

## PROTEGOL® – GETTING THE JOB DONE!

No single factor influences the integrity of a steel pipeline more than the effectiveness of the coating protecting it. Choosing the suitable coating system for rehabilitation of a pipeline in the field, whether in-service or out-of-service, including works in and over the ditch, needs careful consideration respecting field conditions as well as technical requirements. This is where TIB Chemicals' PROTEGOL® comes in as a high performance coating system based on polyurethane or epoxy resins providing a long-lasting protection against corrosion. The external coating applied directly in the field stands out by its easy-to-operate single-pass application process.

:: **PROTEGOL® polyurethanes** give long-term protection against corrosion attack even under severe soil stress conditions.

:: **PROTEGOL®** has excellent bonding to steel and is extremely abrasion and impact resistant.

:: **PROTEGOL®** coating products have been developed to be applied in-shop and in the field.

:: **PROTEGOL®** coating systems are based on over 50 years of expertise.



TIB Chemicals AG headquarters in Mannheim, Germany

## CONTACT

Want to find out more about PROTEGOL® coating systems?  
Need more information or have specific questions?  
Just get into contact with us! We'll be happy to hear from you!

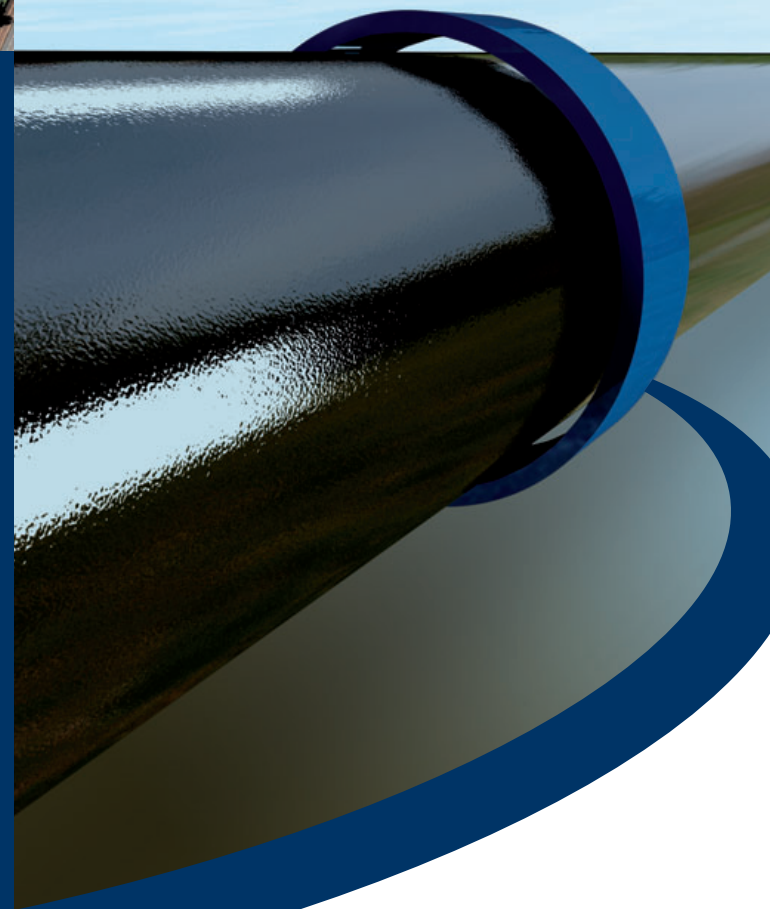
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## PIPELINE REHABILITATION – PROTEGOL® HIGH-PERFORMANCE COATINGS

Corrosion Protection Systems  
for the Oil & Gas Industry



## CORROSION PROTECTION WITH PROTEGOL® – AN INVESTMENT FOR THE FUTURE!

Corrosion is one of the core challenges facing the oil and gas industry, with protective coatings playing an essential role when it comes to corrosion protection. Especially if a steel pipeline is exposed to external corrosion, then safe and economic operation should be assured. Rehabilitation should be done before it is too late in order to ensure its future integrity and operational life.

In close cooperation with engineering and oil and gas companies, applicators and raw material suppliers TIB Chemicals' business unit Coating Systems develops and manufactures innovative high-performance coating systems that generate the respective product requirements in environmentally friendly ways.

The products, of course, not only meet the specific customer requests but also pervade international standards.

