Polyols
Product Range

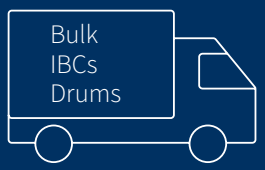
HARKE
Coatings &
Polymers



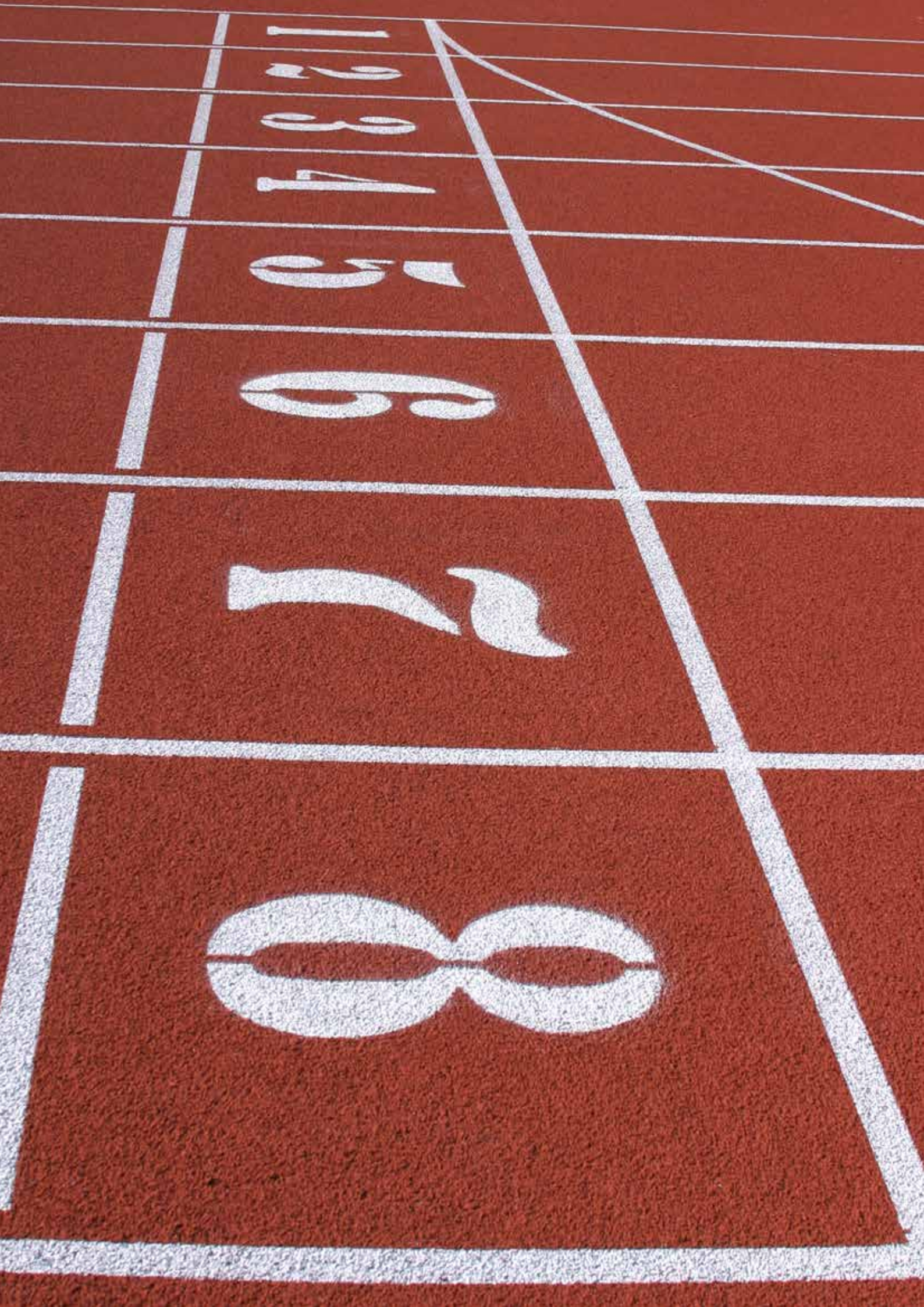
Coatings, Plastics
& Polymers

BENEFITS

- Useable for several applications
- Different molecular weights
- Steady quality
- Diols, triols etc.



YOUR PARTNER FOR
COATINGS, PLASTICS & POLYMERS



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HARKE Chemicals GmbH stands for certified quality and constant engagement for a sustainable protection of the environment.

