TIBCHEMICALS

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

Description

PROTEGOL® UR Coating 32-60 Cartridge 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 air-assisted pneumatic dispenser.

Uses

Internal and external coating of
- Pipes, pipe bends
- Fittings
- Field joints
- Tanks, containers
- Repair of factory and field coatings

Benefits

- Excellent corrosion protection
- Very fast reaction and curing time
- Fast mechanical capacity
- Easy to use
- No flushing - no need for solvent

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 duromer 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/cm³)	
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

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	25 °C to 45 °C
Component B	25 °C to 45 °C
Max. rel air humidity	80 %
Potlife at 35 °C	25 sec
Potlife at 45 °C	15 sec

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TIB Chemicals AG | Mülheimer Straße 16 -22 | 68219 Mannheim | Postfach 81 02 20 | 68202 Mannheim
Telefon +49 621 8901-812 | Fax +49 621 8901-902 | info.protegol@tib-chemicals.com | www.tib-chemicals.com

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Coating properties according to DIN EN 10290:2002 (typical values)

Hardness Shore D (±5) according DIN EN ISO 868 (1 sec.)	77
Hardness Shore D (±5) according ISO 868 (15 sec.)	73
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 Ωm²
Thermal aging, adhesion (100 d)	26 MPa (100° C)
Flexural strength	pass
Elongation at break	16 %

Coating properties according to AWWA C222-18 (typical values)

Hardness Shore D according ASTM D4541	>65
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
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)
Adhesion to plant coatings	9,6 MPa (3 LPE, 95 °C)
Specific electrical insulation resistance	1,2*10^{10} Ωm²

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} Ωm²
Spec. el. insulation resistance (70° C)	1,2*10^5 Ωm²
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

Coverage, theoretical

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

Packing

Component A	Component B
2K cartridge 0,90 kg	0,90 kg

Shipping and Storage Regulations, Application, Health and Safety

Storage:
In a cool and dry place shelf life is approx. 12 months in tightly closed original packs.
Maintenance of tools:
Immediately after use, all tools should be cleaned 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.

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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 (DIN EN 16985 "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.

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