE if sold as set- sheath/core	6mm ¹ / ₄ " PP 4.5kN	9mm ³ / ₈ " PP 8.5kN	9.5mm ³ / ₈ " PA/PP 14.6kN	9.5mm ³ / ₈ " PP/PP 3.2kN	9.
WEIGHT with specified rope BAG ONLY	482kg 17oz	1.06kg 2.3lb	1.1kg 2.45lb	341g 12oz	
DIMENSIONS	25.4 x 14cm 10 x 5.5"	30.5 x 20.3cm 12 x 8"	30.5 x 20.3cm 12 x 8"	~25 x 10cm ~10 x 4"	
FLOTATION RING/EYE INSIDE CHEM-EYE					
HANDLE/FASTEX BELT BELT LOOP LASH TAB					
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggled cord 	toggled cord 	toggled cord 	toggled cord 	
BAG MATERIALS REFLECTIVE	500D nylon 	500D nylon 	500D nylon/mesh 	Nylon	
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE 	 Bag will rotate so lights are uppermost in water	 Bag will rotate so lights are uppermost in water	 Sterling Grabline twin lightstick mounts. Bag will rotate so lights are uppermost in water		
WEBSITE	force6.com	force6.com	force6.com	fox40world.com	

WATER RESCUE THROW BAGS

					
CMC	CMC	CMC	FORCE 6	FORCE 6	FORCE 6
THROW BAG S 15 433135	THROW BAG M 23 433150	THROW BAG L 30 433175	MINI DART 15 B205	DART 15 B20X	K2 23 B150 & B140
					
£26 \$34 €30	£26 \$35 €30	£31 \$41 €36	£34 \$44 €39	£55 \$70 €62	£39 \$50 €45
15m/50'	23m/75'	30m/100'	15m/70'	21m/70'	23m/75'
8mm 5/16"	8mm 5/16"	8mm 5/16"	6mm 1/4" PP 4.67kN	6mm 1/4" PP 4.67kN	9mm 3/8" PP 5.3kN
106g 3.7oz	117g 4.3oz	150g 5.3oz	250g 8.8oz	470g 1.04lb	966g 2.12lb
20 x 15.2cm 8 x 6"	25 x 15.2cm 10 x 6"	33 x 17cm 13 x 7"	20.3 x 14cm 8 x 5.5"	28 x 15.2 x 7.6cm 11 x 6 x 3"	33 x 15.2cm 13 x 6"
					
Velcro	Velcro	Velcro	Press-Stud + Zip x2	Press-Stud + Zip	toggled cord
Packcloth	Packcloth	Packcloth	600D nylon	600D nylon	600D Polyester
BAG ONLY	BAG ONLY	BAG ONLY	Weight forward design makes Dart fly like a football	Weight forward design makes Dart fly like a football	
cmcpro.com	cmcpro.com	cmcpro.com	force6.com	force6.com	force6.com
					
FOX 40	HIKO	HIKO	HIKO	HIKO	HIKO
RESCUE 27 7909-0302	FALCON 10 71601_ONE	FALCON 15 71611_ONE	HAWK 10 71301_ONE	HAWK 15 71311_ONE	HAWK 20 71321_ONE
					
£20 \$38 €33	£53 \$70 €58	£58 \$77 €64	£56 \$74 €62	£62 \$82 €68	£67 \$88 €74
27m/90'	10m/33'	15m/50'	10m/33'	15m/50'	20m/65'
5mm 3/8" PP/PP 3.2kN	8mm 3/8" PP/PP DB 8kN	8mm 3/8" PP/PP DB 8kN	10mm 3/8" PP HB 10kN	10mm 3/8" PP HB 10kN	10mm 3/8" PP HB 00kN
1kg 2.2lb	~420g 0.9lb	~520g 1.15lb	~530g 1.2lb	~580g 1.3lb	~620g 1.4lb
~27 x 12cm ~10.6 x 4.7"	~16 x 10 x 6cm 6.3 x 4 x 2.5"	~18 x 10 x 6.3cm 7 x 4 x 2.5"	20 x 12 x 7cm 7.8 x 4.7 x 2.75"	24 x 12 x 7cm 9.4 x 4.7 x 2.75"	26 x 14 x 8cm 10.2 x 5.5 x 3.1"
					
toggled cord x2	Web/fastex x2	Web/fastex x2	Web/fastex x2	Web/fastex x2	Web/fastex x2
Nylon	Cordura	Cordura	Cordura	Cordura	Cordura
	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Belt not included
fox40world.com	hikosport.com	hikosport.com	hikosport.com	hikosport.com	hikosport.com

Images NOT to Scale

£\$€ = Currency conversion only-exc duties etc.

Bag only (no rope) column in pale yellow

Prices in **GREEN** are for the bag & Rope

●●●●● = Partial feature or OK but not ideal

□□□□□ = Option

HANDLE= ADDITIONAL to rope loop

FASTEX=web with side-squeeze clip as handle/attach

PA= Nylon PES = Polyester PP=Polypropylene

HMPE/PE= High Modulus Polyethylene /
 PP= Double Braid/Braided core 2 sheets

DB= Double Braid/braided core & sheath.
HB = Hollow Braid. KM=Kermantle

CHEM-EYE – Chemical/Lightstick attachment eyes

CHEM-EYE= Chemical/Lightstick attachment eyes
CAM-HARDWARE Majority of PP rope not suitable for

CAM-HARDWARE Majority of PF rope not suitable to use with camming hardware like descenders & grabs.



MANUFACTURER	HIKO	HIKO	HIKO	HIKO
MODEL size (metres) VARIANT	HAWK 25 71331_ONE	EAGLE 10 71501_ONE	EAGLE 15 71511_ONE	EAGLE 20 71521_ONE
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£72 \$95 €80	£60 \$79 €66	£65 \$86 €72	£71 \$94 €78
ROPE CAPACITY	25m/82'	10m/33'	15m/50'	20m/65'
ROPE DIA TYPE if sold as set- sheath/core	10mm >3/8" PP HB 10kN	10mm >3/8" PP DB 10kN	10mm >3/8" PP DB 10kN	10mm >3/8" PP DB 10kN
WEIGHT with specified rope BAG ONLY	~750g 1.65lb	~550g 1.1lb	~600g 1.3lb	~810kg 1.8lb
DIMENSIONS	29 x 14 x 8cm 11.4 x 5.5 x 3.1"	20 x 12 x 7cm 7.8 x 4.7 x 2.75"	24 x 12 x 7cm 9.4 x 4.7 x 2.75"	26 x 14 x 8cm 10.2 x 5.5 x 3.1"
FLOTATION RING/EYE INSIDE CHEM-EYE	 12-	 12-	 12-	 12-
HANDLE/FASTEX BELT BELT LOOP LASH TAB	--   --	--   --	--   --	--   --
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	Web/fastex  x2	Web/fastex  x2	Web/fastex  x2	Web/fastex  x2
BAG MATERIALS REFLECTIVE	Cordura 	Cordura 	Cordura 	Cordura 
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE 	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye	Bespoke optional Waist Belt can be connected via rope loop and top-eye
WEBSITE	hikosport.com	hikosport.com	hikosport.com	hikosport.com

Images NOT to Scale

£\$€ = Currency conversion only-exc duties etc.

Bag only (no rope) column in pale yellow

Prices in GREEN are for the bag & Rope

●●●●● = Partial feature or OK but not ideal

□□□□□ = Option

HANDLE= ADDITIONAL to rope loop

FASTEX=web with side-squeeze clip as handle/attach

PA= Nylon PES = Polyester PP=Polypropylene

HMPE/PE= High Modulus Polyethylene /

DB= Double Braid/braided core & sheath.
HB = Hollow Braid. KM=Kermantle

CHEM-EYE= Chemical/Lightstick attachment eyes

CHEM-EYE = Chemical/Lightstick attachment eyes
CAM-HARDWARE Majority of PP rope not suitable for

CAM-HARDWARE Majority of FF rope not suitable to use with camming hardware like descenders & grabs



MANUFACTURER	HIKO	HIKO	HIKO	HIKO	
MODEL size (metres) VARIANT	THROW 10 77602	THROW 15 73400	THROW 20 73400	THROW 25 73400	
ORIGIN					
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£32 \$42 €35	£36 \$48 €40	£42 \$55 €46	£49 \$65 €54	
ROPE CAPACITY	10m/33'	15m/50'	20m/65'	25m/82'	
ROPE DIA TYPE if sold as set- sheath/core	8mm 3⁄8" PP 8kN	8mm 3⁄8" PP 8kN	8mm 3⁄8" PP 8kN	8mm 3⁄8" PP 8kN	:
WEIGHT with specified rope BAG ONLY	~400g 14oz	~500g 1.1lb	~600g 1.30lb	1.1kg 2.4lb	
DIMENSIONS	~17 x 10cm 6.7 x 4"	~19 x 11cm 7.5 x 4.3"	~21 x 11cm 6.3 x 4.3"	~22 x 11cm 8.7 x 4.3"	
FLOTATION RING/EYE INSIDE CHEM-EYE	 --	 --	 --	 --	
HANDLE/FASTEX BELT BELT LOOP LASH TAB	--   -	--   -	--   -	--   -	
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	
BAG MATERIALS REFLECTIVE	Cordura 	Cordura 	Cordura 	Cordura 	
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆	Cone shaped top for easier restuffing	Cone shaped top for easier restuffing	Cone shaped top for easier restuffing	Cone shaped top for easier restuffing	Co
WEBSITE	hikosport.com	hikosport.com	hikosport.com	hikosport.com	

WATER RESCUE THROW BAGS

					
HIKO EAGLE 25 71531_ONE	HIKO CONE 15 77400	HIKO CONE 20 77500	HIKO CONE 15 77200	HIKO CONE 20 77300	HIKO PROOF 20 73400
					
£72 \$95 €84	£42 \$55 €46	£49 \$65 €54	£52 \$69 €57	£59 \$78 €65	£51 \$67 €56
25m/82'	15m/50'	20m/65'	15m/50'	20m/65'	20m/66'
10mm >3/8" PP DB 10kN	8mm 5/16" PP 8kN	8mm 5/16" PP 8kN	10mm >3/8" PP 10kN	10mm >3/8" PP 10kN	10mm >3/8" PP 10kN
~1.1kg 2.4lb	~512g 1.1lb	~600g 1.32lb	~685g 1.51lb	~800g 1.76lb	~950g 2.1lb
29 x 14 x 8cm 11.4 x 5.5 x 3.1"	26 x 11cm 10.2 x 4.3"	34 x 12cm 13.3 x 4.7"	26 x 11cm 10.2 x 4.3"	34 x 12cm 13.3 x 4.7"	~30 x 12cm 11.8 x 4.7"
					
Web/fastex  x2	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord  x2
Cordura 	Cordura 	Cordura 	Cordura 	Cordura 	Cordura 
Cone shaped top for easier restuffing	Cone shaped top for easier restuffing. Eyes for clipping connector through bag & rope loop	Cone shaped top for easier restuffing. Eyes for clipping connector through bag & rope loop	Cone shaped top for easier restuffing. Eyes for clipping connector through bag & rope loop	Cone shaped top for easier restuffing. Eyes for clipping connector through bag & rope loop	Cone shaped top for easier restuffing
hikosport.com	hikosport.com	hikosport.com	hikosport.com	hikosport.com	hikosport.com
					
HIKO WAIST 15 73400	HIKO WAIST 20 73400	H2O RESCUE SIDEARM 15	H2O RESCUE SIDEARM 23	H2O RESCUE SHARPSHOOTER 23	H2O RESCUE SHARPSHOOTER PRO 23
					
£73 \$95 €81	£82 \$108 €91	£69 \$00 €00	£92 \$00 €00	£8129 \$00 €00	£11629 \$00 €00
15m/50'	20m/65'	15m/50'	23m/75'	23m/75'	23m/75'
10mm >3/8" PP 10kN	10mm >3/8" PP 10kN	8mm 5/16" PP 7.25kN	6mm 1/4" Dyneema 11.3kN	8mm 5/16" PP 7.1kN	8mm 5/16" Dyneema 13.6kN
~1.3kg 2.9lb	~1.5kg 3.3lb	00kg 00lb	00kg 00lb	00kg 00lb	00kg 00lb
~25 x 10 cm 10 x 4"	~25 x 10 cm 10 x 4"	00 x 00 cm 00 x 0"	00 x 00 cm 00 x 0"	31.75 x 15 cm 12.5 x 6"	31.75 x 15 cm 12.5 x 6"
					
toggle-cord  x2	toggle-cord  x2	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 
Cordura 	Cordura 	1000D Cordura 	1000D Cordura 	1000D Cordura 	1000D Cordura 
Cone shaped top for easier restuffing	Cone shaped top for easier restuffing	 Comes with QR Belt	 Comes with QR Belt ◆ Sterling Ultralite	 Comes with QR Belt	 Comes with QR Belt ◆ Sterling Ultralite
hikosport.com	hikosport.com	h2orescuegear.com	h2orescuegear.com	h2orescuegear.com	h2orescuegear.com

Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope =Partial feature or OK but not ideal = Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KM=Kernmantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs				
MANUFACTURER	H2O RESCUE	H2O RESCUE	H2O RESCUE	H2O RESCUE
MODEL size (metres) VARIANT	SHARPSHOOTER XL 23	SHARPSHOOTER XL 23	BIGSHOT 23	BIGSHOT 23
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£84 \$00 €00	£111 \$00 €00	£76 \$00 €00	£114 \$00 €00
ROPE CAPACITY	23m/75'	23m/75'	23m/75'	23m/75'
ROPE DIA TYPE if sold as set- sheath/core	9mm 3/8" PP 13kN	9mm 3/8" Dyneema 23.8kN	9mm 3/8" PP 13kN	9mm 3/8" Dyneema 23.8kN
WEIGHT with specified rope BAG ONLY	00kg 00lb	00kg 00lb	00kg 00lb	00kg 00lb
DIMENSIONS	43.2 x 18 cm 14 x 7"	43.2 x 18 cm 14 x 7"	43.2 x 18 cm 14 x 7"	43.2 x 18 cm 14 x 7"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB				
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord x2	toggle-cord x2	toggle-cord -	toggle-cord -
BAG MATERIALS REFLECTIVE	1000D Cordura	1000D Cordura	1000D Cordura	1000D Cordura
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ♦ NOTES	 Comes with QR Belt	 Comes with QR Belt ♦ Sterling Ultraline	 Comes with QR Belt	 Comes with QR Belt ♦ Sterling Ultraline
WEBSITE	h2orescuegear.com	h2orescuegear.com	h2orescuegear.com	h2orescuegear.com
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MANUFACTURER	KENT SAFETY	KENT SAFETY	KENT SAFETY	LEHMAR/MARSARS
MODEL size (metres) VARIANT	RESCUE 15 152800-300-050-13	RESCUE 22 152800-300-075-13	RESCUE 30 152800-300-100-13	2ND CHANCE LED 15 B50 B50L
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£46 \$60 €52	£49 \$65 €56	£53 \$70 €60	£53 \$70 €60
ROPE CAPACITY	15m/50'	22m/75'	30m/100'	15m/50'
ROPE DIA TYPE if sold as set- sheath/core	9mm 3/8" PP 5kN	9mm 3/8" PP 5kN	9mm 3/8" PP 5kN	9.5mm PP 8.1kN
WEIGHT with specified rope BAG ONLY	730g 1.6lb	910g 2lb	1.2kg 2.6lb	1.1kg 2.42b
DIMENSIONS	24.1 x 12.7cm 9.5 x 5"	28 x 12.7cm 11 x 5"	34.3 x 14cm 13.5 x 5"	29 x 14.2cm 11.4 x 5.6"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB				
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggled cord	toggled cord	toggled cord	toggled cord
BAG MATERIALS REFLECTIVE	600D coated Poly	600D coated Poly	600D coated Poly	Nylon -
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ♦ NOTES				Includes a 'Wiffle' ball to enable a second throw without repacking the rope. LED=embedded 200hr light
WEBSITE	kentsafetyproducts.com	kentsafetyproducts.com	kentsafetyproducts.com	lehmar.de marsars.com

		
IONIC RESCUE THROWLINE 15 SAF62001	IONIC RESCUE THROWLINE 15 SAF62031	IONIC RESCUE THROWLINE 18 SAF62026
		
£35 \$46 €40	£35 \$46 €40	£28 \$37 €32
15m/50'	15m/50'	18m/60'
10mm >3/8" PP 10kN	10mm >3/8" PP Dyneema 20kN	10mm >3/8" PP 10kN
700g 1.54lb	500g 1.1lb	600g 1.3lb
~27 x 11cm 10.6 x 4.3"	~27 x 11cm 10.6 x 4.3"	~35 x 11cm 13.8 x 4.3"
		
--□--	--□--	--□--
toggle-cord  x2	toggle-cord 	toggle-cord  x2
600D nylon 	600D nylon 	600D nylon 
-	NFPA rope/kit	-
ionicrescue.com	ionicrescue.com	ionicrescue.com
		
LEHMAR/MARSARS 2ND CHANCE LED 22 B75 B75L	LEHMAR/MARSARS 2ND CHANCE LED 27 B90 B90L	LEHMAR/MARSARS 2ND CHANCE LED 33 B110 B110L
		
£95 \$125 €108	£103 \$135 €117	£110 \$145 €125
22m/75'	27m/90'	33m/110'
1.5mm³ /s" PP 8.1kN	9.5mm 3/8" PP 8.1kN	9.5mm 3/8" PP 8.1kN
1.3kg 2.86lb	~1.45kg 3.2lb	~1.6kg 3.5lb
36 x 14.2cm 11.4 x 5.6"	29 x 14.2cm 11.4 x 5.6"	29 x 14.2cm 11.4 x 5.6"
		
--□--	--□--	--□--
toggled cord 	toggled cord 	toggled cord 
Nylon -	Nylon -	Nylon -
Includes a 'Wiffle' ball to enable a second throw without repacking the rope. LED=embedded 200hr light	Includes a 'Wiffle' ball to enable a second throw without repacking the rope. LED=embedded 200hr light	Includes a 'Wiffle' ball to enable a second throw without repacking the rope. LED=embedded 200hr light (pic shown)
lehmar.de marsars.com	lehmar.de marsars.com	lehmar.de marsars.com

WATER RESCUE THROW BAGS



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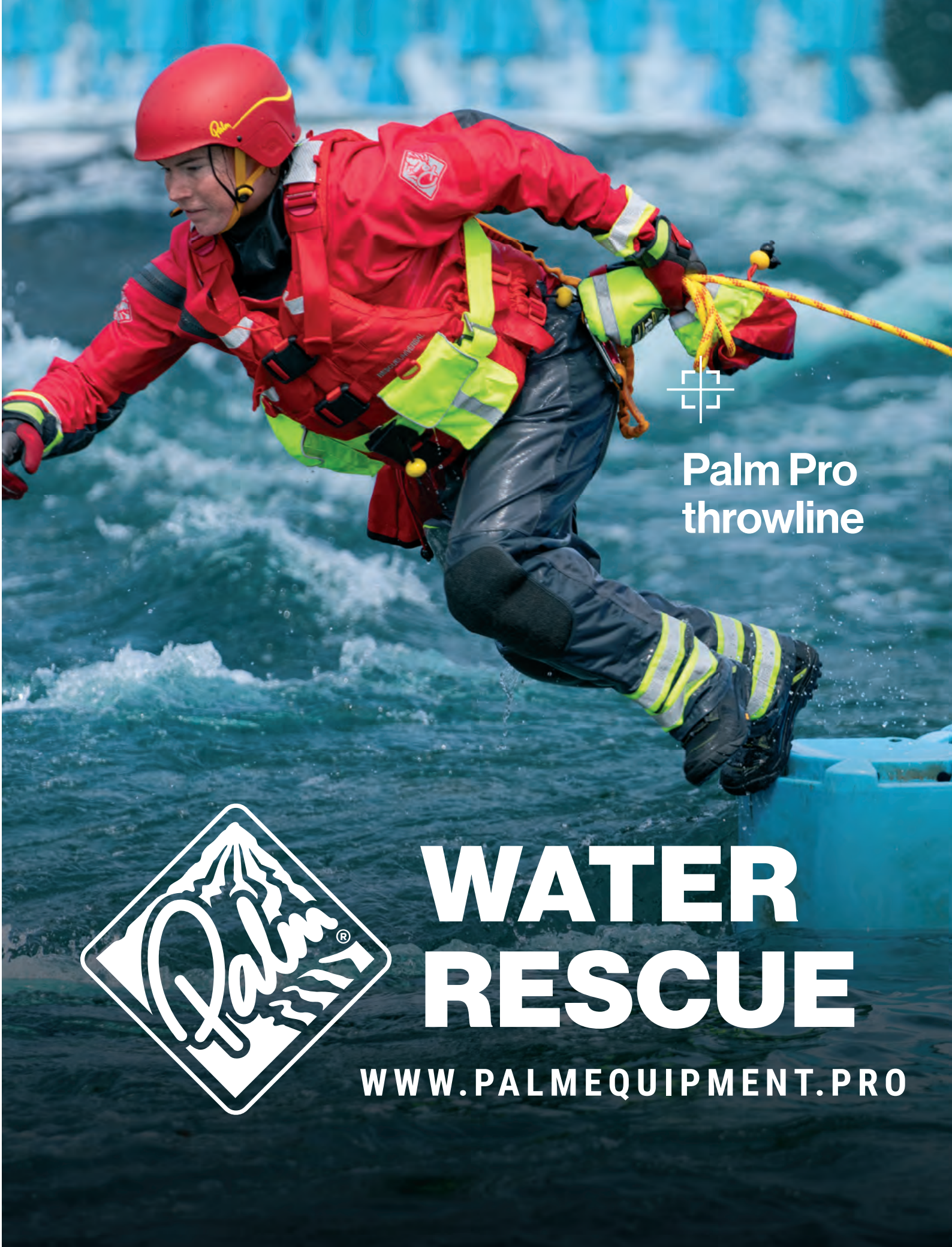


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MANUFACTURER	LIFE SAVING SYSTEMS	MORICE	MORICE	MUSTANG
MODEL size (metres) VARIANT	237-P (USCG) 23 NSN: 4220-01-483-1921	- 23 000	RESCUE BELT 23 000	PRO 23 MRD175
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£117 \$155 €134	£00 \$00 €00	£00 \$180 €00	£44 \$97 €80
ROPE CAPACITY	23m/75'	20m/65'	20m/65'	23m/75'
ROPE DIA TYPE if sold as set- sheath/core	11mm 17⁄16" PP/PP 10kN	9.8mm 5⁄8" PP 7kN	8mm 5⁄8" PP 7kN	9.5mm 3⁄8" PP/PA 9.1kN
WEIGHT with specified rope BAG ONLY	1.6kg 3.5lb	0kg 0lb	0kg 0lb	~1kg 2.2lb
DIMENSIONS	~34 x 15.2cm ~13 x 6"	00 x 00cm 00 x 00"	00 x 00cm 00 x 00"	28 x 14cm 11 x 5.5"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-	- -	- -	- - -
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	Web/press-stud ■ x2	Velcro ■ x2	Fastex -	toggle-cord ■
BAG MATERIALS REFLECTIVE	Polyester ■	950D Cordura® nylon ■	950D Cordura®& PVC ■	Cordura® nylon -
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	Updated USCG issue throw-bag. Side webbing (with fast-clip buckle) runs the length of the bag.	Also sold in the USA with BW Suregrip and Sterling Ultralite	Waist belt houses the throw-bag inc a fipline pouch . Does not inc hardware in pic	Accepts APALS mini strobe in bag. NB: Mustang UK quoted price seems to be too low compared to US price.
WEBSITE	lifesavingsystems.com	moricerequipment.com	moricerequipment.com	mustangsurvival.com
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MANUFACTURER	NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER
MODEL size (metres) VARIANT	WEDGE 2350 LG 30 10TB-16B	WEDGE 3350 LG 18 10TB-16C	PRO 800SM 23 10TB-85	PRO 1800LG 23 10TB-86
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£138 \$183 €157	£133 \$175 €151	£55 \$74 €63	£74 \$99 €85
ROPE CAPACITY	30.2m/100'	18m/60'	23m/75'	23m/75'
ROPE DIA TYPE if sold as set- sheath/core	6mm/1⁄4" PES/HMPE 10kN	9mm/5⁄8"PES/HMPE 16kN	6mm/1⁄4" PP 3.5kN	9mm/3⁄8" PP 8kN
WEIGHT with specified rope BAG ONLY	100g 900g 3.5oz	100g 900g 3.5oz	665g 1.5lb	1kg 2.2lb
DIMENSIONS	32 x 18 x 6.4cm 12.5 x 7 x 2.5"	32 x 18 x 6.4cm 12.5 x 7 x 2.5"	26.7 x 14 x 10cm 10.5 x 5.5 x 4"	34.3 x 18 x 11.4cm 13.5 x 7 x 4.5"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-	-	-	-
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord +web ■	toggle-cord +web ■	toggle-cord +web ■ x2	toggle-cord +web ■ x2
BAG MATERIALS REFLECTIVE	420/500D rip-stop nylon	420/500D rip-stop nylon	420/500D r-s nylon & mesh ■	420/500D r-s nylon & mesh ■
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	 fastex-style clip doubles as a pealeess whistle. Spectra-X= Polyester/HMPE KM	 fastex-style clip doubles as a pealeess whistle. Spectra-X= Polyester/HMPE KM	 fastex-style clip doubles as a pealeess whistle.	 fastex-style clip doubles as a pealeess whistle
WEBSITE	northwater.com	northwater.com	northwater.com	northwater.com

WATER RESCUE THROW BAGS

					
MUSTANG	NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER
STD 23 MRD075	MICRO 15 10TB-99X	REGULATION 15 10TB-36X	WEDGE 800 SM 21 10TB-30A	WEDGE 1800 LG 21 10TB-16	WEDGE 2350 SM 18 10TB-30AA
					
£55 \$74 €63	£29 \$38 €32	£38 \$50 €44	£52 \$68 €58	£74 \$98 €83	£98 \$129 €111
23m/75'	15m/50'	15m/50'	21m/70'	21m/70'	18m/60'
9mm 3/8" PP 8.6kN	6mm 1/4" PP 3.6kN	6mm 1/4" PP 3.6kN	6mm 1/4" PP 3.6kN	9mm 3/8" PP 8kN	6mm 1/4" PES/HMPE 10kN
~800g 1.76lb	60g 300g 2.1oz	60g 400g 2.1oz	80g 500g 2.8oz	100g 900g 3.5oz	80g 500g 2.8oz
35 x 13 x 13cm 13.8 x 5.1 x 5.1"	20 x 15cm 8 x 6"	24 x 15 x 6.3cm 9.5 x 6 x 2.5"	26 x 15 x 6.3cm 10.25 x 6 x 2.5"	32 x 18 x 6.4cm 12.5 x 7 x 2.5"	26 x 15 x 6.33cm 10.25 x 6 x 2.5"
					
toggle-cord	toggle-cord +web x2	toggle-cord+web x2	toggle-cord +web	toggle-cord +web	toggle-cord +web
Cordura® nylon	420/500D r's nylon & mesh	420/500D rip-stop nylon	420/500D rip-stop nylon	420/500D rip-stop nylon	420/500D rip-stop nylon
Mustang bags for both Mustang bags vary markedly - often only listed on US sites	fastex-style clip doubles as a pealess whistle	fastex-style clip doubles as a pealess whistle. Rope Red or yellow	fastex-style clip doubles as a pealess whistle	fastex-style clip doubles as a pealess whistle	fastex-style clip doubles as a pealess whistle. Spectra-X = Polyester/HMPE KM
mustangsurvival.com	northwater.com	northwater.com	northwater.com	northwater.com	northwater.com
					
NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER	NORTH WATER
PRO 2350SM 23 10TB- 90	PRO 2350LG 35 10TB- 92	PRO 3350LG 21 10TB- 91	PRO 2200SM 21 10TB- 87	PRO 2200 LG 35 10TB-89	PRO 4400 LG 23 10TB-88
					
