



SAFETY DATA SHEET

R-1234ze(E)

Issue: September 2026 Version 2.2

Date: 3 September 2026

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name:	R-1234ze(E)
Chemical name:	Trans-1,3,3,3-Tetrafluoroprop-1-ene
CAS No:	29118-24-9
REACH registration number:	01-0000019758-54-XXXX
UFI (not mandatory):	5C00-X01K-300K-FX6R

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture:	Refrigerant
Restrictions on use:	For professional use only.

1.3. Details of the supplier of the safety data sheet

Supplier's name:	GAS SERVEI S.A.
Address:	C/ Motors, 151-155, Unit No. 9 08038 Barcelona SPAIN
Telephone:	+34 (93) 2231377
Fax:	+34 (93) 2231479 www.gas-servei.com
Email of the person responsible for the SDS:	gas-servei@gas-servei.com

1.4. Emergency telephone number

National Institute of Toxicology and Forensic Sciences: + 34 (91) 5620420

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Criteria: Regulation (EC) No 1272/2008 (Classification, Labelling and Packaging):

Pressurised gases, Liquefied gas H280: Contains gas under pressure; risk of explosion if heated.

2.2. Label elements

Hazard pictograms:	Symbols: GHS04
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Signal word:	Warning
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Hazard statements:	H280: Contains gas under pressure; may explode if heated.
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Precautionary statements:

Storage:

P410+P403: Protect from sunlight. Store in a well-ventilated place.

Additional labelling:

Contains fluorinated greenhouse gases .

2.3. Other hazards

This substance/mixture does not contain any components considered to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) at concentrations of 0.1% or higher.

Ecological information: The substance/mixture does not contain any components that exhibit endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at concentrations of 0.1% or higher.

Toxicological information: The substance/mixture does not contain any components with endocrine-disrupting properties in accordance with Article 57(f) of REACH, Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at concentrations of 0.1% or higher.

The vapours are heavier than air and may cause asphyxiation by reducing the oxygen content of the air breathed.

Incorrect use or intentional inhalation may cause death without warning symptoms, due to cardiac effects.

Rapid evaporation of the product may cause frostbite.

It may displace oxygen and cause rapid asphyxiation.

SECTION 3. Composition/information on ingredients

3.1. Substances

Components

Chemical name	Concentration (% by weight)	CAS No.	EC No	REACH registration number	Classification
					EC Regulation No 1272/2008
Trans-1,3,3,3-Tetrafluoroprop-1-ene (HFO 1234ze(E))	100	29118-24-9	471-480-0	01-0000019758-54-XXXX	 2.5 H280 Compressed Gas

3.2. Mixtures

Not applicable

SECTION 4. First aid measures

4.1. Description of first aid measures

	General recommendations:	In the event of an accident or if you feel unwell, seek medical attention immediately.
	Protection of first-aiders:	If symptoms persist or if in doubt, seek medical advice. No special precautions are required for first-aiders.
	In case of inhalation:	If inhaled, move the person to fresh air. If the person is not breathing, administer artificial respiration. If breathing is difficult, give oxygen. Seek medical attention immediately.
	In the event of skin contact:	Thaw the frozen areas with warm water. Do not rub the affected area. Seek medical attention immediately.
	In the event of eye contact:	Seek medical attention immediately.
	If swallowed:	Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

May cause cardiac arrhythmia.

Other symptoms possibly related to misuse or abuse by inhalation include:

Cardiac sensitisation	Anaesthetic effects
Mild dizziness	Vertigo
Confusion	Lack of coordination
Drowsiness	Loss of consciousness

The gas reduces the amount of oxygen available for breathing.

Contact with the refrigerated liquid or gas can cause cold burns and frostbite.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment:

Symptomatic treatment and supportive care as appropriate.

Due to possible cardiac arrhythmias, catecholamines, such as epinephrine, which may be used in life-support emergencies, should be used with particular caution.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Extinguishing media:

Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Powdered chemical

Extinguishing agents

Not suitable:

Do not use a water jet

5.2. Specific hazards arising from the substance or mixture

Specific hazards in
firefighting:

Exposure to combustion products may pose a health hazard. Do not inhale the gases produced.

The product is not flammable under normal conditions.

Due to the high vapour pressure, there is a risk that containers may burst in the event of a rise in temperature.

Hazardous

combustion products:

Hydrogen fluoride
Carbonyl fluoride
Carbon oxides
Fluorinated compounds

5.3. Advice for firefighters

Protective equipment

Special protective equipment:

If necessary, use self-contained breathing apparatus when fighting the fire. Wear personal protective equipment.