POLYETHER POLYOLS – PETOL

Type	Hydroxyl Value (mg KOH/g)	Acid value (BBT), max. mg KOH/g	Viscosity at 25 °C (cP)	Water (Karl-Fischer) max. (%)	Typical density at 25°C (g/cm³)	Functio-nality	Average molecular weight (g/mol)
POLY (PROPYLENE OXIDE) HOMOPOLYMERS (PPG)							
56-2 A	53-59	0.05	280-380	0.05	1.002	2	2000
56-2 LM	53-59	0.05	300-450	0.05	1.002	2	2000
120-2	110-130	0.05	100-180	0.05	1.003	2	935
110-2 A	108-116	0.05	140-180	0.05	1.003	2	1000
250-2	240-260	0.05	60-100	0.08	1.002	2	450
28-2LM	26-30	0.05	900-1200	0.05	1.001	2	4000
9-2EXP	7.5-10.5	0.02	5000-7000	0.05	1.001	2	12000
Applications:	▪ coating ▪ adhesives ▪ elastomers ▪ sealants ▪ defoamers ▪ viscosity reducer in polyol blends for polyurethane foams ▪ flexibleness agent for epoxi resins ▪ lubricants						
TRIOLS (BASED ON GLYCERINE) FOR FLEXIBLE FOAMS							
46-3MB	43-49	0.05	500-700	0.1	1.015	3	3600
48-3MB	46-50	0.05	530-630	0.1	1.015	3	3500
56-3	53-59	0.05	400-600	0.1	1.005	3	3000
36-3BR	33-39	0.05	700-1000	0.1	1.017	3	4800
28-3B	26-30	0.05	1050-1300	0.1	1.015	3	6000
S38-3B	36-40	0.1	1050-1250	0.1	1.080	3	4400
56-3LM	53-59	0.05	500-700	0.1	1.005	3	3000
48-3S	46-50	0.05	630-830	0.1	1.015	3	3500
V 50-3S*	48-54	0.05	700-900	0.1	1.000	2.7	3000
Applications:	▪ flexible slabstock foams (standard, soft or super soft) ▪ high resilience flexible slabstock foams ▪ high resilience molded polyurethane foams ▪ semi-rigid and integral skin foams						
TRIOLS (BASED ON GLYCERINE) FOR SPECIAL APPLICATIONS							
160-3	150-170	0.05	240-300	0.08	1.018	3	1000
250-3	240-260	0.05	240-300	0.08	1.027	3	670
400-3	360-400	0.1	330-430	0.08	1.050	3	440
45-3S**	43-47	0.05	700-850	0.05	1.005	3	3740
Applications:	▪ base polyols for OCF ▪ rigid foams formulations ▪ CASE applications ▪ flexibleness agent for epoxi resins hydraulic fluids						

Type	Hydroxyl Value (mg KOH/g)	Acid value max. mg KOH/g	Viscosity at 25 °C (cP)	Water content max. (%)	Ethylene oxide content (%)	Average molecular weight (g/mol)
REACTIVE POLYETHER POLYOLS DIOLS (EO TIPPED POLYPROPYLENE GLYCOL)						
28-2B	26-30	0.05	800-1000	0.05	18-20	4000
56-2B**	53-59	0.05	280-380	0.05	11-13	2000
49-2B**	46.5-50.5	0.05	400-500	0.05	29-31	2300
Applications:	▪ adhesives ▪ binder ▪ elastomers ▪ component in polyurethane products formulations					

* *Based on castor oil*
** *Under development*

CHIMCOMPLEX

Type	Hydroxyl Value (mg KOH/g)	Solid Content (%)	Viscosity at 25 °C (cP)	Water (Karl-Fischer) (max.) %	Typical density at 25°C (g/cm³)	Functio-nality	Average molecular weight (g/mol)
SAN POLYMER POLYOLS (STYRENE-ACRYLONITRILE COPOLYMER GRAFTED ON THE POLYETHER CHAINS)							
PP 452	28-36	44-47	3500-4600	0.1	1.03	3	3000
PP 251	36-40	24-27	1000-1700	0.1	1.028	3	3500
PP 151	39-43	14-16	850-1100	0.08	1.025	3	3500
PP 101	41-45	9-11	700-1000	0.08	1.02	3	3500
PP 2045	18-22	44-46	5500-8000	0.1	1.05	3	4800
Applications:	▪ slabstock flexible polyurethane foams						

