SURFACE PREPARATION
NEW SURFACES

NS # 1. MILDEWED SURFACES:
Any existing mildew on the surface must be completely killed and removed prior to the application of primer or paint. Any mildew not removed may continue to grow through the new finish. Using a long-handled brush, scrub mildewed surface with a mixture of one quart of household bleach and three quarts of warm water. Rinse completely and let dry.

NS # 2. DRYWALL:
Drywall must be clean and dry. All nail heads must be set and spackled with *LANCO® Spackling Compound SC-101*. Joints must be taped and covered with joint compound. Spackled nail heads and taped joints must be sanded smooth and all dust removed prior to the application of primer.

NS # 3. EXTERIOR COMPOSITION BOARDS:
Whether factory primed or unprimed, exterior composition boards siding (hardboard) must be cleaned thoroughly and primed with *LANCO® Wall-Prep White-Pigmented Alkyd Binder Undercoater™ WP-825.*

NS # 4. PLASTER:
New Plaster should be completely dry before application of any primer or coating (30-60 days), but will vary depending upon the mix and atmospheric conditions. Rooms must be ventilated while drying; cold, damp weather rooms must be heated. Damaged places must be repaired with *LANCO® Patching Plaster™ PP-223.* Bare plaster, new or old, should be dry, cured and hard. Texture or swirl types and soft porous or powdery plaster should be treated with a solution of 1 pint of household vinager with 1 gallon of water. Rinse off with clean water and allow to dry.

NS # 5. ASBESTOS SIDING:
If glazed, allow to weather at least two years before or sandblasted before painting. Remove all dust and dirt. If siding has been weathered and is porous, treat with *LANCO® Stain Killer WP-039.*

NS # 6. CONCRETE, BLOCK AND CINDER:
All new surfaces must be free from dirt, loose or excess mortar and thoroughly dry. Priming or painting may proceed in thirty days under normal drying and painting conditions.

NS # 7. BRICK:
Must be free from dirt, loose-excess mortar or foreign material. All brick should be allowed to weather at least one year followed by wire brushing to remove efflorescence. These surfaces should then be treated with *LANCO® Wall-Prep Clear Alkyd Binder Undercoater™ WP-824.*

NS # 8. CONCRETE FLOORS:
The surface must be thoroughly cleaned. Lifting, bleeding or peeling can occur because of incomplete surface preparation. Use of commercial detergents on concrete floors to remove grease and grime is required. Brush lasting of poured concrete or a 10% muriatic acid etch with thorough rinsing of concrete is required. Elimination of moisture in or beneath the concrete substrate is required before coating.

NS # 9. CONCRETE, POURED:
A good surface preparation ensures primer and coating adhesion to the surface and prolongs the service life of the coating system; the methods indicated below can serve as guides:

(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 70ºF for at least thirty days.

(2) MOISTURE – Concrete must be free from moisture as much as possible (it seldom drops below 15%). Vapor pres sure, temperature and humidity differentials, and hydrostatic pressure can cause coatings to prematurely fail. One check of moisture content in concrete is to tape an asphalt tile on the surface, sealing all edges. After 48 hours remove and examine the backside for moisture condensation and inspect the concrete surface for darkened areas. The source of the moisture, if present, must be located, and the cause corrected prior to coating.

(3) TEMPERATURE – Air, surface and material temperature must be at least 55ºF for 24 hours prior to, during and after coating application.
(4) CONTAMINATION – Remove all grease, dirt, paint, oil, tar, glaze, laitance, efflorescence, loose mortar and cement by the recommendations indicated below.
(5) SURFACE CONDITION – Hollow areas, bug holes, honeycombs, voids, fins, form marks, and all protrusions or rough edges are to be ground or stoned to provide a smooth continuous surface of suitable texture for proper adhesion of the coating. Imperfections may require patching, use *LANCO® Siliconizer Crack Filler™ RC-230.*
(6) CONCRETE TREATMENT – Form oils if not used in a proper way or if used in excess will cause primer or top coat adhesion problems such as:
Wax: Can cause paint adhesion problem
Petroleum Base: In excess will cause adhesion problem.
Oil Base: Can cause discoloration.
Resin: In excess can cause discoloration.
Lacquer: Will cause no problem.

