

1:9 Surface preparation (part 2)

'White' metal blast cleaning

1. All surfaces to be coated shall be cleaned to a White Metal finish according to SSPC-SP5 (Sa3 of Swedish Standard SIS 05 59 00).
2. A White Metal blast cleaned surface finish is defined as a surface from which mill scale all rust and all foreign materials are entirely removed. The surface when viewed without magnification shall be free of all oils, grease, dirt, visible mill scale, rust, corrosion products, oxides, paint and other foreign matter. The colour of the clean surface may be affected by the particular abrasive medium used. Photographic or other visual standards of surface preparation may be used if required to further define the surface if specified in the contract.

Blast cleaning	SSPC	Swedish Standard SIS 05 59 00	Australian Standard AS1627- Part 4
Light or Brush	SP7	Sa1	Class 1
Medium or Commercial	SP6	Sa2	Class 2
Near White Metal	SP10	Sa2.5	Class 2.5
White Metal	SP5	Sa3	Class 3

Types, sizes and resulting profile of abrasives used in air blast equipment

Abrasive	Maximum particle size passing through mesh	Height of profile	
		No. mils	Microns
Sand, very fine	80	1.5	40
Sand, fine	40	2.0	50
Sand, medium	18	2.5	65
Sand, large	12	2.8	70
Steelgrit # G-80	40	1.3-3.0	30-75
Iron grit # G-50	25	3.3	85
Iron grit # G-40	18	3.6	90
Iron grit # G-25	16	4.0	100
Iron grit # G-16	12	8.0	200
Steel shot # S-170	20	1.8-2.8	45-70
Iron shot # S-230	18	3.0	75
Iron shot # S-330	16	3.3	85
Iron shot # S-390	14	3.6	90

(b) Pickling

Pickling (chemical descaling) is the removal of mill scale and rust using chemical solutions, usually acids, according to SSPC-SP8. Pickling cannot be used on erected structures and is essentially a process for the workshop. Carried out efficiently it is equivalent to white metal blast cleaning and leaves a relatively smooth surface on which it is often easier to obtain a more even paint coating. Surfaces descaled by chemical treatments are smoother than those produced by blast cleaning and may reduce the adhesion of some paints. With some very high build paint coatings the 'tooth' from a blast cleaning profile may be preferred.

1. Solvent or alkaline cleaning or mechanical methods shall be used initially to remove heavy deposits of oil, grease and dirt. Small quantities of such matter may be removed by the pickling procedures, provided that no detrimental residues reduce the efficiency of the pickling solutions. Weld splatter and slag shall also be removed prior to pickling.
2. A Pickled Steel Surface Finish is defined as one from which all mill scale, all welding scale, all rust and other foreign matter are removed.
3. Pickling may be carried out by any of the methods using either acid, alkaline or electrolytic baths, or combination, provided adequate precautions are observed to
 - a. Ensure sufficient inhibitor has been added to minimise attack on the base metal when pickling in acid solutions.
 - b. Acid pickling or cathodic treatment methods are not used on steel having a tensile strength greater than 10.25 tonnes per square cm or on the welded areas of low alloy steels as these heat affected zones would approach 10.25 tonnes per square cm. This precaution is necessary to prevent hydrogen absorption and subsequent embrittlement, which may result in failure due to hydrogen cracking.
4. The pickled steel surface shall be free of unreacted or harmful acid or alkali, smut, metal deposits, improperly cleaned areas. Any inhibitive iron phosphate coating shall be firmly adherent to the underlying metal.

(c) Hand tool cleaning (SSPC-SP2)

A method of preparing steel surfaces by use of non-power hand tools. Hand tool cleaning removes all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife.

Hand wire brushing, hand abrading, hand scraping or other similar non-impact methods are acceptable for the removal of loose mill scale, all loose or non-adherent rust and all loose paint.

Stratified rust (rust scale) and weld slag must be removed using impact hand tools.

Regardless of method use for cleaning, feather edges of remaining old paint so that the unpainted surface can have a reasonably smooth appearance.

Hand tool cleaning should only be specified when it is an acceptable method of preparation. It is only suitable for normal atmospheric exposures and interiors when the painting system includes a primer of good wetting ability.