

General

Mild steel, for its strength to weight ratio and cheapness, is one of the most widely used construction materials. However, it readily rusts and must be painted to prevent this corrosion and to give it a decorative appearance. Mill scale found on new steel is a hard, brittle coating of several distinct layers of iron oxides formed during processing of steel by hot rolling of girders, tank plates and other structural shapes. Usually bluish black in colour, mill scale cracks and fissures readily and is permeable to both air and moisture. Rusting at the mill scale steel interface occurs and in time the scale sloughs off due to the pressure created by the rust layer. Mill scale is cathodic to the steel substrate and if left in place, corrosion will occur as a result of the electrical potential difference between them.

Rust is a mixture of oxides of iron formed by the action of air and water. It is voluminous and occupies about one and three quarter times the volume of the steel from which it originated. Rust forming under a paint coating or through breaks in the coating may burst through or may creep under the coating resulting in flaking so that repair is both difficult and costly.

It may cost a little more for a well prepared surface, but as the paint coating will last many times longer, the overall cost saving in maintenance will justify the initial expense. Other types of steel, such as low alloy steels like Austen 50, which are selected in areas requiring increased strength, hardness or improved resistance to corrosion, may also be prepared by the following surface preparation.

Surface preparation

D801.1 Wash and degrease surfaces

Thoroughly wash surface with Resene Paint Prep and Housewash (see [Data Sheet D812](#)) using a nylon bristle brush or broom. Thoroughly scrub the surface to ensure complete removal of all grease and other contaminants. Rinse thoroughly with clean water and allow to dry.

D801.2 Remove all moss and mould

Thoroughly clean down to remove all loosely adhered material. Treat areas of moss or mould infestation with Resene Moss & Mould Killer (see [Data Sheet D80](#)) correctly diluted with clean water. Leave for up to 48 hours to achieve full kill. For heavy infestations further applications may be needed. Wash thoroughly with clean water to remove residues.

D801.3 Waterblast 3000 psi

Carefully waterblast at 3000 psi to remove all dirt, chalk, moss and mould residue, any loose and flaking paint and other contaminants. Allow the surface to dry out for at least 24 hours.

D801.4 Hand tool cleaning

Hand tool clean to SSPC-SP2 standard - 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 the method used for cleaning, feather edges of remaining old paint so that the unpainted surface has a reasonably smooth appearance. Hand tool cleaning should only be specified for normal atmospheric exposures and interiors when the painting system includes a primer of good wetting ability. Round off any sharp edges to allow better film build.

Immediately prime all bare steel with Resene Rust-Arrest (see [Data Sheet RA30A](#)) to prevent further rusting or contamination.

Ferrous metals

Mild steels

Referred to in Resene specification sheet:

6 Ferrous metals

For smoke damaged surfaces
see [D86](#)

For repaints see [D87](#)



D801.5 Power tool cleaning

Power tool cleaning, a method of preparing steel surfaces by use of power assisted hand tools, 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. Power wire brushing, power abrading, power impact or other power rotary tools are acceptable means for removal of loose mill scale, all loose or non-adherent rust and all loose paint. Do not burnish the surface. Use rotary or impact power tools to remove stratified rust (rust scale) and weld slag. Operate power tools in a manner that prevents the formation of burrs, sharp ridges and sharp cuts. Regardless of the method used, feather edges of remaining old paint so that the repainted surface will have a reasonably smooth appearance. Round off any sharp edges to allow better film build.

Immediately apply the specified primer to prevent further corrosion or contamination.

D801.6 Spot blast clean

Spot blast clean areas of corrosion to SSPC-SP10. All damaged areas or areas of corrosion must be blast cleaned to a 'near white' metal finish according to SSPC-SP10 (Sa 2.5 of Swedish Standard SIS 05 59 00). A 'near white' metal blast cleaned surface finish is defined as a surface from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed except for very slight shadows, very slight streaks or slight discolouration caused by rust stain, mill scale, oxides or slight, light residues of paint or coating that may remain. At least 95% of each square centimetre of surface must be free of all visible residues and the remainder limited to the light discolouration mentioned above. Photographic or other visual standards of surface preparation may be used if required to further define the surface if specified in the contract. Round off any sharp edges to allow better film build.

Immediately apply the specified primer to prevent flash rusting or other contamination. Four hours is the maximum time the surface may be left unprimed.

D801.7 Blast clean

Blast clean to SSPC SP10. All surfaces to be coated must be blast cleaned to a 'near white' metal finish according to SSPC-SP10 (Sa 2.5 of Swedish Standard SIS 05 59 00). A 'near white' metal blast cleaned surface finish is defined as a surface from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed except for very slight shadows, very slight streaks or slight discolouration caused by rust stain, mill scale, oxides or slight, light residues of paint or coating that may remain. At least 95% of each square centimetre of surface area must be free of all visible residues and the remainder limited to the light discolouration mentioned above. Photographic or other visual standards of surface preparation may be used if required to further define the surface if specified in the contract. Round off any sharp edges to allow better film build.

Immediately apply the specified primer to prevent flash rusting or other contamination. Four hours is the maximum time the surface may be left unprimed.

D801.8 Remove weld flux

Any welded sections will need special attention. After welding, all surfaces to be painted must be thoroughly cleaned and free from flux, weld spatter and surface defects, including cracks and deep pits. Remove weld spatter carefully by blasting or mechanical grinding. All rough welding must be ground smooth. Remove weld flux by thorough washing with a detergent solution followed by copious washing with clean water.