Methods for surface preparation of concrete:

Method # 1: Blast cleaning
Includes dry blasting, water blasting, water blasting with abrasives, and vacuum blasting with abrasive.
(1) Use 16-30 mesh sand and oil-free air.
(2) Remove all surface contaminants.
(3) Stand approximately two feet from surface to be blasted.
(4) Move nozzle at uniform rate.
(5) Laitance must be removed and bug holes opened.
(6) Surface must be clean, dry (check for moisture using asphalt tile test) and exhibit a texture similar to that of medium grit sandpaper.
(7) Vacuum or blow down and remove dust and particles from surface.

Method # 2: Acid Etching
(1) Sweep or blow down surface to remove loose dirt.
(2) Wet surface with clean water.
(3) Etch with 10-15% muriatic acid or 50% phosphoric acid at the rate of 1 gallon per 75 square feet.
(4) Scrub with stiff brush.
(5) Allow sufficient time for scrubbing until bubbling stops.
(6) If no bubbling occurs, surface is contaminated with grease, oil or concrete treatment interfering with proper etching. Remove the contamination with suitable cleaner and then etch the surface.
(7) Rinse surface two or three times. Remove 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 texture is not achieved on first etch. Bring pH of surface to neutral with 3% solution of tri-sodium phosphate and flush with clean water to achieve sound, clean surface. Allow surface to dry and check for the presence of moisture using asphalt tile test.

Method # 3: Hand tool or power 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 and remove dust and loose particles from surface.
(3) Check for the presence of moisture using the asphalt tile test.

NS # 10. COPPER:
Surface must be cleaned of dirt, oxide and foreign matter and shall be painted with *LANCO® Super Enamel Alkyd Paint™*.

NS # 11. GALVANIZED METALS AND INORGANIC ZINC:
Allow to weather a minimum of six months prior to coating. Solvent clean per (SSPS-SP 1-63), then prime as required. When weathering is not possible, solvent clean per (SSPS-SP 1-63) and apply a test area, prime as required. Allow primer to dry one week before testing for adhesion. If adhesion is poor, brush blast is recommended to remove this treatment. Remove silicate or white rust by sanding (SSPC-SP 7-63). Water-soluble contaminants should be rinsed off with water. After erection abrasions, nuts and bolts should be hand cleaned (SSPC-SP 2-63) or power tool cleaned (SSPC-SP 3-63) to remove any rust or contamination. Welds should be ground smooth and welt spatter removed before priming.

NS # 12. ALUMINUM:
New surfaces must be free of oils and lubricants often used in the fabrication or machining of aluminum. Use solvent cleaning preparation (SSPC-SP 1-63) with *LANCO® Lacquer Thinner LT-102* to clean and remove any foreign matter that could affect the performance of the coating. This can also be accomplished on exterior products by weathering for a month to six weeks prior to the application of primer. Surface must be clean and free of contaminants. If detergent is used, be sure to rinse well, and allow surface to dry before painting. If small thin oxide film is found on surface, remove by hand cleaning (SSPC-SP 2-63) or power cleaning (SSPC-SP 3-63) sanding or scrubbing.

NS # 13. STEEL, IRON AND METALS:
Surface preparation is important for the performance of the new coating. The following is a brief summary of the standards published by the Steel Structures Painting Council for cleaning structural steel.