The business unit brings products to the market based on two-component solvent-free, liquid polyurethane and epoxy systems that have been developed as corrosion protection for pipelines, bends, valves, fittings and vessels. With the established trademark PROTEGOL®, TIB Chemicals is one of the most recognised manufacturers of high-performance coatings for several decades with an international reputation of reliability and customer care.

TIB Chemicals' manufacturing history dates back to over 130 years of know how. High-quality products, for both shop and in-field application, custom-made solutions and a flexible distribution are the basis of our success.



TIB Chemicals is certified according to DIN EN ISO 9001.

## POLYURETHANE COATING COMPOUNDS FOR SOLVENT-FREE, AIRLESS SPRAYING

Two-component polyurethane, 100% solids, coatings are used for the external protection of for example pipes, bends and fittings. Throughout its high mechanical strength it is moreover suitable for thrust bore/ horizontal direction drilling sections made of cast-iron or steel. PROTEGOL® coatings are approved according to DIN EN 10 290 „Steel tubes and fittings for on- and offshore pipelines – External liquid applied polyurethane and polyurethane-modified coatings“ and are applied by airless hot-spraying technology. They give a perfect corrosion protection with high abrasion, impact and chemical resistance.

The following PROTEGOL® systems offer the perfect features for pipeline rehabilitation:

### PROTEGOL® UR 32-45R

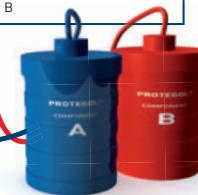
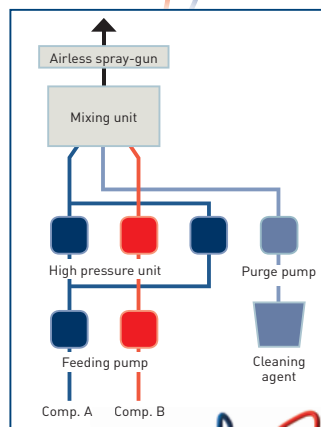
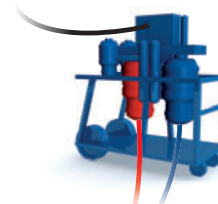
Suitable for airless hot-spray equipment adjusted for mixing ratio 3:1 by volume. With its density of 1.45 g/cm<sup>3</sup> high coating thicknesses of 2 mm per operation are achievable.

### PROTEGOL® UR 32-55

Solvent-free coating that apart from DIN EN 10 290 also meets DIN 30677, part 2 "External corrosion protection of buried valves. Heavy-duty thermo-set plastics coatings".

### PROTEGOL® UR 32-60

Formulated with a mixing ratio of 1:1 an extremely short reaction and curing time has been achieved. PROTEGOL® UR 32-60 plays in an own class with a pot life of 10 to 15 seconds at 60 °C. No need of solvent-flushing when applied by fusion gun!



## PIPELINE REHABILITATION COATING SYSTEMS AT A GLANCE

	PROTEGOL® UR 32-45R	PROTEGOL® UR 32-55	PROTEGOL® UR 32-60
Mixing ratio by volume	3 : 1	3.5 : 1	1 : 1
Application method	airless hot-spraying technology		
Pot life at 60°C	approx. 30 sec.	approx. 40 sec.	approx. 10 to 15 sec.
Density Comp. A Comp. B Comp. A+B	1.52 g/ cm <sup>3</sup> 1.24 g/ cm <sup>3</sup> 1.45 g/ cm <sup>3</sup>	1.72 g/ cm <sup>3</sup> 1.24 g/ cm <sup>3</sup> 1.63 g/ cm <sup>3</sup>	1.20 g/ cm <sup>3</sup> 1.20 g/ cm <sup>3</sup> 1.20 g/ cm <sup>3</sup>
Consistency at 25°C Comp. A Comp. B	approx. 8,500 mPa approx. 200 mPa	approx. 15,000 mPa approx. 100 mPa	approx. 2,500 mPa approx. 1,700 mPa
Application thickness per operation	up to 2 mm	up to 1 mm	up to 2 mm
Minimum coating thickness	600 µm		
Application temperature Comp. A Comp. B	30°C to 60°C 20°C to 40°C	50°C to 80°C 40°C to 60°C	55°C to 60°C 55°C to 60°C
Curing time Touch dry after Stackable after	approx. 10 min. approx. 8 hours	approx. 10 min. approx. 8 hours	approx. 5 min. approx. 10 min.
Coverage	approx. 1.45 kg / mm dft./ m <sup>2</sup>	approx. 1.6 kg / mm dft./ m <sup>2</sup>	approx. 1.2 kg / mm dft./ m <sup>2</sup>