

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. Reference Standards

4.1 The standards referenced in this specification are listed in Section 4.4 and form a part of the specification.

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

4.3 If there is a conflict between the requirements of any of the cited reference standards and the specification, the requirements of the specification shall prevail.

4.4 SSPC SPECIFICATIONS:

SP 1	Solvent Cleaning
SP 2	Hand Tool Cleaning
SP 3	Power Tool Cleaning
SP 6	Commercial Blast Cleaning
SP 7	Brush-Off Blast Cleaning
SP 11	Power Tool Cleaning to Bare Metal

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, 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 All work and materials supplied under this specification shall be subject to timely inspection by the purchaser or his authorized representative. The contractor shall correct such work or replace such material as is found defective under this specification. In case of dispute the arbitration or settlement procedure established in the procurement documents, if any, shall be followed. If no arbitration

or settlement procedure is established, the procedure specified by the American Arbitration Association shall be used.

6.2 The procurement documents covering work or purchase should establish the responsibility for testing and for any required affidavit certifying full compliance with the specification.

7. Safety

7.1 All safety requirements stated in this specification and its component parts apply in addition to any applicable federal, state, and local rules and requirements. They also shall be in accord with instructions and requirements of insurance underwriters.

8. Notes*

8.1 While every precaution is taken to insure that all information furnished in SSPC specifications is as accurate, complete, and useful as possible, SSPC cannot assume responsibility or incur any obligation resulting from the use of any materials, paints, or methods specified therein, or of the specification itself.

8.2 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	SSPC-SP COM Section
Film Thickness	10
Inhibitors	8.3
Rust Back	4.5
Weld Spatter	4.4.1
Visual Standards	11

*Notes are not requirements of this specification.