

Surface preparation of steel pipes and fittings

Shop application

\$' , %

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SURFACE PREPARATION

Surface preparation of steel pipes must be carried out according to the Dutch standard NEN 6901 or the Swedish standard SIS 055900.

The metal surface must be freed from mill scale, corrosion and all contaminations such as oil, grease, dirt, soluble salts, markings and old coatings.

Weldspatters and laminations must also be removed.

The coating must be applied as soon as possible after completion of the surface preparation.

CHEMICAL PRETREATMENT

The substrate must be precleaned to remove dirt, grease and oil.

Pickling must be carried out on an industrial scale by one of the following methods.

The first table describes a pickling process followed by a double water rinse.

The second table describes a phosphating process consisting of pickling and rinsing followed by phosphating.

The requirements for the pickling and the phosphating process are drawn up to avoid excess thickness of phosphate layers and to ensure that no acids remain on the substrate. All pickling - rinsing or phosphating liquids must be renewed when the concentrations specified are reached (see tables). The content of the bath must also be renewed when the pretreated metal leaves the bath with contamination or if sediment interferes the action of the pickling process.

Table 1 Pickling Process

Pickling		
Acid concentration	Hydrochloric acid 55 - 220 g/l	Sulphuric acid 50 - 295 g/l
Temperature	ambient	50 - 65°C
Max. iron concentration	100 g/l	70 g/l
Duration	till complete removal of millscale and rust	
First Rinsing		
Min. water temperature	ambient	ambient
Max. acid concentration	0,75 g/l	0,25 g/l
Duration	5 min.	5 min.
Second Rinsing		
Min. water temperature	70°C	70°C
Max. acid concentration	0,20 g/l	0,10 g/l
Duration	1 min.	1 min.



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Table 2 Pickling/Phosphating Process

Pickling			
Acid concentration	Hydrochloric acid 55 - 220 g/l	Sulphuric acid 50 - 295 g/l	Phosphoric acid 105 - 225 g/l
Temperature	ambient	50 - 65°C	60 - 85°C
Max. iron concentration	100 g/l	70 g/l	30 g/l
Duration	till complete removal of millscale and rust		
Rinsing			
Min. water temperature	60 - 65°C	65°C	--
Max. acid concentration	0,75 g/l	1,00 g/l	--
Duration	5 min.	5 min.	
Phosphating			
Temperature	80°C	80°C	80°C
Duration	5 min.	5 min.	5 min.
Max. iron content	5 g/l	5 g/l	5 g/l
Normal phosphoric acid concentration	20 - 10 g/l	20 - 10 g/l	20 - 10 g/l
Phosphoric acid concentration for application of epoxy- and polyurethane coatings *	5 g/l	5 g/l	5 g/l

* The performance of epoxy- or polyurethane coatings on phosphated steel should always be checked in advance.

BLAST CLEANING

Before blast cleaning the surface should be thoroughly degreased by means of suitable detergents or emulsifiers.

Irregularities in the pipe surface should be removed by grinding or rotating discs. The surface should be dry before blasting.

Blasting must be carried out until to standard of cleanliness of SIS-Sa2½ of the Swedish norm SIS055900 (see sheet 1490). Usually a blasting profile (R_Z) is recommended of approx. 50 micrometers which means a Ra or CLA value of 10-15 micrometers.



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Ventilation of sufficient capacity has to be used in order to maintain a workable and safe climate during blast cleaning. The pipes should rotate during the blasting operation at a sufficient speed to obtain a regular blasted surface.

Only suitable abrasives according to specification should be used (see sheet 1491).

Attention should be given to the weld seams which have to be blast cleaned in a way that the whole weld seam is pretreated.

Abrasives and dust should be removed completely from the blasted surface.

ROTATING WIRE BRUSH CLEANING

Pipes to be used for the transport of Natural Gas, showing only minor rust and in good condition, may be pretreated by rotating wire brushes before they are coated with a flowcoat.

Before wire brush cleaning the surface should be thoroughly degreased by means of suitable detergents or emulsifiers.

Irregularities in the pipe surface should be removed by grinding or rotating discs. The surface should be dry before blasting.

Cleaning must be carried out until to standard of cleanliness of SIS-St3 of the Swedish norm SIS055900 (see sheet 1490).

Ventilation of sufficient capacity has to be used in order to maintain a workable and safe climate during wire brush cleaning. The pipes should rotate during the cleaning operation at a sufficient speed to obtain a regular cleaned surface.