Specific

for extinguishing:

Use extinguishing methods appropriate to the local circumstances and the surrounding area.

Fight the fire from a distance due to the risk of explosion.

Use a water spray to cool closed containers.

Remove undamaged containers from the fire area if it is safe to do so.

Evacuate the area.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas.

Use self-contained breathing apparatus and appropriate personal protective equipment whilst cleaning up spills.

Avoid skin contact with the leaking liquid (risk of frostbite).

Ventilate the area.

Follow the safe handling advice (see Section 7) and the recommendations for personal protective equipment (see Section 8).

6.2. Environmental precautions

Do not release into the environment.

Prevent the product from entering the soil/subsoil.

Prevent it from entering surface water or the sewerage system.

Safely prevent further leaks or spills.

Contain and dispose of contaminated water.

In the event of a gas leak or the product entering watercourses, the soil or the sewerage system, inform the relevant authorities.

6.3. Methods and material for containment and cleaning up

Clean-up methods: Ventilate the area.

Do not direct the water jet at the source of the leak.

Containment and

containment and clean-up: Suitable material for collection: None. Allow to evaporate.

Local or national regulations may apply to the release and disposal of this material, and to the materials and equipment used in cleaning up spills. You should determine which regulations apply.

Sections 13 and 15 of this safety data sheet provide information on certain local or national requirements.

6.4. Reference to other sections

See also sections 7, 8, 11, 12 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Technical measures: Use equipment rated for the cylinder pressure. Fit a backflow prevention device in the pipework. Close the valve after each use and after emptying.

Local/general ventilation: Use only in well-ventilated areas.

Advice on
safe handling:

Avoid contact with skin and eyes.

Avoid inhaling vapours and mists from the fluid.

Do not use empty containers that have not been cleaned beforehand.

Handle in accordance with good industrial safety and hygiene practices, based on the results of the workplace exposure assessment.

Wear cold-resistant gloves and face/eye protection.

The valve protection caps and threaded plugs on the valve outlet must remain in place unless the container is secured with the valve outlet connected to the point of use.

Fit a non-return valve or a trap (vent, siphon trap or interceptor) in the discharge line to prevent dangerous backflow into the cylinder.

Before carrying out transfer operations, ensure that the containers are free from incompatible materials and/or residues.

Prevent gas from flowing back into the gas cylinder.

Use a pressure regulator when connecting the cylinder to systems or pipework operating at lower pressure.
Close the valve after each use and after emptying.
DO NOT alter or force the connections.
Prevent water from seeping into the gas cylinder.
Never attempt to lift the cylinder by its cap.
Do not drag, slide or roll the cylinders.
Use a suitable hand trolley to move the cylinder.
Keep away from heat and sources of ignition.
The transfer of liquid refrigerant from refrigerant containers to systems and from systems may cause the build-up of static electricity. Ensure there is a suitable earth connection.
Certain mixtures of HFO and chlorine may be flammable or reactive under certain conditions. Avoid the build-up of electrostatic charges.
Take care to mitigate the risk of high pressures developing in systems, caused by a rise in temperature when liquid becomes trapped between closed valves or when containers have been overfilled.
Prevent spillage and waste. Minimise release into the environment.

Hygiene measures:

If exposure to chemicals is likely during normal use, provide eye-wash stations and safety showers near the work area.
Do not eat, drink or smoke whilst using the product.
Wash contaminated clothing before reusing it.

7.2. Conditions for safe storage, including any incompatibilities

Technical requirements for

storage facilities and containers:

Keep cylinders in a well-ventilated area away from sources of ignition.
Cylinders must be stored upright and securely fastened to prevent them from falling or being knocked over.
Keep full containers separate from empty ones.
Do not store near combustible materials.
Avoid areas where salt and other corrosive materials are present.
Store in correctly labelled containers.
Keep in a cool, well-ventilated place.
Keep it away from direct sunlight.
Store in accordance with specific national regulations.

Guidance on
joint storage:

Do not store with the following types of products:
Self-reactive substances and mixtures
Organic peroxides
Oxidising agents
Flammable liquids
Flammable solids
Pyrophoric liquids
Pyrophoric solids
Substances and mixtures that undergo spontaneous heating.
Substances and mixtures which, on contact with water, give off flammable gases.
Explosives
Highly toxic mixtures and substances.
Very toxic mixtures and substances.
Mixtures and substances with chronic toxicity

Recommended
:

< 50 °C

Storage life:

> 10 years

Further information
on stability
during storage:

The product has an indefinite shelf life when stored correctly.

