Surface preperation guide for Mine Marshal 8000

Improperly prepared surfaces can result in reduced coating integrity and service life. Up to 80% of all coatings failures can be directly attributed to inadequate surface preparation, which affects coating adhesion.To ensure adhesion of the coating to the substrate and prolong the service life of the coating system, select and implement the proper surface preparation. The method of surface preparation depends on the substrate, the environment, and the expected life of the coating system.

Economics and surface contamination (including its effect on the substrate) will also influence the selection of surface preparation methods.

- The surface must be dry and in sound condition.
- Remove mildew, oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
- No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F
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The table below provides an overview of proper surface preparation for a variety of common substrates.

1.1 Cement plaster, concrete and unglazed brickwork: Ensure that concrete has dried for at least four weeks and other masonry surfaces two weeks before painting. Remove any loose particles and laitance by most suitable means. Remove any oil, grease and mould release agents with PLASCON AQUASOLV DEGREASER. Rinse thoroughly. N.B. Soft, underbound, friable and highly porous surfaces must be restored to a sound condition with PLASCON MULTI-SURFACE PRIMER or PLASCON PLASTER PRIMER.
1.2 Fibre-cement: Remove any loose particles and laitance by most suitable means. Apply 1 coat of PLASCON BONDING LIQUID. Allow to dry for 16 hours. N.B. BONDING LIQUID must be overcoated within 3 days after application.
1.3 Gypsum plaster (e.g. Rhinolite, Cretestone): Apply one coat of PLASCON PLASTER PRIMER. If a gypsum plaster has been used as the joint skimming filler on gypsum board or dry wall partitioning, then these areas must be sealed with PLASCON PLASTER PRIMER.
1.4 Wood: Sand smooth with 150 grit paper working in the direction of the grain. Dust off. Seal knots and resinous areas with PLASCON KNOT SEAL. Prime exterior wood with PLASCON WOOD PRIMER.
1.5 Mild steel: Degrease with PLASCON AQUASOLV DEGREASER. Rinse thoroughly with water. Remove any rust by coarse sanding, mechanical grinding, etc. or PLASCON RUST REMOVER. Prime general surfaces the same day with PLASCON METAL PRIMER or PLASCOSAFE 18 PRIMER – use ZINC PHOSPHATE PRIMER RED OXIDE for structural steelwork.
1.6 Galvanised steel: Clean with PLASCON GALVANISED IRON CLEANER to achieve a water break-free surface. Rinse thoroughly with water. Prime the same day with PLASCON GALVANISED IRON PRIMER.
1.7 PVC gutters and down pipes: Clean and sand lightly. Prime with PLASCON PLASTER PRIMER or PLASCON MULTI SURFACE PRIMER.

2. Previously Painted Surfaces:

2.1 Previously painted surfaces in good condition: Remove loose and flaking paint back to a sound substrate and a firm edge by scraping and sanding. Spot prime bare areas with appropriate primer. Clean with POLYCELL SUGAR SOAP POWDER solution to remove all contaminants and chalked material. Rinse with clean water to remove all traces of SUGAR SOAP. Alternatively, clean with high pressure water jet. Sand glossy enamel surfaces to a matt finish to aid adhesion.
2.2 Chalky surfaces: Remove completely by scraping, wire brushing, sandpapering, etc. to expose the underlying substrate. Apply PLASCON BONDING LIQUID or PLASCON PLASTER PRIMER. N.B. BONDING LIQUID must be allowed to dry for 16 hrs and overcoated within 3 days after application.
2.3 Previously painted surfaces in poor condition: Completely remove paint by most appropriate means or by stripping with REMOVALL ALL PURPOSE COATINGS REMOVER. Treat as for new work.

1. phosphate or similar alkali cleaner and flush with clean water to achieve a sound, clean surface.
2. Allow surface to dry and check for moisture (ref. ASTM D4263).