£140 \$175 €150	£159 \$213 €182	£148 \$198 €169	£80 \$107 €91	£127 \$167 €145	£108 \$144 €123
23m/75'	35m/115'	23m/75'	23m/75'	35m/115'	235m/75'
6mm 1/4" PES/HMPE 10kN	6mm 1/4" PES/HMPE 10kN	9mm 3/8" PES/HMPE 16kN	6mm 1/4" PP/Spectra 10kN	6mm 1/4" PP/Spectra 10kN	9mm 3/8" PP/Spectra 20kN
700g 1.54lb	1.1kg 2.4lb	1.1kg 2.4lb	660g 1.5lb	1kg 2.2lb	1.1kg 2.4lb
26.7 x 14 x 10cm 10.5 x 5.5 x 4"	34.3 x 18 x 11.4cm 13.5 x 7 x 4.5"	34.3 x 18 x 11.4cm 13.5 x 7 x 4.5"	26.7 x 14 x 10cm 10.5 x 5.5 x 4"	34.3 x 18 x 11.4cm 13.5 x 7 x 4.5"	34.3 x 18 x 11.4cm 13.5 x 7 x 4.5"
					
toggle-cord +web x2	toggle-cord +web x2	toggle-cord +web x2	toggle-cord +web x2	toggle-cord +web	toggle-cord +web
420/500D r's nylon & mesh	420/500D r's nylon & mesh	420/500D r's nylon & mesh	420/500D r's nylon & mesh	420/500D r's nylon & mesh	420/500D r's nylon & mesh
fastex-style clip doubles as a pealess whistle. Spectra-X = Polyester/HMPE KM	fastex-style clip doubles as a pealess whistle. Spectra-X = Polyester/HMPE KM	fastex-style clip doubles as a pealess whistle. Spectra-X = Polyester/HMPE KM	fastex-style clip doubles as a pealess whistle. Spectra A = PP sheath & PES/Spectra core	fastex-style clip doubles as a pealess whistle. Spectra A = PP sheath & PES/Spectra core	fastex-style clip doubles as a pealess whistle. Spectra A = PP sheath & PES/Spectra core
northwater.com	northwater.com	northwater.com	northwater.com	northwater.com	northwater.com

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MANUFACTURER	NRS	NRS	NRS	NRS
MODEL size (metres) VARIANT	WEDGE 16 45105.XX	GUARDIAN 16 45107.02	PRO GUARDIAN 16 45108.02	COMPACT 21 45100.XX
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£50 \$65 €56	£76 \$100 €100	£106 \$140 €125	£53 \$70 €70
ROPE CAPACITY	16.75m/55'	16.75m/55'	16.75m/55'	21m/70'
ROPE DIA TYPE if sold as set- sheath/core	6mm/¼" PP 4.2kN	6mm/¼" PP 4.2kN	6mm/¼" PP/Spectra 11.1kN	6mm/¼" PP 4.2kN
WEIGHT with specified rope BAG ONLY	410g 15oz	590g 1.3lb	630g 1.4lb	540g 1.15lb
DIMENSIONS	23 x 14cm 9 x 5.5"	25.4 x 14cm 10 x 5.5"	24 x 14cm 9.5 x 5.5"	25.4 x 12.7cm 10 x 5"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB				
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord +web ■ x2	toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord +web ■
BAG MATERIALS REFLECTIVE	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	Flat profile	Wedge-bag integrated into a waist pack.	Wedge-bag integrated into a waist pack. Stronger 'Ultralite' rope and enhanced reflective panels	
WEBSITE	nrs.com	nrs.com	nrs.com	nrs.com
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MANUFACTURER	NRS	NRS	NRS	NRS
MODEL size (metres) VARIANT	PRO COMPACT 21 45101.01.100	STANDARD 22 45103.01.100	PRO RESCUE 22 45102.01.100	PRO RESCUE NFPA 22 45104.01.100
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£114 \$150 €150	£60 \$78 €78	£189 \$250 €250	£99 \$130 €111
ROPE CAPACITY	21m/70'	22.8m/75'	22.8m/75'	22.8m/75'
ROPE DIA TYPE if sold as set- sheath/core	6mm/¼" PP/Spectra 11.1kN	9mm/¾" PP 8.45kN	9mm/¾" PP/Spectra 23.3kN	9.5mm/¾" PA/PP 14.6kN
WEIGHT with specified rope BAG ONLY	545g 1.2lb	970g 2.15b	1.2kg 2.65lb	1.2kg 2.7lb
DIMENSIONS	23 x 12.7cm 9 x 5"	30.5 x 15.2cm 12 x 6"	34.3 x 15.2cm 13.5 x 6"	35.6 x 15.2cm 14 x 6"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-	-	-	* -
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord +web ■	toggle-cord +web ■	toggle-cord +web ■	toggle-cord +web ■
BAG MATERIALS REFLECTIVE	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	◆ Sterling Ultralite enhanced reflective panels		◆ NRS Pro Throwline enhanced reflective panels	◆ Sterling Grabline enhanced reflective panels
WEBSITE	nrs.com	nrs.com	nrs.com	nrs.com



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H2 23 0000	22 0000	POOL 12 LE1168A
£60 \$78 €68	£206 \$720 €235	£24 \$32 €28
22.8m/75'	22m/75'	12m/39'
10mm/5/16" PP 16kN	6mm 1/4" PA/Spectra 8.9kN	8mm 5/16" PP 7kN
1.65kg 105g 3.6lb 3.7oz	<2.3kg <5lb	370g 13oz
33 x 15.2cm 13 x 6"	30.4 x 15.2cm 12 x 6"	21 x 11cm 8.3 x 4.3"
toggle-cord	Toggle-cord NO	toggle-cord
Light nylon	Cordura® nylon	Cordura® nylon
◆ PMI H2 Rope Throwbag-only (no-rope) = £16/\$20/€18	2x con-joined bags-1 for rope, 1 for collar & CO2 canister	Short range bag intended for pool lifeguards but applicale to open water too
pmirope.com	quickcollar.com	rlss.org.uk

Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●●●●=Partial feature or OK but not ideal □□□□□□= Option HANDLE = ADDITIONAL to rope loop FASTEX =web with side-squeeze clip as handle/attach PA = Nylon PES = Polyester PP =Polypropylene HMPE/PE = High Modulus Polyethylene / Dyneema DB = Double Braid/braided core & sheath. HB = Hollow Braid KM =Kernmantle CHEM-EYE = Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs				
MANUFACTURER	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE
MODEL size (metres) VARIANT	UMT/URBAN MICRO 90000	ECONOMY 15 0000	ECONOMY 21 0000	ECONOMY 15 0000
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£46 \$60 €52	£41 \$54 €47	£50 \$66 €57	£00 \$00 €00
ROPE CAPACITY	9m/30'	15m/50'	21m/70'	15m/50'
ROPE DIA TYPE if sold as set- sheath/core	6mm/¼" PP/Spectra 11.1kN	8mm/⅜" PP 8.4kN	9mm/⅜" PP 8.4kN	8mm/⅜"
WEIGHT with specified rope BAG ONLY	240g 8.5oz	800g 1.7lb	1.1kg 2.4lb	60g 2.2oz
DIMENSIONS	12.7 x 15.24 x 10.16cm 5 x 6 x 4"	25.4 x 17.8 cm 10 x 7"	33 x 17.8 x 15.2cm 13 x 7 x 6"	29.2 x 24.1cm 11.5 x 9.5"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB				
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord	toggle-cord	toggle-cord	toggle-cord
BAG MATERIALS REFLECTIVE				
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	◆ Sterling Ultraline			NO-ROPE BAG ONLY
WEBSITE	rocknrescue.com	rocknrescue.com	rocknrescue.com	rocknrescue.com
Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●●●●=Partial feature or OK but not ideal □□□□□□= Option HANDLE = ADDITIONAL to rope loop FASTEX =web with side-squeeze clip as handle/attach PA = Nylon PES = Polyester PP =Polypropylene HMPE/PE = High Modulus Polyethylene / Dyneema DB = Double Braid/braided core & sheath. HB = Hollow Braid KM =Kernmantle CHEM-EYE = Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs				
MANUFACTURER	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE
MODEL size (metres) VARIANT	NFPA TRIDENT DELUXE 220000	NFPA TRIDENT DELUXE 220000	NFPA/SNAGPLATE 220000	NFPA TECHNICIAN 220000
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£58 \$76 €66	£69 \$91 €79	£85 \$112 €97	£76 \$100 €86
ROPE CAPACITY	22m/75'	22m/75'	22m/75'	22m/75'
ROPE DIA TYPE if sold as set- sheath/core	8mm/⅝" PP/PA 6.1kN	*9.5mm⅝" PP/PP 15.2kN	9.5mm PA/PP 14.6kN	9.5mm PA/PP 14.6kN
WEIGHT with specified rope BAG ONLY	800g 1.7lb	1.2kg 2.6lb	1.1kg 2.4lb	1.2kg 2.6lb
DIMENSIONS	22.9 x 15.2 x 17.8cm 9 x 6 x 7"	33 x 16.5 x 12.7cm 13 x 6.5 x 5"	30.5 x 16.5 x 12.7cm 12 x 6 x 5.5"	30.5 x 19 x 15.2cm 12 x 7.5 x 6"
FLOTATION RING/EYE INSIDE CHEM-EYE				
HANDLE/FASTEX BELT BELT LOOP LASH TAB				
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord	toggle-cord	toggle-cord	toggle-cord
BAG MATERIALS REFLECTIVE				
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	Sterling Waterline	Sterling Waterline (*listed as 10mm by RnR) Also available with 10 (9.5)mm Sterling Grabline	◆ Sterling Grabline Removable plastic Snagplate for rope capture	◆ Sterling Grabline
WEBSITE	rocknrescue.com	rocknrescue.com	rocknrescue.com	rocknrescue.com

					
ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE	ROCKnRESCUE
ECONO TRIDENT 15	ECONO TRIDENT 21	ECONO TRIDENT 30	NFPA TRIDENT 15	NFPA TRIDENT 22	NFPA TRIDENT 30
0000 	0000 	0000 	0000 	0000 	0000 
£41 \$54 €47	£52 \$69 €60	£41 \$54 €47	£49 \$64 €55	£65 \$85 €74	£80 \$105 €91
15m/50'	21m/70'	30m/100'	15m/50'	22m/75'	30m/100'
8mm/ 5/16" PP 11.1kN	8mm/ 5/16" PP 11.1kN	8mm/ 5/16" PP 11.1kN	10mm PA/PP 14.6kN	10mm PA/PP 14.6kN	10mm PA/PP 14.6kN
800g 1.7lb	820g 1.8lb	1g 2.2lb	800g 1.7lb	1.1kg 2.5lb	1.5kg 3.2lb
5.4 x 15.24 x 12.7cm 10 x 6 x 5"	30 x 17.8 x 12.7cm 12 x 7 x 5"	33 x 16.5 x 12.7cm 13 x 6.5 x 5"	28 x 17.8 x 12.7cm 11 x 7 x 5"	34.3 x 19 x 12.7cm 13.5 x 7.5 x 6"	33 x 22.9 x 15.24cm 13 x 9 x 6"
					
toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 
			◆ Sterling Grabline	◆ Sterling Grabline	◆ Sterling Grabline
rocknrescue.com	rocknrescue.com	rocknrescue.com	rocknrescue.com	rocknrescue.com	rocknrescue.com
					
RQ3	RQ3	RQ3	RQ3	RQ3	RQ3
MINI 15 BG3116	MINI 15 BG3141	STANDARD 15 BG3118	STANDARD 15 BG3123	STANDARD 15 BG3122	SECOND CHANCE 22 BG3144
					
£24 \$31 €27	£57 \$75 €65	£28 \$37 €32	£43 \$57 €49	£80 \$105 €91	£67 \$88 €76
15m/50'	15m/50'	15m/50'	15m/50'	15m/50'	23m/75'
6mm/1/4" PP 5.4kN	6mm/1/4" PA/PP 11.1kN	9mm/3/8" PP 8.4kN	9.5mm/3/8" PA/PP 14.6kN	9mm/3/8" Spectra/PP 23.3kN	9.5mm/3/8" PA/PP 14.6kN
363g 12.8oz	363g 12.8oz	818g 1.8lb	818g 1.8lb	818g 1.8lb	1.36kg 3lb
15.24 x 10cm 6 x 4"	15.24 x 10cm 6 x 4"	28 x 15.24cm 11 x 6"	28 x 15.24cm 11 x 6"	28 x 15.24cm 11 x 6"	28 x 15.24cm 11 x 6"
					
toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 	toggle-cord 
UV Nylon	UV Nylon	UV Nylon	UV Nylon	UV Nylon	Nylon
Sterling Grabline	◆ Sterling Ultraline	Throwbag-only (no-rope) = £17 \$22 €19	◆ Sterling Grabline Throwbag-only (no-rope) = £17 \$22 €19	◆ Sterling Ultraline Throwbag-only (no-rope) = £17 \$22 €19	◆ Sterling Grabline Throwbag-only (no-rope) = £17 \$22 €19
rescuesource.com	rescuesource.com	rescuesource.com	rescuesource.com	rescuesource.com	rescuesource.com

Images NOT to Scale

£\$€ = Currency conversion only-exc duties etc.
 Bag only (no rope) column in pale yellow
 Prices in GREEN are for the bag & Rope
 ●●●●●●●● = Partial feature or OK but not ideal
 □□□□□□ = Option
 HANDLE= ADDITIONAL to rope loop
 FASTEX=web with side-squeeze clip as handle/attach
 PA= Nylon PES = Polyester PP=Polypropylene
 HMPE/PE= High Modulus Polyethylene / Dyneema
 DB= Double Braid/braided core & sheath.
 HB = Hollow Braid KM=Kernmantle
 CHEM-EYE= Chemical/Lightstick attachment eyes
 CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs



MANUFACTURER	RQ3	RQ3	RQ3	SKED
MODEL size (metres) VARIANT	STANDARD 22 BG3137	STANDARD 15 BG3124	STANDARD 15 BG3136	STANDARD 15 SK-1002
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£38 \$50 €43	£60 \$79 €68	£112 \$148 €128	£56 \$74 €64
ROPE CAPACITY	23m/75'	23m/75'	23m/75'	15m/50'
ROPE DIA TYPE if sold as set- sheath/core	9mm/3/8" PP 8.4kN	9.5mm/3/8" PA/PP 14.6kN	9mm/3/8" Spectra/PP 23.3kN	7mm/3/8"
WEIGHT with specified rope BAG ONLY	1kg 2.3lb	1kg 2.3lb	1kg 2.3lb	910g 2lb
DIMENSIONS	28 x 15.24cm 11 x 6"	28 x 15.24cm 11 x 6"	28 x 15.24cm 11 x 6"	n/a
FLOTATION RING/EYE INSIDE CHEM-EYE	■ --	■ --	■ --	■ 1 --
HANDLE/FASTEX BELT BELT LOOP LASH TAB	- ■ - ■ -	- ■ - ■ -	- ■ - ■ -	■ -- ■ -
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord ■	toggle-cord ■	toggle-cord ■	toggle-cord ■
BAG MATERIALS REFLECTIVE	Nylon	Nylon	Nylon	Cordura®
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆	Throwbag-only (no-rope) = £17 \$22 €19	◆ Sterling Grabline Throwbag-only (no-rope) = £17 \$22 €19	◆ Sterling Ultraline Throwbag-only (no-rope) = £17 \$22 €19	◆ PMI Water Rescue
WEBSITE	rescuesource.com	rescuesource.com	rescuesource.com	skedco.com

Images NOT to Scale

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 Prices in GREEN are for the bag & Rope
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 □□□□□□ = Option
 HANDLE= ADDITIONAL to rope loop
 FASTEX=web with side-squeeze clip as handle/attach
 PA= Nylon PES = Polyester PP=Polypropylene
 HMPE/PE= High Modulus Polyethylene / Dyneema
 DB= Double Braid/braided core & sheath.
 HB = Hollow Braid KM=Kernmantle
 CHEM-EYE= Chemical/Lightstick attachment eyes
 CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs



MANUFACTURER	SOLGEAR	SOLGEAR	SOLGEAR	SOLGEAR
MODEL size (metres) VARIANT	SUREGRIP BAG 23 0000	SUREGRIP BAG 15 0000	SUREGRIP BAG 18 0000	SUREGRIP BAG 23 0000
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£87 \$114 €99	£73 \$96 €83	£83 \$109 €95	£98 \$129 €112
ROPE CAPACITY	23m/75'	15m/50'	18m/60'	23m/75'
ROPE DIA TYPE if sold as set- sheath/core	6.5mm1/4" PP/Dynma10kN	8.2mm3/8" PP/Dynma14.2kN	8.2mm3/8" PP/Dynma14.2kN	8.2mm3/8" PP/Dynma14.2kN
WEIGHT with specified rope BAG ONLY	545g / 1.2lb	727g / 1.6lb	818g / 1.8lb	910g / 2lb
DIMENSIONS	17.8 x 12.7cm 7 x 5"	22.8 x 12.7cm 9 x 5"	30.5 x 12.7cm 12 x 5"	26.7 x 12.7cm 10.5 x 5"
FLOTATION RING/EYE INSIDE CHEM-EYE	■ --	■ --	■ --	■ --
HANDLE/FASTEX BELT BELT LOOP LASH TAB	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■
CLOSURE BASE ROPE EYE(S)/GROMMET(S)				
BAG MATERIALS REFLECTIVE	Polyester mesh ■	Polyester mesh ■	Polyester mesh ■	Polyester mesh ■
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆	BW SureGrip	NFPA ◆ BW SureGrip	NFPA ◆ BW SureGrip	NFPA ◆ BW SureGrip
WEBSITE	solgear.com	solgear.com	solgear.com	solgear.com

					
SKED	SOLGEAR	SOLGEAR	SOLGEAR	SOLGEAR	SOLGEAR
STANDARD 22 SK-1001	WAIST BELT 18 0000	THROWBAG 23 0000	GRABLINE BAG 15	GRABLINE BAG 23	SUREGRIP BAG 15
					
£74 \$98 €84	£133 \$175 €151	£71 \$94 €81	£71 \$95 €82	£94 \$124 €107	£71 \$94 €81
22m/70'	18m/60'	23m/75'	15m/50'	23m/75'	15m/50'
7mm/3/8"	8.2mm 3/8" PP/Dynma 14.2kN	8mm 5/16" PP/PA 7.1kN	9.5mm 3/8" PP/PP-PA 14.6kN	9.5mm 3/8" PP/PP-PA 14.6kN	6.5mm 1/4" PP/Dynma 10kN
1.4kg 3lb	1.1kg / 2.4lb	635g / 1.4lb	910g / 2lb	1.2kg / 2.6lb	362g / 12.8oz
n/a	28 x 12.7 x 10cm 11 x 5 x 4"	26.7 x 12.7cm 10.5 x 5"	26.7 x 12.7cm 10.5 x 5"	25.4 x 15.2cm 10 x 6"	15.2 x 12.7cm 6 x 5"
					
toggle-cord 	Web/velcro/fastex  x2	toggle-cord  x2	Web/velcro/fastex  x2	Web/velcro/fastex  x2	
Cordura®	Cordura® nylon 	Polyester mesh 	Polyester mesh 	Polyester mesh 	Polyester mesh 
 PMI Water Rescue	Throwbag slots inside waist belt -not sold separately. NFPA  BW SureGrip	Sterling Waterline	NFPA Sterling Grabline rope	NFPA Sterling Grabline rope	BW SureGrip
skedco.com	solgear.com	solgear.com	solgear.com	solgear.com	solgear.com



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MANUFACTURER	SRE (NDIVER)	SRE (NDIVER)	SRE (NDIVER)	SRE (NDIVER)	
MODEL size (metres) VARIANT	THROWBAG 23 PROTHROWBAGRL-15	THROWBAG 20 PROTHROWBAGRL-20	THROWBAG 25 PROTHROWBAGRL-25	THROWBAG 30 PROTHROWBAGRL-30	
ORIGIN					
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£35 \$46 €40	£39 \$51 €44	£42 \$58 €48	£44 \$58 €48	
ROPE CAPACITY	15m/50'	20m/65'	25m/82'	30m/98'	
ROPE DIA TYPE if sold as set- sheath/core	8mm/5/16" 900kg PA/PP	8mm/5/16" 900kg PA/PP	8mm/5/16" 900kg PA/PP	8mm/5/16" 900kg PA/PP	
WEIGHT with specified rope BAG ONLY	0.7kg 1.54lb	0.9kg 2lb	1.1kg 2.42lb	1.2kg 2.64lb	
DIMENSIONS	27 x 11cm 10.6 x 4.3"	35 x 11cm 13.8 x 4.3"	38 x 11cm 14.9 x 4.3"	40 x 11cm 15.7 x 4.3"	
FLOTATION RING/EYE INSIDE CHEM-EYE	■ 2 1 *	■ 2 1 *	■ 2 1 *	■ 2 1 *	
HANDLE/FASTEX BELT BELT LOOP LASH TAB	■ - ■ ■ ■ ■	■ - ■ ■ ■ ■	■ - ■ ■ ■ ■	■ - ■ ■ ■ ■	
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	toggle-cord NO	toggle-cord NO	toggle-cord NO	toggle-cord NO	
BAG MATERIALS REFLECTIVE	Cordura® nylon ■ *	Cordura® nylon ■ *	Cordura® nylon ■ *	Cordura® nylon ■ *	
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	*Reflective rope. Mesh draining base with handle and tie-in eye. *Optional LED fits to lash tab	*Reflective rope. Mesh draining base with handle and tie-in eye. *Optional LED fits to lash tab	*Reflective rope. Mesh draining base with handle and tie-in eye. *Optional LED fits to lash tab	*Reflective rope. Mesh draining base with handle and tie-in eye. *Optional LED fits to lash tab	
WEBSITE	ndiver-rescue.com	ndiver-rescue.com	ndiver-rescue.com	ndiver-rescue.com	
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MANUFACTURER	WWTC	WWTC	WWTC	WWTC	
MODEL size (metres) VARIANT	CLASSIC 18 20	HERO 18	HERO 20	HERO 18-20	
ORIGIN					
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£49 \$46 €44	£99/145 \$93/136 €89/130	£103/148 \$96/139 €92/133	£50 \$47 €45	£99
ROPE CAPACITY	18m/60'	18m/60'	20m/66'	20m/60'	
ROPE DIA TYPE if sold as set- sheath/core	7.8mm 5/16" PP/PESPP 14kN	9.3mm 5/16" PP/PESPP 21kN	9.3mm 5/16" PP/PESPP 21kN	9.3mm 5/16" PP/PESPP 21kN	7.8mm
WEIGHT with specified rope BAG ONLY	113g 4oz	1.29/1.35kg 2.8/3lb	1.1/1.4kg 2.4/3.1lb	138g 4.9oz	85g
DIMENSIONS	2526 x 11 x 8cm 9.810.2 x 4.3 x 3.2"	26 x 13 x 9cm 10.2 x 5.1 x 3.5"	28 x 13 x 9cm 11 x 5.1 x 3.5"	2628 x 13 x 9cm 10.211 x 5.1 x 3.5"	
FLOTATION RING/EYE INSIDE CHEM-EYE	■ 1- ■	■ 1- ■	■ 1- ■	■ 1- ■	
HANDLE/FASTEX BELT BELT LOOP LASH TAB	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	Web/velcro ■ x2*	Web/velcro ■ x2*	Web/velcro ■ x2*	Web/velcro ■ x2*	
BAG MATERIALS REFLECTIVE	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■	Cordura® nylon ■	
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	NO ROPE - BAG ONLY *grommets on side. Velcro carabiner pouch. Exc 'biner.	Waist belt included *grommets on side. Velcro carabiner pouch. Exc 'biner. *WEIGHT & COST = exc/inc Waist belt	Waist belt included *grommets on side. Velcro carabiner pouch. Exc 'biner. *WEIGHT & COST = exc/inc Waist belt	NO ROPE - BAG ONLY	*g car
WEBSITE	wwtc.info	wwtc.info	wwtc.info	wwtc.info	

					
SRE (NDIVER)	SRE (NDIVER)	WWTC	WWTC	WWTC	WWTC
PRO 20 PROTHROWBAGRLM-20	PRO 25 PROTHROWBAGRLM-25	PRO 15 000	PRO 15 000	CLASSIC 18 000	CLASSIC 20 000
					
£59 \$78 €68	£69 \$92 €79	£73/111 \$69/104 €66/100	£39 \$37 €35	£85/132 \$79/180 €76/120	£94 \$88/190 €84/125
20m/66'	25m/82'	15m/50'	15m/50'	18m/60'	20m/66'
8mm ⅝ PP 17.6kN	8mm ⅝ PP 17.6kN	7.8mm ⅝ PP/PESPP 14kN	7.8mm ⅝ PP/PESPP 14kN	7.8mm ⅝ PP/PESPP 14kN	7.8mm ⅝ PP/PESPP 14kN
600g 1.32lb	900g 2lb	*575/785g 1.3/1.7lb	80g 2.8oz	620/960g 1.4/2.2lb	690/1030g 1.5/2.3lb
35 x 13 x 13cm 13.8 x 5.1 x 5.1"	39 x 13 x 13cm 15 x 5.1 x 5.1"	24 x 10 x 7cm 9.5 x 4 x 2.8"	24 x 10 x 7cm 9.5 x 4 x 2.8"	25 x 11 x 8cm 9.8 x 4.3 x 3.2"	26 x 11 x 8cm 10.2 x 4.3 x 3.2"
					
toggle-cord  x2	toggle-cord  x2	Web/velcro  x2	Web/velcro  x2	Web/velcro  x2*	Web/velcro  x2*
Cordura® nylon  *	Cordura® nylon  *	Cordura® nylon 	Cordura® nylon 	Cordura® nylon 	Cordura® nylon 
Optional -LED fixes to lash tab. Rope is also reflective	*Optional LED fixes to lash tab. *Rope is also reflective	*WEIGHT & COST = exc/inc Waist belt	NO ROPE - BAG ONLY	Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt	Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt
ndiver-rescue.com	ndiver-rescue.com	wwtc.info	wwtc.info	wwtc.info	wwtc.info
					
WWTC	WWTC	WWTC	WWTC	WWTC	WWTC
HERO 23	HERO 25 000	HERO 23-25 000	CRAFT 23 000	CRAFT 27 000	CRAFT 23-27 000
					
£101/145 \$93/195 €89/130	£103/148 \$96/139 €92/133	£50 \$47 €45	£0 \$102/150 €98/144	£117/123 \$110/156 €105/150	£57 \$53 €51
23m/75'	25m/82'	25m/82'	23m/75'	27m/88'	27m/75'
8mm ⅝ PP/PESPP 14kN	7.8mm ⅝ PP/PESPP 14kN	7.8mm ⅝ PP/PESPP 14kN	9.3mm ⅝ PP/PESPP 21kN	9.3mm ⅝ PP/PESPP 21kN	9.3mm ⅝ PP/PESPP 21kN
5/1110g 1.9/2.45lb	855/1180g 1.9/2.6lb	138g 4.9oz	1.23/1.53kg 2.7/3.4lb	1.4/1.7kg 3/3.75lb	151g 5.3oz
24 x 13 x 9cm 9.5 x 5.1 x 3.5"	26 x 13 x 9cm 10.2 x 5.1 x 3.5"	2426 x 13 x 9cm 9.5 x 5.1 x 3.5"	32 x 14 x 10cm 12.6 x 5.5 x 4"	34 x 14 x 10cm 13.4 x 5.5 x 4"	3234 x 14 x 10cm 12.613.4 x 5.5 x 4"
					
Web/velcro  x2*	Web/velcro  x2*	Web/velcro  x2*	Web/velcro  x2*	Web/velcro  x2*	Web/velcro  x2*
Cordura® nylon 	Cordura® nylon 	Cordura® nylon 	Cordura® nylon 	Cordura® nylon 	Cordura® nylon 
Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt	Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt	NO ROPE - BAG ONLY	Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt	Waist belt included *grommets on side. Velcro carabiner pouch. Exc. biner. *WEIGHT & COST = exc/inc Waist belt	NO ROPE - BAG ONLY
wwtc.info	wwtc.info	wwtc.info	wwtc.info	wwtc.info	wwtc.info

Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●●●● = Partial feature or OK but not ideal □□□□□□ = Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KM=Kermantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs				
				
