



Corrosion Protection Systems

PROTEGOL® UR Coating 32-55 RM

Solvent-free, airless sprayable
two-component polyurethane coating compound

Description

PROTEGOL® UR Coating 32-55 RM is a solvent-free two-component polyurethane coating compound.

Meets DIN 30677 Part 2 Sept. 1988 „External corrosion protection for buried valves; Heavy-duty thermoset plastics coatings“ as well as DIN EN 10290 „Steel tubes and fittings for on- and offshore pipelines - External liquid applied polyurethane and polyurethane modified coatings“. The product is applied by airless hot-spraying.

PROTEGOL® UR Coating 32-55 RM is used whenever high coating thicknesses per operation are required and when a prolonged pot life is necessary.

Uses

Interior and exterior coating of

- Pipes
- Fittings
- Valves
- Containers / Tanks
- Thrustbore pipes made of cast-iron and steel

Benefits

- Good corrosion protection
- Abrasion resistant
- Impact resistant
- Good chemical resistance

Product Data

The following data have been determined at +20 °C unless otherwise stated:

Type	internally plasticized two-component material
Base	PUR
Solvents	None
Volume solids	100 %

Consistency	
Comp. A	Pasty
Comp. B	Liquid
Density	
Comp. A	1.72 g/cm ³
Comp. B	1.24 g/cm ³
Comp. A + B	1.63 g/cm ³
Mixing ratio comp. A : B	82 : 18 parts by weight 3.3 : 1 parts by volume ***
Application method	Airless hot-spray system
Application thickness	Up to 2,500 µm per operation on vertical surfaces
Minimum coating thickness	600 µm
Pot life	Approx. 100 sec. at 60 °C
Application temp.	Substrate > 10 °C Comp. A 50 °C - 80 °C Comp. B 20 °C - 60 °C

Curing time	at 20 °C	at 90 °C
touch dry	after approx. 60 min.	after 10 min. *
stackable	after approx. 15 h	after 60 min. *

Exposure to mechanical and chemical load	After one week
Temperature limits without simultaneous mechanical stress	-30 °C to +80 °C, up to +110 °C for short-term periods (without temperature gradient to the substrate)
Shore D acc. to DIN 53 505	75 ± 5 **
Cleaning material	Solvent B or G
Adhesion test (pull-off) acc. to DIN EN 10 290	At 23 °C; 13 MPa
Cathodic disbondment acc. to DIN EN 10 290	After 28d, at 23 °C; 2,9 mm
Specific electrical insulation resistance acc. to DIN EN 10 290	After 100d, at 23 °C; (1.5) 10 ¹⁰ Ωm ²
Thermal aging (adhesion test) acc. to DIN EN 10 290	After 100d at 100 °C; 11 MPa
Flexibility acc. to DIN EN 10290	At 23 °C, fulfils requirements
Elongation acc. to DIN EN 10 290	13.0 %

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Impact resistance acc. to DIN EN 10 290 At 23°C
Test voltage = 20 kV
Impact (max.) = 10. J

- * After the coating has cooled down below 30 °C
- ** After the coating has fully reacted and cured
- *** Volumetric mixing ratio determined on processing conditions

Colours

Light ivory	approx. RAL 1015
Capri blue	approx. RAL 5019
Reseda green	approx. RAL 6011
Feh grey	approx. RAL 7000
Achat grey	approx. RAL 7038
Graphite black	approx. RAL 9011
Others on request	

Coverage

Approx. 1.6 kg/1,000 µm dft./m² (theoretical value)

Packaging

- Comp. A (30 kg) and comp. B (25 kg) in 30 l non-returnable drums
- Comp. A (300 kg) and comp. B (250 kg) in 210 l non-returnable drums
- Comp. A (1,250 kg) in 1,000 l non-returnable or returnable bulk containers

Storage

In a cool and dry place, approx. 24 months in tightly closed original packs.

Before material withdrawal, the component A has to be mixed thoroughly.

When stored below 0°C Comp. B may partly crystallize. In this case warm up to approx. 25°C in an oven or by oil bath in order to re-dissolve the crystals. (Do not use water bath as Comp. B is sensitive to moisture!) Comp. B with crystals should on no account be used since the presence of crystals results in the spraying equipment becoming blocked up as well as interfering with the curing process.

