IMPORTANCE OF SURFACE PREPARATION

Long-term coating performance depends directly on proper surface preparation. When surfaces are inadequately prepared, adhesion is compromised and overall service life is reduced Industry studies commonly report that a large percentage of coating failures—sometimes estimated at up to 80%—are linked to inadequate surface preparation that compromises adhesion. Selecting and properly implementing the correct preparation method ensures coating adhesion and maximizes the durability of the coating system.

The appropriate preparation method is influenced by substrate type (Figure 1), environmental exposure, coating system selection, and expected service life. Budget considerations, degree of contamination, and jobsite conditions must also be evaluated. This guide serves as a reference for preparation methods and assists in determining the proper approach for specific project conditions.

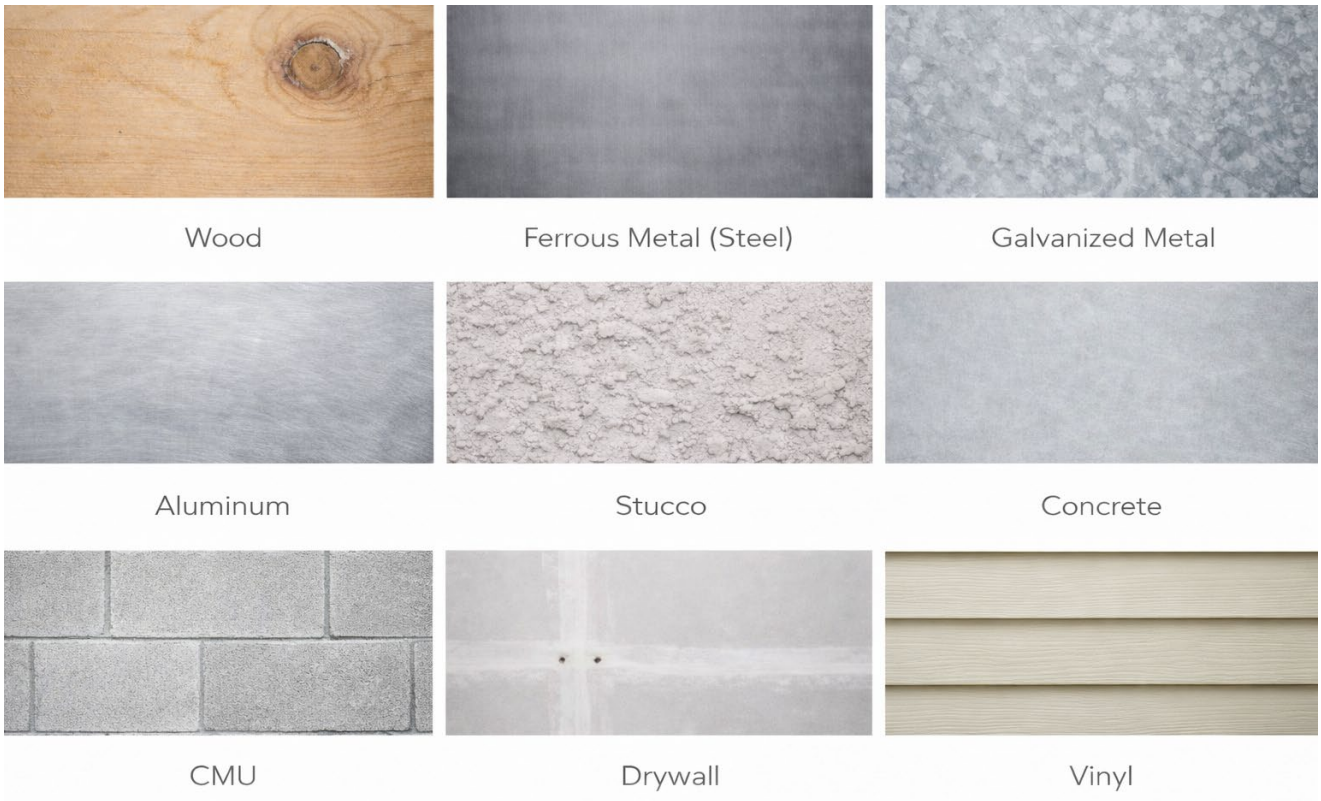

Figure 1

Labor associated with preparation and application typically represents the largest portion of total project cost, often exceeding material costs. Labor costs have increased at a faster rate than material costs in recent years. These economic factors further emphasize the importance of proper specification, inspection, and quality control to achieve long-term performance.