MANUFACTURER	WRS INTERNATIONAL	WRS INTERNATIONAL	WRS INTERNATIONAL	WRS INTERNATIONAL
MODEL size (metres) VARIANT	CHAOS <25 0000	CHAOS RAPID 15 0000	CHAOS RAPID 18 0000	CHAOS 20 0000
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£36 \$47 €40	£64/75 \$84/99 €72/85*	£80 \$105 €90	£73/84 \$97/113 €83/96*
ROPE CAPACITY	25-15m/75-50'	15m/50'	18m/60'	20m/66'
ROPE DIA TYPE if sold as set- sheath/core	8-10mm	10mm PP 12kN	8mm PP 9kN	10mm PP 12kN
WEIGHT with specified rope BAG ONLY	~90g 3.2lb	810g 1.79lb	820g 1.8lb	1kg 2.2lb
DIMENSIONS	36 x 14 x 8cm 14.1 x 5.5 x 3.15"	36 x 11 x 7cm 14.1 x 4.3 x 2.75"	36 x 11 x 7cm 14.1 x 4.3 x 2.75"	36 x 14 x 8cm 14.1 x 5.5 x 3.15"
FLOTATION RING/EYE INSIDE CHEM-EYE	■ -- ■	■ -- ■	■ -- ■	■ -- ■
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-- □ ■ -	-- □ ■ -	-- □ ■ -	-- □ ■ -
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	Web/Press-Stud NO	Web/Press-Stud NO	Web/Press-Stud NO	Web/Press-Stud NO
BAG MATERIALS REFLECTIVE	HD Nylon ■	HD Nylon ■	HD Nylon ■	HD Nylon ■
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	Light sticks slide into a pouch rather than extraneous eyes	*Costs for non-reflective/reflective rope options	Rope =Reflective only	*Costs for non-reflective/reflective rope options
WEBSITE	wrsinternational.com	wrsinternational.com	wrsinternational.com	wrsinternational.com
Images NOT to Scale £\$€ = Currency conversion only-exc duties etc. Bag only (no rope) column in pale yellow Prices in GREEN are for the bag & Rope ●●●●●●●● = Partial feature or OK but not ideal □□□□□□ = Option HANDLE= ADDITIONAL to rope loop FASTEX=web with side-squeeze clip as handle/attach PA= Nylon PES = Polyester PP=Polypropylene HMPE/PE= High Modulus Polyethylene / Dyneema DB= Double Braid/braided core & sheath. HB = Hollow Braid KM=Kermantle CHEM-EYE= Chemical/Lightstick attachment eyes CAM-HARDWARE Majority of PP rope not suitable for use with camming hardware like descenders & grabs				
				
MANUFACTURER	WRS INTERNATIONAL	YAK	YAK	YAK
MODEL size (metres) VARIANT	CHAOS 25 0000	THROWLINE 15 6222	THROWLINE 20 0000	THROWLINE 25 0000
ORIGIN				
COST (inc Tax/VAT) BAG ONLY (in black) Currency conversion only inc ROPE (in green)	£96 \$128 €109	£55 \$70 €60	£60 \$76 €66	£65 \$84 €73
ROPE CAPACITY	25m/82'	15m/50'	20m/66'	25m/82'
ROPE DIA TYPE if sold as set- sheath/core	8mm PP 9kN	8mm PP 3kN	8mm PP 3kN	8mm PP 3kN
WEIGHT with specified rope BAG ONLY	1.02kg 2.24lb	~550g 1.2lb	~675g 1.5lb	~775g 1.7lb
DIMENSIONS	36 x 14 x 8cm 14.1 x 5.5 x 3.15"	*32 x 15cm 12.6 x 6"	*40 x 16cm 15.7 x 6.3"	*48 x 18cm 18.9 x 7"
FLOTATION RING/EYE INSIDE CHEM-EYE	■ -- ■	■ -- ■	■ -- ■	■ -- ■
HANDLE/FASTEX BELT BELT LOOP LASH TAB	-- □ ■ -	-- □ ■ -	-- □ ■ -	-- □ ■ -
CLOSURE BASE ROPE EYE(S)/GROMMET(S)	Web/Press-Stud NO	toggle-cord ■ x2	toggle-cord ■ x2	toggle-cord ■ x2
BAG MATERIALS REFLECTIVE	HD Nylon ■	Polyester ■	Polyester ■	Polyester ■
OTHER BAG COLOURS USE ROPE WITH CAM-HARDWARE ◆ NOTES	Rope= reflective only	*Length/Heigh inc. 'cuff'	*Length/Heigh inc. 'cuff'	*Length/Heigh inc. 'cuff'
WEBSITE	wrsinternational.com	crewsaver.com	crewsaver.com	crewsaver.com



1/2" BW-HR3

Strong & durable hybrid
Polyester/Polypropylene design
5,000 lbf. @ 89 g/m



9.5mm NFPA Sure-Grip

Braided HMPE fiber core with
an innovative tactile sheath
4,923 lbf. @ 40 g/m



BLUEWATER

R O P E S

209 Lovvorn Rd. Carrollton, GA 30117
T: 770.834.7515 E: info@bluewaterropes.com

www.bluewaterropes.com

DRY BAGS



Unlike the gear bags in our Arborist and Rope Equipment BUYERS GUIDES which contain many waterproof bags, these bags go one step further and are water tight. That means that you could theoretically, use them as a water container and indeed we often do with the smaller bags. Dry bags will keep the contents entirely dry even if the bag were somehow submerged. Not an easy proposition given the degree of buoyancy so unless it was being jettisoned from a submarine hatch, or you've managed to vacuum seal the contents, we'll go with inundation, it will keep your gear dry even in the event of prolonged inundation.

To achieve this, the seams are welded or glued and welded instead of sewn although they could be sewn if they were then patch welded over the entire seam. The main players in this category of bags tend not to be the same as the main players in rope and tackle bags because the market is more specialised along with the manufacturing processes.

Some have taken a leaf out of drysuit technology and use high grade waterproof zips while the majority use rolled lids that are then buckled together to complete the seal. This style of bag with Radio-frequency welded seams was pioneered by Ortlieb in Germany and a few years later by Sealine in the US around 1985 give or take a year. Both of these companies are still market leaders today, in fact we still use bags from both that are decades old and still going strong.

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IN THE FOLLOWING TABLES:.....

A large, modern transport pack is quite sophisticated with a whole load of different features that are not always apparent from simply looking at it.

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** for reference - they are lower than the actual price because it does not take into account import duty, shipping or tax.

ORIGIN: Is the country of the company selling the item, not necessarily the same as the origin of the product itself which is shown as an inset flag where we know.

STYLE/FUNCTION: The bags in this guide can be defined as one or two of the following

- **BUCKET/ROPE BAG** - an upright, top-feeder that holds its shape to allow rope to be fed in or out.
- **BACKPACK:** two shoulder straps and maybe a waist belt but either way- carried on the back giving both hands free to carry even more stuff. Often a combo with a rope bucket.
- **DUFFLE/DUFFEL:** a horizontally carried bag with handles on the top. May also has hidden rucksack straps in the base to convert to vertical orientation.
- **TRANSPORTER:** a multi-compartmented pack - usually a rucksack style - that will either present the equipment in a cabinet style or will open out entirely on the ground to show everything in pockets/pouches or attached.

VOLUME: in Litres/liters /US Gallons (20% less than UK Gallon)

Market Origin: Bags are either specifically designed for arborists (Pro Arb), or for the Rope Access and/or rescue markets - both requiring tough equipment. Sport can be equally tough if its caving and canyoning but tends not to be used all day every day.

NOMINAL/INTENDED ROPE CAPACITY: As provided by the manufacturer but varies with the diameter. In organiser packs, rope storage may only be part of the overall volume whereas it may be all of the internal volume in a dedicated rope bag/duffle.

46m/150ft x 12.7mm/ $\sqrt{2}$ " = 76m/250' x 11mm $\frac{7}{16}$ " = 91m/300' x 9mm/ $\frac{3}{8}$ "

WEIGHT: empty with no optional extras included

MAX DIMENSIONS: Height and the width and maybe depth front-to-back. These figures are for the body of the bag and do not include extraneous handles or external pouches that are stuffed to bursting. Most bags will end up much wider!

2xBACK STRAPS=rucksack style carrying straps

1xSHOULDER=a single strap for slinging over your shoulder

WAIST BELT=rucksack style waist belt to keep the pack tight to your body when walking any distance

[PADDED]=in brackets[] indicates straps padded for comfort.

BACK/LUMBAR PADDING=padding on the pack itself rather than straps, again for improved comfort carrying a heavy load. Lumbar is lower back, behind the waist belt if there is one.

DETACH/STOW CARRY STRAPS: refers to rucksack style straps that can either be ditched entirely or can be stuffed into an integral pocket so that no straps are exposed to snagging.

REINFORCED SIDES (Free-standing)=the pack has stiffened panels or bars that keep the bag upright during rope feed.

CARRY HANDLES WLL ENDS SIDE dedicated carrying handles with ergonomic adjuncts to make carrying a heavy weight more comfortable. Mounted on the top or for duffle-style side-carry. Can also be used to clip on kit. **WLL**=the max weight you can carry via these handles or an additional haul eye.....

ADDITIONAL HAUL WLL SEWN EYES RINGS Top handles can be used for hauling but there is often a sewn loop between the top of shoulder straps or there may be metal eyes around the top.

GEAR (individual) EYES EXTERNAL INTERNAL These can be daisy chain eyes, Molle eyes or individual plastic eyelets but all are intended to clip one carabiner and/or clippable hardware

GEAR LOOPS [STRAPS] EXTERNAL INTERNAL harness-style larger semi-circles of cord or plastic that allow multiple items to be clipped into the same loop. All handles could be used as a gear loop! **[STRAPS]** [in brackets] is securing web with buckles

TOTAL POCKETS EXTERNAL INTERNAL The total number of closable pockets and open pouches outside and **inside** the bag. This **does not** include saw pockets/pouches listed separately. **of which.. MESH/CLEAR EXTERNAL INTERNAL** of the total number of pockets those which are clear plastic or open mesh allowing free drainage but more importantly visibility of the contents. Mesh makes the bag lighter than a full, heavy duty enclosure.

CLOSURES Velcro POP Zipped Draw-Cord Buckle Referring ONLY to the outside pockets - a colour square indicates the type of closure and the number is the pockets that have that specific closure.

LID ZIPPED BUCKLE ROLL-TOP Referring ONLY to the top lid and compartment doors if it is an organiser type pack.

LOCKABLE: the main compartment(s) can be locked with a small padlock (not usually supplied). Usually needs a chunky YKK style zip large enough to clip in a padlock clasp but may be a tougher, bespoke element like the *FTC-Tree Koompasia*.

ID PANEL: a small-see-through rectangle for a luggage style label or large enough for an inventory or risk assessment sheet.

END/SIDE STRAPS: in addition to the carry straps these are adjustable webbing straps on the sides that can either act to compress the bag to a smaller size if it's not fully filled or you can secure items behind them. Side straps are often set above open pouches that can house a saw, pole or spikes or **end** straps can be used to secure a hank of rope or a tarpaulin etc.

REFLECTIVE TRIM: not seen as much on arb packs as they are

263

Images NOT to Scale

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HAUL EYES = can carry the entire weight of the bag & contents eg. for hauling or attaching to harness. May double as handles shown as 1/1
POP= Popper or press stud
BUCKLE ROLL TOP= all roll tops are closed with a push-fit/Fastex buckle
 ●●●●● =Partial feature or OK but not ideal
 □□□□□ = Option



MANUFACTURER	FTC TREE	FTC TREE		
MODEL litres/liters VARIANT				
ORIGIN				
COST (inc Tax/VAT) Currency conversion only				
VOLUME L/US Gallon intended market				
LOAD CAPACITY				
WEIGHT empty				
DIMENSIONS				
BACK STRAPS HANDLES WAIST BELT				
POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH				
ID-PANEL DRAIN/VENT HAUL EYE(S)				
LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
OUTER MATERIALS REFLECTIVE TRIM				
OTHER COLOURS				
NOTES				
WEBSITE				

Images NOT to Scale

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POP= Popper or press stud
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 □□□□□ = Option



MANUFACTURER	KONG	KONG	KONG	KONG
MODEL litres/liters VARIANT	RopeBag 28	Genius II 30	Linnhà 40 982522000KK	RopeBag 43
ORIGIN	Italy	Italy	Italy	Italy
COST (inc Tax/VAT) Currency conversion only	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
VOLUME L/US Gallon intended market	28L/7.4gal Pro	30L/7.9gal Pro	40L/10.6gal Canyoning	43L/11.4gal Pro Access
LOAD CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
WEIGHT empty	0kg 0lb	0.85kg 0lb	0kg 0lb	0kg 0lb
DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
BACK STRAPS HANDLES WAIST BELT	---	---	---	---
POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	---	---	---	---
ID-PANEL DRAIN/VENT HAUL EYE(S)	---	---	---	---
LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM	--	PVC	--	--
OTHER COLOURS				
NOTES	-	-	-	-
WEBSITE	Kong.it	kong.it	Kong.it	Kong.it

BUYERSGUIDES Water Rescue

Images NOT to Scale

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 □□□□□ = Option



MANUFACTURER	
MODEL litres/liters VARIANT	
ORIGIN	
COST (inc Tax/VAT) Currency conversion only	
VOLUME L/US Gallon intended market	
LOAD CAPACITY	
WEIGHT empty	
DIMENSIONS	
BACK STRAPS HANDLES WAIST BELT	
POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	
ID-PANEL DRAIN/VENT HAUL EYE(S)	
LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	
OUTER MATERIALS REFLECTIVE TRIM	
OTHER COLOURS	
NOTES	
WEBSITE	

ORTLEIB

ORTLIEB

ORTLIEB

Images NOT to Scale

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 □□□□□ = Option



MANUFACTURER	
MODEL litres/liters VARIANT	
ORIGIN	
COST (inc Tax/VAT) Currency conversion only	
VOLUME L/US Gallon intended market	
LOAD CAPACITY	
WEIGHT empty	
DIMENSIONS	
BACK STRAPS HANDLES WAIST BELT	
POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	
ID-PANEL DRAIN/VENT HAUL EYE(S)	
LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	
OUTER MATERIALS REFLECTIVE TRIM	
OTHER COLOURS	
NOTES	
WEBSITE	

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PETZL

Bucket 15



£41 \$50 €42

15L/4gal Pro Access 3

50kg 45m x11mm 88'x1½" 50

465g 1lb

30 x 25cm
11.8 x 9.8"

-21

11 - 2 -



TPU (PVC-free)



*two loops intended for tieo=ing in the rope ends. *ti

Images NOT to Scale

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	MANUFACTURER	SEAL LINE	SEAL LINE	SEAL LINE	SEAL LINE
	MODEL litres/liters VARIANT	Discovery View 5	Discovery View 10	Discovery View 20	Discovery View 30
	ORIGIN				
	COST (inc Tax/VAT) Currency conversion only	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME L/US Gallon intended market	0L/0gal Pro & Exped	0L/0gal Pro & Exped	0L/0gal Pro & Exped	0L/0gal Pro & Exped
	LOAD CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES WAIST BELT	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	---	---	---	---
	ID-PANEL DRAIN/VENT HAUL EYE(S)	---	---	---	---
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM	---	---	---	---
	OTHER COLOURS				
	NOTES	-	-	-	-
	WEBSITE	sealinegear.com	sealinegear.com	sealinegear.com	sealinegear.com

Images NOT to Scale

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POP= Popper or press stud
BUCKLE ROLL TOP= all roll tops are closed with a push-fit/Fastex buckle
●●●●● =Partial feature or OK but not ideal
□□□□□ = Option



	MANUFACTURER	SEAL LINE	SEAL LINE	SEAL LINE	SEAL LINE
	MODEL litres/liters VARIANT	Skylake 18	Pro Dry Pack 40	Pro Dry Pack 40	Black Canyon 65
	ORIGIN				
	COST (inc Tax/VAT) Currency conversion only	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME L/US Gallon intended market	0L/0gal Pro & Exped	0L/0gal Pro & Exped	0L/0gal Pro & Exped	0L/0gal Pro & Exped
	LOAD CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES WAIST BELT	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	---	---	---	---
	ID-PANEL DRAIN/VENT HAUL EYE(S)	---	---	---	---
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM	---	---	---	---
	OTHER COLOURS				
	NOTES	-	-	-	-
	WEBSITE	sealinegear.com	sealinegear.com	sealinegear.com	sealinegear.com

					
SEAL LINE	SEAL LINE	SEAL LINE	SEAL LINE		SEAL LINE
Blocker Compression 5	Blocker Compression 10	Blocker Compression 20	Blocker Compression 30		
					
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0		
0L/0gal Pro & Exped	30L/0gal Pro & Exped	40L/0gal Pro & Exped	70L/0gal Pro & Exped		
0m 0'	0m 0'	0m 0'	0m 0'		
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb		
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"		
---	---	-61	-61		
---	---	-- 10- -	-- 10- -		
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--	--	--	--		
					
-	-	-	-		
sealinegear.com	sealinegear.com	sealinegear.com	sealinegear.com		
					
SEAL LINE	SEAL LINE	SEAL LINE	SEAL LINE	SEAL LINE	
Black Canyon 115	Bigfork Daypack 30	Pro Zip Duffel 40	Pro Zip Duffel 70	Pro Zip Duffel 100	
					
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	
0L/0gal Pro & Exped	30L/0gal Pro & Exped	40L/0gal Pro & Exped	70L/0gal Pro & Exped	100L/0gal Pro & Exped	
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	
---	---	-61	-61	-61	
---	---	-- 10- -	-- 10- -	-- 10- -	
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-	-	-	-	-	
sealinegear.com	sealinegear.com	sealinegear.com	sealinegear.com	sealinegear.com	

Images NOT to Scale

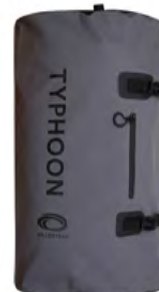
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POP= Popper or press stud
BUCKLE ROLL TOP= all roll tops are closed with a push-fit/Fastex buckle
 ●●●●● =Partial feature or OK but not ideal
 □□□□□ = Option



	MANUFACTURER	SINGING ROCK	SINGING ROCK	SINGING ROCK	SINGING ROCK
	MODEL litres/liters VARIANT	Drybag 40	Drybag 40	Dry Duffel 40 C0046BB70	Dry Duffel 60 C0046BB90
	ORIGIN				
	COST (inc Tax/VAT) Currency conversion only	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME L/US Gallon intended market	40L/10gal Pro Access	40L/10gal Pro Access	40L/10.6gal Pro Access	60L/15.8gal Pro Access
	LOAD CAPACITY	0m 0'	0m 0'	0kg 0lb	0kg 0lb
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
	BACK STRAPS HANDLES WAIST BELT	---	---	---	6
	POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH	---	---	---	---
	ID-PANEL DRAIN/VENT HAUL EYE(S)	---	---	---	---
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM	---	---	---	---
	OTHER COLOURS				
	NOTES	-	-	-	-
	WEBSITE	singingrock.com	singingrock.com	singingrock.com	singingrock.com

Images NOT to Scale

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HAUL EYES = can carry the entire weight of the bag & contents eg. for hauling or attaching to harness. May double as handles shown as 1/1
POP= Popper or press stud
BUCKLE ROLL TOP= all roll tops are closed with a push-fit/Fastex buckle
 ●●●●● =Partial feature or OK but not ideal
 □□□□□ = Option



	MANUFACTURER	TYPHOON	TYPHOON	TYPHOON	TYPHOON
	MODEL litres/liters VARIANT	Osea Backpack 20 C0046BB90	Osea Backpack 40 C0046BB90	Osea Duffel 40 360340	Osea Duffel 60 360360
	ORIGIN				
	COST (inc Tax/VAT) Currency conversion only				
SPECIFICATIONS	VOLUME L/US Gallon intended market				
	LOAD CAPACITY				
	WEIGHT empty				
FEATURES	DIMENSIONS				
	BACK STRAPS HANDLES WAIST BELT				
	POCKETS Ext/Int EYES/LOOP Ext/Int EXT MESH				
	ID-PANEL DRAIN/VENT HAUL EYE(S)				
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	OUTER MATERIALS REFLECTIVE TRIM	250D Tarp	250D Tarp	500D Tarp	500D Tarp
	OTHER COLOURS				
	NOTES				
	WEBSITE	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk	typhoon-int.co.uk

BUYERSGUIDES Water Rescue

HAND-PORTABLE SUB-SEA ROVS



VideoRay's Pro3 (now in it's Pro4 & 5 versions) in use with St. Louis County Sheriff's Rescue Squad in Minnesota's sector of the Great Lakes



We should first define the acronym that we're using here - ROV or Remote Operated Vehicle - further defined by the term SubSea because an ROV could just as easily be your kids toy car. There are other terms - UUV is Underwater Unmanned Vehicle and AUV is an Autonomous Underwater Vehicle which is not directly controlled by an operator but rather preprogrammed to carry out a specific task via a specified route and mode - these don't use a tether and are not usually utilised by rescue teams. As far as ROVs are concerned, there is a fine line between a mini or hand-portable underwater Remote Operated Vehicle that rescue agencies would or could use and the smaller end of the scientific and oilfield ROVs defined as Work-Class ROVS that look like a block of flats with arms. The difference of course is the ability for your average search team to be able to carry and deploy it and their ability to buy it in the first place. **All of the models in this guide weigh less than 40kg and cost less than a fire truck** - some of them cost less than a set of tyres for your Off Road vehicle but those big boxy exploration and maintenance ROVs are 5 and 6 figure sums or they weigh the same as a small elephant at their smallest! Take this Oceaneering OmniMaxx on the right - it looks a lot like some of the models in our guide if you look at this picture in isolation, but it's 1.3m/50" long and over a quarter of a tonne and don't even bother about asking the cost. They know you can't afford it, rescue/emergency response isn't mentioned once



in their blurb. Most of the big ROV manufacturers don't mention rescue or search & recovery in their list of possible taskings and industries served. They are all about inspection and maintenance of pipelines, subsea comms cables, ships and submarines - you can see where all the money is - oil, gas, shipping and the military... rescue, not so much (although *Poseidon's* pipe inspection ROV, the *Midway* -above- is a cylindrical shape for 12" pipes and that could well be of use to rescuers). So even though ROV's like that *Omni Maxx* might be the kind of vehicle that a dive team would crave, it is, to all intents and purposes, 'out of your league'.

As we said earlier, it's a fine line between the most 'recreational' ROV and the cheapest Search and/or Rescue ROV but cost is often the first consideration. Emergency responders and Government agencies not related to defence are unlikely to have money to burn and for most, an ROV is a luxury. It will be tempting to look at some of the numerous Chinese 'recreational' models costing only a few hundred up to a thousand or two on the basis that any capability is better than nothing? Or is it? Once you rock up to a scene with expectations of a capability in underwater search and maybe light-recovery you effectively have a duty of care to perform that task to a level of professionalism expected of any emergency service. Deploying an ROV that looks like your kids skilfully constructed it using one of those month by month publications that builds into a complete ROV might leave you with egg on your face. Because, despite the fact it worked fine in the practice pool, when it came to deployment at an actual incident with time pressing, weather rubbish and the incident commander waiting for you to perform, the video graphics looked sketchy, the tether ran out 20feet short of the target and the battery packed up after 7 minutes because the water

is pretty chilly. Not buying 'cheap' is a broad concept that you could apply to any technological kit used for rescue but ROVs - whether aerial or subsea - are a relatively new phenomenon with many new companies vying for your attention and most don't have the kind of track record that you might otherwise look for in selecting equipment. That's certainly true of aerial ROVs but in fact, subsea ROVs do have some specialists from our sector. Regular readers of **TECHNICALRESCUE** magazine will be familiar with *JW Fishers* who have been featuring for the past 30 years and this century we have seen Canadian company *DeepTrekker* and US company *VideoRay* targeting the rescue, inspection and research sectors. It's fair to say that *Deeptrekker* and *VideoRay* represent perhaps the more technological end of things - reliable modern complex subsea robotics with a range of vehicles that include an absolute maze of mission possibilities. Compared to the many Chinese models available (which may or may not be good) *Deeptrekker*, *VideoRay* and *JW Fishers* have skin in the game, a track record in rescue that you can hang your hat on. *JW Fishers* represents the bombproof, more traditional end of robotics. Their *Sea Lion* and slightly more basic *Sea Otter* are perhaps the most robust in this sector with a simple cylinder modified to take the lighting units, thrusters and manipulators common to all ROVs. We often think of them in terms of that great (and probably urban myth) analogy that retells how NASA engineers were proud of their latest innovation after thousands of hours of research and design and hundreds of thousands of dollars - a pen that could write in any orientation, underwater, in zero gravity, in freezing temperatures or extreme heat to which the Soviets replied that they too has such an innovation - they called it a pencil. Whether this is true or not, and we doubt it, the point of the analogy is that simple is often the best option. With ROVs being operated in an alien environment by rescuers who rarely get level of use and experience that deep-sea explorers and maintenance workers get but who may be operating under critical time and environmental constraints, the less to go wrong the better.



POWER/BATTERIES

All of these ROVs are electrically driven but not all have an independent on-board battery system. Some like the *Ocean Engineering Phoenix* can only operate via hardwire tether connection to a top-side power source usually housed in a Pelican style hardcase like the *Video-Ray power-case* (bottom). With transformers, many can use other top-side power sources like vehicle batteries or even mains supplies. Many fuel-driven generators on rescue trucks have AC power sockets which some, like *Video-Ray's Defender*, can use. But for the most part, in rescue we're talking independent battery power. The top-side systems provide much greater longevity and easier power monitoring and management than autonomous on-board batteries and, since a tether is usually used for retrieval, control and live feed, it is not a stretch to add a power cable. Nevertheless a tether adds bulk and drag which an on board battery doesn't but work/search durations are radically different - expect 1 to 4 hours with an on-board high end Li-ion or polymer. The *BlueROV2* left quotes 2 hours for heavy use up to 6 hours with 'light' use. A tether may allow up to 8 hours from a top-side powerpack.

CONTROL OF THRUSTERS

In terms of controlling your ROV, this relies on thrusters, basically impellers that can have variable orientation but are more usually fixed. Vector thrusters are paired in opposing directions as you can see in the *Fishers Sea Lion* at the top, the *Oceanobotics* model in the titles and the *Blue ROV* above with additional vertical thrusters for lift. Variable thrusters can be rotated to give infinite directional control. The way you control might be via a simple thumb toggle or, taking a leaf out of military UAVs, the *Play Station*-style controller is seen by many under 50 year-olds as an easier means to control the ROV. The control systems and imaging options are often pre-mounted into a *Peli*-style hard case with the monitor handily located in the lid and ready for use when you open the case like the Fisher system top for their *Sea Lion2*.

Lighter weight, out-of-the-box controllers are also available like

UPDATED Jul '26

the *Deeptrekker* system far right used to control its *DTG3* ROV and *Video-Ray's Expeditionary* controller on the previous page using a tablet with add-ons from the main control box. Lap top computers are another common interface to provide video and sonar viewing.

SENSORS

On-board sensors can provide data on temperature, depth, direction/orientation, size of and proximity to objects. Exact location of your ROV has to be achieved via transponders **rather than GPS because satellite-based systems only work in the surface layers of water.** A little easier to work out is orientation of the ROV in terms of whether it is upside down etc. and this is achieved with an onboard gyroscope or gimbal relaying attitude to the system. This is all important information that affects the ability of the ROV to perform and enable the controller to carry out specific tasks. Some ROVs have these sensors as standard, most can be added to a package. At a minimum, rescuers will want the option of temperature because the colder it is, the shorter time your battery will last and a navigation package. Navigation in terms of directing the ROV where to go is usually undertaken with **USBL** tracking which uses the surface boat (if you are using one) as its reference GPS. There are also computer analytics that use DVL or Doppler Velocity Log (speed relative to the seabed) and distance from mother-ship figures to calculate location. Usually, DVL just give you an accurate speed. We have lumped these into ASPECT sensors shown as a green square ■ in our tables.

VIDEO, IMAGING & LIGHTING

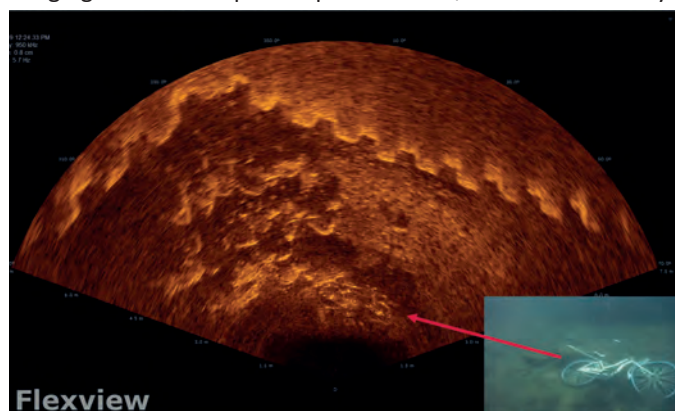
Getting your Remotely Operated Vehicle to the underwater scene is only one part of the package requirements, in fact, by itself is of no use whatsoever. The ROVs need to be able to do something tangible and this means at least the ability to scan an area with Sonar or IR etc or film and illuminate a scene and to relay that back in real time to the team on top. There they will view data and control the ROV from a mobile 'command-Post' like the *Fishers* model above. Real-time visuals include video and higher resolution stills and these generally need to be well illuminated. All ROVs have on-board lighting - arrays of LEDs these days offering differing lighting levels and types of beam from long range spot to short range wide-area flood.

Something that doesn't require lighting is Sonar. Sonar is the most often used asset by rescue agencies and this is a complex field in itself with most ROVs designed to accommodate a specific brand/model of multi-beam rather than scanning or side-scan sonar (there will be separate GUIDE to SONAR). The image below is via a *Kongsberg Flexview* sonar which can be retrofitted to many ROVs and in this case has picked out the outline of a bicycle but humans can be far less distinct and it



takes a skilled operator with lots of experience to discern a bone-fide target from all the other clutter than may be adorning a lake, bay or river bed.

