



TIBCHEMICALS

PROTEGOL® UR Coating 32-60 solvent-free two-component polyurethane coating

Description

PROTEGOL® UR Coating 32-60 is a two-component polyurethane coating. The product meets the requirements of DIN EN 10290:2002, DIN 3476-2:2018-08, DIN EN ISO 21809-3:2020-09, AWWA C222-18.

Application is made by 2K airless hot spray system.

Uses

Internal and external coating of

- Pipes, pipe bends
- Fittings
- Field joints
- Tanks, containers

Benefits

- Excellent corrosion protection
- Very fast reaction and curing time
- Quick development of mechanical capacity
- Easy to use
- Applied with impingement gun - no solvent flushing necessary

Referenced Standards

DIN EN 10290:2002 Steel tubes and fittings for onshore and offshore pipelines - External liquid applied polyurethane and polyurethane-modified coatings

DIN 3476-2:2018-08 Valves - Requirements and tests - Part 2: Protection against corrosion by durometer thick coating

DIN EN ISO 21809-3:2020-09 Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 3: Field joint coatings (ISO 21809-3:2016 + Amd 1:2020); English version EN ISO 21809-3:2016 + A1:2020

AWWA C222-18 Polyurethane Coatings and Linings for Steel Water Pipe and Fittings

Product data

The following data has been obtained at +23°C unless otherwise stated:

Type	polyurethane
Component A (Base)	polyol
Component B (Hardener)	isocyanate

Physical state	
Component A	viscous
Component B	liquid

Viscosity	
Comp. A at 25 °C	2600 mPa*s
Comp. B at 25 °C	800 mPa*s

Density (g/cm ³)	
Comp. A	1,20
Comp. B	1,20
Comp. A + B	1,20

Mixing ratio Comp A : Comp B	
Gravimetric	50:50
Volumetric	1,0:1,0

Coating properties

Recommended dry film thickness	≥1500 µm
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Actual required DFT may vary in certain applications, please contact us for technical clarification.

Service temperature	-20 °C to 95 °C
Short term temperature load without temperature gradient to the substrate	110 °C
Minimum surface temperature min. +3°C above dew point	5 °C
Processing temperature	
Component A	75 °C to 85 °C
Component B	65 °C to 75 °C

Max. rel air humidity	80 %
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Potlife at 60 °C	10 sec
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Coating properties according to DIN EN 10290:2002/10289:2002 (typical values)

Hardness Shore D (±5)	75
according DIN EN ISO 868 (1 sec.)	
Hardness Shore D (±5)	73

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according ISO 868 (15 sec.)

Impact resistance (max. impact energy) 12 J/mm
Adhesion to steel 23 MPa

Cathodic disbondment after 28 d
at 23 °C 1,70 mm

Specific electrical insulation resistance
after 100 d at 23 °C $4,6 * 10^8 \Omega m^2$

Thermal aging, adhesion (100 d) 26 MPa (100° C)
Flexural strength pass
Elongation at break 16 %

Coating properties according to AWWA (typical values)

Hardness Shore D >65
according ASTM D4541
Cath. disbondment (30 d, 23°C, ASTM G8) 7,34 mm
Flexibility (ASTM D522) pass
Abrasion resistance (ASTM D4060) 6 mg (500 r)
Abrasion resistance (ASTM D4060) 15 mg (1000 r)
Impact resistance (ASTM G14) 9,2 J
Dielectric strength (ASTM D149) 31 kV/mm
Water absorption (ASTM D570) pass
Chemical resistance (ASTM D543) pass

Coating properties according to ISO 21809-3 (typical values)