Method # 1: Solvent cleaning (SSPC-SP 1-63) This system covers many methods of cleaning, some of which go beyond solvent action and utilize chemicals to remove oil, grease, dirt, soil, drawing compounds, and other similar matter. It includes the removal of old paint by the use of paint removers or alkaline paint strippers. Corrosive salt, such as chlorides and suphates are not removed by hydrocarbons and must be removed with water prior to cleaning the surface with hydrocarbon solvents. This method of cleaning will not remove rust, rust scale, or mill scale. When rags are used for solvent cleaning, they should be changed frequently as they absorb grease and act as a transfer medium for contaminants. Any alkaline compound should be removed carefully as they may form soap, which will inhibit future good adhesion. As a final step for extra protection, the surface should be wiped clean with a weak phosphoric acid solution. Caution should be used when using solvent cleaning as there is always danger of combustion.

Method # 2: Hand tool cleaning (SSPC-SP 2-63) This system is primarily a method for preparing metal surfaces for coating by removing loose mill scale, loose rust and loose paint by hand brushing, sanding, scraping or chipping. Other hand-impact tools or combination of these methods can be used. This type of cleaning is normally used in preparing surfaces where corrosion is only a minor problem. Care should always be taken on weld seams or spots to remove flux as it promotes premature system failure. Hand cleaning is not a recommended system for the faster drying finishing systems such as vinyl.

Method # 3: Power cleaning (SSPC-SP 3-63). This is a method of preparing metal surfaces for coating by removing the loose mill scale, loose rust, and loose old paint with power wire brushes, impact tools, grinders, sanders or a combination of these tools. In employing this method, care should be taken that burnished mill scale is not mistaken for bright, clean metal. Prime coating will not adhere to burnished areas of this type and premature failure results. This system does not intend that tight mill scale, tight rust, and tight paint be removed by this process. Loose mill scale, loose rust, and loose paint and other detrimental foreign matter present, however, should be removed.

Method # 4: Flame Cleaning Of New Steel (SSPC-SP 4-63). This is a method of preparing unpainted metal surfaces for coating by passing high temperature, high velocity, oxygen acetylene flames over the entire surface and then wire brushing to remove loosened scale and rust. It is intended in this method that all unbound scale, rust and other detrimental foreign matter be removed by this process, leaving a warm dry surface to which the primer coat can be applied before the surface cools. Care should be taken when using the flame cleaning, as there is the ever-present danger of fire.

Method # 5: Blast Cleaning To White Metals (SSPC-SP 5-63). This is a method of preparing surfaces for coating by removing all mill scale, rust scale, paint or other foreign matter by the use of abrasive propelled by centrifugal wheels. "White" metal is defined as a surface with a gray-white uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface should be free of visible mill scale, rust, corrosion, oxide paint or other foreign matter. The cost of this method is comparatively high and is generally used only when such costs are warranted by top performance of fast drying finishing systems.

Method # 6: Commercial Blast Cleaning (SSPC-SP 6-63). Commercial blast cleaning is a method of preparing metal surfaces for coating by the use of abrasives propelled through nozzles or by centrifugal wheels. It requires the removal of all visible scale, rust and other surface contaminants. Generally evenly dispersed very light shadows, streaks and discoloration caused by stains of rust, stains of mill scale and stain of previously applied paint may remain on no more than 33% of the surface. Slight residues of rust and paint may also be left in the craters or pits if the original surface is pitted.

Method # 7: Brush-off Blast Cleaning (SSPC-SP 7-63). This is a method of preparing metal surfaces for painting by removing loose mill scale, loose rust and loose paint by use of abrasive propelled through nozzles or by centrifugal wheels. It is not intended that the surface be free of all scale, rust and paint. The remaining scale, rust and paint should be tight and surface should be sufficiently abraded to provide good adhesion and bonding of paint. The low cost of this method may result in economical protection in mild environment. A blast-cleaned surface should be treated or primed before any rusting occurs. Otherwise the benefit of blast cleaning is lost. The exposed, bare metal will rust quickly under conditions of high humidity, when wet or when in a corrosive atmosphere. It is, therefore, best practice to prime or chemically treat within eight hours of blasting. Under normal conditions, the period may be extended to 24 hours.