Your ROV may be equipped with a manipulator arm that can either grab and retrieve objects (to a very specified weight) or perform other manipulation and or cutting tasks but the vast majority of dive and surface water rescue teams are using their ROVs as a search tool so it is the video capability and/or acoustic/sonar imaging that are most important. And these are elements that can really rack up the bill on your ROV. Imaging sonar will triple the price of a US\$10K ROV. it's always



the add-ons that get you but these add-ons can be crucial. High Definition video aided by high intensity white light LEDs with images relayed by a hard-wire (fibre-optic) tether offer the most reliable way to get the best quality images to the controller on top though there are WiFi telemetry systems that will undoubtedly improve in the coming years. This may not be quite as useful a development as you might think because virtually all ROV deployments would use a tether to the surface anyway in order to deploy, recover or find your ROV should it shut-down and become lost or entrapped. The downfall of video is that it relies on fairly clear water and this is often not what you're dealing with in inclement weather which is why acoustic imaging or sonar is a more favoured function - it not only 'sees' through the murk, it does so over distance of 100s of feet. It is sonar which sets apart the more serious ROV packages.

MORE TECHNICAL INFO NEEDED on Cameras VIDEO & IMAGING

Make Searching Open Waters Safer & Easier with JW Fishers Underwater Equipment

Hand Held Underwater Metal Detectors



Pulse 8X

- Detects ALL metals on land & underwater
- Audio and Visual output
- Commercial construction
- Ideal for evidence recovery
- Rated #1 by US Homeland Security

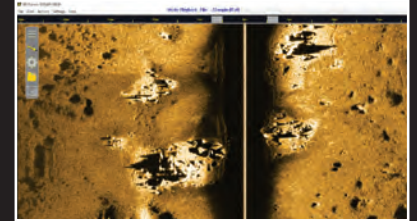
SAR-1

- "Snareless" design with VIBRATING handle
- Bright red LED display
- Specialized for low visibility environments
- 200' depth rating

Side Scan Sonar



* Simulated Drowning Victim



600kHz - CW

- Simple to operate
- Up to 225' (75m) range on each side
- Displays images on laptop or tablet
- Commercial construction
- Works in all waters, regardless of clarity
- In use by public safety dive teams

450kHz / 900 kHz - CHIRP

- Fully digital
- Up to 495' (150m) range on each side
- Breaks down for easy transport (case included)
- Commercial construction
- Low cost and easy operation
- Complete turnkey system

Remote Operated Vehicle with Sector Scanning Sonar

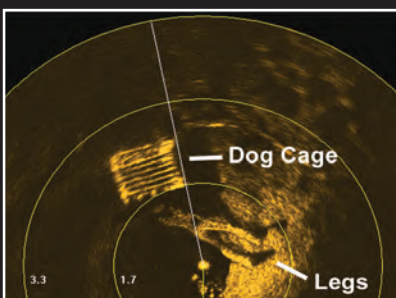


SeaLion-3

- 7 vectored, thruster system
- Front and rear 1080p HD cameras
- Two monitors for viewing and control
- Picture in picture (PIP) functionality
- Easily transportable
- Commercial construction
- 1,000' depth capability

SCAN-650

- Target sizing capability
- 360° sweep pattern
- High resolution imagery
- User friendly software
- Commercial construction
- ROV, pole or tripod mountable
- Starting at \$6,995



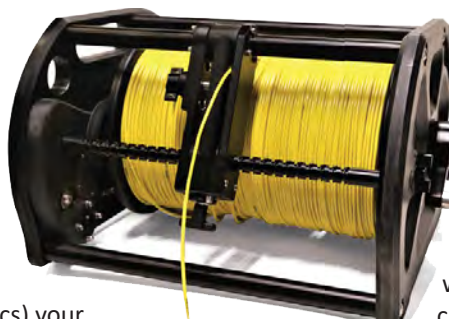
PHONE: (508) 822-7330
info@jwfishers.com
jwfishers.com

TETHERS

Technically a tether is simply the load-capable connection between your ROV and top-side that enables you to drag it back should it lose power. Once you add a power cable and data transmission cable (fibre-optics) your tether is actually an umbilical providing and receiving vital power and/or data as well as being the distance restraint and haul-back line. Power transmission cables like the *Video-Ray Expedition Reel* above, may not be as long as a simple tether cord or cord & fibre-optic tether which is only limited in length by the capabilities of your ROV and sheer weight and bulk of log tether lengths. Your ROV will have a depth rating which is related to water pressure and what the casing can withstand. This can be anything from 5 metres/16feet to 2000m/6560ft. Two things to note here - 1) you might think 5 metres - what the hell use is that? But if you are an inland water rescue or dive team it is highly likely that the vast majority of your incidents will involve water depths of less than 30ft so size isn't everything. 2) Equally, do not think that if your ROV has a limit of say 100feet, you only need 100 feet of tether or umbilical. Again, it's not about depth, it's about lateral searching.

JWFisher's tether option for the 1000ft rated *Seal Lion* is 1500ft, not so that you can run it so far beyond 1000feet that you might break it but so that you can move up to 1500ft laterally from your control position - it might only ever be 15ft deep. Of course you then have concerns about the battery life and in particular if you are fighting a current or water flow. That's when that tether might become even more crucial as it allows you to run your ROV out to the max and then manually haul it back rather than operating on only half the limit because you are guiding it back under power before passing the PONR.

Tethers add considerably to the air weight of the package and to the in-water drag that the ROV experiences though they are often neutrally buoyant. Experienced controllers learn to manage the cables so that they impart the minimum drag from the cable reel or pack to the water's edge. In-water there's not too much you can do other than avoid changes of direction after obstacles or even seaweed wracks that will conspire to add drag and limit the endurance time of your ROV.



MANIPULATION ARM, GRABS & TOOLS

The majority of ROVs, especially the larger, more complex models, will have a limited number of ports into which accessories can be plugged/screwed/clipped. Aside from sensors, imaging and lighting already mentioned, other add-ons

include a Magnetometer which detects Ferrous metal as distinct from a metal detector that can detect all metals (Magnetometer is shown as **FE=** in our tables). A key tool is the ubiquitous grasping jaws that you see in every deep-sea film but for rescuers, it's not so common even though it can prove immensely useful. Some are more versatile than others, the simplest, cheapest options are

single axis arms that only move up and down or left and right. Some don't move at all and are 'grabbers' or other tools that connect direct to the ROV body. Manipulators like the set sported by *Video-Ray's Defender* left, can operate in all axis directions, swivelling at the union and articulating at the elbow and 'wrist'. The best option might be a modular arrangement that allows you to quickly remove or attach a **MANIPULATOR ARM** or a head (connecting directly to an ROV

without the articulated arm) and if that also allowed you the choice of **GRAB** jaws, hydraulic **CUTTER** or even a **LASER** so much the better. But as an inherent feature that you specify at the time of purchase, these are extra expenses, complications to electronics and snag hazards that could trip you up if you are only using them infrequently. Blueprint make a generic series of manipulator arms and tools (pic right) that are used by *Boxfish* and *Video-Ray* among others.



In terms of retrieval of an object or body by grabbing it with jaws, the grip strength is not the same as the ROV's load capacity. You must remember that a strong grip closure can damage an item or disintegrate a cadaver so your control needs to be finite and accurate. You have the advantage that the load capacity is significantly increased by the buoyancy of water - a 10kg/22lb payload may just be enough to move an adult weighing 100kg/220lb under the water. *DeepTrekker*, *Video-Ray* and *Boxfish* (for instance) offer a **LASER** (scaler) which is not a James Bond villain cutting tool but a rangefinder or incredibly accurate measuring device using two beams.

KEY to TABLES.....

Any use, feature, accessory or component that is **inherent** in the product is shown as a **solid coloured square** ■■■■

If it's an **OPTION** it is shown as an **outline square** □□□□

A circle ● in the 'USE' columns indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture, If we know it's made in a different country there will be a smaller inset flag.

COST: a rough guide only - **includes** local taxes/VAT. Varies with exchange rates, extra taxes etc. We usually round up to the nearest Pound£/US Dollar\$/Euro€. We now give a currency conversion figure in orange £\$€ which is simply to give an idea of price, it is not the selling price which will have import duties and bulk shipping etc. to add.

WEIGHT (with cable/tether) Weight of the ROV only - this does not include the control system usually housed in a waterproof case like Pelican - such systems can add 15-25kg/33-55lb to the weight of the ROV and tether as an entire system

DIMENSIONS height x width x Depth: of the ROV only

DEPTH RATING

ACCESSORY PORTS: Are what enables an ROV to have audio-visual, data tracking, comms and load manipulation accessories added - things like sonar, lights and cameras and grabber tools can only be added up to the number of available ports. The number given here will be the total number of accessories that can be added at any one time but that often excludes any camera and lighting that come as standard in the base (no=options added) price.

ROV LIFT/GRAB CAPACITY: in freshwater, sea water would offer slightly higher figures. ROV lift is the body of the ROV either as an internal carrying space or with the lad attached to a central lifting eye. **GRAB** is the weight an articulated arm or grab can lift

TETHER: The type (copper for power &/or fibre-optic or both)

SUPPLIED OPTIONAL The price includes a length of tether with the range of **optional** lengths that can be purchased

BREAKING STRENGTH DIAM The linear breaking strength (tensile) and the total diameter of the cable/umbilical

SPEED OPERATING TEMP**POWER- BATTERY TETHER**

ONBOARD BATTERY DURATIONRECHARGE= The type of battery and voltage and/or WorkHours and/or AmpHours. **Duration** will vary with speed and payload and most quote a max time. **Recharge** is to 100% but many quote a figure to 80% which make the ROV functional but 100% charge is preferable.

TEMP= of the environment not the ROV

SONAR= Location finding of the target or obstructions.

GPS = TRANSPONDER that can be interrogated for position

because satellite GPS only functions in shallow water. BAE's POSYDEN system seeks to have acoustic buoys across the world to provide a bat-like response to a known location to provide GPS style data.

ASPECT= an indication of the orientation and direction using a combination of compass, USBL and DVL

METAL FE DETECTION LASER RF= FE detects ferrous metals only. **LASEER RF** is a distance rangefinder

MANIPULATOR GRAB CUTTER**HORIZ/VERTVARIABLETHRUSTERS****CAMERA(S) RESOLUTION****B W COLOUR PAN TILT****LID LAPTOP HAND MONITOR****DIRECTIONAL LIGHTING****CASE SD/STORAGE****WARRANTY**

Fill in explanations

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT
basic ROV only - full operational
package to suit your specific needs
may cost much more

£\$€=Currency conversion only - no
tax, duty, shipping etc

USES/ FEATURES:

● = OK BUT NOT IDEAL

□ □ □ □ = Option

N/A = info Not Available/not given



MANUFACTURER	BLUE EYE	BLUE EYE	BLUE EYE
MODEL VARIANT	X1	X3 ULTRA	X7
ORIGIN			
COST (base operational ROV)	£0 \$0 €0	£0 >\$40,000 €0	£0 >\$40,000 €0
WEIGHT inc battery (with cable/tether)	8.6kg* 18.96lb	<9kg 19.84lb	20kg 44lb
DIMENSIONS height x width x depth	485 x 257 x 354mm 19 x 10 x 13.94"	485 x 257 x 354mm 19 x 10 x 13.94"	680 x 430 x 250mm 00 x 00 x 00"
DEPTH RATING	150m 500ft	305m 1000ft	500m 1640ft
SPEED OPERATING TEMP	3knots -10to50°C/ 14-113°F	3knots -10to50°C/ 14-122°F	3knots -10to50°C/ 14-122°F
PAYLOAD/GRAB CAPACITY	??	??	??
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	150500m/4921640ft copper 000kg/000lb 0.0mm/0.0"	300500m/9841640ft copper 000kg/000lb 0.0mm/0.0"	300700m/9841640ft copper 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	20v ■	14.8v 96.2Wh *212.4Wh ■	2x 6.3Ah/90.7Wh 14.4v■ or*□
ONBOARD BATTERY DURATION RECHARGE	2-5hrs 2hrs	2-5hrs 2hrs	2.5hrs 2hrs Onboard
ACCESSORY PORTS	1	3	7
TEMP SONAR GPS ASPECT	■ - □ ■	■ □ □ ■	■ □ ■
METAL DETECTION LASER RF	- -		
MANIPULATOR GRAB CUTTER	□ □	□ ■ ■ rotates 260°	□ ■
HORIZ/VERTVARITHRUSTERS	4	4	4/3
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1x front 4K HD 1920x1080, 30FPS ■ ■ ■-30/+30	1x front 4K UHD 8xZoom 3840x2160, 115 FOV/30fps ■ ■ ■-30/+30	1x front 4K UHD 8xZoom 3840x2160, 115 FOV/30fps ■ ■ ■-70to+90
LID LAPTOP HAND MONITOR			
DIRECTIONAL LIGHTING	1x 3300 lumen, dimmable	1x 3300 lumen, dimmable	1x 10,000 lumen, dimmable
CASE(S) SD/STORAGE	■ ■256gb sd card	■ ■512 GB SD card	■ ■ 512 GB SD card
CERTIFICATION WARRANTY	CE 0 year	CE 1 year	CE 1 year
NOTES	Single-operator deployment Live streaming via app. Operates in currents up to 2 knots 100kilo tether max load ABS + aluminium construction *Weight includes salt water ballast.	*optional High Capacity battery ABS + aluminium + polycarbonate construct HCP 30 polymer foam buoyancy Operates in up to 2-knot current 3 guest ports with full power + comms UHD 4K camera High-performance IMU 1000 ft depth rating	Field-changeable tool heads. *Optional topside power tether
WEBSITE	blueyerobotics.com	blueyerobotics.com	blueyerobotics.com

			
BLUE ROBOTICS	BLUE ROBOTICS/BLUELINK	BLUE ROBOTICS/BLUELINK	BOXFISH
BLUEROV2 ALU-FRAME	BLUEROV-HEAVY/SARbot	SARbot LITE	ROV ALPHA
			
£3630/£3855 \$4650/4940* €4280/€4545	£0 \$0 €0	£19,500 \$25,000 €23,000	£45,000 \$55,000 €52,000
11 12kg 24 27lb	13.5-16kg 30-35lb	13.5-16kg 30-35lb	23kg* 53lb
457 x 338 x 254mm 28 x 17 x 14"	457 x 575 x 254mm 18 x 22.6 x 10"	457 x 575 x 254mm 18 x 22.6 x 10"	714 x 435 x 351mm 28 x 17 x 14"
100300m 328984ft	100300m 330984ft	100300m 330984ft	300m 984ft
3 knots -00to00°C/ 00-00°F	? knots -00to00°C/ 00-00°F	? knots -00to00°C/ 00-00°F	-10to45°C/ 14-113°F
1.2-1.4kg/2.6-3.1lb	?	?	??
100300m/330984ft 000kg/000lb 0.0mm/0.0"	50to300m/984ft 000kg/000lb 0.0mm/0.0"	50to300m/984ft 000kg/000lb 0.0mm/0.0"	fibre-optic 100<3000m/330<10000ft 000kg/000lb 0.0mm/0.0"
	Lithium ion 18ah 21.6v ■	Lithium ion 18ah 21.6v ■	Lithium Polymer 21.6v 600Wh ■
2-6hrs 0hrs	0hrs 0hrs	0hrs 0hrs	<12hrs 5hrs
	 	  	   
			
	■ rotates 360°	■ rotates 360°	
4/2	4/4	4/4	8
1x HD Video 1080p ■ +-90°	1x HD Video 1080p ■	1x HD Video 1080p ■	1main + 2 fore/aft NavCams 4K ■
			17" 4K
2 or 4x 0 to 1500 lumen	6000 lumen	6000 lumen	2 x 5000 lumen + reversing lights
	 	 	
	0 year	0 year	1 year
*Price excludes controllers, monitor etc. The BlueROV2 is the world's most affordable high-performance ROV. With a 6-thruster vectored configuration, open-source electronics and software, and plenty of expandability.	Difference between SARbot and SARbot Lite?	*Weight includes Sonar package	Should this be just the ALPHA? *Weight includes salt water ballast. 5hrs Battery mains Recharge or 1.5hrs Field recharge. Auto RTB if comms are lost Blueprint Oculus and tool compatible
bluerobotics.com blue-linked.com	bluerobotics.com blue-linked.com	bluerobotics.com blue-linked.com	boxfishrobotics.com

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT
basic ROV only - full operational package to suit your specific needs may cost much more

£\$€=Currency conversion only - no tax, duty, shipping etc

USES/ FEATURES:

● = OK BUT NOT IDEAL

□ □ □ □ = Option

N/A = info Not Available/not given



MANUFACTURER	BOXFISH	DEEPINFAR	DEEPINFAR
MODEL VARIANT	ROV	MAX 2	M6
ORIGIN			
COST (base operational ROV)	£70,000 \$85,000 €80,000	£0 \$0 €0	£0 \$0 €0
WEIGHT inc battery (with cable/tether)	24kg* 53lb	15kg 33.07lb	15kg 33.07lb
DIMENSIONS height x width x depth	714 x 435 x 351mm 28 x 17 x 14"	485 x 380 x 295mm 19.09 x 14.96 x 11.61"	550 x 380 x 295mm 21.65 x 14.96 x 11.61"
DEPTH RATING	500/1000m 1640/3300ft	150m 492.13ft	150m 492.13ft
SPEED OPERATING TEMP	-10to45°C/ 14-113°F	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F
PAYLOAD/GRAB CAPACITY	??		
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	fibre optic 200<3000m/660<10000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	Lithium Polymer 21.6v 600Wh ■	■	■
ONBOARD BATTERY DURATION RECHARGE	4-15hrs 5hrs	4hrs 0hrs	0hrs 0hrs
ACCESSORY PORTS	7		
TEMP SONAR GPS ASPECT	■ □ □ □	□ □	□ □
METAL DETECTION LASER RF	□		
MANIPULATOR GRAB CUTTER	□ □	□ □ □ rotates 180°	□ □ □ rotates 180°
HORIZ/VERTVARITHRUSTERS	8		
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1main + 2 fore/aft NavCams 4K ■	4K/25fps video 12 Million Pixel Photos 1080p/120fps Slo-mo 130° Field of View ■	1x 4k camera ■
LID LAPTOP HAND MONITOR	17" with secondary 10" telemetry screen		
DIRECTIONAL LIGHTING	2 x 0 to 8500 lumen 1 rear light	lumen	lumen
CASE(S) SD/STORAGE	■	■ ■	■ ■
CERTIFICATION WARRANTY	1 year	0 year	0 year
NOTES	Should this be just the ALPHA? *Weight includes salt water ballast. 5hrs Battery mains Recharge or 1.5hrs Field recharge. Auto RTB if comms are lost Blueprint Oculus and tool compatible	Compact micro-class ROV with vector layout and optional sonar/laser/arm modules.	Options:4K Camera/Single/dual function/ robotic arm/Multi-beam image sonar/ Laser measurement systems/Water quality sensors
WEBSITE	boxfishrobotics.com	deepinfar.com	deepinfar.com

			
DEEPINFAR	DEEPINFAR	DEEPINFAR	DEEPINFAR
M8	OTTER	PT-3	PT-4
			
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
18kg 39.68lb	23kg 00lb	35kg 00lb	34kg 00lb
600 x 420 x 320mm 23.62 x 16.54 x 12.6"	787 x 456 x 297mm 00 x 00 x 00"	755 x 514 x 410mm 00 x 00 x 00"	795 x 400 x 340mm 00 x 00 x 00"
150m 492.13ft	300m 000ft	300m 000ft	300m 000ft
-00to00°C/ 00-00°F	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F
000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"
	196Whv 	196Whv 	196Whv 
0hrs 0hrs	0hrs 0hrs	0hrs 0hrs	0hrs 0hrs
 	 	 	 
   rotates 180°	   rotates 180°	   rotates 180°	   rotates 180°
1x 	1x 	1x 	1x 
lumen	lumen	lumen	lumen
 	 	 	 
0 year	0 year	0 year	0 year
Options:4K Camera/Single/dual function/ robotic arm/Multi-beam image sonar/ Laser measurement systems/Water quality sensors	Weight excludes counterweight. 2D Imaging Sonar/ Mechanical Scanning Sonar/Doppler Velocity Log (DVL)/Altimeter Ultra-Short Baseline (USBL)/Fiber Optic In- ertial Navigation System/One/Two Function Manipulator/Water Quality Sensor/Cleaning Brush	Options: 4K Camera/Single/dual function robotic arm/Multi-Beam Imaging Sonar/ Doppler Meter/Navigation and Positioning Systems/Laser measurement systems/ Water quality sensors	Options: 4K Camera Single/dual/five function robotic arm/ Multi-Beam Imaging sonar/Doppler Meter/ Navigation and Positioning Systems/Laser Measurement Systems/Water quality sensors Crawling chassis
deepinfar.com	deepinfar.com	deepinfar.com	deepinfar.com

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT
basic ROV only - full operational package to suit your specific needs may cost much more

£\$€=Currency conversion only - no tax, duty, shipping etc

USES/ FEATURES:

● = OK BUT NOT IDEAL

□ □ □ □ = Option

N/A = info Not Available/not given



MANUFACTURER	DEEP OCEAN ENGINEERING	DEEPTREKKER	DEEPTREKKER
MODEL VARIANT	PT-4	DTG3 DTG3 SMART	PHOTON
ORIGIN			
COST (base operational ROV)	£0 \$0 €0	£0 \$8500 €0	£0 \$0 €0
WEIGHT inc battery (with cable/tether)	39.5kg 87lb	8.5kg 18lb	11.6kg 25.6lb
DIMENSIONS height x width x depth	889 x 559 x 406mm 35 x 22 x 16"	279 x 325 x 258mm 11 x 12.8 x 10.2"	576 x 36p x 310mm 0 x 0 x 0"
DEPTH RATING	300500m 1000ft	200m 656ft	120-305m 400-1000ft
SPEED OPERATING TEMP	4 knots -00to00°C/ 00-00°F	-00to00°C/ 00-00°F	-10to50°C/ 14-122°F
PAYLOAD/GRAB CAPACITY			
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	000000m/000000ft 000kg/000lb 0.0mm/0.0"	75200m/246656ft 000kg/000lb 0.0mm/0.0"	<2000m/6560ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	90-250VACsingle phase	■ Li-ion cartridge 14.8v 300Wh	■ Li-ion cartridge 14.8v 300Wh
ONBOARD BATTERY DURATION RECHARGE	0hrs 0hrs	4-8hrs 0hrs	2-4hrs 0hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	□ □ □ ■	□ □	□ □ □
METAL DETECTION LASER RF			□
MANIPULATOR GRAB CUTTER	□ □ □	□ □ □ rotates 180°	□ □ □ rotates 0°
HORIZ/VERTVARITHRUSTERS	4/1	2	2/1
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	Sony HD camera (1920x1080) Rear/aux camera/optional 30x optical & 12x digital zoom with image stabilization Horizontal field of view: 65° ■	1x front 4K HD 1920x1080, 30FPS ■	1x front 4K HD 1920x1080, 30FPS ■
LID LAPTOP HAND MONITOR			178 mm (7") Wide-Angle LCD
DIRECTIONAL LIGHTING	18000 lumen	1000 lumen (option 1-4000lmn)	1000 lumen (option 1-4000lmn)
CASE(S) SD/STORAGE	■ ■	■ ■	■ ■
CERTIFICATION WARRANTY	0 year	1 year	1 year
NOTES		Battery cartridges are upgradeable to 600Wh (recharge 3hrs) and all are hot-swappable	Battery cartridges are upgradeable to 600Wh (recharge 3hrs) and all are hot-swappable
WEBSITE	deepocean.com	deeptrekker.com	deeptrekker.com

RELENTLESS

PLACEHOLDER



The power you need to get tough jobs done

Mission Specialist underwater robotic systems are engineered to work hard. With powerful thrusters to handle currents up to four knots. A modular platform built to handle heavy payloads and a wide array of accessories. And durable construction that can take a beating and keep on working. That's how we're redefining "inspection class" to give you the performance you really need.

videoray.com | +1.610.458.3000

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Images NOT to Scale ~ = approximate COST: ~ includes local tax/VAT basic ROV only - full operational package to suit your specific needs may cost much more £\$€=Currency conversion only - no tax, duty, shipping etc USES/ FEATURES: ● = OK BUT NOT IDEAL □□□□ = Option N/A = info Not Available/not given			
MANUFACTURER	DEEPTREKKER	DEEPTREKKER	DELAIR MARINE
MODEL VARIANT	PIVOT	REVOLUTION	SEASAM
ORIGIN			
COST (base operational ROV)	£0 \$17600 €0	£0 >\$40,000 €0	>£15,000 >\$20,000 >€18,000
WEIGHT base ROV inc battery (with cable/tether)	20kg 45lb	35kg 75lb	9.6kg 21lb
DIMENSIONS height x width x depth	576 x 360 x 313mm 0 x 0 x 0"	717 x 0 x 0mm 0 x 0 x 0"	550 x 450 x 230mm 22 x 18 x 9"
DEPTH RATING	305m 1000ft	305m 1000ft	100200m 300600ft
SPEED OPERATING TEMP	-10to50°C/ 14-122°F	-10to50°C/ 14-122°F	1.75knots ~-0to40°C/ 00-00°F
PAYLOAD/GRAB CAPACITY		32kg/70lb	2kg
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	100<2000m/328<6560ft 000kg/000lb 0.0mm/0.0"	300<2000m/984<6560ft 000kg/000lb 0.0mm/0.0"	100200m/328656ft copper 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	■ Li-ion cartridge 14.8v 300wh □	■ Li-ion cartridge 14.8v 300wh □	■ NMC Lithium 196Wh v
ONBOARD BATTERY DURATION RECHARGE	4-6hrs 1.5hrs	4-6hrs 0hrs	1.3-4hrs 0hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	□ □ □ □	□ □ □ □	□ □ ■ ■
METAL DETECTION LASER RF	□	□	
MANIPULATOR GRAB CUTTER	□ ■ ■ rotates 97°	□ ■ ■ rotates 260°	□ □ □ rotates 180°
HORIZ/VERTVARITHRUSTERS	6	6	
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1x front 4K HD 1920x1080, 30FPS ■	1x front 4K HD 1920x1080, 30FPS ■	1x CMOS Sony IMX290 (low light) HD 1080p-30 fps- 80° FoV ■
LID LAPTOP HAND MONITOR			
DIRECTIONAL LIGHTING	1000 lumen (option 1-4000lmn)	1000 lumen (option 1-4000lmn)	2X 1000 lumen
CASE(S) SD/STORAGE	■ ■		
CERTIFICATION WARRANTY	1 year	1 year	0 year
NOTES	Battery cartridges are upgradeable to 600Wh (recharge 3hrs) and all are hot-swappable	Field-changeable tool heads. Battery cartridges are upgradeable to 600Wh (recharge 3hrs) and all are hot-swappable	Options: 4K Camera Single/dual/five function robotic arm/ Multi-Beam Imaging sonar/Doppler Meter/ Navigation and Positioning Systems/Laser Measurement Systems/Water quality sensors Crawling chassis.
WEBSITE	deeptrekker.com	deeptrekker.com	delairmarine.com

NEW AD SPACE

Images NOT to Scale
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basic ROV only - full operational
package to suit your specific needs
may cost much more
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N/A = info Not Available/not given



MANUFACTURER	QYSEA TECHNOLOGY	QYSEA TECHNOLOGY	QYSEA TECHNOLOGY
MODEL VARIANT	FIFISH V6 EXPERT	FIFISH E MASTER STD-NAVI	FIFISH W6 NAVI
ORIGIN			
COST (base operational ROV)	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
WEIGHT base ROV inc battery (with cable/tether)	4.6kg 0lb	6.7kg 0lb	23.4kg 51.5lb
DIMENSIONS height x width x depth	383 x 331 x 143mm 00 x 00 x 00"	430 x 345 x 185mm 00 x 00 x 00"	710 x 490 x 339mm 00 x 00 x 00"
DEPTH RATING	100m 328ft	150m 492ft	350m 1148ft
SPEED OPERATING TEMP	3 knots -10to60°C/ 14-140°F	3 knots -10to60°C/ 14-140°F	3 knots -10to60°C/ 14to140°F
PAYLOAD/GRAB CAPACITY	??	??	10kg 20kg
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	100200m 328656ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	305m/1000ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	■ Lithium Polymer 156Wh	■ Lithium Polymer 69Wh	■ Lithium Polymer 388.8Wh
ONBOARD BATTERY DURATION RECHARGE	1-4hrs 1.5hrs	1-4hrs 1.5hrs	1-4hrs 1.5hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	■ □ □ ■	■ □ □ ■	■ □ ■ □
METAL DETECTION LASER RF	□	■	■
MANIPULATOR GRAB CUTTER	□ □ □	□ □ □	□ □ □
HORIZ/VERTVARITHRUSTERS	2/4	2/4	2/4
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	Dual 12MP photo & Video 4K & 1080p HD ■	Dual 12MP photo & Video 4K & 1080p HD ■	Dual 12MP photo & Video 4K & 1080p HD ■
LID LAPTOP HAND MONITOR			
DIRECTIONAL LIGHTING	2 x 3000 lumen	2 x 6000 lumen	2 x 6000 lumen
CASE(S) SD/STORAGE	□ ■	□ ■	□ ■
CERTIFICATION WARRANTY	1 year	1 year	1 year
NOTES	*Weight includes salt water ballast. 5hrs Battery mains Recharge or 1.5hrs Field recharge. Auto RTB if comms are lost Blueprint Oculus and tool compatible	*Weight includes salt water ballast. Hot-swap batteries. E-Master is available as a 'Standard' model with all add-ons as options.	Array of Options includes various manipulator, grab and measuring heads. Laser scaler
WEBSITE	qysea.com	qysea.com	qysea.com

