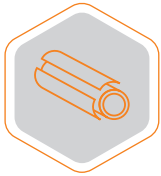




We Protect Assets

PROTEGOL[®] Coating Systems



We Protect Assets

PROTEGOL® Coating Systems

Since the 1960's we have been dedicated to delivering innovative coatings and linings. Our products protect metallic and non-metallic surfaces against corrosion respectively from mechanical and chemical stress. Yet, by doing so we do far more: We protect assets.

With products available for a wide range of oil, gas and water transmission lines and industrial installations such as tanks, valves, elbows and fittings, all our PROTEGOL® Coatings have been developed to provide added value through versatility, long service life, easy application and high quality.

PROTEGOL® Coatings provide maximum internal and external protection against corrosion, abrasion and chemical stress for buried and submerged installations, for new construction and for maintenance works.

Our innovative products are perfectly complemented by the expertise of our customer service team who assesses your requirements, assists in specifying the optimum coating solution and provides further technical advice, training and support. We supply premium products that are tested by independent laboratories and approved and certified to relevant industry standards. The continuous drive for product excellence ensures that we provide state-of-the-art coating solutions which may not only meet but exceed your requirements.

PROTEGOL® Coatings

- Outstanding protection against corrosion, mechanical and chemical stress
- One-coat solution direct to steel and ferrous substrate
- VOC-free and fast curing coatings
- Excellent adhesion to steel and parent coatings like PE, PP and FBE
- Compatibility to cathodic protection even at elevated temperatures
- High stability and mechanical strength during pipe handling and laying

PROTEGOL® is a registered trademark of TIB Chemicals AG.



Find more information about our PROTEGOL® Coatings on:

www.tib-chemicals.com



COATINGS FOR OIL & GAS LINES AND STRUCTURES

COATING SYSTEM	MIXING RATIO BY VOLUME COMP. A (BASE) : B (HARDENER)	STANDARDS AND PROPERTIES
PROTEGOL® UR 32-45 R Systems	3 : 1	DIN EN 10290, spray-applied polyurethane
PROTEGOL® UR 32-49	2.5 : 1	DIN EN 15189, spray-applied polyurethane
PROTEGOL® UR 32-55 R Systems	3.3 : 1	DIN EN 10290, spray-applied polyurethane
PROTEGOL® UR 32-55 PN	2.3 : 1	DIN EN ISO 21809-3, spray-applied polyurethane
PROTEGOL® UR 32-55 TD	3 : 1	DIN EN 10290, brush- and spray-applied polyurethane
PROTEGOL® UR 32-60	1 : 1	DIN EN 10290, DIN EN ISO 21809-3, DIN 3476-2, spray-applied polyurethane
PROTEGOL® UR 32-60 PT	1 : 1	Injected polyurethane, e.g. for field joints
PROTEGOL® UR 32-62	1 : 1	DIN EN 10290, spray-applied polyurea
PROTEGOL® UR 32-63	1 : 1	Spray-applied polyurea hybrid
PROTEGOL® UR 32-70	1 : 1	DIN EN 10290, DIN EN ISO 21809-3, DIN EN 15189, spray-applied polyurethane
PROTEGOL® EP 32-89 S	2 : 1	DIN EN 10289, spray-applied epoxy



COATINGS FOR WATER LINES AND STRUCTURES

COATING SYSTEM	MIXING RATIO BY VOLUME COMP. A (BASE) : B (HARDENER)	STANDARDS AND PROPERTIES
PROTEGOL® UR 32-45	3 : 1	DIN EN 10290, spray-applied polyurethane
PROTEGOL® UR 32-45 TH	3 : 1	Spray-applied polyurethane
PROTEGOL® UR 32-46	2 : 1	AWWA C222-18, Commission Regulation(EU) No 10/2011, spray-applied polyurethane
PROTEGOL® UR 32-60	1 : 1	AWWA C222-18, spray-applied polyurethane
PROTEGOL® UR 32-68 PW	1 : 1	DVGW worksheet W270, UBA guideline, spray-applied polyurethane
PROTEGOL® EP 32-97	1.75 : 1	AWWA C210-15, spray-applied epoxy
PROTEGOL® PU Repair	1 : 1	DVGW worksheet W 270, KTW-BWGL for P3, brush-applied polyurethane



COATINGS IN READY-FOR-USE CARTRIDGES

COATING SYSTEM	MIXING RATIO BY VOLUME COMP. A (BASE) : B (HARDENER)	STANDARDS AND PROPERTIES
PROTEGOL® UR 32-45/55 L	3 : 1	Air-assisted application, polyurethane
PROTEGOL® UR 32-45 L SP	3 : 1	Air-assisted application, fast curing, polyurethane
PROTEGOL® UR 32-45 R	3 : 1	DIN EN 10290, air-assisted spray, polyurethane
PROTEGOL® UR 32-60	1 : 1	DIN EN 10290, air-assisted spray, polyurethane
PROTEGOL® UR 32-60 PT	1 : 1	Injected polyurethane, e.g. for field joint
PROTEGOL® UR 32-70	1 : 1	DIN EN 10290, DIN EN ISO 21809-3, DIN EN 15189, air-assisted spray, polyurethane
PROTEGOL® PU Repair	1 : 1	DVGW worksheet W 270, KTW-BWGL for P3, brush-applied polyurethane
PROTEGOL® EP 32-89 S	2 : 1	DIN EN 10289, air-assisted spray or with flex hose brush-applied, epoxy



FREQUENTLY ASKED QUESTIONS ABOUT PROTEGOL® COATINGS

Where are PROTEGOL® Coatings mostly used?