Type	Hydroxyl Value (mg KOH/g)	Average molecular weight (g/mol)	Viscosity at 25 °C (cP)	Water (Karl-Fischer) (max.) %	Typical density at 25°C (g/cm³)	Functio-nality
SUCROSE/SORBITOL BASED POLYOLS						
PZ 360-4G	345-375	700	2700-3700	0.1	1.05-1.15	4.6
PZ 400-4G	400-450	630	4000-6000	0.1	1.05-1.15	4.5
PZ 480-4G	460-490	530	6500-9000	0.1	1.05-1.15	4.5
585-4D	570-600	380	4000-4700	0.1%	1.05-1.15	4
PZ 400-5G	400-450	700	5000-11000	0.1	1.05-1.15	5
PS 460-5P	440-480	650	12500-15500	0.1	1.07-1.09	5.4
PS 500-5G	480-520	550	7500-10500	0.1	1.08-1.09	4.8
PS 500-4G	480-520	450	2000-4000	0.1	1.07-1.09	4
PS 400-4G	400-450	630	3000-5000	0.1	1.09-1.1	4.5
PS 480-6	460-500	700	30000-40000	0.2	1.08-1.12	6
Applications:	▪ Polyol blends for rigid polyurethane foams					
ALIPHATIC AMINES AND MANNICH POLYOLS						
PA 450-4E	430-470	500	3000-5000	0.1	1.02-1.07	4
PA 640-4E	615-665	350	14500-19500	0.2	1.02-1.07	4
PA 450-3T	400-500	375	300-400	0.1	1.04-1.06	3
PM 410-4N	400-440	530	8000-15000	0.1	1.01-1.10	4
Applications:	▪ rigid polyurethane foams ▪ crosslinker agent ▪ semirigid polyurethane foams					

POLYCARBONATE POLYOLS

Available Types

Type	Name	OH number [mg KOH/g]	Average Molecular Weight [g/mol]	Viscosity at 50 °C [cps]	Melting Range [°C]	Appearance	Functio-nality
102	Ravecarb Homopolymer from Hexanediol	106 - 118	1000	1000	33 - 43	white, solid	2
103	Ravecarb Copolymer from Hexanediol and Pentanediol	106 - 118	1000	1000	-	liquid	2
106	Ravecarb Homopolymer from Hexanediol	53 - 59	2000	10000	36 - 50	white, solid	2
107	Ravecarb Copolymer from Hexanediol and Pentanediol	58 - 64	2000	8000	-	liquid	2
111	Ravecarb Copolymer from Polycaprolactonediol and Hexanediol	56	2000	3500	-	liquid	2

Application: Aliphatic polycarbonate polyols have a very good weathering resistance, excellent hydrolytic stability and low viscosity. Formally polycarbonate esterification are out of carbonic acid and at least difunctional alcohols. Our polycarbonate polyols are suitable for direct use in high-quality coatings. They also can be used to the further development of polyurethane binders. Especially noteworthy were polyurethane dispersions.



MITSUBISHI CHEMICAL

POLYURETHANE ADDITIVES

Finishing Lacquers

These are the products to finish the moulded soles, our range includes dipping and spray types. These are used with specific machines and the soles are dipped directly into the bath containing the lacquer. The consumption of lacquer is only about 15 - 25 gr/pair.

- Transparent finish
- Special effects such as cork imitation, metallic, velvet imitation or rubber-like touch
- Brush-Off finish (age effects)

Flame Retardants

These additives can influence the flammability, the propagation of the flame and/or the fire load. For each application the most suitable flame retardant solution should be used to assure a high fire retardant effect of the material.

- Halogenated/halogen-free
- Solid/liquid
- Reduces flammability
- Prevent negative effects (toxic gases, smoke or odors)

Pigment Paste

They have been developed for colouring both Polyether and Polyester Polyurethane compounds, used in the production of shoe soles, integral skin, rigid and slab-stock foams, RIM and elastomers. They are a concentrated pigment dispersion in plasticizer or in polyol.

- Viscosity range from 500 - 10.000 cps
- Usage level between 0.5 - 5 %
- OH number from 0 - 32
- Concentrated pigment paste with plasticizer or polyol as carrier

Release-Agents

Water or solvent based (high or low concentration) Release-Agents for the production of shoe soles, flexible hot & cold foam, RIM, RRIM and SRIM as well for elastomers. Additionally we are providing our customers cleaners for their moulds and mixing heads.

- Solvent or water based
- Ready to use products manually or by air gun
- Available for all PU applications





PTMG

MITSUBISHI CHEMICAL

PTMG – Poly(tetramethylene ether) Glycol is manufactured by tetrahydrofuran (THF). It is a linear polyether glycol with primary hydroxyl groups at both ends. It easily reacts with isocyanates compounds (e.g. MDI, TDI), and generates polymers with the superior characteristic described below.

