

Stainless Steel Cleaning Procedures

Stainless Corrosion

Stainless or Stain Resistant

Stainless steels contain at least 12% chromium and form a thin, invisible protective, corrosion-resistant, passive film on their surface. This film forms spontaneously when the chromium reacts with oxygen in air and water. If the film is damaged or removed during fabrication or polishing, it self-repairs immediately so long as the surface is clean. If stainless steel corrodes, typically highly localized metal loss or pitting occurs – rarely general or uniform corrosion of the entire surface.

While problems with stainless products are infrequent, the name stainless can be somewhat misleading. It is not actually, stainless, but stain resistant – it is a corrosion resistant alloy, not rustproof. Stainless steel may show some forms of corrosion and/or deterioration, dependent upon the degree of contaminants in its particular environment. Under certain conditions, it can rust unless a program of preventive maintenance is followed.

The environment in and around swimming pools and salt water contain salts which actively attack stainless steel. Heat and humidity increase the corrosive activity of chlorine and bromine salts. In addition, the corrosive action caused by salts that occurs from ice melting agents such as calcium chloride and sodium chloride can create the formation of rust. Other chemical reactions that can cause deterioration include carbon pick up from bending or fabricating tools, finishing equipment or steel covered work benches. It is also typical for contractors or masons to use muriatic acid solution on masonry – even the fumes from this liquid can attack stainless steel.

The material's mechanical finish – satin or mirror – also plays a role in corrosion resistance. Corrosion-causing agents will collect in the fine lines of a satin finish as opposed to the smooth surface of a mirror finish.

Stainless steel is manufactured in various formats and can sometimes be selected to perform better in certain environments or applications. They are identified by T-304, T-316, etc. as well as L Grades (low carbon).

If you have trouble with your stainless products, it is likely that there is a contaminant in the environment. The first step is to identify the contaminant and to eliminate it. After that, assure that a preventive maintenance program is in place and being followed.

Stainless Steel Preventive Maintenance Suggestions

- Inspect the installation on a frequent schedule taking note of discoloration and stains. Discoloration can and should be removed by cleaners recommended for stainless steel.
- Ongoing maintenance consisting of a fresh water wash and wiping with a clean cloth is recommended to minimize deterioration. In all but the most severe cases this regular washing will eliminate the need for polishing.
- Note: Never use steel wool or harsh abrasive elements.

Light staining can often be removed by the standard cleaning products used to remove dust and fingerprints from surfaces. Try one of these first before using more aggressive cleaning products.

How can paint and marker pen stains be removed?

Use a proprietary alkaline or solvent paint stripper after first testing it on a stainless steel sample or a low visibility area to make sure that it does not cause surface discoloration. Use a soft, bristle brush that will not scratch the surface to loosen the paint or marker pen residue.

Permanent marker pen stains may require repeated applications of paint stripper. They can be very difficult to remove from rough surfaces. A 200 mesh or finer calcium carbonate cleaning product may help to remove the final remnants of the stain.

What is the best way to remove adhesives?

If possible, contact the adhesive manufacturer and obtain their advice. The cleaning products that are necessary to remove specific adhesives can vary considerably. Solvents are generally used in combination with a soft bristle plastic brush and a soft clean cloth for applying the solution. After using the solvent, it is usually best to wash the stainless steel with a mild detergent solution to remove any residual solvent (see the questions on standard cleaning).

- Remove the tape, adherent stickers, strippable film and other deposits by hand. Avoid the use of abrasives or brushes that could scratch the surface. Plastic scrapers may be used to gently remove deposits without scratching the surface.
- Initially try rubbing alcohol, a citric acid cleaner or a product that combines these ingredients. Other less hazardous solvents and adhesive removers may be tried.
- Methyl ethyl ketone (MEK) or products containing this chemical are usually the most effective means of removing adherent adhesives, particularly those that have been on a surface for some time. They are hazardous and should be avoided if possible. Use the chemical sparingly with appropriate precautions as described in the manufacturer's literature.

How should I remove adherent or hardened grime deposits (not containing adhesives)?

Adherent deposits can range from hydrocarbon or oil and dirt mixtures to bird droppings. Degreasers can effectively loosen deposits containing hardened hydrocarbons or oil. Test in a low visibility spot before use. Follow manufacturer's application and rinsing instructions.

- Use an acid free liquid degreaser that is designed for use on stainless steel.
- Use a pH neutral, acid free cleaning product that contains a 200 mesh or finer calcium carbonate abrasive and detergent. There are various proprietary products sold around the world with this basic composition. These products are typically mixed with enough water to create a paste and then applied to the surface. Some of these products are more effective if they are allowed to sit on the surface for 10 -15 minutes before rubbing. Rub gently until deposit is removed. Rinse thoroughly to remove the entire cleaning product residue.

How can light surface contaminants, such as dirt and light fingerprints, be removed from an exterior application?

It is not uncommon to clean stainless steel when the windows are cleaned to keep it sparkling clean. Vinegar or ammonia-containing window cleaning products will remove light dirt and fingerprints from stainless steel

There are also proprietary spray-on industrial oil and wax free stainless steel fingerprint removers designed for use on stainless steel that do not leave a coating on the surface. These products will also remove light dirt deposits. Check the ingredients carefully and follow manufacturer's instructions.

Are all "stainless steel cleaners" safe for stainless steel?

No, some products whose labels identify them as a "stainless steel cleaner" contain chlorides or acids that can cause stainless steel corrosion. It is especially important to avoid any cleaner that contains hydrochloric acid (also called Muriatic acid). Other "stainless steel cleaners" contain coarse abrasives that will scratch the finish.

Do not assume that a product is appropriate because of its "stainless steel cleaner" label. Check the ingredients and, if necessary, test the cleaner on a low visibility spot before use.

The best means of restoring the corrosion resistance of a weld is to pickle and grind the weld area. Stainless steel abrasive pads and brushes may remove the heat tint, but they may not remove the chromium-depleted layer and this will make the welded joint more susceptible to corrosion. If an abrasive pad or brush is used to remove heat tint, it should always be stainless steel and it is important to make sure that that brush or pad is only used on stainless steel.