PROTEGOL® Coatings are mostly used on buried and submerged pipes for gas, oil, water and slurry, tanks, valves and elbows, both on the external and internal face of the structure. Further it should be also mentioned as corrosion protection for the coating of the field joints. PROTEGOL® Coatings are used on new construction and rehabilitation projects, both applied in factory and field.

What is the coating thickness usually applied?

The coating thickness varies depending on the project specifications and the specified and selected product. In general, the recommended coating thickness is 1.500 µm as e.g. DIN EN 10290, which can usually be applied in one application pass.

What is the biggest pipe diameter that can be coated with PROTEGOL® Coatings?

There is really no limit. PROTEGOL® Coatings have already been applied to 126" OD pipe. Since the material is spray-applied, applications are possible from small and simple components to large and complex geometries.

Which equipment is required to work with PROTEGOL® Coatings?

PROTEGOL® Coatings are either spray-applied by high volume airless hot-spray equipment with or by air-assisted manual dispenser for cartridge systems. Additionally, for manual application, formulations can be processed by brush, spatula or roller.

How long has PROTEGOL® been used?

The first PROTEGOL® -coated segment was put into service in 1961. The first major pipe rehabilitation project in the field was undertaken in Texas/US in 1989. On this occasion, TIB supported CRC Evans Pipeline International in developing the first spray ring for line coating with 2 component liquid polyurethane, enabling rehabilitative coating over the ditch.

Is a primer required?

No primer is required, PROTEGOL® Coatings are applied directly to the substrate.

What are PROTEGOL® Coatings made of?

Most of our PROTEGOL® Coatings are based on aromatic polyurethanes, some are based on epoxy resin and some recent developments include polyurea and polyurea hybrid systems, partly on bio-based raw materials.

Where are PROTEGOL® Coatings produced?

PROTEGOL® Coatings are produced at TIB Chemicals` headquarters in Mannheim, thus "Made in Germany".

What are the surface requirements?

Adequate surface preparation is essential as it profoundly affects the performance of the coating. Poor surface preparation invariably develops a poor adhesive bond between the substrate and the coating and causes premature coating failure. The steel surface shall be blasted to near-white metal (Sa2 1/2) and achieve a near white metal and achieving an angular anchor pattern of min. 50 µm Rz.

How to touch up damages?

Touch up is easily done with the same applied coating or with products for manual application thus obtaining a final homogenous coat.

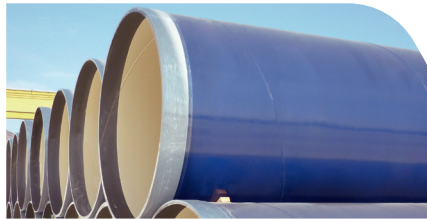
How long can PROTEGOL® Coatings be expected to last in service?

PROTEGOL® Coatings are long-lasting solutions for best protection of up to over 20 years. Depending on the quality of application, the service and soil conditions, expected service life can be much higher.



FOCUS ON PROTEGOL® COATINGS

Pipelines deteriorate at different rates during their planned lifecycle, depending on specific conditions. During the last years, an increasing number of aged pipelines have been excavated for inspection and refurbishment.



PROTEGOL® polyurethane-based coatings possess excellent properties, the combination of high hardness and flexibility make it an outstanding solution for an entire network, including sections such as field joints, valves and distribution units. Two-component, liquid-applied polyurethane coatings have been designated the most versatile and reliable solution, as they combine optimum long-term corrosion protection and excellent performance in the field due their ease of application, by spraying a single layer direct-to-steel and without pre or post-heating and whether the pipe is in or out of service and in or over the ditch.

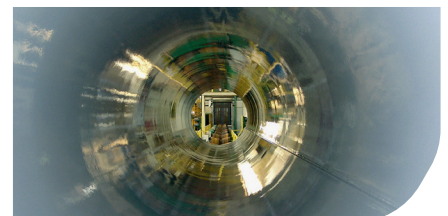
PROTEGOL® Coatings are applied directly onto the prepared surface without a primer. The coatings are characterized by an extremely short reaction time, so the coatings are already touch-dry after approximately 10 minutes at 20 °C.



These proven and reliable coatings offer high performance and durable corrosion protection.



PROTEGOL® Coatings can be considered superior in their physical properties and performance compared with many alternative protection systems available in today's market.





NORMS AND STANDARDS

DIN EN 10289: 2004-08:

Steel tubes and fittings for onshore and offshore pipelines – External liquid applied epoxy and epoxy-modified coatings

DIN EN 10290: 2004-08:

Steel tubes and fittings for onshore and offshore pipelines – External liquid applied polyurethane and polyurethane-modified coatings

DIN EN 10301: 2004-01:

Steel tubes and fittings for onshore and offshore pipelines – Internal coating for the reduction of friction for conveyance of non-corrosive gas

DIN EN 15189: 2007-02:

Ductile iron pipes, fittings and accessories – External polyurethane coating for pipes – Requirements and test methods

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; Part 11: Coating repairs on rehabilitation

DIN 3476-2: 2008-08:

Valves – Requirements and tests – Part 2: Protection against corrosion by duromer thick coating

AWWA C210-15:

Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings

AWWA C222-18:

Polyurethane Coatings and Linings for Steel Water Pipe and Fittings

EU 10/2011:

Commission Regulation on plastic materials and articles intended to come into contact with food

DVGW Worksheet W 270: 2007-11:

Microbial Enhancement on Materials to Come into Contact with Drinking Water – Testing and Assessment

DVGW Worksheet GW 15 (A) January 2021:

Field Coating of Pipelines – Qualification of Coating Applicators

UBA Coating Guideline – 2022:

Guideline for Hygienic Assessment of Organic Coatings in Contact with Drinking Water



PASSION FOR CHEMISTRY

Celebrating 150 years of experience!

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