			
CHASING	CHASING	CHASING	CHASING
M2 S	M2 PRO	M2 Pro Max	M2 X
			
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
4.5kg 0lb	5.7kg 0lb	8kg 0lb	0kg 0lb
380 x 267 x 165mm 00 x 00 x 00"	480 x 267 x 165mm 00 x 00 x 00"	608 x 294 x 196mm 00 x 00 x 00"	810 x 636 x 453mm 00 x 00 x 00"
100m 328ft	150m 492ft	200m 656ft	350m 1148ft
4.5 knots -10to45°C/ 14to00°F	4.5 knots -10to45°C/ 14to00°F	4.5 knots -10to45°C/ 14to00°F	4.5 knots -10to45°C/ 14to00°F
2.6 to 3.2kg	3 to 3.9kg	3.6 to 5.7kg	
000000m/0000000ft 000kg/000lb 0.0mm/0.0"	200m/656ft 000kg/000lb 0.0mm/0.0"	000000m/0000000ft 000kg/000lb 0.0mm/0.0"	000000m/0000000ft 000kg/000lb 0.0mm/0.0"
☒ Lithium Polymer 97.68Wh ☐	☒ Lithium Polymer 300Wh ☐	☒ Lithium Polymer 25.2v 300Wh ☐	☒ Lithium Polymer 1000Wh ☐
4hrs 2.5hrs	4hrs 2.5hrs	4hrs 2.5hrs	2hrs 2.5hrs
5		5	
☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
☐	☐	☐	☐
☐ ☐ ☐	☐ ☒ ☐ rotates 97°	☐ ☐ ☐	☐ ☒ ☐ rotates 97°
8	8	8	6
1x Sony CMOS 4K+EIS F2.8 UHD 3080p-30to120 fps- 150° FoV	1x CMOS F2.8 UHD 3080p-30to120 fps- 160° FoV	1x Sony CMOS 4K+EIS F2.8 UHD 3080p-30to120 fps- 150° FoV	1x CMOS UHD 3080p-30to120 fps- 160° FoV
			
2 x 4000 lumendimmable	2 x 2000 lumen dimmable	2 x 4000 lumen dimmable	2 x 6000 lumen dimmable
			
controllable via app Oculus Blueprint Oculus option Hot-swappable batteries. Optional 200Wh battery pack. Takes stills while videoing	Hybrid ROV with topside and on-board power options Controllable via app Oculus Blueprint Oculus option	controllable via app Oculus Blueprint Oculus option Hot-swappable batteries. Optional 200Wh battery pack. Takes stills while videoing	controllable via app Oculus Blueprint Oculus option
chasing.com	chasing.com	chasing.com	chasing.com

Images NOT to Scale ~ = approximate COST: ~ includes local tax/VAT basic ROV only - full operational package to suit your specific needs may cost much more £\$€=Currency conversion only - no tax, duty, shipping etc USES/ FEATURES: ● = OK BUT NOT IDEAL □□□= Option N/A = info Not Available/not given			
MANUFACTURER	HYDROMEAE	JW FISHERS	JW FISHERS
MODEL VARIANT	EXRAY	SEA OTTER II	SEA LION II
ORIGIN			
COST (base operational ROV)	£0 \$0 €0	£0 \$21000 €0	£0 \$30,000 €0
WEIGHT inc battery (with cable/tether)	9kg 20lb	0kg 0lb 0oz	0kg 0lb
DIMENSIONS height x width x depth	600 x 378 x 134mm 23.62 x 14.88 x 5.28"	00 x 00 x 00mm 00 x 00 x 00"	00 x 00 x 00mm 00 x 00 x 00"
DEPTH RATING	200m 656ft	152m 500ft	305m 1000ft
SPEED OPERATING TEMP	2knots 0to40°C/ 32-104°F	4mph	4mph
PAYLOAD/GRAB CAPACITY			
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	100300m 330984ft copper <2000m 6516ft Fibre-optics 000kg/000lb 0.0mm/0.0"	000000m/2501500ft 000kg/000lb 0.0mm/0.0"	000000m/2501500ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	■3x Lithium ion 98Wh 14.4-16.8v		
ONBOARD BATTERY DURATION RECHARGE	4-6 hrs 1.3hrs	0hrs 0hrs	0hrs 0hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	■	■ □ ■	□ □ □
METAL DETECTION LASER RF		□	□
MANIPULATOR GRAB CUTTER	■	□	□
HORIZ/VERTVARITHRUSTERS	4/4	2/2	2/2
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1x 4K ■ ■ ■ 70°horizontal	1x Front 1x Rear ■ ■ ■	
LID LAPTOP HAND MONITOR	15.6" Colour	■ □ □ 10.5" Colour	■ □ □ 15" Colour
DIRECTIONAL LIGHTING	2x 4800 lumen dimmable	■ 2200 Lumen LED - Front LED Ring - Rear	■ 2200 Lumen LED - Front LED Ring - Rear
CASE(S) SD/STORAGE	■	2 ■ ■	2 ■ ■
CERTIFICATION WARRANTY	1 year	2 years	2 years
NOTES			Has a power-boost option to counter sudden current/flow change
WEBSITE	hydromea.com	jwfishers.com	jwfishers.com

			
OCEANBOTICS	OCEANBOTICS	OCEANBOTICS	
SRV-8C	SRV-8	SRV-8X	
			
£0 \$85,000 €0	£0 \$65,000 €0	£0 \$110,000 €0	
13kg 29lb	18.6kg 41lb	32kg 71lb	
460 x 370 x 390mm 18 x 14.5 x 15.5"	500 x 430 x 410mm 19.5 x 17 x 16"	640 x 510 x 510mm 25 x 20 x 20"	
350m 1148ft	350m 1148ft	350/500/1200m 1148/1640/3930ft	
copper 000000m/000000ft 000kg/000lb 0.0mm/0.0"	copper or fibre-optic 000000m/000000ft 000kg/000lb 0.0mm/0.0"	copper or fibre-optic 000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"
	 and/or 	 and/or 	
4hrs 0hrs	8hrs 0hrs	8hrs 0hrs	
  - 	   	   	
 	 	 	
  	  	  	
8	8	8	
	  15" Colour	  15" Colour	
 2x 1500 Lumen LED	 2x 1500 Lumen LED	 2x 1500 Lumen LED	
	2  	2  	
	2 years	2 years	
Deploys in 3minutes	Deploys in 3minutes <i>Ultra</i> a simpler system with lighter control system (8.4kg) but doesn't accept most accessories including sonar and does not operate in fast flow/currents.	Deploys in 3minutes <i>ATS</i> is a specialist 'ping' detector option with a sensitive acoustic (sonar) detection system for locating downed craft. Also an MDV Mine Disposal Vehicle for remote detonation of undersea mines	
oceanbotics.com	oceanbotics.com	oceanbotics.com	

Images NOT to Scale

~ = approximate

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basic ROV only - full operational
package to suit your specific needs
may cost much more

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MANUFACTURER	OUTLAND TECHNOLOGY	OUTLAND TECHNOLOGY	OUTLAND TECHNOLOGY
MODEL VARIANT	ROV-500	ROV-1500	ROV-3000
ORIGIN			
COST (base operational ROV)	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
WEIGHT inc battery (with cable/tether)	0kg 0lb 0oz	0kg 0lb 0oz	0kg 0lb
DIMENSIONS height x width x depth	00 x 00 x 00mm 00 x 00 x 00"	00 x 00 x 00mm 00 x 00 x 00"	00 x 00 x 00mm 00 x 00 x 00"
DEPTH RATING			
SPEED OPERATING TEMP	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F
PAYLOAD/GRAB CAPACITY			
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	■	■	■
ONBOARD BATTERY DURATION RECHARGE	0hrs 0hrs	0hrs 0hrs	0hrs 0hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	□ □	□ □	■
METAL DETECTION LASER RF			
MANIPULATOR GRAB CUTTER	□ □ □ rotates 180°	□ □ □ rotates 180°	■
HORIZ/VERTVARITHRUSTERS			
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1x ■	1x ■	1x ■
LID LAPTOP HAND MONITOR			
DIRECTIONAL LIGHTING	lumen	lumen	lumen
CASE(S) SD/STORAGE	■ ■	■ ■	■ ■
CERTIFICATION WARRANTY	0 year	0 year	
NOTES			
WEBSITE	outlandtech.com	outlandtech.com	outlandtech.com



POSEIDON ROBOTICS	POSEIDON ROBOTICS	POSEIDON ROBOTICS	POSEIDON ROBOTICS
MIDWAY	LANAI	LANAI SAR	LANAI PRO
£0 \$0 €0	£28,600 \$39,000 €33,350	£43,230 \$59,000 €50,420	£57,900 \$79,000 €67,540
8.2kg 18lb	14kg 0lb	0kg 0lb	20.3kg* 0lb
00 x 00 x 00mm 16.9 x 10 x 10"	559 x 356 x 305mm 22 x 14 x 12"	559 x 356 x 305mm 22 x 14 x 12"	576 x 387 x 353mm 22 x 14 x 12"
305m 1000ft	400m 1312ft	400m 1312ft	400975m 1312ft
	4.6kmh 2.9mph 2.5knots	4.6kmh 2.9mph 3knots	4.6kmh 2.9mph 3knots
1.4kg 3lb	1.5kg 3.3lb		3kg 6.6lb
305-1500m/1000-5000ft fibre-optic 000kg/000lb 0.0mm/0.0"	125m 318ft fibre-optic 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	250000m/820000ft 200kg/440lb 9.3mm/0.37"
■ 1kw	■ 5/12/24v DC	■	■ 1.5kw
0hrs 0hrs	0hrs 0hrs	0hrs 0hrs	0hrs 0hrs
■ □	□	■ □	■ □
□	■ Newton	■ Newton	■ Newton
4 /2	4x 35° /4		
	1080p HD ■ ■	1080p HD ■ ■	1080p HD ■ ■
15.6" Colour in case-lid	12" Colour in case		
2 x 1500 Lumen	4 x 1500 Lumen	4 x 1500 Lumen	6 x 1500 Lumen
■	4 ■	■	■
2 years	2 years	2 years	2 years
Cylindrical shape designed to enter a 12" pipe	Price includes control PC & software and sunlight readable monitor. 6-person onsite SAR training for 2 days.	Rescue specific version of the Lanai Pro Price includes 6-person onsite SAR training for 2 days.	
poseidonrov.com	poseidonrov.com	poseidonrov.com	poseidonrov.com

Images NOT to Scale

~ = approximate

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may cost much more

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□□□□ = Option

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MANUFACTURER	POSEIDON ROBOTICS		THOR ROBOTICS
MODEL VARIANT	LANAI X		TRENCHROVER 110
ORIGIN			
COST (base operational ROV)	£79,860 \$109,000 €93,140		£0 \$0 €0
WEIGHT inc battery (with cable/tether)	19kg 41.8lb		4.2kg 9.25lb
DIMENSIONS height x width x depth	615 x 360 x 450mm 00 x 00 x 00"		360 x 200 x 200mm 14.2 x 7.9 x 7.9"
DEPTH RATING	400950m 13123116ft		5-30m 16-98ft
SPEED OPERATING TEMP	4.8kmh 3mph 2.6knots		1.5kn 2.8kmh
PAYLOAD/GRAB CAPACITY	2.6kg 5.7lb		
SUPPLIED OPTIONAL TETHER BREAKING STRENGTH DIAM	500m/1640ft fibre-optic 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	30m/000000ft 000kg/000lb 0.0mm/0.0"
POWER= BATTERY TETHER	■ 1.5kw		■ 12v 3Ah NiMH or 5Ah LiPo
ONBOARD BATTERY DURATION RECHARGE	0hrs 0hrs		0hrs 0hrs
ACCESSORY PORTS			
TEMP SONAR GPS ASPECT	■ □		
METAL DETECTION LASER RF			
MANIPULATOR GRAB CUTTER	■ Newton		
HORIZ/VERTVARITHRUSTERS			2/2
CAMERA(S) RESOLUTION OPTION B W COLOUR PAN TILT	1080p 60hz HD		
LID LAPTOP HAND MONITOR			
DIRECTIONAL LIGHTING	6 x 1500 Lumen		2x 300 lumen
CASE(S) SD/STORAGE			■ ■
CERTIFICATION WARRANTY	2 years		2 years
NOTES			Wireless version available. NB: uses proprietry battery <u>not</u> supplied
WEBSITE	poseidonrov.com		thorrobotics.com



THOR ROBOTICS	VIDEO RAY	VIDEO RAY	VIDEO RAY
TRENCHROVER 200H	PRO4 IP65 ULTRA	PRO5	MISSION SPECIALIST DEFENDER
£0 \$0 €0	£0 \$20-35,000 €0	£0 \$0 €0	£0 \$120,000 €0
15kg 9.25lb	6.1kg 13.5lb	11.8 36.6kg 26 80.9lb	17.2 32kg 38 71.6lb
500 x 340 x 280mm 19.7 x 13.4 x 11"	375 x 289 x 223mm 14.75 x 11.4 x 8.75"	516 x 330 x 257mm 20.3 x 13 x 10.1"	711 x 394 x 238mm 28.8 x 15.5 x 10.4"
30m 98ft	305m 1000ft	305m 1000ft	1000m 3280ft
2kn 3.7kmh		4.4 kn	4.4 kn
		11.3 22.6kg 25 50lb	11.3- 22.6kg 25 50lb
30m/0000000ft 000kg/000lb 0.0mm/0.0"	000000m/000000ft 000kg/000lb 0.0mm/0.0"	76550m/2501804ft 000kg/000lb 0.0mm/0.0"	76550m/2501804ft 000kg/000lb 0.0mm/0.0"
■ 12v 3Ah NiMH or 5Ah LiPo		■48vDC NiMH or Li-ion & ■48vDC	■48vDC NiMH or Li-ion & ■48vDC
0hrs 0hrs	0hrs 0hrs	0hrs 0hrs	NIMH 1-2hrs, Li-ion 2-4hrs 1-8.5hr
	■	■ □ □ ■	■ □ □ ■
	□	□	□
■	□	□ □ □	■ □ □
4/4		2/1	4/3
		1x Front 13mp still. 16x digital zoom ■ ■ ■	1x Front 1x Rear 13mp still. 16x digital zoom ■ ■ ■
■ □ □	■ □ 15" Colour	■ □ □ 15-21" Colour	■ □ □ 15-21" Colour
2x 300 lumen		2x7600 Lumen spot & flood on both LED arrays	2x7600 Lumen spot & flood on both LED arrays
■ ■	2 ■ ■	3 ■ ■	3 ■ ■
2 years	2 years	2 years	2 years
Wireless version available. NB: uses propriety battery <u>not</u> supplied	Ultra a simpler system with lighter control system (8.4kg) but doesn't accept most accessories including sonar and does not operate in fast flow/currents.	Sonar options include Teledyne, Tritech and Blueprint systems. Blueprint Oculus systems offer 5 to 120m/394ft ranges.	Sonar options include Teledyne, Tritech and Blueprint systems. Blueprint Oculus systems offer 5 to 120m/394ft ranges..
thorrobotics.com	videoray.com	videoray.com	videoray.com

HAND-PORTABLE SURFACE ROVS



Most of the models in this Guide are more accurately described as Powered Rescue Buoys (PRB) or Remote Control Rescue Bouys (RCRB) and in the reconstituted words of the great Dr Michael Croslin - anything that helps rescue the casualty without the rescuer needing to enter the water is a good thing. Currently, there are 5 types of SURFACE ROVS:

- **Aerial life belts** (not to be confused with AUV's like Australia's *Little Rippers* that drop floatation rather than 'being' floatation themselves.) These fly to the scene before becoming passive lifebuoys on the surface but one of the *ING RESCUE* models has directional thrusters for more accurate positioning towards the casualty.
- **Horseshoe shaped Jet-propulsion 'Buoys' (RCRBs)**
- **Flat 'long' or 'Stretcher' Jet Propulsion Boards**
- **Remote controlled Boats - both mini and full-size**

The majority are Chinese - both the top-end professional models and the more dubious cheap ones! It is best to go with the models you have heard of, seen advertised or had recommended to you. It's hard to pin down the exact manufacturer of some models. Two of the more prolific manufacturers would seem to be JTT and Ing Rescue in China with some really interesting rescue products but we could not find any viable certification or adoption by any agency outside of China so you would need to research and liaise with such companies to take things further. Most of these powered buoys have a shell made of high density polymer or reinforced composite with closed cell foam inside to ensure buoyancy even if damaged and make no mistake, these things are pretty robust with bump guards on the nose. The majority will self-right thanks to strategic weight and buoyancy placement, hull curvature and directional thrusters. Some can be manually controlled by the rescuer like the Amara R1 above (shown in our tables with ♦) but the remote element lends itself to a degree of full autonomy that will (and is) seeing these things used in place of a regular lifebuoy/life-ring. Above-right is Vector's vision of how RCRBs can be used in the absence of a beach

rescue/lifeguard service. Note that the **Pull or tow** ability of some of these SROVs may seem very low but the in-water mass of a typical person requires only 10kg or so of pull force to overcome drag rather than body mass. Some figures that seem unusually high in manufacturer literature like 1 metric tonne/1000kg is because a typical body mass weighs close to 0kg in water and it is simply the drag they create during towing.

For example, if your SROV were to tow a 5m inflatable with 10 people at 2knots on a flat calm sea it would be pulling around 80kgf/180lbf but the true mass would be close to a metric tonne.

We have reviewed the USAFE model in **TECHNICAL RESCUE#84**, but the technology of Surface ROVs is relatively new and a little out of our expertise so we have deferred to OceanAlpha's main engineers for this introduction, and are grateful for their unbiased assessment of what to look for in a surface ROV.

Powered Rescue Buys are not a replacement for trained rescuers, but they can change the first minutes of an open-water incident. Their value depends on speed, controllability, buoyancy, propulsion protection, communications, and how well they are integrated into rescue procedures. In many water rescue incidents, as lifeguards will tell you, the first challenge is in identifying that a person is actually in difficulty because it's the ones NOT waving and shouting that are most in need of rapid rescue and this will almost always require lifeguard or rescuer swimmer intervention because they are not able to help themselves onto a remote controlled craft or lifebuoy. For those that are in difficulty but still able to wave, shout or even swim, the first consideration is getting buoyancy to that person quickly, accurately, and without putting another rescuer into the same hazard.

Traditional equipment remains essential. Throw lines, rescue tubes, reach poles, inflatable boats, jet skis, and rescue boards all have clear roles in a trained response. Each, however, also has operating limits. A thrown lifebuoy is simple and reliable, but its range and accuracy depend on the rescuer, the wind, and the distance to the casualty. A boat or jet ski can cover distance quickly, but it needs trained operators, launch access,



TITLE PIC OPPOSITE: *OceanAlpha's Dolphin 3* is one of the industry's best-known powered rescue buoys. In the image opposite, it is being used to retrieve a swimmer, delivering flotation and controlled return support while allowing the rescuer to remain in a safer position. The USAFE device shown above illustrates a different rescue application, where a rescuer can be carried toward a casualty. Above-right: not all rescue flotation devices are launched from the surface. Some aerial delivery platforms, such as the JTT rescue ring, are deployed from above and then become passive floating rescue aids, while powered surface devices can help bring a casualty back toward safety.

turning room, and careful handling near a person in the water. A swimmer rescue can be immediate, but it places the rescuer directly into the current, surf, cold water, low visibility, or panic contact zone.

Remote-controlled lifebuoys sit between these tools. They are best understood as powered flotation devices that can be sent toward a casualty from a safer position. The rescuer remains on shore, on a vessel, on a pier, or at another stable launch point, while the device carries buoyancy and handholds to the person in the water. Once contact is made, the device can be guided back or used to stabilise the casualty until another recovery method arrives.

This makes the technology useful, but not automatic. For rescue organisations, the key question after affordability is not whether a powered lifebuoy is fast. It is whether it can be controlled, seen, held, recovered, maintained, and trusted under the actual conditions in which the team works. The first design consideration is the balance between speed and controllability. High top speed helps when the casualty is far from shore or drifting quickly, but excessive speed near a person in the water can create handling and contact risks. Operators need progressive control, predictable turning, and a clear approach method. In practice, many teams train their operators to use higher speed during the transit phase, then reduce speed during final approach. This allows the device to arrive quickly without striking the casualty or overshooting the target.

Buoyancy and towing capacity are equally important. A powered lifebuoy does not need to lift a person fully out of the water, but it must provide stable flotation that a weakened, panicking, or cold casualty can hold. Handles, ropes, body shape, and the height of the device in the water all affect this

SURFACE ROVs



TOP: Remote control has been successfully applied to all manner of vehicles and craft. Rescue is usually a poor relation to the military in terms of development but there are already commercially available inflatable rescue boats like this model from JTT. Below that an enlargement of the life-buoy concept with Germany's Fire&Resq heated and folding 'stretcher' akin to an open-backed swiftwater raft—an excellent idea for keeping hypothermic casualties warmer. LEFT is the FASTY from Marin Robotics, one of several that use twin propulsion 'jets' in a horseshoe configuration. The remote controls for all of these craft are an important consideration. Some are simple controllers that rely on the rescuer watching the device itself while others have screens linked to on-board cameras as well as one way or even two-way mics for direct communication with the casualty which can be essential in calming and advising.

interaction. In multi-casualty or heavy-current scenarios, towing capability also matters. A device may need to support one person, assist several people holding the same platform, or help move equipment and lines across water.

The propulsion system is one of the most safety-critical areas. Open propellers can create entanglement and injury risks, especially around hair, loose clothing, weeds, floating debris, and rescue lines. For this reason, many modern powered lifebuoys use guarded or ducted propulsion. The purpose is not only to protect the equipment, but also to reduce the risk of secondary injury when the device reaches the casualty. Intake design, grille spacing, thrust output, and resistance to blockage all affect reliability in rivers, surf zones, ports, and floodwater. Self-righting capability is another practical requirement. A device may be thrown from height, hit by waves, rolled by surf, or pulled over by a casualty. If it cannot recover its operating orientation, speed and power become irrelevant. Automatic self-righting reduces the number of failed deployments and makes the device more tolerant of rough handling during emergency use.

Communications and visibility determine whether the rescuer can keep control during the incident. Control range figures should always be read with conditions in mind, especially line of sight, antenna position, interference, rain, spray, and vessel traffic. Bright colour, navigation lights, position lights, and screen feedback help the operator track the device. In low-light operations, searchlights or loudspeakers can support both

visibility and casualty instruction. A calm voice instruction from the shore may help a panicking person understand where to hold and how to cooperate with the recovery. Battery readiness is less 'dramatic' than speed, but it is central to real-world use. Rescue equipment must be ready at the start of the shift, not only after a full charge in a demonstration environment. Teams should consider charging time, standby mode, storage method, battery health checks, and post-incident turnaround. Waterproof charging interfaces, magnetic power isolation, and dedicated storage stands can reduce small operational failures that otherwise prevent a device from being available when needed.

Smart functions can add value, but they should be treated as support tools rather than a substitute for training. Positioning systems, auto-return, cameras, remote monitors, and status displays can help in certain scenarios. They are especially useful when the casualty is at distance, visibility is poor, or the operator needs real-time information about battery level and signal strength. However, teams should still train for manual operation, loss of signal, low battery, current drift, and recovery of the device after use.

The most effective deployments usually follow a simple sequence. The team identifies the casualty and hazard, chooses a launch point with the clearest approach, powers and checks the device, enters the water if the model supports water-triggered activation, drives toward the casualty, slows for final approach, instructs the casualty to hold the handles or ropes, and guides the device back to a recovery point. After use, the team should rinse the device if used in saltwater or contaminated water, inspect the hull and propulsion area, check the battery, and record any impact, drop, or abnormal operation.

There are also situations where a powered lifebuoy should not be treated as the primary answer. It may be unsuitable where the casualty is trapped, unconscious face-down, under a structure, beyond reliable visual control, close to heavy vessel movement, or in floodwater containing significant debris. It also does not remove the need for medical response, spinal precautions, casualty assessment, or trained extraction from the water. The strongest role for the device is often early flotation and contact: reaching the casualty before a boat, swimmer, or recovery team can do so safely.

We'll use the *OceanAlpha Dolphin 3 Series* to describe the various features that can be present on the twin propulsion systems in particular:

The typical 'horseshoe' surface lifebuoy is an intelligent, self-propelled rescue device for water rescue. The *Dolphin 3* as an example, measures 100 cm x 70 cm x 25 cm and uses an LLDPE hull with an IP67 waterproof rating. Key specifications include a maximum speed of 7 m/s, endurance of up to 70 minutes at 3 m/s under calm-water conditions, and line-of-sight control range of up to 800 m. The device includes handles, handle ropes, position and signal lights, an OLED screen, magnetic power switch, charging port, camera, bumper, and throttle buttons. The *Dolphin 3* and *Dolphin 3 Plus* both include auto

self-righting, while *Dolphin 3 Plus* adds Dual GNSS, auto return, on-board camera, and remote monitor. A charging stand, search light, and loudspeaker are listed as optional equipment.

These specifications are useful, but they are only part of the evaluation. A rescue organisation considering any remote-controlled lifebuoy should test it in its own operating environment: calm water, current, surf, night conditions, vessel deployment, pier deployment, and after repeated launches. Operators should practise approach angles, casualty instruction, manual recovery, lost-signal procedures, and multi-person coordination. The device should then be written into the team's standard operating procedures, with clear rules on who deploys it, where it is stored, how it is charged, and when another rescue method takes priority.

Remote-controlled lifebuoys are a great example of how technology is assisting rescuers. Their purpose is not to make rescue automatic. Their purpose is to give trained responders another way to deliver flotation, reduce unnecessary rescuer exposure, and buy time for a controlled recovery. Used with the right training and limitations, they can become a useful part of the modern water rescue toolkit.



A USER-PERSPECTIVE OF SURFACE ROV PERFORMANCE using the USAFE

by Dr Steve Glassey & Geoff Bray

*Indicative of all the leading brands is the USAFE model which we reviewed in **TECHNICAL RESCUE** #84 in 2024 - this is an excerpt:*

Operating the remote control is straightforward: forward (and speed), left, right. Individuals familiar with gaming consoles or drones will quickly adapt to the device. Notably, if the buoy flips over, it automatically signals resetting it's orientation with the controller through its patented "Flip and Move" feature. Turn it on, toss it into the water, and start using the controller—it's that simple.

PERFORMANCE

The *USafe* is user-friendly and performs exceptionally well on flat water, allowing operation as far as the eye can see. It demonstrated the power to retrieve both a victim and a rescuer (manikin) without significant difficulty. We even had it tow a small inflatable sled and carry a rope across the water. In calm waters, it met expectations without any surprises. However, the real test was in swiftwater conditions.

In our first scenario, using the device unmanned under remote control, it navigated through Class III rapids while enduring waves and frequent flips. Thanks to buoy's "Flip and Move" auto-correct feature, we could easily continue operating despite the flips. What became evident was that the operator needed



to master using water currents to their advantage, employing ferry angles, and understanding hydrology, all of which amplified the device's effectiveness. We successfully used it to carry an 8mm water rescue line across the channel. In more challenging flow conditions, it performed well but couldn't navigate up drops, a feat that even competent kayakers or rafters might struggle with. While we attempted a run-up, our limited experience might have been a limiting factor. To assess its suitability for retrieving a victim with minimal water experience from the other side, we placed a swiftwater rescue technician on the device, with another operator on shore controlling it. Together, they worked effectively, with the in-water technician providing kick propulsion and adjusting their body position, while the shore-based operator transmitted additional propulsion through the electric motors. However, in isolation, both had their challenges, highlighting the device's potential when used in combination.