Method # 8: Pickling (SSPC-SP 8-63). This is a method of preparing metal surface for painting by completely removing all mill scale, rust, rust scale by chemical reaction, by electrolysis, or a combination of both. It is intended that the metal surface should be completely free of all scale, rust and foreign matter. The surface should also be free of unreacted or harmful acid or alkali or smut. This type of cleaning must generally be done in the mill. It is rarely done in the field.

Method # 9: Weathering and Cleaning (SSPC-SP 9-63T). This is a method of preparing unpainted metal surfaces for coating by weathering metals to remove all or part of mill scale followed by blast cleaning by one of the above standards.

Method # 10: Near-White Blast Cleaning (SSPC-SP 10-64). Near-White Blast Cleaning is a method of preparing metal surfaces for painting or coating by removing nearly all mill scale, rust, rust scale, paint or foreign matter by the use of abrasives propelled through nozzle or by centrifugal wheels to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discoloration caused by rust stain, mill scale oxides or slight residues of paint or coating that may remain. At least 95% of each square inch of surface area should be free of all visible residues and the remainder should be limited to the slight discoloration mentioned above.

Note: After erection, all nuts, bolts, scratches and abraded areas should be cleaned and spot-primed before additional coats of primer or finish coating are applied. Welds should be grounded smooth to remove weld splatter before priming.

NS # 14. INTERIOR WOOD:

Most adhesion failures on wood are caused by water or water vapor entrapped in the substrate. All finishing lumber and flooring should be stored on the premises in dry, warm rooms to prevent absorption of moisture, shrinkage and roughening of the wood. Fill any nail holes with *LANCO® Color Wood Filler* and let dry 24 hours. All surfaces should be sanded smooth in the grain direction, never across it. Remove all sanding dust by vacuuming or dusting the surface with a "tack" cloth.

NS # 15. EXTERIOR WOOD:

Most adhesion failures on exterior wood are caused by water or water vapor entrapped in the substrate. Pre-priming of wood surfaces before erection would substantially reduce paint adhesion failure.

Caution: Smooth painted clapboards or siding must be sanded thoroughly to break the "mill glaze" and allow proper penetration and adhesion. Unweathered areas such as eaves, ceilings and overheads should be washed with a detergent solution and rinsed with a stream of water to remove salts that can interfere with adhesion.

NS # 16. FIBERBOARD:

All contamination must be removed prior to priming or topcoating. Loose dirt must be removed by bristle brush or blowing clean with air pressure. Oil and grease must be removed with solvents or commercial detergents. Mold or mildew must be removed prior to coating application.

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SURFACE PREPARATION
PREVIOUSLY PAINTED SURFACES

PS # 1. FERROUS METAL, STEEL, UNGALVANIZED ROOF DECKING, EXTERIOR OF STORAGE TANKS, SILOS, TUBING, PIPE RACKS, LADDERS, DOORS, FRAMES, ETC:

Surfaces in good condition:

Surface to be painted must be clean, dry and free of loose paint, mill scale, rust, dust, mold, efflorescence and sealer. Proper surface preparation is essential to the life of any coating system. Sand any old hard glossy coating by Brush-off Blast (SSPC-SP 7-63). All surface contaminants such as oil, grease, wax and dirt must be removed by Solvent Cleaning (SSPC-SP 1-63) with *LANCO® Lacquer Thinner LT-102*. When rags are used for Solvent Cleaning they should be changed frequently as they absorb grease and act as a transfer medium for contaminants.

Be aware that any surface preparation short of total removal of the old coating may compromise the service length of the system. Always check for compatibility of the previously painted surface with the new coating by applying a test coat of three square feet. Allow to dry thoroughly and check for adhesion.

Surfaces in poor condition:

If more than 25% of the previous coating has failed, it should be completely removed. If the previous coating can be easily scraped off the surface, it should be completely removed.

