SSPC: The Society for Protective Coatings

SURFACE PREPARATION SPECIFICATION NO. 8

Pickling

1. Scope

1.1 This specification covers the requirements for the pickling of steel surfaces.

2. Definition

2.1 Pickling is a method of preparing steel surfaces by chemical reaction, electrolysis, or both. The surfaces when viewed without magnification shall be free of all visible mill scale and rust.

3. Appearance of the Completed Surface

3.1 The surface shall be etched to a degree suitable for the specified painting system.

3.2 Uniformity of color may be affected by the grade, original surface condition, and configuration of the material being cleaned, as well as by discolorations from mill or fabrication marks, and the shadowing from etching patterns.

3.3 Visual standards of surface preparation agreed upon by the contracting parties may be used to further define the surface.

4. Referenced Standards

4.1 The latest issue, revision, or amendment of the referenced standards in effect on the date of invitation to bid shall govern, unless otherwise specified.

4.2 If there is a conflict between the requirements of any of the cited referenced standards and this specification, the requirements of this specification shall prevail.

4.3 SSPC AND JOINT SPECIFICATIONS:

SP 1	Solvent Cleaning
SP 2	Hand Tool Cleaning
SP 3	Power Tool Cleaning
SP 6/NACE No. 3	Commercial Blast Cleaning
SP 7/NACE No. 4	Brush-Off Blast Cleaning
SP 11	Power Tool Cleaning to Bare Metal
SP 14/NACE No. 8	Industrial Blast Cleaning

5. Pickling Methods and Operation

5.1 BEFORE PICKLING, PERFORM THE FOLLOWING:

5.1.1 Remove heavy deposits of oil, grease, soil, drawing compounds, and foreign matter other than rust, scale, or oxide by any of the methods specified in SSPC-SP 1. Small quantities of such foreign matter may be removed in the pickling tanks provided no detrimental residue remains on the surface.

5.1.2 Remove heavy deposits of rust, rust scale, and all paint by any one of the methods specified in SSPC-SP 2, SP 3, SP 6, SP 7, SP 14, or SP 11. Rust deposits which can be removed without unduly prolonging the pickling time may be removed in the pickling tanks.

5.2 REMOVE ALL MILL SCALE AND RUST BY ANY OF THE FOLLOWING PICKLING METHODS:

5.2.1 Pickling in hot or cold solutions of sulfuric, hydrochloric (muriatic), or phosphoric acid to which sufficient inhibitor has been added to minimize attack on the base metal, followed by adequate rinsing in hot water above 140 ˚F (60˚C).

5.2.2 Pickling in 5%-10% (by weight) sulfuric acid, containing an inhibitor, at a minimum of 140˚F (60˚C) until all rust and scale is removed; then thorough rinsing in clean water, then immersion for one to five minutes in 1%-2% (by weight) phosphoric acid containing about 0.3%-0.5% iron phosphate, at a temperature of about 180˚F (82˚C).

5.2.3 Pickling in 5% (by volume) sulfuric acid at 170-180˚F (77-82˚C), with sufficient inhibitor added to minimize attack on the base metal, until all rust and scale is removed, followed by a two minute rinse in hot water at 170-180˚F (77-82˚C). Next, immerse the pickled and rinsed steel for at least two minutes in a hot, inhibitive solution maintained above 190˚F (88˚C) and containing about 0.75% sodium dichromate and about 0.5% orthophosphoric acid.

5.2.4 Electrolytic pickling in an acid or an alkaline bath using alternating or direct current. If (when using direct current) the work-piece is made the cathode, hydrogen embrittlement must be prevented or minimized by adequate treatment. If carried out in an alkaline bath, the electrolytic pickling must be followed by a thorough rinse in hot water; then followed by a dip in a dilute solution of phosphoric acid, or chromic acid, or

solution of dichromate until no trace of alkali remains on the surface.

5.2.5 "Hydride" descaling, pickling in baths of acid salts, pickling in baths of molten salts, or pickling in any other manner than outlined in the preceding sections shall be permitted only when specified, since their details are beyond the scope of this specification.

5.3 Do not exceed a dissolved iron content of 6% in sulfuric acid baths, or 10% in hydrochloric (muriatic) acid baths.

5.4 Use only clean water or steam condensate for solutions and rinses. Supply rinse tanks continuously with new water. Do not permit the total amount of acid or dissolved salts due to carry-over to exceed two grams per liter (0.2% by weight).

5.5 To minimize carry-over, suspend all steel briefly over the acid tank from which it has been withdrawn and permit the major portion of the acid to drain.

5.6 Remove deleterious smut, unreacted acid or alkali, metal deposits, or other contaminants.

5.7 Do not stack pickled steel surfaces in contact with one another until completely dry.

5.8 Apply paint before visible rusting occurs.

6. Inspection

6.1 Unless otherwise specified in the procurement documents, the contractor or material supplier is responsible for quality control to assure that the requirements of this document are met. Work and materials supplied under this standard are also subject to inspection by the purchaser or an authorized representative. Materials and work areas shall be accessible to the inspector

6.2 Conditions not complying with this standard shall be corrected. In the case of a dispute, an arbitration or settlement procedure established in the procurement documents (project specification) shall be followed. If no arbitration or settlement procedure is established, then a procedure mutually agreeable to purchaser and material supplier (or contractor) shall be used.

7. Disclaimer

7.1 While every precaution is taken to ensure that all information furnished in SSPC standards and specifications is as accurate, complete, and useful as possible, SSPC cannot assume responsibility nor incur any obligation resulting from the use of any materials, coatings, or methods specified herein, or of the specification or standard itself.

7.2 This specification does not attempt to address problems concerning safety associated with its use. The user of this specification, as well as the user of all products or practices described herein, is responsible for instituting appropriate health and safety practices and for ensuring compliance with all governmental regulations.

8. Notes

Notes are not requirements of this specification.

8.1 A Commentary Section is available and contains additional information and data relevant to this specification. The Surface Preparation Commentary, SSPC-SP COM, is not part of this specification. The table below lists the subjects discussed relevant to pickling and appropriate Commentary Section.

Subject	Commentary Section
Film Thickness	10
Inhibitors	8.4
Rust Back	4.5
Weld Spatter	4.4.1
Visual Standards	11