

STAINLESS STEEL HARDWARE CARE AND CLEANING

What Makes Stainless Steel “Stainless”?

Stainless steel differs from carbon steel by the amount of chromium present. Unprotected carbon steel rusts readily when exposed to air and moisture. This iron oxide film (the rust) is active and accelerates corrosion by forming more iron oxide. The corrosion will continue until all the carbon steel is converted into iron oxide.

Stainless steel is a group of alloys that contain a minimum of 10.5% chromium. Because stainless steel contains at least 10.5% chromium, the oxidation of the iron is changed to produce a complex oxide that resists further oxidation and forms a passive layer on the surface. The passive layer is only a few microns in thickness and will reform if it is removed by scratching or machining. If stainless steel is properly selected and maintained, it should not suffer any corrosion. For highly corrosive areas, 316 grade or clear coat over 304L may be recommended.

What Makes Stainless Steel Corrode?

Stainless steel is corrosion resistant not corrosion proof and will corrode under certain conditions. Corrosion in stainless steel is not the same type of corrosion as found in carbon steel. The most likely form of stainless steel corrosion is “pitting”. Pitting occurs when the environment overpowers the ability of stainless steel to reform the passive layer. Normally dark brown pits occur on the surface of the stainless steel.

The three key types of corrosion that normally effect door hardware products are:

1. **Atmospheric Corrosion**

Atmospheric corrosion occurs when stainless steel is exposed to airborne liquids, solids or gases. Some sources of atmospheric corrosion are sea spray, rain in coastal zones, salt (possibly from de-icing), and dirt. This form of corrosion is typically worse outdoors, especially near marine environments.

2. **Chemical Corrosion**

Chemical corrosion takes place when stainless steel comes in direct contact with a material that has a high chloride concentration or a strong corrosive solution. Some factors which affect the severity of chemical corrosion include: chemical/chloride concentration level, duration of contact, frequency of washing, and the operating environment.

3. **Contact Corrosion**

A small piece of carbon steel, scale, copper, or foreign material lodged in stainless steel may be sufficient to destroy passivity at the point of contact and cause pitting. Carbon steel brushes and steel wool should never be used to clean stainless steel.

Maintenance of Stainless Steel Finishes

Cleanliness is essential for maximum resistance to corrosion. Surface contamination by dirt or other materials hinders the ability of stainless steel to reform the passive layer and traps corrosive agents, reducing corrosion protection.

In many cases, standard household cleaners can be used to clean and maintain stainless steel hardware items. Soap, ammonia, and detergent and water are used to clean normal dirt. Cleaning should always be followed by rinsing with clean water. When water contains mineral solids, which leave water spots, it is advisable to wipe the surface completely with dry towels.

In selecting cleaning practices, consider the possibility of scratching and the potential for post cleaning corrosion caused by incompletely removed cleaners. Select only cleaners that are not abrasive, not acidic, and low in chloride. Many antibacterial cleaners used to clean and sanitize door hardware contain high levels of chlorides, which will cause corrosion if not properly removed from the surface by rinsing.

Routine cleaning is essential, especially in environments that have elevated levels of atmospheric