NEW SUBSTRATES

All surfaces must be properly cured, clean, dry, and free of any contaminants that can interfere with coating adhesion. Repair cracks, voids, and imperfections with suitable patching compounds and allow repairs to cure prior to coating application.

- **Drywall:** Joint compounds must be fully cured and properly sanded. Fill cracks and holes with patching compound and sand smooth. Remove all sanding dust prior to priming with *High Build PVA Sealer No. 1100*.

- **Plaster:** Allow to cure for 30 days and confirm it has hardened before coating application. If painting cannot be delayed, allow a minimum of 7 days drying time and prime with *Uniprime II No. 4600*.

  Soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of clean water to help neutralize surface alkalinity. Repeat as necessary until the surface hardens. Rinse thoroughly with clean water and allow to dry completely before priming.

- **Brick, Concrete, Masonry, and Stucco:** Allow to cure for 30 days. The pH must be 10 or lower prior to coating. Remove bond breakers and all form release and curing agents. Smooth masonry may require an adequate profile for adhesion. Remove all loose aggregate and debris. If coating must proceed prior to full cure or if pH exceeds 10, allow a minimum of 7 days curing and apply an alkali-resistant primer such as *Uniprime II No. 4600*.

- **Concrete Masonry Units (CMU - Concrete Block, Cinder Block, Split-Faced Block):** Block mortar joint should cure for at least 30 days. Remove efflorescence. Prime the surface with *100% Acrylic Block Filler No. 018*.

- **Fiber-Cement:** For factory-primed fiber-cement, clean the surface thoroughly, then caulk the butt joints before applying the topcoat. For unprimed fiber-cement, start with a primer such as *Uniprime II No. 4600*, followed by caulking the butt joints and applying the topcoat.

- **Tannin-Rich Wood (Cedar, Redwood, etc.):** Remove mill glaze with sandpaper to open the pores of the wood. Remove sanding dust then prime the surface with *Carefree Prime-ZALL No. 8000*. If tannin bleed is severe, a second primer coat may be necessary. Allow the first coat to dry for 24 hours before applying the second coat. For exterior applications, prime all exposed wood surfaces—especially edges and end grain—to reduce moisture intrusion. Where accessible prior to installation, prime undersides and backsides to help limit moisture absorption and improve dimensional stability.

- **Wood and Engineered Wood Products**

  Lightly sand to remove mill glaze and surface imperfections. Remove sanding dust then prime the surface with *Uniprime No. 4000*. For exterior applications, prime all exposed wood surfaces—especially edges and end grain—to reduce moisture intrusion. Where accessible prior to installation, prime undersides and backsides to improve dimensional stability.

- **Steel:** Minimum surface preparation is Hand Tool Cleaning per SSPC-SP2. Remove all oil and grease from the surface per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6. Prime prepared steel the same day using *Protec Metal Prime No. 9600* to minimize flash rusting.

- **Shop-Primed Steel:** Shop-primed steel coatings vary widely in quality, resin type, and film build, so any factory-applied primer should be assessed carefully to confirm its condition and whether it's suitable for additional coatings. These primers are typically meant only for short-term protection during storage and transport, not as a full corrosion-resistant system. Because handling and shipping often introduce surface contamination, thorough cleaning is essential before recoating. Any damaged or bare areas should be repaired with a compatible primer following SSPC-PA 1. For exterior conditions, long-term performance may require applying a full coat of a corrosion-inhibitive primer rather than relying solely on the shop coat. Always verify that the field-applied coatings are compatible with the existing shop primer. After proper surface preparation, spot-prime any rusted areas with *Protec Metal Prime No. 9600*.

- **Galvanized Steel:** Remove oil, grease, and contaminants per SSPC-SP1. Hot-dipped galvanized and galvannealed steel is often treated with passivation agents (chromates or silicates) to prevent premature oxidation. These treatments can interfere with coating adhesion. Where passivation is present or suspected, adhesion testing is recommended. If adhesion is inadequate, light abrasive or brush blasting per SSPC-SP16 may be required to promote mechanical bonding. Rusty galvanizing requires a minimum Hand Tool Cleaning per SSPC-SP2. Prime prepared areas the same day using *Metal Pro Primer No. 4800*.