Concrete - Power Tool Cleaning or Hand Tool Cleaning

1. Use needle guns or power grinders, equipped with a suitable grinding stone of appropriate size and hardness, which will remove concrete, loose mortar, fins, projections, and surface contaminants. Hand tools may also be used.
2. Vacuum or blow down to remove dust and loose particles from surface (ref. ASTM D4258, or Method "D" below).
3. Test for moisture or dampness by taping the 4 edges of an 18-inch by 18-inch plastic sheet (4 mils thick) on the bare surface (an asphalt tile or other moisture impervious material will also do), sealing all of the edges. After a minimum of 16 hours, inspect for moisture, discoloration, or condensation on the concrete or the underside of the plastic. If moisture is present, the source must be located and the cause corrected prior to painting.

Concrete - Surface Cleaning

The surface must be clean, free of contaminants, loose cement, mortar, oil, and grease. Broom cleaning, vacuum cleaning, air blast cleaning, water cleaning, and steam cleaning are suitable as outlined in ASTM D4258.

Concrete curing compounds, form release agents, and concrete hardeners may not be compatible with recommended coatings. Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow concrete to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, surface preparation per methods outlined in ASTM D4259 are required.

Cement Composition Siding/Panels

Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow siding to dry.

Existing peeled or checked paint should be scraped and sanded to a sound surface.

Glossy surfaces should be sanded dull.

Pressure clean, if needed, with a minimum of 2100 psi to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly.

If the surface is new, test it for pH, many times the pH may be 10 or higher.

Copper

Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP 2, Hand Tool Cleaning.

Drywall - Interior/Exterior

Drywall must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.

Exterior surfaces must be spackled with exterior grade compounds.

Exterior Composition Board (Hardboard)

Some composition boards may exude a waxy material that must be removed with a solvent prior to coating. Whether factory primed or unprimed, exterior composition board siding (hardboard) must be cleaned thoroughly and primed with an alkyd primer.

Galvanized Metal

Allow galvanized metal to weather a minimum of 6 months prior to coating.

Solvent clean per SSPC-SP1, then prime as required.

When weathering is not possible or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test area, priming as required.

Allow the coating to dry at least one week before testing.

If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

Plaster

Plaster must be allowed to dry thoroughly for at least 30 days before painting.

The room must be ventilated while drying. In cold, damp weather, rooms must be heated.

Damaged areas must be repaired with an appropriate patching material.

Bare plaster must be cured and hard.

Textured, soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.

Previously Coated Surfaces

Maintenance painting will frequently not permit or require complete removal of all old coatings prior to

repainting. However, all surface contamination such as oil, grease, loose paint, mill scale, dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers must be removed to assure sound bonding to the tightly adhering old paint.

Glossy surfaces of old paint films must be clean and dull before repainting. Thorough washing with an abrasive cleanser will clean and dull in one operation, or, wash thoroughly and dull by sanding.

Spot prime any bare areas with an appropriate primer.

Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system. Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow surface to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, complete removal is required (per ASTM 4259, see Concrete, S-W 5, "Blast Cleaning" above).

Steel - Structural Plate

Steel should be cleaned by one or more of the nine surface preparations described below. These methods were originally established by the Steel Structures Council in 1952, and are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Steel Structures Painting Council; ask for SSPC-Vis 1-67T.

Steel - Solvent Cleaning

Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale.

Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.

Steel - Hand Tool Cleaning

Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process.

Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP 1.

Steel - Power Tool Cleaning

Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process.

Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP 1.

Steel - White Metal Blast Cleaning

A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter.

Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

Steel - Commercial Blast Cleaning

Staining shall be limited to no more than 33 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied paint.

Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

Steel - Brush-Off Blast Cleaning

A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint.

Tightly adherent mill scale, rust, and paint may remain on the surface.

Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

Steel - Power Tool Cleaning to Bare Metal

Metallic surfaces which are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP 1, Solvent Cleaning, or other agreed upon methods.

Steel - Near-White Blast Cleaning

A Near White Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

Steel - Water Blasting

Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.

Stucco

Must be clean and free of any loose stucco.

If recommended procedures for applying stucco are followed, and normal drying conditions prevail, the surface may be painted in 30 days.

The pH of the surface should be between 6 and 9.

Wood - Exterior

Wood must be clean and dry.

Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied.

Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

Caulk should be applied after priming.

Wood - Interior

All finishing lumber and flooring must be stored in dry, warm rooms to prevent absorption of moisture, shrinkage, and roughening of the wood.

All surfaces must be sanded smooth, with the grain, never across it.

Surface blemishes must be corrected and the area cleaned of dust before coating.

Vinyl Siding

Vinyl siding must be cleaned thoroughly by scrubbing with a warm, soapy water solution. Rinse thoroughly.

Preparation Steps by Surface Type

Aluminum

Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

Block (Cinder and Concrete)

Remove all loose mortar and foreign material from block. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners.

- Concrete and mortar must be cured at least 30 days at 75°F.
- The pH of the surface should be between 6 and 9.
- On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface.
- Fill bug holes, air pockets, and other voids with a cement patching compound.

Brick

Brick must be free of dirt, loose and excess mortar, and foreign material.

- All brick should be allowed to weather for at least one year followed by wire brushing to remove efflorescence.
- Treat the bare brick with one coat of Loxon Conditioner.

Concrete

The following guides will help assure maximum performance of the coating system and satisfactory coating adhesion to concrete:

1. Cure - Concrete must be cured prior to coating application. Cured is defined as concrete poured and aged at a material temperature of at least 75°F for at least 30 days. The pH of the surface should be between 6 and 9.
2. Moisture - (Reference ASTM D4263) Concrete must be free of moisture as much as possible (moisture seldom drops below 15% in concrete). Test for moisture or dampness by taping the 4 edges of an 18 inch by 18 inch plastic sheet (4 mils thick) on the bare surface (an asphalt tile or other moisture impervious material will also do), sealing all of the edges. After a minimum of 16 hours, inspect for moisture, discoloration, or condensation on the concrete or the underside of the plastic. If moisture is present, the source must be located and the cause corrected prior to painting.
3. Temperature - Air, surface and material temperature must be at least 50°F (10°C) during the application and until the coating is cured.
4. Contamination - Remove all grease, dirt, loose paint, oil, tar, glaze, laitance, efflorescence, loose mortar, and cement by the recommendations A, B, C, or D, listed below.
5. Imperfection may require filling with a material compatible with Sherwin-Williams coatings.
6. Concrete Treatment - Hardeners, sealers, form release agents, curing compounds, and other concrete treatments must be compatible with the coatings, or be removed.

Concrete - Blast Cleaning

(Reference ASTM D4259) Brush Blasting or Sweep Blasting-Includes dry blasting, water blasting, water blasting with abrasives, and vacuum blasting with abrasives.

1. Use 16 - 30 mesh sand and oil-free air.
2. Remove all surface contamination (ref. ASTM D4258). See Method "D" below.
3. Stand approximately 2 feet from the surface to be blasted.
4. Move nozzle at a uniform rate.
5. Laitance must be removed and bug holes opened.
6. Surface must be clean and dry (moisture check: ref. ASTM D4263) and exhibit a texture similar to that of medium grit sandpaper.
7. Vacuum or blow down and remove dust and loose particles from the surface (ref. ASTM D4258).

Concrete - Acid Etching

The following guides will help assure maximum performance of the coating system and satisfactory coating adhesion to concrete:

1. Remove all surface contamination (ref. ASTM D4258).
2. Wet surface with clean water.
3. Apply a 10 - 15% Muriatic Acid or 50% Phosphoric Acid solution at the rate of one gallon per 75 square feet.
4. Scrub with a stiff brush.
5. Allow sufficient time for scrubbing until bubbling stops.
6. If no bubbling occurs, the surface is contaminated with grease, oil, or a concrete treatment which is interfering with proper etching. Remove the contamination with a suitable cleaner (ref. ASTM D4258, or Method "D" below) and then etch the surface.
7. Rinse the surface two or three times. Remove the acid/water mixture after each rinse.
8. Surface should have a texture similar to medium grit sandpaper.
9. It may be necessary to repeat this step several times if a suitable texture is not achieved with one etching. Bring the pH (ref. ASTM D4262) of the surface to neutral with a 3% solution of trisodium