7.3. Specific end use(s)

Subject to Member State regulations, the uses for which it may be applied are as follows:
Refrigerant.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

There is no information indicating any occupational exposure limit.

Derived No-Effect Level (DNEL) in accordance with Regulation (EC) No 1907/2006:

Name of the substance	CAS	End use	Route of exposure	Potential health effects	Value (mg/m ³)
Trans-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	Workers	Inhalation	Long-term – systemic effects	3,902
		Consumers	Inhalation		830

Predicted No-Effect Concentration (PNEC) in accordance with Regulation (EC) No 1907/2006:

Substance name	CAS No.	Environmental compartment	Value
Trans-1,3,3,3-Tetrafluoroprop-1-ene	29118-24-9	Freshwater	0.1 mg/l

8.2. Exposure controls

Occupational exposure controls

Personal protective equipment must comply with current EN standards: Respiratory protection EN 136, 140, 149; Safety spectacles/Eye protection EN 166; Protective clothing EN 340, 463, 469, 943-1, 943-2; Protective gloves CEN 374, 511; Protective footwear EN-ISO 20345.

Do not breathe in the vapours.

Engineering controls

Ensure adequate ventilation, particularly in confined spaces.

Minimise exposure concentrations in the workplace.

Personal protection



Respiratory protection:

If there is no adequate exhaust ventilation or the exposure assessment indicates exposure exceeding the recommended limits, use a self-contained breathing apparatus or a positive-pressure air supply with a mask.
The equipment must comply with UNE EN 14387.
Organic gas and low-boiling-point vapour type (AX).

Filter type:

Skin

and body protection:

Wash skin after any contact with the product.

When handling containers, the use of safety footwear is recommended.



Hand protection:

Material:

Notes:

Gloves resistant to low temperatures

Select chemical-resistant gloves taking into account the quantity and concentration of the hazardous substances to be handled in the workplace. It is recommended to check with the manufacturer of the above-mentioned protective gloves whether they offer the necessary resistance for applications involving specific chemicals. Wash your hands before breaks and at the end of the working day. No break time has been specified for this product. Change gloves frequently.



Eye protection:

Wear the following personal protective equipment:

Chemical-resistant goggles must be worn.

Face shield.

The equipment must comply with UNE EN 166.

SECTION 9. Physical and chemical properties

Appearance:	Liquefied gas
Colour:	Colourless
Odour:	Faint, similar to ether
Odour threshold:	No data available
pH:	No data available
Melting/freezing point:	No data available
Initial boiling point and boiling range:	
boiling point and range:	-19 °C
Flash point:	Not applicable
Evaporation rate:	Not applicable
Flammability (solid, gas):	Will not burn
Upper explosion limit	
/Flammability limit	
Upper:	Upper flammability limit Method: ASTM E681
	None.
Lower explosive limit	
/Lower flammability limit	
:	Lower flammability limit Method: ASTM E681
	None.
Vapour pressure:	4.985 hPa (25 °C)
Vapour density:	26.32 kg/m ³ (25 °C)
Relative density:	1.166 (25 °C) (water = 1)
Density:	1.163 g/cm ³ (25 °C) (as a liquid)
Solubility	
Water solubility:	0.373 g/l
Partition coefficient	
(n-octanol/water):	log Pow 1.6
Auto-ignition temperature:	368 °C
Decomposition	
decomposition:	Not applicable
Viscosity:	Not applicable
Explosive properties:	Non-explosive
Oxidising properties:	The substance or mixture is not classified as an oxidiser.
Particle size:	Not applicable

Other data

Critical temperature: 109.4 °C

Critical pressure: 36.35 bar

SECTION 10. Stability and reactivity

10.1. Reactivity

Not classified as a reactivity hazard.

10.2. Chemical stability

Stable when used as directed. Follow the precautionary advice and avoid incompatible materials and conditions.

10.3. Possibility of hazardous reactions

Certain mixtures of HFO may be flammable or reactive under certain conditions.

It may react with strong oxidising agents.

10.4. Conditions to avoid

This substance is not flammable in air at normal temperatures and pressures. However, mixtures of this substance with air at pressures higher than atmospheric pressure may become flammable in the presence of an ignition source. This substance may also become flammable in an oxygen-enriched atmosphere (oxygen concentrations higher than those found in air). Therefore, a mixture containing air and this substance, or this substance in an oxygen-enriched environment, may become flammable. This will depend on the relationship between 1) temperature, 2) pressure and 3) the proportion of oxygen in the mixture. Generally, this substance must not be mixed with air at pressures above atmospheric pressure or at high temperatures; nor in an oxygen-enriched atmosphere. For example, this substance must NOT be mixed with air under pressure for leak testing or for other purposes.