Sand Blasting is the preferred method for removing rust, mill, old paint and similar surface contaminants on previously painted steel prior to coating. In addition to cleaning the surface, Sand Blasting cuts the steel to provide an anchor pattern which assures good adhesion of the primer to the surface.

Surfaces Preparation Procedures for Steel:

(1) Solvent Cleaning (SSPC-SP 1-63)
(2) Hand Cleaning (SSPC-SP 2-63)
(3) Power Cleaning (SSPC-SP 3-63)
(4) Flame Cleaning (SSPC-SP 4-63)
(5) White Metal Cleaning (SSPC-SP 5-63)
(6) Commercial Blasting (SSPC-SP 6-63)
(7) Brush-off Blast (SSPC-SP 7-63)
(8) Pickling (SSPC-SP 8-63)
(9) Weathering & Cleaning (SSPC-SP 9-63T)
(10) Near White Blast (SSPC-SP 10-64)

PS # 2. CONCRETE, POURED, BLOCK, DRYWALL AND STUCCO:

Surfaces in good condition:

Surface should be clean, dry and free of dust and latence. All windows frames, doors jams and joints should be caulked with *LANCO® SiliconFlex White™ CC-767*. Joint holes and hairline cracks should be patched with *LANCO® Siliconizer Crack Filler™ RC-230*. Sand any glossy area and dust clean. Wipe away dirt and chalk or use *LANCO® Stain Killer WP-039*. Use soap and water in overhead areas such as eaves and ceilings to remove invisible residues-a major cause of peeling in these areas. Rinse clean and allow to dry. Prime the complete area as recommended. Any existing mildew in the surface must be completely killed and removed prior to the application of primer or paint. Any mildew not removed may continue to grow through the new finish. Using a long-handled brush, scrub mildewed surfaces with a mixture of one quart of household bleach and three quarts of warm water. Rinse completely and let dry. Prime the entire area as recommended.

Surfaces in poor condition:

All surface contaminants such as oil, grease, mill scale, dirt, mold, mildew mortar, efflorescence and sealer must be removed to assure sound bonding to the previous finish. Old coatings that are partially removed or loose by blistering, rupture or scratching should be removed to provide a sound surface.

Sand any glossy areas and dust clean, wipe away dirt, chalk or use *LANCO® Stain Killer WP-039*. Prime as recommended.

PS # 3. WOOD:

Surfaces in good condition:

Previously painted wood in good condition must be clean, completely dry and free of loose paint, rust, dust, mold or sealer. Proper surface preparation is essential to the life of any coating system. Fill nail holes or cracks with *LANCO® Color Wood Filler* and let dry 24 hours. Glossy surfaces must be lightly sanded in the grain direction and never across it. Remove all sanding dust by vacuuming or dusting the surface with a "tack" cloth. Prime the entire area as recommended.

Surfaces in poor condition:

All painted wood surfaces that exhibit blistering, peeling or scaling must be removed up to 15 inches beyond the damaged area and cleaned by appropriate means. Exposed wood should be spot primed with recommended *LANCO® Primer* before applying an overall coat of primer. Medium to heavy chalk deposits must be removed; for a more effective and efficient performance the use of a high-pressure power wash is strongly recommended. Any mildew should be removed; see *Surface Preparation* under *New Surfaces section NS # 1*.

If more than 25% of the previous coating has failed, it should be completely removed. If the previous coating can be easily scraped off the surface, it should be also removed by appropriate means. Chronic peeling and scaling may be overcome by venting clapboard siding with wedges, screened disk, or installation of an exhaust fan in the laundry room and bathrooms. Peeling around windows and door frames can frequently be eliminated by caulking. Damp basements can also contribute to the absorption of water in wood substrate, which is frequently the result of poor drainage around the foundation.

Unweathered areas such as eaves, ceiling, and overhangs should be washed with a detergent solution and rinsed with a stream of water from a garden hose to remove salt that can interfere with adhesion. Prime the entire area as recommended.

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