- High impact resilience
- Flexibility at low temperature
- Tear resistance
- Hydrolysis resistance
- Abrasion resistance
- Fungus resistance

PTMG has superior characteristics for use in the soft segment of polyurethane and polyester resins. The polymer obtained is used in a wide range of applications, from clothing and other ordinary consumables to various industrial materials (e.g. mechanical parts). Its applications are expected to increase in the future.

Feature of PTMG process:

1. Stable and high product quality (uncolored and low impurity), which is highly valued from leading manufacturer of spandex fibers
2. Using original catalysts
3. Cost competitive process
4. Green process/low waste and low environmental loadd

Grade	Molecular Weight	Hydroxyl Value (mg KOH/g)	Acid Value (mg KOH/g)	Moisture (%)	Volatile Content (%)	Color (Hazen)	Viscosity (mPA*s)
PTMG 250	210 ± 25	477.5 ~ 606.5	max. 0.10	max. 0.05	max. 0.1	max. 50	50 (20 °C)
PTMG 650**	650 ± 50	160 ~ 187	max. 0.05	max. 0.03	max. 0.1	max. 50	160 (40 °C)
PTMG 850*	850 ± 50	125 ~ 140	max. 0.05	max. 0.03	max. 0.1	max. 50	2
PTMG 1000**	1,000 ± 50	107 ~ 118	max. 0.05	max. 0.03	max. 0.1	max. 50	320 (40 °C)
PTMG 1300*	1,300 ± 65	82 ~ 91	max. 0.05	max. 0.03	max. 0.1	max. 50	
PTMG 1500*	1,500 ± 75	71 ~ 79	max. 0.05	max. 0.03	max. 0.1	max. 50	
PTMG 1800*	1,800 ± 100	59 ~ 66	max. 0.05	max. 0.03	max. 0.1	max. 50	
PTMG 2000**	2,000 ± 100	53 ~ 59	max. 0.05	max. 0.03	max. 0.1	max. 50	1,400 (40 °C)
PTMG 3000**	3,000 ± 200	35 ~ 40	max. 0.05	max. 0.03	max. 0.1	max. 50	3,450 (40 °C)
PTMG 4000*	4,000 ± 250	26 ~ 30	max. 0.05	max. 0.03	max. 0.1	max. 50	4,510 (40 °C)
Polyurethane Applications:	▪ Elastic polyurethane fiber (Spandex) ▪ Polyurethane elastomers Thermoset elastomer (TSU) Thermoplastic elastomer (TPU) ▪ Paint and Coating materials ▪ Adhesives/Sealants ▪ Synthetic leather/Artificial leather ▪ Flexible urethane foam						
Polyester Applications:	▪ Polyester elastomer (TPEE)						
Polyamide Applications:	▪ Polyetheramide elastomer						

* *On request*
** *Also available as BioPTMG, see next page*

Also available as BioPTMG, see next page

MITSUBISHI CHEMICAL

BIOPTMG

BioPTMG is a new environmentally friendly product that is manufactured from plant-derived raw materials and contributes to help prevent global warming. The quality of BioPTMG is comparable to our conventional PTMG and offers a high bio-based carbon content. This drop-in solution can contribute to diversify our customer's bio-based product portfolio.

Reduces CO_2 Emission Compared to Conventional Products

Plant Derived High Bio-Based Carbon Content

Grade	Molecular Weight	Hydroxyl Value (mg KOH/g)	Acid Value (mg KOH/g)	Moisture (%)	Volatile Content (%)	Color (Hazen)
BioPTMG 650	650 ± 50	160 ~ 187	less than 0.05	less than 0.03	less than 0.1	less than 50
BioPTMG 1000	1,000 ± 50	107 ~ 118	less than 0.05	less than 0.03	less than 0.1	less than 50
BioPTMG 2000	2,000 ± 100	53 ~ 59	less than 0.05	less than 0.03	less than 0.1	less than 50
BioPTMG 3000	3,000 ± 200	35 ~ 40	less than 0.05	less than 0.03	less than 0.1	less than 50



WHY HARKE

Countless Opportunities for a Successful and Future-Oriented Collaboration



one group of **16** companies | **17** offices worldwide | **7** divisions

25 business units | **15** diverse service functions | **4** laboratories | **2** production sites

230 employees | working with **35** industries | in more than **63** countries | on **4** continents

with over **3,000** customers | and more than **40,000** deliveries per year

relevant portfolio | long-standing business relations | growing company group

excellent technical know-how | responsible partner | fast action | sustainable enterprise

digitization | stable management | passionate people



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11 | 2026