

Paint Matters - Painting Stainless Steel

What is stainless?

Stainless steel is a hard, high-carbon alloy of iron that is resistant to corrosion. It is not usually painted; however, in some exposures, painting can prolong the life of this material, the same as with carbon steel.

When ordinary carbon steel is exposed to water, it forms iron oxide or 'rust' on the surface. Rust is not protective and eventually, the entire piece of steel will corrode and be converted to rust.

Stainless steel possesses in excess of 10.5 - 11% chromium content; when enough chromium (more than about 10%) is added to ordinary steel, the oxide on the surface is transformed into a very thin chromium-rich oxide film, virtually invisible and corrosion resistant.



Stainless Steel Handrail

Why paint it?

Stainless steel is most frequently used without a coating and generally does not require painting in dry environments except for esthetic purposes (e.g. if the architect wants to change the color); however, there are various grades of stainless steel, and the cheaper grades will corrode when exposed to marine environments, chemicals, or high humidity in light-to-harsh environments.

When painting stainless steel, it is important to note that the substrate will last much longer than the paint, so provision will eventually have to be made for repainting in the field, just as with other coated metal substrates.

What to look for

As stainless is a smooth substrate, it is difficult to obtain consistent adhesion results. Most paint failures on stainless steel are caused by inadequate surface preparation or improper coating selection for the exposure environment.

Note: Stainless is sometimes polished to achieve a mirror-like finish; polished stainless steel cannot be coated.

System options

Moderate to light Industrial

Latex systems provide almost equivalent performance to previously used alkyds, but with the advantage of much lower VOC. Latex may also be used for interiors, high performance architectural, plus it is suitable for use in commercial and institutional applications such as schools, public buildings, hospitals, etc.

If waterborne products with higher performance are needed, MPI's WB Light Industrial Coating system, using [MPI #163](#) (semi-gloss), is a good choice for incidental chemical spillage applications where conventional latex would fail, but the very high resistance of an epoxy isn't required.

Aggressive/Marine

An epoxy intermediate/topcoat system using [MPI #77](#) or [MPI #177](#) is recommended for interior industrial, commercial, and public locations where excellent abrasion, chemical, and solvent resistance is required. However, epoxies tend to lose gloss, chalk, and yellow in direct sunlight; for these applications, top-coating the epoxy with an aliphatic polyurethane provides the optimal performance.

Water Resistance

If the primary concern is water resistance – to humidity, condensation, or direct water contact -- an aluminum paint system using [MPI #1](#) is an alternative; the thin, flat flake-like aluminum particles overlap horizontally, which reduces the permeability of the paint film. This finish does NOT have the abrasion or chemical resistance of alkyds, epoxies, or polyurethanes, and should be avoided if these conditions exist.

Primers

[MPI #95](#) Quick Dry Primer is recommended; other alternatives include a solvent-based bonding primer such as [MPI #69](#) that's designed for use on problematic surfaces to promote adhesion of subsequent coatings, or an epoxy primer [MPI#101](#) if an epoxy system is specified.

Professional Tip

During the application of any coating or coating system, there are some tests that should be performed to assure a durable finish. Of these, environmental monitoring is the most common.