Avoid heat, flames and sparks.

10.5. Incompatible materials

Strong oxidising agents, alkali metals and alkaline earth metals, and other metals and transition metals, aluminium powder, zinc, etc.

10.6. Hazardous decomposition products

Halogenated compounds, hydrogen fluoride resulting from thermal decomposition and hydrolysis.

SECTION 11. Toxicological information

11.1. Information on the hazard classes defined in Regulation (EC) No 1272/2008

Information on

possible routes of exposure: Inhalation
 Skin contact
 Eye contact

a. Acute toxicity

Not classified based on the available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Acute inhalation toxicity: LC0 (Rat): > 207,000 ppm
 Exposure time: 4 h
 Test atmosphere: gas
 Method: OECD Test Guideline 403

Acute dermal toxicity: Assessment: The substance or mixture does not exhibit any acute dermal toxicity.

b. Skin corrosion/irritation

Not classified based on the available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Species: Rabbit
 Method: OECD Test Guideline 404
 Result: Does not irritate the skin.

c. Severe eye damage/irritation

Not classified based on the available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

No data available. The study is not technically feasible.

d. Respiratory or skin sensitisation

Skin sensitisation

Not classified based on the available information.

Respiratory sensitisation

Not classified based on the available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Species: Humans

Result: Does not cause skin sensitisation.

e. Germ cell mutagenicity

Not classified based on available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

In vitro genotoxicity: Test type: Bacterial reverse mutation assay (Ames test).

Method: OECD Test Guideline 471

Result: Negative

Test type: In vitro chromosomal aberration test

Method: OECD Test Guideline 473

Result: Negative

In vivo genotoxicity: Test type: Mammalian bone marrow mutagenicity, chromosomal analysis (in vivo cytogenetic assay)

Species: Mouse

Cell type: Micronuclei

Route of administration: inhalation (gas)

Method: OECD Test Guideline 474

Result: Negative

f. Carcinogenicity

Not classified based on the available information.

g. Reproductive toxicity

Not classified based on available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Effects on fertility: Test type: Two-generation reproductive toxicity study

Species: Rat

Route of exposure: Inhalation

Method: OECD Test Guideline 416

General toxicity in parents: NOEL: > 20,000 ppm

General toxicity in F1: NOEL: > 20,000 ppm

Effects on foetal development: Species: Rat

Route of administration: Inhalation

Method: OECD Test Guideline 414

General maternal toxicity: NOEC: 15,000 ppm

Developmental toxicity: NOAEC: 15,000 ppm

h. STOT – single exposure

Not classified based on available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Not classified based on available information.

i. STOT – repeated exposure

Not classified based on the available information.

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Not classified based on the available information.

j. Aspiration hazard

Not classified based on available information.

11.2. Information on other hazards

a. Endocrine-disrupting properties

Assessment:

The substance/mixture does not contain any components with endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at concentrations of 0.1% or higher.

SECTION 12. Ecological information

12.1. Toxicity

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Toxicity to fish:

CL0 (Cyprinus carpio (Carp)): > 117 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to Daphnia

and other aquatic invertebrates:

EC50 (Daphnia magna (giant water flea)): > 160 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to

algae/aquatic plants:

ErC50 (green algae): > 170 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
NOEC (green algae): > 1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

12.2. Persistence and degradability

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Biodegradability:

Result: Not readily biodegradable.

12.3. Bioaccumulation potential

Components:

Trans-1,3,3,3-tetrafluoroprop-1-ene:

Bioaccumulation:

Remarks: Bioaccumulation is unlikely.
Partition coefficient
(n-octanol/water): log Pow: ≤ 4

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

Assessment: This mixture does not contain any components considered to be persistent and bioaccumulative (PBT) or very persistent and very bioaccumulative (vPvB) at concentrations of 0.1% or higher.

12.6. Endocrine disrupting properties

Assessment: The mixture does not contain any components that exhibit endocrine-disrupting properties in accordance with Article 57(f) of REACH, Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at concentrations of 0.1% or higher.

12.7. Other adverse effects

Global warming potential

Regulation (EU) No 2024/573 on fluorinated greenhouse gases

Product:

Global warming potential over 100 years: 1.37

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Product: Dispose of in accordance with local regulations. However, this product should be recycled or reclaimed wherever possible.

