



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:

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

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| Physical state | |
| Component A | viscous |
| Component B | liquid |

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

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

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

Coating properties

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| 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 | 5 °C |
| min. +3°C above dew point | |
| Processing temperature | |
| Component A | 75 °C to 85 °C |
| Component B | 65 °C to 75 °C |

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| 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 (typical values)

| | |
|--|---------------------------------------|
| Hardness Shore D (±5) | 77 |
| according DIN EN ISO 868 (1 sec.) | |
| Hardness Shore D (±5) | 73 |
| 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 Ωm ² |
| 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)

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| 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)

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| 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) |

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| Adhesion (ISO 4624, 23°C) | |
| Adhesion to pipe surface | >12,9 MPa |
| Adhesion to plant coatings | 11,3 MPa (3 LPE) |

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| 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 Ωm ² |

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

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|---|-------------------------------------|
| Resistance to thermal aging | pass (in air) |
| Resistance to thermal aging | 7 MPa (in water) |
| Spec. el. insulation resistance (23° C) | 4*10 ¹⁰ Ωm ² |
| Spec. el. insulation resistance (70° C) | 1,2*10 ⁵ Ωm 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)

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| 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 |
| hobcock 25,00 kg | hobcock 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 12 months for comp. B 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))

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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 (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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