Impact resistance (Annex D) 10 J/mm (23° C)
Impact resistance (Annex D) 6 J/mm (-5° C)
Indentation resistance 17% (80°C)
Indentation resistance 19% (95° C)
Cathodic disbondment (28 d) 0,6 mm (23° C)
Cathodic disbondment (28 d) 5,9 mm (80°C)
Cathodic disbondment (28 d) 17,5 mm (95° C)
Hardness Shore D (±5) 71 (15 sec)
Adhesion (ISO 4624, 23°C)
Adhesion to pipe surface >12,9 MPa
Adhesion to plant coatings 11,3 MPa (3 LPE)
Adhesion after 28-d hot-water immersion at T_{max}
(Annex I plus ISO 4624)
Adhesion to pipe surface 11,1 MPa (95 °C)
(3 LPE ,80 °C)
Adhesion to plant coatings 9,6 MPa (3 LPE, 95

°C)

Specific electrical insulation resistance $1,2 * 10^{10} \Omega m^2$

Coating properties according to DIN 3476-2 (typical values)

Resistance to thermal aging pass (in air)
Resistance to thermal aging 7 MPa (in water)
Spec. el. insulation resistance (23° C) $4 * 10^{10} \Omega m^2$
Spec. el. insulation resistance (70° C) $1,2 * 10^5 \Omega m^2$
Elongation at break 17 %
Adhesion (DIN EN ISO 4624) 14 MPa
Cathodic disbondment 1 mm (28 d, 23° C)
Cathodic disbondment 4 mm (2 d, 80° C)

Coating properties according to other standards (typical values)

Adhesion to FBE (internal test) 22,7 MPa
Adhesion to FBE (28-day hot water soak; internal test) 5,9 MPa (95° C)

Cleaning agent Solvent B, G

Repair material PROTEGOL® PU Repair
PROTEGOL® UR Coating 32-45/55 L (Cartridge)
PROTEGOL® UR Coating 32-60 (Cartridge)

Colours

RAL 9011 - Graphite black

Other colours on request (subject to technical feasibility and minimum order quantities)

Coverage, theoretical

Approx. 1,20 kg/m² at 1.000 µm DFT and not considering excess consumption.

Packing

Component A	Component B
barrel 230,00 kg	barrel 230,00 kg
hobbock 25,00 kg	hobbock 25,00 kg
2K cartridge	

Shipping and Storage Regulations, Application, Health and Safety

Storage:

In a cool and dry place shelf life is approx. 24 months for comp. A and 18 months for comp. B in tightly closed original packs.

Maintenance of tools:

Immediately after use, all tools should be cleaned

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with Solvent B, G.

Solvent-free: The product does not contain any volatile organic ingredients (VOC) according to regulation 814.018 (VOCV) of Switzerland (Verordnung 814.018 über die Lenkungsabgabe auf flüchtigen organischen Verbindungen (VOCV))

Refer to our general work instructions for PROTEGOL® Coatings.

Refer to our safety data sheets prior to use.

Carefully read and follow all safety instructions on labels and packaging. Handle and store material with care in accordance with the safety data sheets. Follow and observe any applicable local or national laws and regulations.

Regulations regarding explosion protection with regard to the construction and equipment of facilities (machines) can be found, among other sources, in the corresponding harmonized European standard (BS EN 16985:2018-12-14 "Spray booths for organic coating material - Safety requirements" (former DIN EN 12215 and DIN EN 13355)); furthermore, local laws and/or regulations must be observed.

Contact us to make sure you have the latest version of safety data sheet, technical data sheet and work instruction at hand.

Important Notice:

The information on the properties of the product components represent average values that correspond to our defined quality specifications. Our products are manufactured and controlled in accordance with strict quality management and quality control requirements, which are subject to ISO 9001: 2015 certification.

Information on the default values defined by us are given in the acceptance test certificates. The product properties marked as "typical values" are taken from the test reports of external institutes, unless otherwise stated.

The information in our documents in printed or electronic form is based on our knowledge and experience. Due to numerous possible influences in the processing and application of our products, our statements do not release the processor from the responsibility to test the goods for their own procedures and purposes; Legally binding assurance of certain properties or suitability for a specific application cannot be derived from our information. It is the responsibility of the recipient of our products to observe any property rights as well as existing laws and regulations.

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