

1:10 Surface preparation (part 3)

(d) Power tool cleaning (SSPC-SP3)

A method of preparing steel surfaces by use of power assisted hand tools. Power 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.

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 can have a reasonably smooth appearance.

Non-ferrous metals

Metals included in the group comprise galvanised steel (also Zincaneal, Zinalume, and Galvabond, each of which are steel coatings with zinc and zinc and aluminium mixtures), aluminium and to a lesser extent copper, brass, bronze and zinc and aluminium metal spray.

The selection of galvanised iron and aluminium is increasingly used for roofing and cladding and both have a long history of satisfactory service when used for those purposes. When used in chemical or industrial plants or coastal atmospheric exposures a suitable paint system is necessary to give protection and added durability. The selection of a correct painting system is essential to prevent subsequent failure.

Adequate surface preparation is essential to ensure adhesion of the paint system and surface preparation with non-ferrous surfaces is usually confined to complete cleanliness such as removal of dirt and oil or grease, and this is adequately covered by Australian Standard CK 9.1, Degreasing of Metal Surfaces, which can be summarised as follows:

1. This specification refers to Australian Standard CK 9.1 by which suitable liquids, other than acids are used to remove detrimental foreign matter such as soluble or loosely adherent oil, grease, drawing and cutting compounds, wax, dirt and perspiration from metal surfaces. Large quantities of dirt may first be removed by hand or power tool cleaning.
2. This method may be used for the removal of the above substances prior to the application of paint or in conjunction with other methods of surface preparation such as CK 9.4 for the removal of rust, mill scale or paint.
3. A metal surface prepared to this degree of cleanliness is one, which is then suitable for the subsequent coating and the type of protective coating to be applied.
4. Degreasing may be carried out using any of the methods described in Australian Standard CK 9.1 except that alkaline cleaning is suitable only for steel surfaces. The Solvent Methods of cleaning are suitable for ferrous metals, galvanised iron, copper, tin, brass, bronze, aluminium and its alloys.

Surface preparation non-metallic

Concrete, masonry, brickwork and asbestos cement

With brickwork and asbestos cement, the basic requirement is that the surface must be clean and dry. With concrete and masonry, additional problems may be caused by efflorescence, chalk and loose material, and from new or insufficiently aged concrete by:

1. Unbound moisture within the concrete (and in the mortar joints of other masonry) remaining from the original mixing with water,
2. The presence within the material of soluble alkaline substances that are brought to the surface by the outward movement of moisture and deposited as efflorescence,

3. Possible contamination with form oil or concrete curing compounds,
4. Glazed areas resulting from casting against a smooth, non-absorbent form.

One method of obtaining a satisfactory surface for painting is to blast clean carefully using a non-metallic abrasive such as sand or ilmenite, taking care not to expose aggregates unduly.

Alternatively the surface may be acid-etched. This treatment consists of treating the surface with dilute acids; either hydrochloric acid diluted with 6 parts, by volume of water, or phosphoric acid diluted with 10 parts, by volume of water. Wet the surface first with freshwater then apply the acid mixture, liberally, by brush or swab so that all areas show a bubbling reaction. After 5-15 minutes rinse off with copious quantities of freshwater and at the same time scrub with stiff brooms to remove loose concrete salts. Allow to dry, avoid any contamination of the etched surface and paint preferably within three days.

After this treatment the concrete should have a clean slightly roughened toothy surface.