One notable shortcoming was a lag in the remote control, which, while not critical in static water, posed challenges in swiftwater, especially as the device moved around in eddies. A few seconds of delay could mean the difference between being pulled into the flow or missing the ideal timing for a turn. We ran aground several times, and a reverse option would have been beneficial instead of relying on a surge of current to recover the device. The cause of the lag, whether due to aerated water affecting the controller signal or other factors, was unclear.

If intended for swiftwater use, it would be more effective in the hands of an experienced swiftwater technician. Future versions should consider incorporating controls on the device's handles for local activation while maintaining remote control. Additional power, achievable with next-generation batteries and motors, could make it a more viable option for swiftwater rescues against powerful currents.

The device's weight (13.7 Kg) allows for easy carrying and operation by a single person. It performs exceptionally well in static water environments, making it ideal for lakes, ponds, pools, and calm rivers or slack floodwater. It might also be a valuable tool for air rescue operators focusing on winching swimmers into the water. Offshore platforms could benefit from its quick deployment compared to an IRB crew.

SUPPORT

The USafe's intakes and internal battery are reasonably easy to remove and service as needed, although the most common requirement is simply recharging the battery through an induction charger, requiring no tools. The distributor network was responsive and provided good customer service. The device includes a two-year warranty. Something we didn't have available at the time of the review was the APP which gives real-time diagnostics relating to battery power and engine status and maintenance regimes (but not physical control of the buoy).

VALUE FOR MONEY

The device is priced at approximately USD\$10,000. Whether it provides good value for money depends on how you intend to

use it. For the same price, one could purchase an IRB with a motor capable of rescuing multiple victims simultaneously. Therefore, its value is subjective and contingent on your specific needs and use-case.

LEGAL CONSIDERATIONS

While the USafe is patented in 71 countries, the regulatory status remains unclear in various countries. In the context of New Zealand, it's uncertain whether the USafe falls under the definition of a commercial vessel, given its motorization and use for transporting people. Users should seek their own legal advice regarding any regulatory requirements that may apply. Obtaining exemptions or approval for its use may be necessary.

ADVANTAGES

- Single-person carry and operation
- Operator remains out of the water during rescues
- Low training requirements (minimal)
- Robust and capable of withstanding impacts
- Highly buoyant
- Auto-correcting controller for flipped device

DISADVANTAGES

- Cost
- Unproven performance in real swiftwater conditions
- Remote controller lag
- Insufficient power for swiftwater rescues involving victims and/or rescuers
- Unclear regulatory framework for use
- No reverse function

CONCLUSION

The USafe is an excellent water safety product for flat water environments. While we lack expertise in surf conditions to evaluate its performance in such an environment, it holds promise for swiftwater scenarios. However, further testing, including comparisons with similar products like the *OceanAlpha Dolphin*, is necessary. In our preliminary assessment, a next-generation device with increased power could be the game-changer needed for swiftwater rescues. In the meantime, it's a valuable addition to the toolbox, though legal considerations should be taken into account.

The authors would like to express their gratitude to Vector Wero, Auckland International Airport (Airport Emergency Service) and Fire & Rescue Safety New Zealand for their invaluable support during this review.

KEY to TABLES.....

TERMINOLOGY: DRONE/ROV- *there are a bewildering number of names and acronyms for this market sector but one thing should be constant - an ROV (Remotely Operated Vehicle) and DRONE is ANY Remote-controlled or pre-programmed 'machine' whether it is sub-sea ROV, a surface water ROV or an aerial UAV.* An **OPTION** it is shown as an **outline square** 

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture, If we know it's made in a different country there will be a smaller inset flag.

INTENDED USE(S):

- ◆ = MARINE RESCUE- Salt water, rough seas
- ◆ = SURF RESCUE - can cope with large breaking waves
- ◆ = SWIFTWATER RESCUE - fast flowing, choppy,
- ◆ = FLAT/FLOOD WATER - lakes and large rivers, floods with debris
- ◆ = DEPLOY FROM HEIGHT - can be thrown from bridge/helo/dock etc)
- ◆ = SELF-DRIVABLE - the ROV can be operated using on-board controls, bypassing the Remote Control

● = OK but not ideal or a feature is only partially present.

COST: a rough guide only - **includes** local taxes/VAT. Varies with exchange rates, extra taxes etc. Rounded up to the nearest Pound£/US Dollar\$/Euro€. **£\$€** = currency conversion only, does not include duty, tariffs, shipping etc.

WEIGHT: Weight of the ROV only - this does not include the control system or a tether if it is supplied/used.

BUOYANCY: The degree of flotation afforded in water

DIMENSIONS height x width x Depth: of the base ROV only

HULL MATERIAL(S): The outer 'skin' and the inner (usually foam)

MAX CONTROL RANGE: Not the same as the total range it can run on one battery charge - control range is the limit that it can work away from the operator. This is usually line of sight and will be far less than the total endurance range shown as **DURATION** below.

BATTERY RANGE/DURATION: T

RECHARGE: Time for a fully depleted battery to fully charge

SPEED: This is the maximum speed when unloaded so is, in effect the response to casualty speed. Once the casualty is on board - those devices that have a tow capability will lose around half of that top speed.

SELF RIGHTING AUTO RETURN: When flipped by a wave or when thrown from height the ROV will **right itself** with handles/controls uppermost. If the ROV loses contact with the controller it will **automatically return** to its deployment point.

LIFT/GRAB & CORD HANDLES: Lift and grab handles are the more robust, moulded-in or extraneously mounted handles that will take most weight. The victim or rescuer can hold on with these. Separately there are often cord tie-in points to create cord loops often much longer than the handles and more easily grabbed by an in water victim or by a rescuer during device retrieval.

ATTACHMENT TOWING EYES: Attachment eyes are small and for cord etc. to create grab handles or securing points. **TOWING** eyes are much more substantial and not normally a feature of one-person powered 'life-buoys'.

OPERATING TEMP: As a battery run tool you can expect significant power and endurance drop-off at the lower and upper operating limits listed by manufacturers - they all operate best at 'room' temperature!

LOAD PULL/TOW CAPACITY: Load capacity is the maximum weight that can be supported by the device in water - akin to the **BUOYANCY** figure. **To pull or tow a weight the device is assisted by the near neutral buoyancy afforded by the water so an average bodyweight of 100kg translates to around 10-kg** of drag rather than actual body mass.

HAND CONTROLLER/SCREEN: These are all Remote Operated Vehicles so have some form of hand controller but some are simple, visual control via joysticks or rotating knobs and some have onboard screens showing the view from the drone itself.

ONBOARD CAMERA/SCREEN

AUDIO/2-WAY SPEAKER/SIREN: One way speech ● from the controller to the person on the board or **two-way speech** ■ allowing the buoy-user to talk back. **SIREN** ■ is an audible fog horn or emergency siren.

POWER/THRUST via...

NAVIGATION/GPS: There are four Satellite navigation systems used worldwide - **GPS** by the US, **BDS** (BeiDou) by the Chinese, **Galileo** by Europe and **GLONASS** by the russians.

BLUETOOTH WIFI APP

LIGHTS: 3 types: onboard search or **AREA** lighting ■ that illuminates the immediate area (not just a position indicator for the drone). ■ = **Navigation or marker lights** are the red and green port/starboard or white/red location marker lights ■ = **HAZARD** lights are the larger flashing emergency services beacon lights normally red, blue or amber

REFLECTIVE: REFLECTIVE material on the casing so that it can be easily seen at distant with any light source highlighting it.

CASE(S) MOUNTING RACK

WARRANTY

OTHER COLOURS

NEW AD SPACE

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT

£\$€=Currency conversion only

USES/ FEATURES:

◆ = MARINE RESCUE

◆ = SURF RESCUE

◆ = SWIFTWATER RESCUE

◆ = FLAT/FLOOD WATER

◆ = DEPLOY FROM HEIGHT

◆ = SELF-DRIVABLE

● = (any colour) OK BUT NOT IDEAL

□ □ □ □ = Option

LIGHTS ■ = Search/Area Light(s)

■ = Navigation/Marker lights

■ = HAZARD emergency service



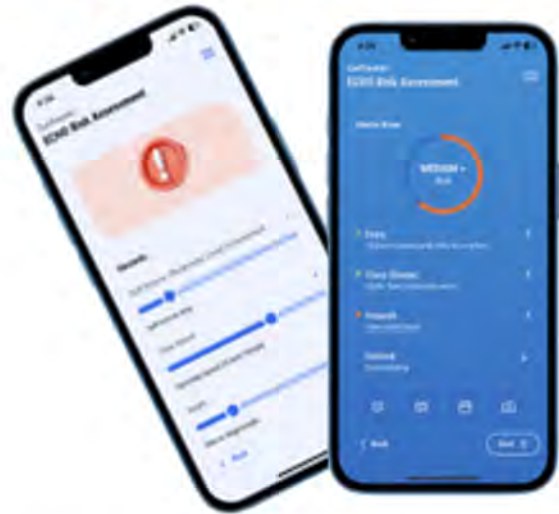
MANUFACTURER	DIDIOK	ING RESCUE	ING RESCUE
MODEL VARIANT	AERIAL LIFEBOUY		
PRODUCT CODE	JX-6A		
ORIGIN			
INTENDED USE(S)	◆ ◆		
COST	£0 \$0 €0		
WEIGHT BUOYANCY	5kg 190N 11lb 42lb		
DIMENSIONS height x width x depth	93.5 x 93.5 x 21cm 00 x 00 x 00"		
HULL MATERIAL(S)	HDPE shell, HD Polyurethane foam inner		
MAX CONTROL RANGE	1.1km/sea 10km/air 000ft		
BATTERY RANGE/DURATION	10mins		
BATTERY TYPE RECHARGE	0mins		
SPEED	46kmh/29mph 25knots		
SELF RIGHTING AUTO RETURN	NO ■		
LIFT/GRAB & CORD HANDLES	0 (life ring)		
ATTACHMENT TOWING EYES	--		
LOAD PULL/TOW CAPACITY	190N 3kg 00lb 00lb		
OPERATING TEMP	-10 to 55°C / 14 to 131°F		
HAND CONTROLLER/SCREEN	■ ■		
ONBOARD CAMERA/SCREEN AUDIO/2-WAY SPEAKER/SIREN	■ ■		
POWER/THRUST via...	4x lift rotors		
NAVIGATION/GPS			
BLUETOOTH WIFI APP			
LIGHTS REFLECTIVE			
CASE(S) MOUNTING RACK	■ ■		
WARRANTY	0 year		
OTHER COLOURS			
NOTES	Aerial rather than floating delivery of a lifebelt serving as a passive floatation . Towed recovery via tether - load figures above do NOT include tether.		
WEBSITE	didiokmaking.com		

AERIAL to SURFACE ROVs



JTT RESCUE	JTT RESCUE
FLYING LIFEBOUY FR01	FLYING LIFE BOAT FR02
	
£0 \$0 €0	£0 \$0 €0
13kg 75kg 28.7lb 165lb	00kg 00kg 00lb 00lb
98 x 78 x 26cm 38.6 x 30.7 x 10.2"	00 x 00 x 00cm 00 x 00 x 00"
HDPE; rubber anti-collision bow	
500m 1640ft	000m 000ft
0.5hrs	/0hrs
270mins	0mins
14.4kmh/8.95mph 7.7knots	00kmh/0mph 0knots
NO 	NO 
0	0
--	2 -
500kg	
-10to55°C/ 00-00°F	-00to00°C/ 00-00°F
n n	n n
1x 	1x 
4x lift rotors	4x lift rotors
 	 
0 year	0 year
jttrescue.com	jttrescue.com

 **PUBLIC SAFETY INSTITUTE**
GLOBAL



Updated swiftwater rescue app by Dr Steve Glassey

Multi-hazard risk assessment tool.

Share risk assessment with notes, photos, videos, date/time, and location. Simple and quick to use. Rescue technique videos.

Free to download.



Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT

£\$€ = Currency conversion only

USES/ FEATURES:

◆ = MARINE RESCUE

◆ = SURF RESCUE

◆ = SWIFTWATER RESCUE

◆ = FLAT/FLOOD WATER

◆ = DEPLOY FROM HEIGHT

◆ = SELF-DRIVABLE

● = (any colour) OK BUT NOT IDEAL

□ = Option

LIGHTS ■ = Search/Area Light(s)

■ = Navigation/Marker lights

■ = HAZARD emergency service



MANUFACTURER	AMARA MARITIME	DIDIOK	DIDIOK
MODEL VARIANT	R1	SMART POWER LIFEBOUY	SMART POWER LIFESAVER
PRODUCT CODE	R1	JX-5Vcompact	JX-5V
ORIGIN			
INTENDED USE(S)	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆
COST	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
WEIGHT BUOYANCY	17kg 00lb 00kg 00lb	14kg 30.8lb ≥500N ≥ 112.4lb	17kg 37.5lb 1500N 337.21lb
DIMENSIONS height x width x depth	120 x 85 x 22cm 00 x 00 x 00"	90 x 70 x 18cm 35.5 x 27.5 x 7"	110 x 80 x 20cm 43.3 x 31.5 x 8"
HULL MATERIAL(S)		HDPE shell, HD Polyurethane foam inner	HDPE shell, HD Polyurethane foam inner
MAX CONTROL RANGE	250m 000ft	2km 6562ft	2km 6562ft
BATTERY RANGE/DURATION	25-75mins	90mins	90mins
BATTERY TYPE RECHARGE	2hrs	55mins	55mins
SPEED	7-15kmh/0mph	7-2-21.6kmh/4.5-13.4mph	9-28.8kmh/6-17.8mph
SELF RIGHTING AUTO RETURN	■ NO	■ ■	■ ■
LIFT/GRAB & CORD HANDLES	4	2 -	7 4
ATTACHMENT TOWING EYES	- -	2 -	- -
LOAD PULL/TOW CAPACITY		1000kg	1000kg
OPERATING TEMP	-00 to 00°C / 00 to 00°F	-10 to 55°C / 14 to 131°F	-10 to 55°C / 14 to 131°F
HAND CONTROLLER/SCREEN	■ -	■ ■	■ ■
ONBOARD CAMERA/SCREEN AUDIO/2-WAY SPEAKER/SIREN	*1x □ □ □	■ ■	■ ■
POWER/THRUST via...	2x jet thrusters	twin ducted jet thrusters	twin ducted jet thrusters
NAVIGATION/GPS	* □		
BLUETOOTH WIFI APP	■ ■		
LIGHTS REFLECTIVE	□		■ ■
CASE(S) MOUNTING RACK	■ ■	■ ■	■ ■
WARRANTY	0 year	0 year	0 year
OTHER COLOURS	□ ■		
NOTES	Manual and remote operation. *Any Comms, camera etc can be screw-mounted via a 1/4-20 thread on the centre consul.	Aerial rather than floating delivery of a lifebelt serving as a passive floatation . Towed recovery via tether - load figures above do NOT include tether.	Aerial rather than floating delivery of a lifebelt serving as a passive floatation . Towed recovery via tether - load figures above do NOT include tether.
WEBSITE	amaramaritime.com	didiokmaking.com	didiokmaking.com

			
DIDIOK	FIRE & RESQ	FIRE & RESQ	FIRE & RESQ
STRETCHER	FAST RESCUE DEVICE FReD	FAST RESCUE DEVICE FReD+	SMART HEATING STRETCHER
JX-WRS200	-	-	-
			
			
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
30kg 66lb	12.5kg 00lb	13.5kg 00lb	32kg 70.4lb
≥100kg ≥220lb	00kg 00lb	00kg 00lb	183kg 402lb
173 x 80 x 28cm 00 x 00 x 00"	00 x 00 x 00cm 00 x 00 x 00"	00 x 00 x 00cm 00 x 00 x 00"	100-190 x 70-55 x 40-30cm 00 x 00 x 00"
HDPE shell, HD Polyurethane foam inner	HDPE shell, HD Polyurethane foam inner	HDPE shell, HD Polyurethane foam inner	HDPE shell, PE Bed HD Polyurethane foam inner
*2.2km 6562ft	1000m 3281ft	600m 1968ft	1000m 3281ft
75mins	/0hrs	<60mins	<60mins
2x18v,36Ah 55mins	0mins	0mins	45Ah/2800w? 0mins
28.8kmh/17.8mph	00kmh/0mph <7knots	00kmh/0mph <13knots	00kmh/0mph 4-8knots
			
7 4	2 2	2 2	6 2
--	- 1	- 1	- 1
150kg			
-10 to 55°C / 14 to 131°F	-00 to 00°C / 00 to 00°F	-00 to 00°C / 00 to 00°F	-00 to 00°C / 00 to 00°F
			
	NO 	  One-way speaker	NO  One-way speaker
twin ducted jet thrusters	Twin thrusters	Twin Thrusters	Twin Thrusters
	-		-
			
			
0 year	0 year	0 year	0 year
*control range extendable to 10kn using 4G/5G module. stretcher bed maintains 25°C patient-warming temperature	up to 2m waves & class 6 wind resistance	Upgraded version of the standard FReD with higher speed, on board camera, remote with screen and walky-talky. up to 2m waves & class 6 wind resistance	Can reverse at 0.5knots Level 3 sea state
didiokmaking.com	fireandrescue.eu	fireandrescue.eu	fireandrescue.eu

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT

£\$€=Currency conversion only

USES/ FEATURES:

◆ MARINE RESCUE

◆ SURF RESCUE

◆ SWIFTWATER RESCUE

◆ FLAT/FLOOD WATER

◆ DEPLOY FROM HEIGHT

◆ SELF-DRIVABLE

● (any colour) OK BUT NOT IDEAL

□ □ □ = Option

LIGHTS ■ = Search/Area Light(s)

■ = Navigation/Marker lights

■ = HAZARD emergency service



MANUFACTURER	FIRE & RESQ	HERO LIFECARE	HERO LIFECARE
MODEL VARIANT	AUTO INFLATE BOAT	NEPTUNE 1	NEPTUNE 2
PRODUCT CODE	-	HSZ-V1010	HSZ-V2020
ORIGIN			
INTENDED USE(S)	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆
COST	£0 \$0 €0	£5140 \$6590 €6065	£5455 \$6,990 €6420
WEIGHT BUOYANCY	32kg 00lb 00lb 00lb	13.5kg 00kg 29.8lb 00lb	15kg 00kg 33.1lb 00lb
DIMENSIONS height x width x depth	230 x 85 x 38cm 90.5 x 33.5 x 15"	98 x 72 x 30cm 36.6 x 28.3 x 11.8"	105 x 76 x 320cm 41.3 x 29.9 x 12.6"
HULL MATERIAL(S)	Hypalon or PVC??	ABS. Reinforced flotation core	ABS. Reinforced flotation core
MAX CONTROL RANGE	1000m 3281ft	800m 2624ft	1000m 3281ft
BATTERY RANGE/DURATION	60mins	0.70hrs	0.75hrs
BATTERY TYPE RECHARGE	45Ah ? 8-9hrs	180-240mins	180-240mins
SPEED	00kmh/0mph 4-8knots	21.6kmh/13.04mph	25kmh/15.6mph
SELF RIGHTING AUTO RETURN	■	■	■
LIFT/GRAB & CORD HANDLES	3 7	2 10	2 10
ATTACHMENT TOWING EYES	2 1	- -	- -
LOAD PULL/TOW CAPACITY	250kg 550lb (1-2 people)		
OPERATING TEMP	-00 to 00°C / 00 to 00°F	-10 to 55°C / 14 to 131°F	-10 to 55°C / 14 to 131°F
HAND CONTROLLER/SCREEN	■ ■ colour	■ ■ B&W	■ ■ B&W
ONBOARD CAMERA/SCREEN	□	1x	1x
AUDIO/2-WAY SPEAKER/SIREN	■ One-way speaker	■	■
POWER/THRUST via...	2 thrusters	n	n
NAVIGATION/GPS	■	-	■+Galileo & BDS
BLUETOOTH WIFI APP	?		
LIGHTS REFLECTIVE	■ ■	■	■
CASE(S) MOUNTING RACK	■	■	■
WARRANTY	0 year	1 year	1 year
OTHER COLOURS	Inflation time <1min 3-chambers Monitor shows orientation, speed etc not real-time view. Optional upgrade to live camera-feed. Packs into large waterproof case		
NOTES			
WEBSITE	fireandrescue.eu	herorobots.com	herorobots.com

			
HERO LIFECARE	HERO LIFECARE	HERO LIFECARE	HERO LIFECARE
NEPTUNE 3	NEPTUNE 4	NEPTUNE 5	NEPTUNE 6
HSZ-V3030	HSZ-V7040	HSZ-V8050	HSZ-V8060
			
			
£5920 \$7590 €6975	£6235 \$7990 €7350	£6780 \$8690 €6985	£7480 \$9590 €8825
17kg 00kg 37.5lb 00lb	19kg 00kg 41.9lb 00lb	22kg 00kg 48.5lb 00lb	15kg 200kg 33.1lb 440lb
112 x 78 x 34cm 44.1 x 30.7 x 13.4"	118 x 82 x 36cm 46.5 x 32.3 x 14.2"	125 x 86 x 38cm 49.2 x 33.9 x 15"	110 x 80 x 20cm 43.3 x 31.5 x 7.9"
ABS. Reinforced flotation core	ABS. Reinforced flotation core	High-impact marine ABS; reinforced flotation core; upgraded bow/stern impact structure	
1200m 3937ft	1500m 4921ft	1800m 5906ft	792m 2600ft
0.9hrs	0.95hrs	1hrs	1.1+hrs
180-240mins	180-240mins	180-240mins	50mins
28.8kmh/18mph 15.6knots	32.3kmh/20.1mph 17.5knots	35.9kmh/22.3mph 19.4knots	28.9kmh/18mph 15.6knots
 	 	 	 
2 10	2 10	3 6	3 6
--	--	--	--
-10 to 55°C / 14 to 131°F	-10 to 55°C / 14 to 131°F	-20 to 50°C / -4 to 122°F	-20 to 50°C / -4 to 122°F
  colour	  colour	  colour	  B&W
1x 	1x 	1x 	1x 
n	n	n	n
 +Galileo & BDS	 +Galileo & BDS	 +Galileo & BDS	 +Galileo & BDS
			
			 
1 year	1year	1 year	1 year
it has the longest range of the 1-3 series fastest speed at 7.77 knots largest hull and best camera	no audio, no app and no AI	first model with bluetooth/wif/app connectivity	Spec is lower than less expensive Neptune 5?
herorobots.com	herorobots.com	herorobots.com	herorobots.com

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT

£\$€=Currency conversion only

USES/ FEATURES:

◆ = MARINE RESCUE

◆ = SURF RESCUE

◆ = SWIFTWATER RESCUE

◆ = FLAT/FLOOD WATER

◆ = DEPLOY FROM HEIGHT

◆ = SELF-DRIVABLE

● (any colour) OK BUT NOT IDEAL

□ □ □ = Option

LIGHTS ■ = Search/Area Light(s)

■ = Navigation/Marker lights

■ = HAZARD emergency service



MANUFACTURER	HERO LIFECARE	HERO LIFECARE	HERO LIFECARE
MODEL VARIANT	NEPTUNE 7	NEPTUNE 8	NEPTUNE 9
PRODUCT CODE	HSZ-V8070	HSZ-V8080	HSZ-V8090
ORIGIN			
INTENDED USE(S)	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆
COST	£7715 \$9890 €9375	£7950 \$10,190 €9375	£8575 \$10,990 €10,110
WEIGHT BUOYANCY	15kg 200kg 33.1lb 440lb	15kg 200kg 33.1lb 440lb	15kg 200kg 33.1lb 440lb
DIMENSIONS height x width x depth	110 x 80 x 20cm 43.3 x 31.5 x 7.9"	110 x 80 x 20cm 43.3 x 31.5 x 7.9"	110 x 80 x 20cm 43.3 x 31.5 x 7.9"
HULL MATERIAL(S)	High-impact marine hull; sealed flotation core (Neptune platform)	High-impact marine hull; sealed flotation core	High-impact marine hull; sealed flotation core
MAX CONTROL RANGE	792m 2600ft	792m 2600ft	792m 2600ft
BATTERY RANGE/DURATION	70mins	70mins	70mins
BATTERY TYPE RECHARGE	50mins	50mins	50mins
SPEED	29kmh/18mph 15.6knots	29kmh/18mph 15.6knots	29kmh/18mph 15.6knots
SELF RIGHTING AUTO RETURN	■ ■	■ ■	■ ■
LIFT/GRAB & CORD HANDLES	2 6	3 6	2 6
ATTACHMENT TOWING EYES	- -	- -	- -
LOAD PULL/TOW CAPACITY			
OPERATING TEMP	-00 to 00°C / -4 to 122°F	-00 to 00°C / -4 to 122°F	-00 to 00°C / -4 to 122°F
HAND CONTROLLER/SCREEN	■ ■ Colour	■ ■ Colour	■ ■ Colour
ONBOARD CAMERA/SCREEN	1x	1x	1x
AUDIO/2-WAY SPEAKER/SIREN	■	■	■
POWER/THRUST via...	twin thrusters	twin thrusters	twin thrusters
NAVIGATION/GPS	■+Galileo & BDS	■+Galileo & BDS	■+Galileo & BDS
BLUETOOTH WIFI APP			
LIGHTS REFLECTIVE	■	■	■
CASE(S) MOUNTING RACK	□ □	■ ■	■ ■
WARRANTY	0 year	0 year	0 year
OTHER COLOURS			
NOTES			
WEBSITE	herorobots.com	herorobots.com	herorobots.com

	
HERO LIFECARE	ING RESCUE
NEPTUNE 10	(HEATED) STRETCHER
	
	
£9200 \$11,795 €10,850	£0 \$0 €0
15kg 200kg 33.1lb 440lb	15.1kg 75kg 750N 33.3lb 165lb
110 x 80 x 20cm 43.3 x 31.5 x 7.9"	98 x 78 x 26cm 38.58 x 30.71 x 10.2"
High-impact marine hull; sealed flotation core	
792m 2600ft	700m 2297ft
70mins	0.5-1hrs
50mins	240mins
29kmh/6-18mph 15.6knots	25.2kmh/15.7mph 13.6knots
	
5 4	2
--	--
200kg 440lb	500kg
-10 to 55°C / -4 to 122°F	-10 to 55°C / 14 to 131°F
 B&W	
1x HD 	1x HD 
twin thrusters	twin thrusters
 +Galileo & BDS	
	
	
0 year	0 year
80ft throw height Operates in reverse	Self-drive controls on handles
herorobots.com	ing-rescue.com

NEW AD SPACE

Images NOT to Scale

~ = approximate

COST: ~ includes local tax/VAT

£\$€ = Currency conversion only

USES/ FEATURES:

◆ = MARINE RESCUE

◆ = SURF RESCUE

◆ = SWIFTWATER RESCUE

◆ = FLAT/FLOOD WATER

◆ = DEPLOY FROM HEIGHT

◆ = SELF-DRIVABLE

● = (any colour) OK BUT NOT IDEAL

□ = Option

LIGHTS ■ = Search/Area Light(s)

■ = Navigation/Marker lights

■ = HAZARD emergency service



MANUFACTURER	ING RESCUE	ING RESCUE	JTT RESCUE
MODEL VARIANT	FOLDABLE STRETCHER		R1
PRODUCT CODE	-	-	-
ORIGIN			
INTENDED USE(S)	◆ ◆ ◆ ◆ ◆	◆ ◆ ◆ ◆ ◆	◆ ◆ ◆ ◆ ◆
COST	£0 \$0 €0		£0 \$0 €0
WEIGHT BUOYANCY	15.1kg 75kg 750N 33.3lb 165lb	15.1kg 200kg 33.1lb 440lb	15.1kg 75kg 750N 33.3lb 165lb
DIMENSIONS height x width x depth	98 x 78 x 26cm 38.58 x 30.71 x 10.2"	110 x 80 x 20cm 43.3 x 31.5 x 7.9"	98 x 78 x 26cm 38.58 x 30.71 x 10.2"
HULL MATERIAL(S)		High-impact marine hull; sealed flotation core	
MAX CONTROL RANGE	1100m 00ft	792m 2600ft	700m 2297ft
BATTERY RANGE/DURATION	70mins	70mins	0.5-1hrs
BATTERY TYPE RECHARGE	Li Polymer 2x18v 36Ah 0mins	50mins	240mins
SPEED	25.2kmh/15.7mph 13.6knots	29kmh/18mph 15.6knots	25.2kmh/15.7mph 13.6knots
SELF RIGHTING AUTO RETURN		■ ■	
LIFT/GRAB & CORD HANDLES	2	4 4	2
ATTACHMENT TOWING EYES	--	--	--
LOAD PULL/TOW CAPACITY	500kg		500kg
OPERATING TEMP	-10 to 55°C / 14 to 131°F	-10 to 55°C / 14 to 131°F	-10 to 55°C / 14 to 131°F
HAND CONTROLLER/SCREEN	■ -	■ ■ B&W	■ -
ONBOARD CAMERA/SCREEN	1x HD ■	1x ■	1x HD ■
AUDIO/2-WAY SPEAKER/SIREN	■	■	■
POWER/THRUST via...	twin thrusters	twin thrusters	n
NAVIGATION/GPS		■ +Galileo & BDS	
BLUETOOTH WIFI APP			
LIGHTS REFLECTIVE		■	
CASE(S) MOUNTING RACK		□ ■	■ ■
WARRANTY	0 year	0 year	0 year
OTHER COLOURS			
NOTES	500+ battery discharge cycles		Self-drive controls on handles
WEBSITE	ing-rescue.com	ing-rescue.com	jttrescue.com