- **Aluminum and Other Non-Ferrous Metals:** Remove oil, grease, and contaminants per SSPC-SP1. Lightly abrade to remove oxidation and create a uniform anchor profile without damaging the substrate. Remove residue and prime the same day using *Metal Pro Primer No. 4800*.

- **Vinyl and Other Architectural Plastics:** Clean thoroughly using warm, soapy water. Rinse and allow to dry completely. Prime with *Polytec Primer No. 8600*.

IMPORTANT: For exterior applications, primers should be topcoated within 14 days. If this window is exceeded, clean surfaces thoroughly before applying the finish coat.Gaps between windows, doors, trim, and other through-wall openings should be filled with the appropriate caulk or sealant after priming the surface.

Previously Painted Surfaces

WARNING! If you scrape, sand or remove old paint, you may release lead dust. LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a NIOSH-approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

Verify the presence of lead-based paint, particularly in buildings constructed before 1978, and confirm that any required hazardous materials assessments have been completed. If lead is identified, presumed, or suspected, any renovation, repair, or painting activities that disturb lead-based paint must comply with the EPA Lead Renovation, Repair and Painting (RRP) Rule, applicable state laws, and required work practices to prevent lead contamination.

Under the RRP Rule, covered work in homes, child care facilities, and kindergartens built before 1978 must be performed by EPA- or state-certified firms using certified renovators and other trained workers as required. These requirements may also apply to in-house maintenance staff and many types of outside contractors. Certified renovators must complete training through an EPA-accredited training provider, and firms must obtain certification by submitting the required application and fee to EPA before performing covered work. Violations of the RRP Rule can result in substantial fines—often severe enough to threaten the financial stability of a company or even force it out of business.

Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Glossy surfaces should be sanded dull. Stains from water, smoke, ink, pencil, grease, etc. should be sealed with the appropriate primer/sealer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

Remove loose, peeling, or chalky paint by sanding, scraping, or other appropriate methods. Abrade smooth or glossy coatings to promote adhesion. Apply a test area and allow the coating to cure before performing adhesion testing. If adhesion is inadequate, additional surface preparation or coating removal may be required. If coatings are severely deteriorated, remove to a sound substrate and treat as a new surface. Whether overcoating is feasible depends on the condition and compatibility of the existing coating system.

- **Glossy Surfaces:** Sand, degloss, or abrade glossy surfaces to promote adhesion. Remove all dust and residue before applying primer or finish coats.

- **Stain-Blocking:** Prime with Carefree Prime-ZALL No. 8000 to block stains. After priming, allow to dry at least 4 hours, then test a small area by applying finish coat. If staining persists, apply a second coat of primer, allow to dry overnight, and retest before full topcoating.

- **Mold & Mildew:** Remove mold and mildew by washing with a solution of 1 part household liquid bleach) to 3 parts clean water, or use a commercially available mildew remover per label directions. Test cleaning solutions in an inconspicuous area before use, as some cleaners may discolor existing coatings. Apply the solution, scrub, allow approximately 10 minutes dwell time, rinse thoroughly with clean water, and allow the surface to dry completely before coating.

  CAUTION: Do not mix bleach with ammonia or detergents. Wear protective eyewear, gloves, and protective clothing.

- **Fire Restoration:** Thoroughly clean smoke-damaged surfaces. Apply one or two coats of Carefree Prime-ZALL No. 8000 and test a small area for bleeding before painting the entire surface. Always check for compatibility and adhesion to the surface by applying a test patch of 2-3 square feet. Allow to dry thoroughly for one week before checking adhesion.

Key Takeaways

Surface preparation is not a one-size-fits-all process. While cleaning and allowing the substrate to dry are universal requirements, each substrate requires a focused approach based on its specific characteristics and condition. Even the best coatings, applied correctly, will not perform satisfactorily if surface preparation is overlooked or not performed properly. Due to variations in substrates, preparation methods, application techniques, and environmental conditions, test the complete coating system for adhesion and compatibility prior to full-scale application.

IMPORTANT: The primer recommendations provided here represent our preferred selections for optimal performance. Alternative primers may also be suitable, depending on the project's performance requirements and budget.