

Anti-Corrosion Coating

Types of coatings used: one- and two-layer FBE coating; two- and three-layer PE coating; two- and three-layer polypropylene coating; internal flow coating. Working temperature range from – 40°C up to + 80°C. Life time min 30 years.

Standards

Coatings	Standards	Application
External	DIN 30670: 2012 /EN 10288, Polyethylene insulation of pipes and shape articles	Insulation of pipes in the ground and water
External	DIN 30678: 2013, Polypropylene coating for steel pipes	Insulation of pipes in the ground and water
External PE	DIN 30670, ISO 21809-1(2,3,4,5), CSA Z245.20 SERIES, Shell DEP 31.40.30.31	Underground/above ground
External PP	DIN 30678: 2013, ISO 21809-1(2,3,4,5)	Underground/above ground
Internal	API RP 5L2, ISO 15724, Shell DEP 31.40.30.35	Gas, oil, water transmission
Internal	EN 10301:2003 Steel tubes and fittings for on and offshore pipelines. Internal coating for the reduction of friction for conveyance of non corrosive gas	Gas, oil, water transmission

Coated Pipes Range

Coatings	OD, mm	Wall Thickness, mm	Length, m
External	114-426	6-35	9-12.5
External	530-1420	7-22	8-11.6
External	168,3-1219,2	4-38	8-18
Internal	508-1420	12-48	9-12.5
Internal	219,1-1219,2	4-38	8-13

Internal Flow Coating Properties

Parameter	Limit
1. Cured coating thickness	60-150 μm
2. Coating adhesion by lattice cut method	1
3. Coating adhesion after 240 hours ageing in water at (20±5)°C by lattice cut method, not more than	2
4. Bend resistance	10 mm
5. Buchholz Hardness, not less than	94
6. Pinchholes, not more than a) in uncured coating b) in cured coating	0 pcs/cm ² 1 pcs/cm ²
7. Gas pressure fluctuation resistance	After the 10 th cycle: No blistering, fractures
8. Hydraulic pressure fluctuation resistance	After 1 cycle: No blistering, fractures
9. Salt spray resistance at (20±5)°C, 240 hours	No blistering, flaking
10. Coating roughness(Rz), not more than	15 μm

External Three-Layer PE Coating Properties

1. Thickness, min, mkm (mil)	
1st layer	100-175(4-7)
2d layer	150-400 (6-16)
3d layer for pipe body	3000
for weld zone	2500
2. Space between coating and pipe ends, mm	130-180
3. Adhesion strength *, N/cm length	
under temperature: + 20 ± 5°C	150
under temperature: + 50 ± 5°C	40
4. Pressure resistance *, max, mm	
under temperature: + 25 ± 2°C	0.2
under temperature: + 50 ± 2°C	0.3
5. Impact resistance, min, J	
under temperature: + 23 ± 2°C	18
6. Elongation, min, % under temperature: -40°C	100

External Coating Process Flowchart

1. The entrance control of pipes.
Visual inspection



2. Preliminary heating in the gas furnace



3. Abrasive cleaning of external pipes surface in a shotblast unit by steel chipped fraction



4. Removal of dust from pipes internal cavity by a purge



5. Visual inspection of pipe



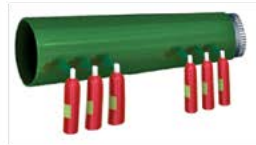
6. Having heated pipes



7. Having heated pipes



8. One- and two-layer FBE coating
a) Epoxy powder paint coating
b) Epoxy impact-resistant coating
(only in case of a two-layer coating)



9. Three-layer PE and polypropylene coating
a) Epoxy primer coating
b) Adhesive coating
c) Polyethylene (or polypropylene) coating



10. Water cooling of coated pipes



11. Uniformity coating inspection with high-voltage flaw detector



12. Coating removal from pipe ends



13. Final quality inspection of coated pipes (visual)



14. Pipe marking and Pipe storage



Internal Coating Process Flowchart

1. Pipe storage before pipe delivery



2. Pipe incoming control



3. Pipe heating



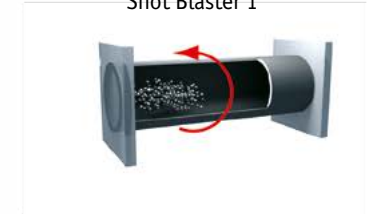
4. Internal pipe surface degreasing



5. Second heating of pipes



6. Internal pipe surface blast cleaning in Shot Blaster 1



7. Blaster internal surface quality examination



8. Internal pipe surface blast cleaning in Shot Blaster 2



9. Internal surface blowout



10. Internal surface preparation quality inspection



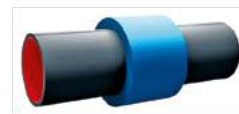
11. Coating application on pipes (in coating chamber)



12. Internal coating pre-curing



13. Pipe induction heating



14. Pipe coating curing in the full-polymerization chamber



15. Internal flow coating quality inspection



15. Marking of coated pipes. Stacking of pipes provided tarpaulin protective caps