			
JTT RESCUE	JTT RESCUE	JTT RESCUE	JTT RESCUE
R2 PRO R2	R0	(HEATED) FOLDING STRETCHER	RESCUE INFLATABLE
-	-	T3	-
			
			
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
15kg 300kg 33.1lb 661lb	13kg 75kg 28.7lb 165lb	26kg 00kg 57.3lb 00lb	00kg 00kg 00lb 00lb
102 x 80 x 20cm 40.16 x 31.50 x 7.87"	98 x 78 x 26cm 38.6 x 30.7 x 10.2"	180 x 74 x 24cm* 71 x 29 x 9.4"	00 x 00 x 00cm 00 x 00 x 00"
1500m 4921ft	500m 1640ft	1500m 000ft	000m 000ft
1.25hrs	30mins hrs	/0hrs	/0hrs
0mins	240mins	0mins	0mins
31.7kmh/19.7mph 17.1knots	14.4kmh/8.95mph 7.7knots	9-21kmh/5.5-13mph 4.8-11.6knots	00kmh/0mph 0knots
			NO 
3 6	2	9 4 (+ Head & Body restraints)	0
--	--	--	--
300kg	500kg	00N 400N/40kg/89lb 00lb 00lb	
-00 to 00°C / 00 to 00°F	-10 to 55°C / 14 to 131°F	-00to00°C/ 00-00°F	-00to00°C/ 00-00°F
 -	 -	 	 
1x 	1x  	1x 	1x 
n	n	2x Water Jet thrusters	3x hull-mounted impellers
		 +BDS*	
 	 	 	
0 year	0 year	0 year	0 year
Self-drive controls on handles		Soft foam matting for head area. *Folds in half for storage/transport) <40°C Heating element in the stretcher bed provides warmth to casualty *BDS is a Chinese satellite version of GPS	
jttrescue.com	jttrescue.com	jttrescue.com	jttrescue.com

Images NOT to Scale ~ = approximate COST: ~ includes local tax/VAT £\$€=Currency conversion only USES/ FEATURES: ◆ = MARINE RESCUE ◆ = SURF RESCUE ◆ = SWIFTWATER RESCUE ◆ = FLAT/FLOOD WATER ◆ = DEPLOY FROM HEIGHT ◆ = SELF-DRIVABLE ● = (any colour) OK BUT NOT IDEAL = Option LIGHTS ■ = Search/Area Light(s) ■ = Navigation/Marker lights ■ = HAZARD emergency service			
			
MANUFACTURER	MAREN ROBOTICS	OCEANALPHA	OCEANALPHA
MODEL VARIANT	FASTY	DOLPHIN 1	DOLPHIN 3 Plus
PRODUCT CODE	-	-	-
ORIGIN			
INTENDED USE(S)	◆ ◆ ◆ ◆ ◆	◆ ◆ ◆ ◆	◆ ◆ ◆ ◆ ◆
COST	£0 \$0 €0	£0 \$6500 €0	£8100-9700 \$8500-10,000 €9500-12,000
WEIGHT BUOYANCY	15kg 220kg 33lb 441lb	13kg 22kg 00lb 00lb	16.75kg 32kg 36.9lb 00lb
DIMENSIONS height x width x depth	115 x 80 x 25cm 52 x 31.4 x 9.8"	115 x 83 x 21cm 52 x 32.6 x 8.3"	100 x 70 x 25cm 39.4 x 29.6 x 9.8"
HULL MATERIAL(S)	Fiberglass - shock-absorbing enclosure	Linear LDPE	Linear LDPE
MAX CONTROL RANGE	800m 2624ft	800m 000ft Line of Sight	800m 2625ft Line of Sight
BATTERY RANGE/DURATION	1hr	30-60mins	30-70mins
BATTERY TYPE RECHARGE	*600Wh Li-ion 4hrs	Li ion 3-4hrs	12.5Ah Li ion 3-4hrs 500 charge cycles
SPEED	7.5-15kmh/4.6-9.3mph 4-8knots	13kmh/8mph 6.9knots	10.8-25kmh/6.7-15.7mph 5.8-13.6knots
SELF RIGHTING AUTO RETURN	■ ■ ?	■ NO	■ ■
LIFT/GRAB & CORD HANDLES	4	4 4	4 + 4
ATTACHMENT TOWING EYES	--	--	--
LOAD PULL/TOW CAPACITY	200kg/2-persons	150kg 1000kg	300kg 661lb / 23kg/50.6lb
OPERATING TEMP	-20to50°C/ 00-00°F	-10to60°C/ -14-140°F	-10to60°C/ -14-140°F
HAND CONTROLLER/SCREEN	2.4 Ghz ■ ■ B&W	■ -	2.4 Ghz ■ ■
ONBOARD CAMERA/SCREEN AUDIO/2-WAY SPEAKER/SIREN	Camera mount. 	NO One-way speaker	1x HD ■ ■ OLED
POWER/THRUST via...	2x Water Jet thrusters	2x Water Jet thrusters	2x Water Jet thrusters
NAVIGATION/GPS		-	■ +Galileo & BDS
BLUETOOTH WIFI APP	■		
LIGHTS REFLECTIVE	 	 	
CASE(S) MOUNTING RACK	■	 	
WARRANTY	0 year	1 year	1 year
OTHER COLOURS	Can be dropped into water from 20m (65 ft)	Legacy model - still supported	3 plus can be automatically deployed via Ai casualty-in-water-identification system.
NOTES	Ruggedized hand controller option. *Optional 2.3kw Portable power pack. Optional Sonar , autopilot modules and self-drive buttons.		Go-Pro mount on front. 30m drop height into water.
WEBSITE	marenrobotics.com rescue-buoy.com	oceanalpha.com	oceanalpha.com

	
USAFE RESCUE	VECTOR
USAFE BUOY	ARK H3
-	H3-ARK
	
	
£0 \$0 €0	£4898 \$6940 €6900
13.7kg 00kg 30.14lb 00lb	13.8kg 00kg 30.2lb 00lb
95.6 x 78 x 25.5cm 37.64 x 30.7 x 10"	103 x 63 x 20cm 00 x 00 x 00"
LDPE	LDPE
5-800m 1640-2624ft Line of Sight*	800m 2624ft
5900m, 3.2nmiles / 00mins	00m, 00nmiles / 45mins
0mins	3hrs
15kmh/9.3mph 8knots	18kmh/11.2mph 9.7knots
	
4	3
2 -	- -
150kg 00kg	200kg 00kg
-00to00°C/ 00-00°F	-00to00°C/ 00-00°F
 -	 -
NO NO	NO NO
2x Water Jet thrusters	2x Water Jet thrusters
	
	- - -
	-
	
0 year	0 year
	
*500m at sea level, 800m 10m above sea level. Clip-on mobile induction charger	
usaferescue.com	vectorwatercraft.com.au

NEW AD SPACE

NEW AD SPACE

WATER RESCUE TRAINING MANIKINS

Ruth Lee's Man-Overboard manikin is given low-visibility clothing in its Search & Rescue variant to make finding it harder. No reflective tape or bright colours.



In its simplest form, an in-water training manikin hasn't necessarily changed much in the past 50 years - a bunch of yacht fenders tied together for arms and legs and stuffed into overalls with more shoved into the chest area to make the torso and finished off with a crab-fishing marker buoy as the head. Simple. But rescuers soon got tired of the lack of realism that a fully floating and relatively light dummy provided and started to improvise by drilling and filling with sand or water for weight and adding extra layers of clothing. The Dacon



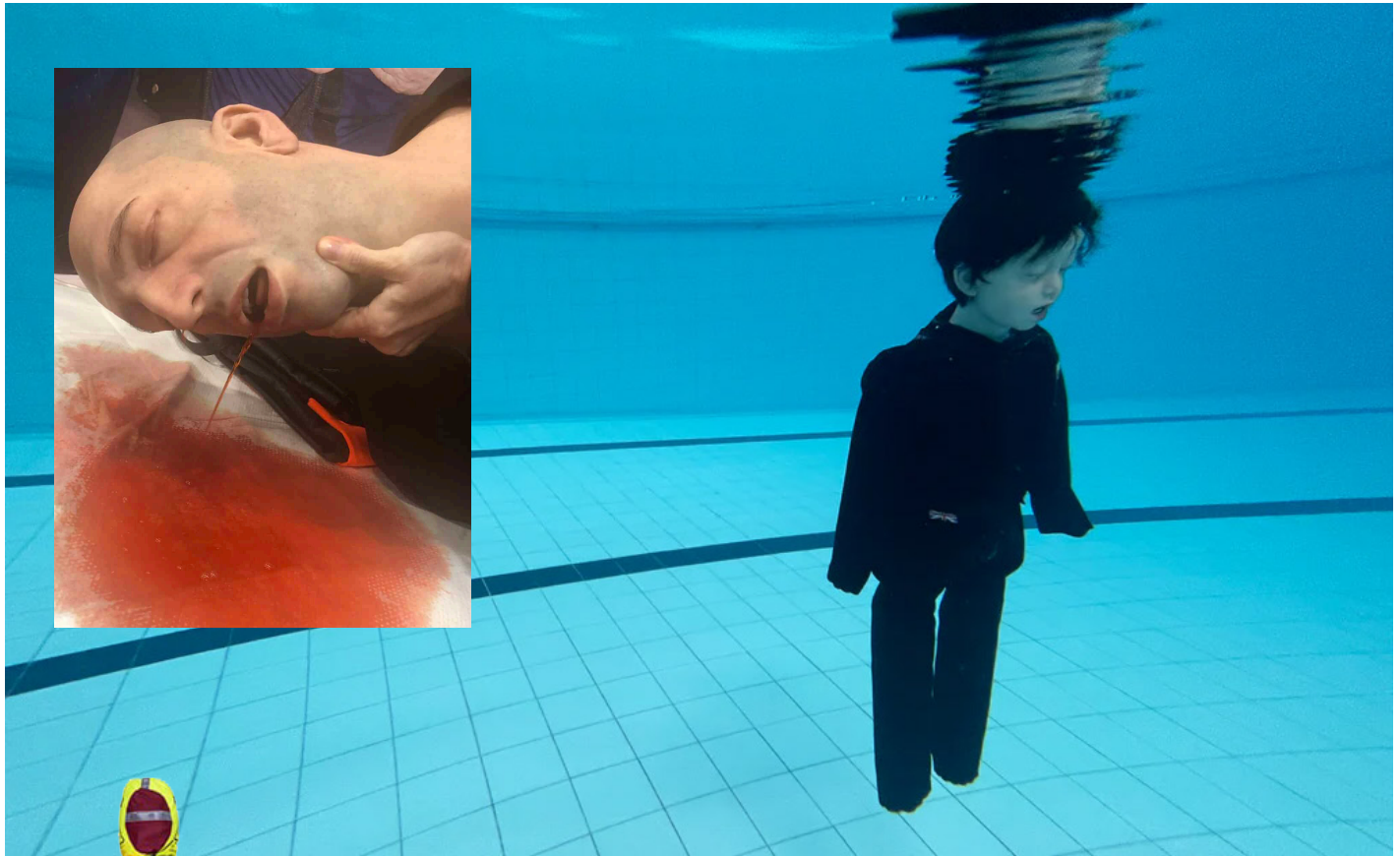
Dummy on the left is the modern incarnation of these early fender-style manikins. These also worked OK on dry land and in fact many a fire service had their own versions of dummies made out of tyres, fenders and fire hoses stuffed with material. Even though medical sector companies like Simulaids were producing trauma manikins or bits of manikins

as long ago as the 60's we didn't really start seeing more realistic full-weight manikins that could be thrown and dragged around in any rescue scenario until the 80's when we had the iconic lifelike rubber/plastic/metal *Rescue Randy* from

Simulaids costing a small fortune and the more amorphous but distinctly more affordable *Ruth Lee* filled fabric manikins. There were others of course producing both realistic and amorphous dummies alongside these early market leaders like the Swedish SRP (right) and ELJI Sport models but as you'll see from our tables - none have quite the scope of these two brands that have tried to corner the market by covering every type of rescue. Water rescue seemed to take a back seat for a while because early development of more realistic training manikins centred on the needs of land-based fire & Rescue services and medical responders. These 'land' manikins could be used short term for water rescue but it quickly became apparent that your hugely expensive and definitely submerged, *Rescue Randy* with metal components didn't last so long in salt water and chlorinated water submersions. Similarly a lot of the fabric models quickly succumbed to mould, disintegration of fibres and some truly unwelcome smells. They all needed materials and constructions more suited to us in water and even today, there is a specific delineation of tasking between land and water manikins - water can do land tasks (but not fire involved training) but land can't do water unless you're treating them as semi-disposable. One very amorphous model, the *Fibrilight BOB* is effectively a giant, shaped dry bag where you fill with whatever weight of water you can deal with and roll the top closed as with any dry bag.



Simulaids (right) were always oriented towards patient



ABOVE: The future should be hyper-realistic manikins like these Lifecast/RuthLee adult and juvenile models with full CPR/Airway management interaction but fiscal prudence will mean that more traditional designs will always have a place.



treatment so they always had a more realistic head for *Rescue Randy* that allowed rescuers to at least try mouth-to-mouth on a mouth rather than a sword fencing face shield but *Ruth Lee* manikins were more about handling and rough handling at that. Despite their amorphous, *Squid-Games* appearance, they offered softer limbs and body than the human-replicants and were/are perhaps more realistic to handle than they look especially for those models with some kind of skeletal-like inserts that mimic human bone in the way it maintains rigidity of limbs and torso. Ultimately of course this arms race between the realism of a very human-looking manikin and the more utilitarian fabric and fender manikins collided with Ruth Lee's collaboration with the Silicon-meister himself



Dave Halliwell and his company *Lifecast body simulation* (lifecastbodysim.com) producing the most scarily realistic manikin heads and torsos in the world. Hollywood-quality medical manikins

in fact that are now termed 'hyper-realistic' and include full size and fully featured babies and toddlers - scary stuff. We have to confess that we consider Dave as one of our own here at TECHNICAL RESCUE as he's been a local paramedic and ALS trainer for decades as many of our own Unit personnel going back to the early nineties can attest. However, we don't blow smoke without good cause and Dave/Lifecast literally lead the world in this stuff. We featured some of his work in TECHNICAL RESCUE#81 including the ability (inset-top-left) for their advanced water manikin to aspirate foamy, pinkish water during and after CPR in about the most realistic post-drowning resus training currently available. What *Ruth Lee* did was to come up with a rugged outer-skin that attached securely



to the hyper-realistic torso (above) and provided the correct orientation, weight and durability for water rescue training. It ain't cheap but at the moment, this is the gold-standard for water rescue - something that provides the physical needs of handling a victim in-water together with proper medical intervention.



Meanwhile back in the original realistic replicant world and *Rescue Randy* was modified and had some offspring. He was given rust-proof joints and salt/chlorine tolerant skin before immaculately and miraculously conceiving three youngsters all of whom were sent off to work in water. Simulaids and other plastic body'd manikins had the advantage of being able to easily alter the weight and orientation by adding/removing water or sand in some models. Simulaids have ports and valves (right) that mean you don't have to suffer the firefighters curse of having to drag your heavy-ass manikin hundreds of yards across all kinds of terrain and up or down stairs and ladders to set up your training scenario. You could empty your manikin for storage or transport and fill it up on-site. As a readily available and heavy filling, water is perfect for changing the weight and orientation of the manikin from full floating to full sinking (with some clothes on and possibly a dive weight). The valves allow filling and rapid draining.



KEY to TABLES.....

Any use, feature, accessory or component that is **inherent** in the product is shown as a **solid coloured square** ■■■■■. If it's an **OPTION** it is shown as an **outline square** □□□□□. A circle ●○○○○ indicates that this feature is only partially present and/or is OK for that purpose but not ideal.

ORIGIN: The 'manufacturer's country, not necessarily the country of manufacture, If we know it's made in a different country there will be a smaller inset flag.

COST: a rough guide only - **includes** local taxes/VAT. Varies with exchange rates, extra taxes etc. We usually round up to the nearest Pound£/US Dollar\$/Euro€. We now give a **currency conversion** figure in orange £\$€ which is simply to give an idea of price, it is not the selling price which will have import duties and bulk shipping etc. to add.

AMORPHOUS HUMAN FACE: Amorphous is a general representative shape. HUMAN more closely resembles a human in the head and at least the upper torso and will always have a realistic face. Some amorphous manikins have a human face to enhance realism and/or allow CPR actions but not necessarily actual CPR but the rest of the body will be amorphous

SPINAL RESISTANCE WAISTNECK: Generally a reinforcing strip, alloy, plastic or carbon-fibre that runs up the spine. It keeps the manikin in-line rather than being 'floppy' and completely bending at the waist or the neck but it is not fully rigid - it will allow limited bend under pressure.

ARTICULATE ELBOW SHOULDER: The arm will bend at these points. Shoulder joints often rotate as well as hinge.

ARTICULATE KNEE THIGH WAIST: The legs will bend at the knee and hip. The WAIST is a rare articulation - most basic anatomy manikins simply pivot at the thigh

LIFTING ATTACHMENTS: To suspend the full weight of the manikin out of water during rescue and/or for drying

CPR AIRWAY CAPABLE: CPR has a mouth into which you can breath or entrain air/oxygen and will have a torso that can resist compressions. **AIRWAY** is a much more advanced feature allowing realistic intubation

ADVANCED FEATURES: D

VARIABLE WEIGHT: You can make the manikin heavier or lighter either by removing/adding internal weight packs or by adding external weight packs or replacing limbs/components with lighter/heavier options.

REDISTRIBUTE WEIGHT: The orientation and buoyancy of the manikin can be adjusted by manipulating the weight distribution with the dummy eg. weight shift from upper torso to upper legs to orient into a more upright stance in the water.

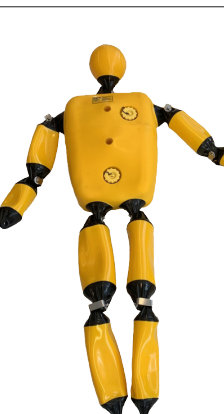
SOLAS REFLECTIVE: SOLAS is the international maritime approval/standard for quality reflective

tape but there are non-SOLAS reflective materials and some may want the manikin to be low vis in order to test search capabilities!

IN WATER ORIENTATION: How the manikin sits in water, most will be head-up with the body and legs at an angle or upright as if treading water. Most will also be semi-submerged with the help of saturated material covers but some may sink. Body recovery manikins sink but of course a drowning victim that may still be alive and able to be resuscitated may also be underwater depending on their attire.

WITH REPLACEABLE BOOTS: May be integrated and difficult to remove/replace - others are usually slip-on/off rubber wellies.

Half page ad

Images NOT to Scale ~ = approximate COST: ~ includes 20% VAT for Europe or 10% state tax in the US £\$€=Currency conversion only USES/ FEATURES: ☐☐☐☐ = Option ●●●● = Partial feature or OK but not ideal PE = Polyester FR = Flame/fire retardant						
	MANUFACTURER	CQC FIBRELIGHT	CQC FIBRELIGHT	DACON	ELJISPORT	ELJISPORT
	MODEL Variant	BOB	BOB+	RESCUE DUMMY	WATER RESCUE WOMAN	WATER RESCUE MAN
	PRODUCT CODE				110	111
	ORIGIN					
COST	£00 \$00 €00	£00 \$00 €00	£0 \$0 €0	£0 \$00 €0	£0 \$0 €0	
DRY WEIGHT	1-30kg 2.2-66lb	1.2-55kg 2.6-121lb	22-85kg 49-187lb	30kg 66lb	30kg 66lb	
HEIGHT	1.74m 5'8"	1.74m 5'8"	1.9m 6'2"	1.5m 5'	1.7m 5'7"	
MATERIALS OUTER INNER	Coated Polyester Foam + Water	Coated Polyester + Polyurethane Liner Foam + Water	PVC/ Stainless Steel Air/Water	PVC, Polyester, Rubber ?	PVC, Polyester, Rubber ?	
AMORPHOUS HUMAN FACE	■	■	■	■ ■	■ ■	
SPINAL RESISTANCE WAISTNECK	-	-				
NECK C-COLLAR ROTATE	-	-	■		■ ■	
ARTICULATE ELBOW SHOULDER	● ●*	● ●*	■ ■	■ ■	■ ■	
ARTICULATE KNEE THIGH WAIST	● ● ●*	● ● ●*	■ ■ -	■ ■ -	● ■ ■ -	
LIFTING ATTACHMENTS			Rear lifting eye			
CPR AIRWAY CAPABLE						
ADVANCED FEATURES						
VARIABLE WEIGHT	Water	Water				
REDISTRIBUTE WEIGHT	No	No				
SOLAS REFLECTIVE	No	No	□	-	-	
IN WATER ORIENTATION	FLOAT/NEUTRAL	FLOAT/NEUTRAL	SINK* FLOAT 90-180°			
WITH REPLACEABLE BOOTS	No	No	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	
STORAGE BAG HARD-CASE			■	■	■	
WARRANTY			1 year	1 year	1 year	
OTHER COLOURS						
NOTES	*All extremities can bend depending on how much water is put in.	Will retain 80% of start weight on land after 3hrs. *All extremities can bend depending on how much water is put in.	Extremely robust, can be dropped from height * negative buoyancy version available for body-recovery training			
WEBSITE	cqc.co.uk	cqc.co.uk	daconrescue.com	eljisport.com	deeptrekker.com	

						
	ELJISPORT	PAX	RUTH LEE	RUTH LEE	RUTH LEE	RUTH LEE
	WATER RESCUE CHILD	WATER RESCUE	MOB II ADULT	MOB YOUTH	MOB TODDLER	MOB BABY
	121					
						
	£0 \$8500 €0	£0 \$00 €1250	£1109 \$1500 €1290	£737 \$995 €855	£462 \$625 €536	£386 \$522 €450
	10kg 22lb	45kg 99lb	40kg 88lb	20kg 44lb	8kg 17.6lb	5kg 11lb
	1m 3'3"	1.82m 6'	1.8m 5'11"	1.3m 4'3"	0.9m 2'11"	0.7m 2'4"
ubber	PVC, Polyester, Rubber ?		Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam
	 					
			 	 	 	 
						
	 		 	 	 	 
	  	  	  	  	  	  
			rear web loop	rear web loop	rear web loop	rear web loop
			-	-	-	-
			-	-	-	-
			Foam pads	Foam pads	Foam pads	Foam pads
	-					
			FLOAT 45-90°	FLOAT 45-90°	FLOAT 45°	FLOAT 45-180°
	 				-	-
						
	1 year					
		 				
		includes solid foam lifejacket DISCONTINUED	MOB=Man Over Board			
m	deeptrekker.com	pax-bags.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com

Images NOT to Scale

~ = approximate

COST: ~ includes 20% VAT for Europe or
10% state tax in the US

£\$€=Currency conversion only

USES/ FEATURES:

□ □ □ □ = Option

● ● ● ● = Partial feature or OK but
not ideal

PE = Polyester

FR = Flame/fire retardant



MANUFACTURER	RUTHLEE	RUTHLEE	RUTHLEE	RUTHLEE	RUTHLEE
MODEL VARIANT	SURF ADULT	POOL ADULT	POOL YOUTH	ADVANCED ADULT	ADVANCED TODDLER
PRODUCT CODE					
ORIGIN					
COST	£1110 \$0 €0	£615 \$1400 €0	£0 \$900 €0	£0 \$0 €0	£0 \$0 €0
DRY WEIGHT	20kg 44lb	30kg 66lb	16kg 35.3lb	0kg 0lb	12kg 26.4lb
HEIGHT	1.5m 5'	1.3m 4'3"	1.1m 3'7"	1.9m 6'2"	0.95m
MATERIALS OUTER INNER	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam
AMORPHOUS HUMAN FACE	■ -	■ ■	■ ■	■ ■	■ ■
SPINAL RESISTANCE WAISTNECK					
NECK C-COLLAR ROTATE					
ARTICULATE ELBOW SHOULDER		■	■	■	■
ARTICULATE KNEE THIGH WAIST					
LIFTING ATTACHMENTS	rear web loop	rear web loop	rear web loop		
CPR AIRWAY CAPABLE				■ ■	■ ■
ADVANCED FEATURES				Lung fluid/foam	Lung fluid/foam
VARIABLE WEIGHT					
REDISTRIBUTE WEIGHT					
SOLAS REFLECTIVE	■	■	■	■	■
IN WATER ORIENTATION	FLOAT 90°	SINK/ NEUTRAL BUOYANCY	SINK/ NEUTRAL BUOYANCY	FLOAT 45°	FLOAT 45°
WITH REPLACEABLE BOOTS	-	-	-	■	■
STORAGE BAG HARD-CASE					
WARRANTY					
OTHER COLOURS	■	■	■	■	■
NOTES	Arms loped above head for in-water pick-up			lifecastbodysim.com	lifecastbodysim.com
WEBSITE	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com

						
	RUTH LEE	RUTH LEE	RUTH LEE	RUTH LEE	SIMULAIDS	SIMULAIDS
	HELI-WINCH	BODY RECOVERY ADULT	BODY RECOVERY YOUTH	BODY RECOVERY TODDLER	WATER RESCUE ADULT	WATER RESCUE CPR ADULT
						
	£0 \$0 €0	£592 \$0 €0	£0 \$0 €0	£0 \$0 €0	£1260 \$985 €1665	£1446 \$0 €2261
	40kg 88lb	50kg 110lb	30kg 66lb	10kg 22lb	20kg 44lb	20kg 44lb
	1.8m 5'11"	1.8m 5'11"	1.3m 4'3"	0.9m 2'11"	1.65m 5'5"	1.65m 5'5"
	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Nylon Mesh/ Reinforced PVC Polypropylene plastic /non-absorbant (1 Day <0.1%) closed cell foam	Vinyl/ Stainless Steel Air/Water	Vinyl/ Stainless Steel Air/Water
	■ -	■ ■	■ ■	■ ■	■ ■	■ ■
	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
					■ ■	■ ■
					■ ■	■ ■
					■ ■ ■	■ ■ ■
		rear web loop	rear web loop	rear web loop	-	-
					-	■ ■
m					Water	Water
	■	■	■	■		
	FLOAT 45°	SINKS	SINKS	SINKS	FLOAT 90°	FLOAT 45°
	■	■	■	-	-	-
					3 Years	3 Years
	■	■	■	■	■	■
com	Shorter legs and different weight distribution to MOB version. Lifetec-Australia version shown.	Includes hair. Can withstand drop height into water of 5-6m	Includes hair. Can withstand drop height into water of 5-6m	Includes hair. Can withstand drop height into water of 5-6m	Arms loped above head for in-water pick-up	
m	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com	ruthlee.com.com

Images NOT to Scale ~ = approximate COST: ~ includes 20% VAT for Europe or 10% state tax in the US £\$€=Currency conversion only USES/ FEATURES: ☐ ☐ ☐ ☐ = Option ☐ ☐ ☐ ☐ = Partial feature or OK but not ideal PE = Polyester FR = Flame/fire retardant					
	MANUFACTURER	SIMULAIDS	SIMULAIDS	SIMULAIDS	SIMULAIDS
	MODEL VARIANT	Water Rescue Adolescent	Water Rescue CPR Adolescent	Water Rescue Timmy	Water Rescue Billy
	PRODUCT CODE				
	ORIGIN				
COST		£1065 \$840 €1412	£1542 \$0 €2190	£323 \$273 €0	£317 \$267 €0
DRY WEIGHT		9kg 19.8lb	5kg 11lb	5kg 11lb	40kg -12lb
HEIGHT		1.25m	0.7m 2'4"	0.7m 2'4"	1.8m 5'11"
MATERIALS OUTER INNER		Vinyl/ Stainless Steel Air/Water	Vinyl/ Stainless Steel Air/Water	Vinyl/ Stainless Steel Air/Water	Nylon Mesh/ Reinforced PVC Polypropylene pla /non-absorbant Day<0.1%) closed foam
AMORPHOUS HUMAN FACE		☐ ☐	☐ ☐	☐ ☐	☐ ☐
SPINAL RESISTANCE WAISTNECK		☐ ☐	☐ ☐	☐ ☐	☐ ☐
NECK C-COLLAR ROTATE					
ARTICULATE ELBOW SHOULDER		☐ ☐	☐ ☐	☐ ☐	☐ ☐
ARTICULATE KNEE THIGH WAIST		☐ ☐ ☐	☐ ☐ ☐	- ☐ ☐	- ☐ -
LIFTING ATTACHMENTS					rear web loop
CPR AIRWAY CAPABLE			☐ ☐		
ADVANCED FEATURES					
VARIABLE WEIGHT		Water	Water	Water	-
REDISTRIBUTE WEIGHT					
SOLAS REFLECTIVE					
IN WATER ORIENTATION		FLOAT	FLOAT	FLOAT	FLOAT
WITH REPLACEABLE BOOTS		-	-	-	-
STORAGE BAG HARD-CASE					
WARRANTY		3 Years	3 Years	3 Years	3 Years
OTHER COLOURS		☐	☐	☐	☐
NOTES		ankles articulate	ankles articulate	3 Years old	6-9 month old
WEBSITE		simulaids.com	simulaids.com	simulaids.com	simulaids.com

						
S	SRP	SRP	SRP	SRP		
Category	Water CPR	Water Floating	Water Sinking	Water Sinking Child		
		15-9161F	15-9161S	15-9161SB		
						
	£285 \$252 €0	£00 \$00 €00	£00 \$00 €00	£00 \$00 €00		
	40kg 88lb	40kg 88lb	40kg 88lb	18kg 39.6lb		
	1.8m 5'11"	1.8m 5'11"	1.8m 5'11"	1m 3'3"		
C astic (1 cell	PVC	PVC				
						
						
						
o						
						
		Heat bar for FLIR searching				
						
	FLOAT	FLOAT	SINKS	SINKS		
	-	-	-	-		
						
						
		Heat bar for FLIR searching				
	srp.se	srp.se	srp.se	srp.se		

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Water Rescue & Water Safety RESCUE DOG PFD



Unlike our previous Guide to Rope Rescue/Access Dog Harnesses the majority of companies making Dog PFDs are not from the rescue sector. Some are specialist marine-safety companies like **Baltic** and **Crewsaver** and some are specialist dog-harness companies like **Ray Allen Mfg**, **Julian K9**, **Non-Stop** and **Ruffwear**. The exception to this is Italian Caving and rescue specialist **ALP Design**, now part of **Kong** (the climbing company not the dog-ball manufacturer although they too have a basic pet dog flotation harness that we haven't included). Their two models are both specialist swim-vests with lift capability. Aside from 4 models suitable for swim-rescue, the rest are Pet Flotation Devices, an acronym we've made up and not to be confused with human Personal Flotation Devices. These are technically NOT life jackets which have an inflatable element to orientate the wearer head-up if unconscious. PFDs are for rescue dogs unexpectedly working around water and also for in-water swim-training like the Norwegian Non-Stop harness pictured on the right. Buoyancy doubles as thermal protection for ground work in colder climates but is otherwise a cumbersome prospect for a non-water dog. Perhaps the most versatile is **Ray Allen's Modular LLC** which is a webbing and mesh 'shell' into which you can mount or swap a flotation jacket, cooling pads and stab/bullet protection and/or kevlar belly shield against sharp terrain. The **Julius K9 3in1** is also a

versatile option because it allows float pads to be inserted into or removed from a neoprene jacket. The newest addition to this genre is the *UnderDog* (below) which comes from a source you might have thought already had such products - **MUSTANG SURVIVAL**. This is one of the best names in professional water safety and having used their gear professionally for decades we we have a high degree of confidence in their products.