Storage and Transport Data

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	Flash point	RID/ADR	ICAO/IATA-DGR
Comp. A	> 100°C		
Comp. B	> 220°C		
Solvent B	ca. 28°C	cl. 3/fig. 31 c	cl. 3/ UN 1263/ III
Solvent G	ca. 7°C	cl. 3/fig. 5 b	cl. 3/UN 1263/III

Application

Substrate

The steel surfaces to be coated must be dry, clean and free from dust, have a good key and be free from all matter acting as release agents (e.g. oil, grease, old paint). In order to obtain the necessary conditions, suitable substrate preparation methods such as blasting must be used.

Steel surfaces must be abrasive blast clean to near white (degree of cleanliness according to DIN EN ISO 12944-4 at least Sa 2½). The first coating must be applied immediately after blast cleaning.

Later application of the base coat is only permissible if the original degree of cleanliness has been maintained.

The constructional design of steel and iron shall comply with DIN EN 14879 part 1.

The surface profile shall range between 50 µm and 70 µm. The blasting material shall be angled shot.

Coating

Ensure that the temperature of the substrate is at least 3°C above the dew point to avoid condensation. The dew point can be determined with a suitable dew point mirror.

PROTEGOL® UR Coating 32-55 RM is only applied by using a two component airless hot spray system.

It is possible to use a fixed or variable metering system. For these systems the manufacturer of the equipment should guarantee dosage accuracy with a maximum deviation of ± 5% of component B relating

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to the fixed component A.

For control and monitoring of this accurate dosage we recommend measuring the gravimetric mixing ratio of the unit, the usage of an automatic pressure control unit and the usage of a fluid control system. Alternatively we recommend an analysis of the nitrogen content of a fully cured foil of coating in our laboratory.

At 20 °C the coating is tack-free after 60 minutes and after 15 hours (depending on the weight of the coated objects) it allows for stacking.

Holiday tests can be carried out after 4 h. The tension applied may be up to 10.000 V per 1,000 µm coating thickness.

A post-heating up to 50 °C by gas filled or infra-red heaters will accelerate curing to such a degree that after the coated objects have cooled to <30 °C holiday tests can be carried out.

Relative humidity during application of the coating must be <80%. (In case of higher relative humidity ask for our special technical advice.)

Waiting periods

If, for technical reasons, several coating operations with prolonged waiting periods between applications are necessary the substrate must always be dry, free of oil, grease and dust.

Between operations, the temperature of the substrate shall be at least 3 °C above the dew point to avoid condensation. Each layer can be over coated without mechanical roughening when the waiting period does not exceed 3 days (storage at room temperature).

Maintenance of Tools

Immediately after use all instruments should be cleaned with Solvent B or G.

Health and Safety

Although PROTEGOL® UR Coating 32-55 RM is solvent-free, it may, if processed at elevated temperatures, develop vapors and aerosols which may cause irritation to the respiratory tract and the skin. It must be ensured by suitable measures, such as continuous ventilation, mechanicals extraction or respiratory protection that such vapors and atomized spray are not inhaled. Therefore we recommend wearing filter or fresh air masks.

In closed spaces assure proper and adequate ventilation as well as breathing protection. Hazard warnings and security instructions on the recipients must be followed.

The unprotected skin should not be allowed to come in contact with component A and B. If any of the material has accidentally splashed onto the skin, the affected area should immediately be washed thoroughly with warm soapy water or better with warm non-alkaline cleaners (e.g. Lutrol E 400, BASF). Clean again thoroughly with soap and water.

When using PROTEGOL® UR Coating 32-55 RM all safety precautions applicable to handling polyurethane resins and their hardeners must be observed. They are listed in the "Merkblatt für den Umgang mit Isozyanaten" (Instructions for handling isocyanates), ed. October 1987, which is available on request. In addition, the health and safety precautions mentioned on the material safety data sheets as well as any regulations valid in the respective country should be observed.

According to the regulations on dangerous substances, component B of PROTEGOL® UR Coating 32-55 RM as well as Solvents B and G are liable to danger identification.

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