Contaminated containers: Empty pressurised containers must be returned to the supplier. Comply with applicable local and national regulations.

13.2. Other information

Waste management provisions:

Directive 2006/12/EC; Directive 2008/98/EC
EC Regulation No. 1013/2006

Personal protective equipment: see Section 8.

SECTION 14. Transport information

14.1. UN number or ID number

ADN:	3163
ADR:	3163
RID:	3163
IATA:	3163
IMDG:	3163

14.2. UN proper shipping name

ADR/ADN/RID:	LIQUEFIED GAS, N.O.S. . (TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
IMDG:	LIQUEFIED GAS, N.O.S. (TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
IATA:	Liquefied Gas, , n.o.s. (Trans-1,3,3,3-tetrafluoroprop-1-ene)

14.3. Transport hazard class(es)

	<u>Class</u>	<u>Subsidiary risks</u>	<u>Classification code</u>	<u>Hazard identification no.</u>
ADR:	2	2.2	2A	20
DNA:	2	2.2	2A	20
RID:	2	2.2, (13)	2A	20
IMDG:	2.2			
IATA:	2.2			

14.4. Packing group

Not assigned by regulation.

Tags

ADR/ADN/RID/IMDG: 2.2



IMDG / IATA: Non-flammable. Non-toxic gas

Packaging instructions

IATA (Cargo): 200

IATA (Passenger): 200

Tunnel Restriction Code

ADR: (C/E)

EmS code

IMDG: F-C, S-V

14.5. Environmental hazards

No: (ADR/ADN/RID/IMDG)

14.6. Special precautions for user

The transport classification(s) provided here are for information purposes only and are based solely on the properties of the unpackaged material as described in this Safety Data Sheet. Transport classifications may vary depending on the mode of transport, the size of the container/packaging and variations in regional or national regulations.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH – Restrictions on the manufacture, placing on the market and use of certain hazardous substances, mixtures and articles (Annex XVII):

Not applicable

REACH – Candidate List of Substances of Very High Concern for Authorisation (Article 59):

This product does not contain substances of very high concern above the relevant legal concentration limit ($\geq 0.1\%$ w/w).

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer:

Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast version):

Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council concerning the export and import of dangerous chemicals:

Not applicable

REACH – List of substances subject to authorisation (Annex XIV):

Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances:

Not applicable

Regulation (EC) No 2024/573 of the European Parliament and of the Council on certain fluorinated greenhouse gases: The fluorinated greenhouse gas R-1234ze(E) must be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases regulated by the Kyoto Protocol. Fluorinated greenhouse gases in containers or cylinders must not be vented into the atmosphere.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out for this product.

SECTION 16. Other information

This safety data sheet supersedes and replaces all previous editions.

Date of issue: 3 September 2026

Version: 2.2

This Safety Data Sheet has been prepared in accordance with:

Regulation (EC) No 1907/2006 and its subsequent amendments: Regulation (EU) No 2015/830 and Regulation (EU) No 2020/878

Text of the phrases used in Section 3:

H280: Contains gas under pressure; risk of explosion if heated.

This document has been prepared by a competent person who has received appropriate training.

The information set out here is based on our knowledge as at the date stated above. It relates exclusively to the product specified and does not constitute a guarantee of any particular qualities.

The user must ensure the suitability and accuracy of this information in relation to their specific intended use of the product.

The information is considered correct but is not exhaustive and is to be used solely as a guide, based on current knowledge of the chemical substance or mixture and applicable to the appropriate safety precautions for the product.

The list of risks, as well as legal, regulatory and administrative texts, is not exhaustive; the recipient or user of the product bears sole responsibility for referring to the official regulations governing the storage, handling and use of these products.

Glossary of abbreviations

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

CMR: Carcinogenic, mutagenic or toxic to reproduction.

DIN: Standard of the German Institute for Standardisation.

CEx: Concentration associated with an x% response.

EmS: Emergency procedure.

GHS: Globally Harmonised System of Classification and Labelling of Chemicals.

IATA: International Air Transport Association.

IBC: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk. Hazardous Chemicals in Bulk.

IMDG: International Maritime Dangerous Goods Code.

LC50: Lethal concentration causing death in 50 per cent of a test population.

NOAEL: No Observed Adverse Effect Level.

NOEL: No Observed Effect Level.

NOELR: No Observable Effect Loading Rate.

IMO: International Maritime Organisation.

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail (COTIF).

UN: United Nations.

VLA: Environmental Limit Values.

UNRTDG: United Nations Recommendations on the Transport of Dangerous Goods.