Most rescue dogs would wear a life jacket in exactly the same circumstances as their handler - as a precaution against falling into water - perhaps when searching around water or over water in a boat in the case of cadaver dogs but there are some dedicated water rescue dogs whose job it is to enter the water, swim to a struggling human and provide a tow back to safety or perhaps assist a human rescuer. These would use dedicated float harnesses with the **ALP Design** models the only options to have strategically located side handles for a victim or rescuer to hold onto. All other floatation vests in this GUIDE are intended solely for the safety of the dog should it fall into water. Unlike a smaller rescue dog with a 'personal' floatation harness, direct contact or tow-rescue dogs like the Newfoundland in the title picture are large, powerful dogs that can resist being 'swamped' by a panicking in-water casualty. In the title picture a tow strap is attached to the top eye which a struggling swimmer can grab to deploy and then be assisted back to shore or the boat. In-water rescue dogs require a degree of self reliance on the part of the casualty to perform a 'rescue'. Think of them more as an in-water version of a sight-assistance dog.

It is a little surprising that only the **ALP Design's 278/Turtle** and the **Ray Allan Modular LLC** have rear leg straps or the option to add them because they provide much greater security in terms of harness retention. As with the hoist-capable harnesses discussed in the previous issue, there can be a danger that the dog can pull backwards out of all other harnesses in this GUIDE perhaps when scared, exhausted and someone is trying to pull them to safety or when connected to a tether and unwilling to be pulled wherever you intend them to go. Admittedly, this may be a peripheral concern and some like the **Julius K9** and **NRS** models would argue that their body wrap design with additional tensioning should negate this but it really depends on whether the dog has been secured into the harness because it is *definitely* entering the water or *just in case* it might fall into water. In the case of the latter the harness may be fitted less firmly to allow for comfort and fur/undercoat that is much bulkier when dry than it is when wet. Once the dog has entered the water the fur inevitably reduces in volume and the harness may be looser than the optimum fit. The **Delphinus** harness has two quick securing Velcro straps (with reflective strips) that mean the dog is at least partially secure within seconds even if the two buckle straps fail to be secured before the dog is swamped. These also mean the harness can be more quickly tightened should winching or lifting be required though it is the buckled straps that provide the true lift/hoist capability.

Much simpler in design, and representative of many of the harnesses in this GUIDE is the **NRS CFD** Harness. Effectively a one piece harness that can be slipped over the dog's head and secured around the chest/neck and under the belly which



NRS CFD harness



Julius K9's 3in1



RESCUE DOG PFDs

needs plenty of padding because a wet dog sees a huge increase in weight which the padding and lift handle needs to be able to cope with. The eye on the top is for a tether NOT for lifting. Remember that such harnesses also function well in providing thermal insulation on dry land in colder months. Even though companies like **NRS**, **Crewsaver** and **Baltic** are professional water-safety companies, theirs and some of the brands not associated with military or law enforcement are intended more for pet animals than they are for professional rescue dogs although **Baltic's** most extensive range of dog PFDs includes one listed as suitable for rescue - the **Special**. Nevertheless, the principle for providing buoyancy and therefore safety for the dog when in water remains the same

and quality of production with these and the specialist dog companies **Julius K9** and **Ruffwear** provide peace of mind for the handler. There are a considerable number of 'dog lifejackets' available online through Amazon and Ali Baba etc. and some of these may well be OK but, as with all

equipment used in the professional rescue sector, if you are not familiar with the manufacturer and unsure of its track record, don't risk it. Expect to pay hundreds for the professional brands while renown pet brands may cost upwards £\$€40. Anything less than this and you will need to check stitching, design and components to satisfy yourself that it will perform its task of keeping your dog safe - it's fair to say that it is rarely worth basing a safety equipment purchase on the lowest price.

Sewn attachments for D-Ring, web eye and handles are very prone to degradation due to water and UV and in particular salt water. They need to be well cleaned after each use and you need to specifically inspect the stitching and integrity of the webbing itself - sometimes this may not be easy if other fabric components are covering it, which, of course, can also be a good thing if it's providing some protection to the stitching. Look for strong bar tacking which are three or four relatively thick parallel lines of stitching or a robust box stitch which is a square with an X stitched to each corner. Salt water corrosion will also be an issue to look out for with metal components, again, ensure that the harness is washed down with fresh water and properly dried after each use. Store in a well ventilated area to avoid mould.

IN THE FOLLOWING TABLES.....

A circle ●● in the 'USE' columns indicates that the feature is OK for that purpose but not ideal.

COST: a rough guide only - includes local taxes. Varies with exchange rates, extra taxes etc. We usually round up to the nearest Pound£/US Dollar\$/Euro€. Larger sizes often cost more.

£\$€ in orange is a currency conversion figure NOT an accurate import price with taxes etc which is shown in black.

SIZES: Given as generic sizing S, M, L etc. which varies wildly between models. Colour-coded to the weight/girth to read more easily but some are universally adjustable. We have tried to include the weight of dog to give an accurate idea for the flotation required but many only provide measurements.

USES: All of these harnesses can be used to provide a degree of floatation in water but one or two may only provide this as a consequence of using foam padding for comfort or thermal protection in which case they will have a diamond in the **BUOYANCY** column.

SWIM-RESCUE refers to the ability of the harness to assist not only the dog in staying afloat but also in assisting either a rescuer or a casualty while in the water. Usually this will be via extra handles on the body of the harness for a person to grab onto and is only present in the two ALP Design models.

SUSPENSION means the harness is capable of being hoisted or lowered vertically. This is usually via a bridle to spread the dog's weight evenly front-to back for hoisting into a helicopter, on or off a ship or up/down a cliff or wall. A single robust top eye does NOT constitute hoist-capable even if it will easily take the dog's weight because it is not even close to being safe - the dog may slip out and/or suffer compression of the thorax or neck. In our previous GUIDE **GROUND** referred to long-duration search, patrol and/or tracking and manoeuvring over boulders etc. requiring freedom of movement and no heavy panels that might rub against legs. In this GUIDE it refers only to the ability to add a lead or tether and use the harness on dry land for a period of time. The ALP Design specialist water rescue harnesses for instance, is shown with a diamond rather than full square because they can have a lead attached but the dog would not be comfortable for long distances on land.



MATERIALS: The main fabric of the body panel containing the foam is shown in **black**. Webbing type is shown in **green** and the hard fittings (buckles & D rings) are shown in **burnt orange**.

WEIGHT/GIRTH of DOG: is the weight of dog that is intended to use the harness. Body mass is a more accurate indication for floatation requirements but girth measurement provides more accurate fitting. **BUOYANCY** provided by the harness is only given by a few manufacturers. It is NOT the same as the weight of dog it will support - a 27kg dog would only need 3 or 4kg of buoyancy to support its weight

reformat to new layout 09.26

Images NOT to scale

N/A = Not Available/not given **COST:** Approx & inc local tax/VAT

£\$€ in orange = currency conversion

USES: ●●=OK BUT NOT IDEAL

USES/FEATURES: □= Option

		MODEL PRODUCT CODE	COMPANY	ORIGIN	COST inc tax/ VAT	SUSPENSION	GROUND	SWIM-RESCUE	MATERIALS: 'JACKET' WEBBING INTEGRAL 'HARDWARE'
		TURTLE 278	ALP DESIGN		£190 \$265 €220	■	■	■	Cordura Polyester 7x double-D buckles 1x D-ring
		DELPHINUS	ALP DESIGN		£220 \$300 €250	■	■	■	Cordura 2x Velcro straps Polyester 7x double-D buckles 1xRing +4xSml Rings
		MAJA (CAT HARNESS)	BALTIC		£28 \$38 €34	-	■	■	Cellu cushion float Polyester 3x plastic fast clips 1 metal D ring
		MASCOT	BALTIC		£25-33 \$32-43 €29-39	-	■	■	Cellu cushion float Polyester 3x plastic fast clips 1x metal D-ring

because the water is supporting much of the load. There is a huge difference between the quality of components in a pet-shop dog harness and a professional dog's lift harness. Unusually for us, this GUIDE contains non-rescue professional designs that are mostly NOT intended for hoisting so the Minimum Breaking Strength/Load - **MBS** (in **burnt orange**) is only provided by one or two. We list the precise weights and sizes in metric with the imperial figures rounded up or down because it's a less precise measurement anyway! We dispensed with the **COMFORT / PADDING** column used in the previous GUIDE to *Hoist-Capable Harnesses* because ALL of these are padded to some degree. **INTEGRAL/ADD-ON FLOTATION** most of these harnesses have integrated flotation indicated by a black square but some can have extra flotation pads added to a neoprene jacket like the JuliusK9 3in1 or to a webbing frame like the Ray Allen Modular LLC. This allows quite a bit of flexibility and is indicated by an orange square ■. Those with minimal buoyancy are indicated by a black circle● meaning OK but not ideal

SECURE: The straps and attachment points which secure the dog in the PFD and you to the dog!

GIRTH/BELLY: a strap that can be adjusted for length on the underside of the dog. The **girth** strap is behind the front legs and the **belly** strap is further back towards the rear legs. For most of these float harnesses the buckles are plastic push-fit (Fastex, Nexus or DuraFlex) but some like the NRS use a plastic ladderlock where you simply pull the web tail to tighten and some, like ALP DESIGN use alloy double D buckles because they are designed for hoisting as well as swimming.

LENGTH: refers to adjustment for length from front to back and is usually a buckle on the top at the shoulders or on the back near the back legs. Only one or two of these harnesses have that

capability.

NECK: indicates that the front or breast strap that encircles the neck can be adjusted for size.

We have omitted the Front eye/Handle column that we had in the last GUIDE to Dog Harnesses because none of these PFDs has that feature but it is an option on the K9 Storm harness.

TOP EYE. TOP HANDLE: Mostly a metal ring or D-ring but can be a reinforced sewn eye. Sewn eyes are indicated by an asterisk and details in the NOTES column. In professional models the top eye(s) may constitute part of a lift/hoist capability indicated in the **SUSPENSION** column. Otherwise assume that all of these are simply lead/tether eyes. The handle, will always be capable of lifting the full weight of the dog but this is simply for assisting out of the water or over an obstacle NOT for hoisting off the ground.

ACCESSORIES:

POUCH. VELCRO. LIGHT ATTACH: A pouch or pocket which can be for accessories like lift straps or dog supplies or the harness itself when not in use. **VELCRO** refers to strips of loop velcro onto which you can add badges, reflection, panniers etc. a key feature of 'tactical' harnesses. **LIGHT ATTACH** refers to elastic or Velcro-secured straps intended to hold a chemical light stick, strobe or torch/flashlight.

HI-VIZ REFLECTIVE MOLLE: **HI-VIZ** is a High visibility colour option like yellow or red. **REFLECTIVE** refers to smaller panels or badges or piping rather than the entire jacket. Often an optional badge and easily applied to harnesses with Velcro. **MOLLE** or **PALS** is military-style attachment webbing.

Any item that is an option is shown as an outline square □□□□

COLOUR: Primary colour of Jacket or panel or webbing if it's a web-only harness. Secondary or web colours are shown in the square's outline frame.

SIZE	WEIGHT of PFD	WEIGHT of DOG	GIRTH of DOG (&/or LENGTH of VEST)	SECURE GIRTH BELLY	NECK LENGTH	TOP /SIDE EYE(S) HANDLES	POUCH/VELCRO ATTACH LIGHT	HI-VIZ REFLECTIVE MOLLE	COLOURS	NOTES	WEBSITE
S/M L	1.2kg/2.6lb 1.5kg/3.3lb	25-40kg/55-88lb 45-65kg/118-143lb	55cm/22" 65cm/25.6"	■ ■	■ ■	1 4*	■ ■	■ ■	■ ■	Full flotation swim harness. *2 handles on flanks	alpdesign.it
S M L	800g/2lb 1kg/2.2lb 1.3kg/2.9lb	20-25kg/44-55lb 25-40kg/55-88lb >40kg/>88lb	- - -	■ ■	- ■	1 6*	■ ■	■ ■	■ ■	Full flotation swim harness with zipped pouch. *2 handles on flanks. 2x rings on each side are options.	alpdesign.it
S M L	178g/6oz 200g/7oz 220g/8oz	0-3kg/0-6.6lb 3-7kg/6.6-15.4lb 7-10kg/15.4-22lb	- - -	■ ■	- ■	1 1	■ ■	■ ■	■	Specifically designed for cats but could suit small dogs or animals?	Baltic.se
XS S M L XL XXL	170g/6oz 208g/7.3oz 248g/8.7oz 412g/14.5oz 470g/16.7oz 530g/19oz	0-3kg/0-6.6lb 3-8kg/6.6-17.6lb 8-15kg/17.6-33lb 15-40kg/33-88lb >40kg/>88lb	- - -	■ ■	- ■	1 1	- ■	■ ■	■ ■		Baltic.se

Images NOT to scale
N/A = Not Available/not given **COST:** Approx & inc local tax/VAT
£/\$ in orange = currency conversion
USES: ● = OK BUT NOT IDEAL
USES/FEATURES: □ = Option

		MODEL PRODUCT CODE	COMPANY	ORIGIN	COST inc tax/ VAT	USES GROUND SUSPENSION	USES SWIM RESCUE	MATERIALS: 'JACKET' WEBBING INTEGRAL 'HARDWARE'
		PLUTO	BALTIC		£20-28 \$24-38 €24-34	-	■	Cellu cushion float Polyester 3x plastic fast clips
		SPECIAL	BALTIC		£65 \$105 €96	-	●	Cellu cushion float Polyester 3x plastic fast clips 2x metal D-rings 2x plastic D-rings
		ZORRO	BALTIC		£39 \$47 €43	-	- ■	Cellu cushion float Polyester Top Zipper 1 ladderlock buckle 1 plastic D-ring
		PETFLOAT	CREWSAVER		£58 \$76 €68	-	■ ■	3x plastic fast clips 1x plastic D-ring
		DOG FLOTATION DEVICE & MICRO DFD	EZYDOG		£37-73 \$49-96 (£29) (\$38)	-	■ ■	Polyester/Neoprene Nylon 3x plastic fast clips 1x St. steel D-ring 1x nylon D-ring
		X2 BOOST	EZYDOG		£49-73 \$65-96 €57-85	-	■ ■	1680D Nylon/ Neoprene Nylon 3x plastic fast clips 1x alloy D-ring
		MULTIFUNCTION / IDC 3IN1 DOG VEST	JULIUS-K9		£82-120 \$120-164 €110-150	●	■ ■	Neoprene Nylon 2x plastic fast clips 3x metal D-rings
		SAR STD/ AERIAL INSERTION STD	K9 STORM		£2179* \$2699* €2520*	■	■ ■	Ballistic Nylon & Kevlar Mil-Spec Nylon 3x alloy fast clips 2x plastic fast clips
		UNDERDOG	MUSTANG SURVIVAL		£56 \$70 €65	●	■	Cordura & Mesh covered foam Nylon 3x plastic fast clips

SIZE	WEIGHT of PFD	WEIGHT of DOG	GIRTH of DOG (&/or LENGTH of VEST)	SECURE GIRTH 3x1LY	NECK LENGTH	TOP / SIDE EYE(S) HANDHOLDS	HI-VIZ REFLECTIVE POUCH/VELCRO ATTACH LIGHT	HI-VIZ MOLE REFLECTIVE	COLOURS	NOTES	WEBSITE
XS S M L XL XXL	133g/4.7oz 133g/4.7oz 175g/6oz 308g/11oz 347g/12oz 407g/14oz	0-3kg/0-6.6lb 3-8kg/6.6-17.6lb 8-15kg/17.6-33lb 15-40kg/33-88lb >40kg/>88lb	- -	 	 -	1 1	 	 	  		Baltic.se
S M L XL XXL	292g/10.3oz 434g/15.3oz 730g/25.7oz 800g/28.2oz 858g/30.2oz	0-8kg/0-17.6lb 8-15kg/17.6-33lb 15-40kg/33-88lb >40kg/>88lb >40+kg/>88+lb	- -	 	 -	2 1	 	 		2 side-mounted d-rings can take side handholds	Baltic.se
XS S M L	133g/4.7oz 133g/4.7oz 133g/4.7oz 133g/4.7oz	2-5kg/4.4-11lb 5-10kg/11-22lb 10-25kg/22-55lb >25kg/>55lb	- -		- -	0 1	 	 	 	Zips along the top. Weights of harness provided by Baltic must mean that increased air volume alone is the difference in the size of dog supported.	Baltic.se
XS S M L XL	300g/10.6oz 375g/13.2oz 450g/15.6oz 525g/18.5oz 600g/21.1oz	-	24-30cm/9-12" 28-35cm/12-14" 35-45cm/14-18" 45-55cm/18-22" 55-65cm/22-26"	 	 -	1 1	 	 	 		crewsaver.com
XS S M L XL	(214g/7.5oz) 317g/11.2oz 389g/13.7oz 508g/18oz 593g/21oz 670g/23.6oz	(<7kg/<15.4lb) 7-11kg/15-24lb 9-20kg/20-44lb 18-27kg/40-60lb 27-41kg/60-90lb >41kg/>90lb	(25-34 30-50cm/10-13 12-20") 25-33 48-81cm/10-13 19-32" 33-41 53-89cm/13-16 21-35" 38-50 64-99cm/15-20 25-39" 43-61 69-112cm/17-24 27-44" 51-66 76-122cm/20-26 30-48"	 	 -	1 1	 	 	 	Micro DFD is a variant for small dogs/animals	ezydog.co.uk
XS S M L XL	300g/10.6oz 350g/12.3oz 400g/14.1oz 450g/15.9oz 500g/17.6oz	7-11kg/15-24lb 9-20kg/20-44lb 18-27kg/40-60lb 27-41kg/60-90lb >41kg/>90lb	30-45 45-55cm/12-18 18-22" 35-50 56-65cm/14-20 22-26" 40-55 66-75cm/16-22 26-29" 45-60 76-85cm/18-24 30-33" 50-65 86-105cm/20-26 35-41"	 	 -	2* 1	 	 	   	* one is a sewn web eye	ezydog.co.uk
S M L XL	g lb	15-25kg/33-55lb 24-40kg/53-88lb 40-60kg/88-132lb	40 44-64cm/16 17-25" 46 55-72cm/18 22-28" 51 65-82cm/20 26-32" 57 75-92cm/22 29-36"		 -	2 1	 	 	  	Flotation panels can be removed *reflective seams	julius-k9.com
Custom*	average 907g/2lb	Custom*	Custom*		 -	1 3	 	 	     *	3 versions , Aerial Insertion, SWAT & SAR. All have #2 ballistic protection & buoyancy. *Customised for dog's wt, size & breed. *+3xMulti-Camo colours	k9storm.com
XS S M L XL	-	0.9-5.4kg/2-12lb 5.4-11kg/12-24lb 11-27kg/24-60lb 27-41kg/60-90lb 41-54kg/90-120lb	31-46cm/12-18" 46-61cm/18-24" 61-76cm/24-30" 69-91cm/27-36" 84-112cm/33-44"	 	 	1 1	 	 	 	*Light attach by virtue of the buckle adjustment web-ends velcro down	mustangsurvival.com

Images NOT to scale

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£\$€ in orange =currency conversion

USES: ●=OK BUT NOT IDEAL

USES/FEATURES: □= Option

		MODEL PRODUCT CODE	COMPANY	ORIGIN	COST inc tax/ VAT	GROUND SUSPENSION	SWIM RESCUE	MATERIALS: 'JACKET' WEBBING INTEGRAL 'HARDWARE'
		SAFE LIFE JACKET 2.0	NON-STOP DOGWEAR		£87-100 \$98-118 €88-107	●	■	PU-coated 210D Polyester Oxford/ 8mm TPE C/S1800 padding, Nylon 2x plastic fast clips* 3x metal D-rings
		PROTECTOR	NON-STOP DOGWEAR		£109-125 \$120-140 €110-135	●	■	PU-coated 210D Polyester Oxford/ HexiVent mesh, 8mm TPE C/S1800 padding, Nylon 2x plastic fast clips* 2x Lateral web loops
		CFD DOG LIFE JACKET	NRS		£49 \$60 €56	-	■	420D Rip-Stop Nylon Nylon 2x plastic fast clips 1x plastic ladderlock 1x metal D-ring
		MODULAR LLC WITH FLOTATION	RAY ALLEN MANUFACTURING		£176* \$210 €96	-	■	Ballistic Nylon Nylon 2 GT Cobra buckles, 1 Roll Bar buckle, 2x Fastex, 6x G-Hooks, 1x metal D-ring
		DOG BUOYANCY AID	RED		£65-90 \$85-120 €76-105	-	●	Cordura 3x plastic fast clips 1x metal D-ring
		PET BUOYANCY AID	RIBER		£23 \$30 €26	-	■	3x plastic fast clips 1x Ladderlock buckle 2x metal D-rings
		FLOATCOAT	RUFFWEAR		£95 \$80 €82	-	●	1000D Cordura PE 'Nylite' 4x 3-bar buckles 1x double-D buckle 4x length adjusters
		AUXILIUM	SPÜR HUNDE SCHULE		£51-61 \$64-77 €58-70	-	■	300D Cordura Nylon 3x plastic fast clips 1 metal D-ring
		K9 AQUAFLOAT	WEST COAST HYDRA- THERAPY		£60-70 \$79-92 €70-81	-	●	3x plastic fast clips 3x Length Adjusters

SIZE	WEIGHT of PFD	WEIGHT of DOG	GIRTH of DOG (&/or LENGTH of VEST)	SECURE GIRTH	NECK LENGTH	TOP / SIDE EYE(S)	HI-VIZ MOLLE REFLECTIVE POUCH/VELCRO ATTACH LIGHT	COLOURS	NOTES	WEBSITE
XS S M L XL XXL	169g/6oz 192g/6.8oz 312g/11oz 473g/17oz 619g/22oz 688g/24oz	1.5-7kg/3.3-15.4lb 2.5-10kg/5.5-22lb 5-20kg/11-44.1lb 10-30kg/22-66lb 15-40kg/33-88.2lb 20-50kg/44-110lb	20cm/8" 25cm/10" 30cm/12" 36cm/14" 42cm/17" 51cm/20"	 	 -	1 2 1	  		2 side-mounted d-rings can take side handholds * Duraflex	nonstopdogwear.com
XS S M L XL XXL	169g/6oz 192g/6.8oz 312g/11oz 473g/17oz 619g/22oz 688g/24oz	1.5-7kg/3.3-15.4lb 2.5-10kg/5.5-22lb 5-20kg/11-44.1lb 10-30kg/22-66lb 15-40kg/33-88.2lb 20-50kg/44-110lb	20cm/8" 25cm/10" 30cm/12" 36cm/14" 42cm/17" 51cm/20"	 	 -	1 2 1	  		2 side-mounted d-rings can take side handholds * Duraflex	nonstopdogwear.com
XS S M L XL	181g/6.4oz 233g/8.2oz 320g/11.3oz 374g/13.2oz 428g/15.1oz	<5kg/<12lb 6-11kg/13-24lb 11-27kg/25-59lb 27-36kg/60-79lb >36kg/>80lb	35-53cm/14-21" 51-66cm/20-26" 64-79cm/25-31" 76-91cm/30-36" 89-104cm/35-41"	 	 -	1 1	- 	 	Bouyancy= 1.2kg/2.7lb 1.5kg/3.4 lb 2.2kg/4.9lb 2.9kg/6.4lb 3.6kg/7.9lb	nrs.com
Uni	408g/0.9lb +flotation panels	all	68-80cm/26-31.5" + extension strap for larger dogs	 	 	2 1	 	  + 	Flotation panels can be removed *price for modular harness + add-on 100N flotation	rayallen.com
XS S M L XL	-	-	33-48cm/13-19" 46-64cm/18-25" 61-81cm/24-32" 76-94cm/30-37" 89-114cm/35-45	 	 -	1 4*	 	  	2 dorsal + 1 running each side from shoulder to chest (black strap that leads to fast clip buckle)	red-equipment.co.uk
M L	-	-	33-55cm/13-22" 40-70cm/21-27" 46-76cm/18-30"	 	 	2 1	 			riberproducts.com
XS S M L XL	.2kg/0.4lb .25kg/0.55lb .34kg/0.75lb .43kg/0.95lb .5kg/1.1lb .6kg/1.35lb	-	33-43cm/13-17" 43-56cm/17-22" 56-69cm/22-27" 69-81cm/27-32" 81-91cm/32-36" 91-107cm/36-42"	 	 -	2* 1	 	 	*1 eye is a webbing eye	ruffwear.com
M L XL	0.4kg/0.88lb	-	40-60cm/21-24" 60-80cm/24-32" 80-100cm/32-39" 100-140cm/39-55"		 -	1 2			100N of buoyancy	spuerhundeschule.de
XS S M L XL XXL XXXL	3.9kg/8.7lb	-	51-61cm/20-24" 54-63cm/21-25" 57-67cm/22-26" 65-80cm/26-31" 73-93cm/29-37" 87-104cm/34-41" 87-107cm/34-42"		 -	3* 1		 	*all are webbing eyes	westcoasthydrotherapy.co.uk



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