

Did You Know?

Contrary to its name & popular belief, stainless steel is not 100 percent stain or corrosion proof and will rust in certain applications and locations without proper & regular maintenance.

This guide is intended to provide you with tips that will help your stainless steel products looking like new long after they are installed.



How does brushing affect stainless steel?

Brushed stainless steel features a pattern of fine lines that run parallel to the direction it is brushed. The finish retains much of its metallic luster, but it also involves abrasive materials that cut the surface of the steel to some degree. Therefore, the brushed finishes may have a detrimental effect on corrosion resistance because it limits the ability of fluids to bead on the surface. As a result, the grooves can accumulate chloride ions and enable rusting to occur.

What causes stainless steel to corrode?

Common causes of stainless steel corrosion include:

- Chlorides
- Hydrochloric acid
- Sulphuric acid
- Contact with iron
- Contact with carbon steel
- High temperatures

Each geographic location will have different environmental factors, including changing weather, humidity and wind. Corrosion is accelerated in coastal areas with saltwater-spray exposure (see page 6 for more details), and in areas where de-icing salts are used during the winter.

Stainless steel corrosion can also be triggered by contact with iron or carbon steel particles. If left unattended, rust spots can compromise the surface and may evolve into “pitting,” or localized corrosion. Contamination also is common when stainless steel is subject to sparks from nearby welding, cutting, drilling or grinding of carbon steel.



How can I care for stainless steel?

Keeping stainless steel products clean and free of salt or other corrosive elements is the best way to avoid having to deal with rust. This can be achieved with an occasional rinse with fresh water. In more severe environments, you may need to apply a protectant or wax that does not contain chlorides.

Dos & Don'ts

Best practices include:

- Wear clean gloves.
- Use stainless steel tools and components.
- Avoid contact with carbon steel or iron.
- Do not weld, cut, drill, or grind carbon steel near stainless steel.
- Avoid contact with concrete detergents.
 - If chloride solutions or concrete detergents contact stainless steel, rinse immediately.
- When power washing nearby surfaces, wrap stainless steel with plastic.
- Avoid direct or constant exposure to sprinklers.

Never use the following products to clean stainless steel:

- Oven cleaners
- Glass cleaners
- Tap Water, especially hard water. (Use distilled or filtered if necessary)
- Chlorine bleach
- Abrasive or powder based cleaners
- Any cleaner containing chloride
- Steel wool or other abrasive scrubbing pads



How to Clean Stainless Steel

Stainless steel needs to be cleaned regularly to prevent corrosion and maintain a pristine appearance. With proper care, stainless steel should not corrode.

For best results:

- Clean stainless steel when it is cool to the touch.
- Use a mild detergent.
- Use clean water. Gritty, dirty or excessively hard water can leave spots or brownish stains.
- Wipe down with a clean sponge or cloth.
- Use clean rinsing water to avoid water marks & mineral deposits.
- Dry with disposable cloth or an air blower.

For tough stains, discoloration, oxidation and water stains, use mild, non-abrasive cleansers.

- Apply with a soft cloth or sponge, rinse with clean water and dry.
- Avoid scouring pastes.
- You can also use cream detergents containing calcium carbonate or citric acid.

To remove contaminants from stainless steel surfaces,

- Use a soft cloth to apply a solution of oxalic acid. Leave the solution on the surface for a few minutes to dissolve contaminating particles. Once clean, thoroughly rinse away all residual solution with clean water.
- If mortar or cement comes into contact with stainless steel, rinse immediately. Use a 10-15 percent phosphoric acid-based solution in warm water. Spread cleaner evenly over the surface, wait 30-60 minutes, then neutralize the acid with an alkaline cleaner or diluted ammonia and rinse with clean water. On lime scale stains, you can also dilute one part of vinegar in three parts of water and apply with a nylon brush.

For neglected and corroded surfaces:

• Minor:

- Use an all-purpose lubricant, such as WD-40, to wipe the affected area.
- Stainless steel cleaners containing calcium carbonate or citric acid can also be used.
- Rinse thoroughly with clean water.

• Moderate:

- Use a phosphoric acid-based stainless steel cleaner, like E-NOX Clean.
- Spray on affected areas and spread cleaner evenly over the surface.
- Leave for 30-60 minutes. Neutralize the acid with a spray-on alkaline cleaner, like Uno SF.
- Wipe the surface clean with a paper towel and thoroughly rinse away all residues with clean water.

• Severe:

- Due to the highly corrosive nature of serious rust treatments, and the inherent risks to personnel and surrounding environments, a professional service provider is recommended.
- Severe rust is treated with a pickling bath, typically containing highly corrosive hydrofluoric acid.

Note: *Stainless steel care and maintenance can require the use of harmful chemicals. Follow all use and safety instructions provided with cleaning or polishing agents. Ensure personal protective equipment is worn in accordance with occupational health and safety guidelines.*

Rust Removal Instructions

Routine cleaning should be performed to preserve the appearance and integrity of stainless steel products. By following these simple steps, you should be able to restore the shine to your units.

1. Clean with soapy water to remove any surface grit or material stuck on unit.
2. Wipe unit dry with a clean rag.
3. Spray an appropriate rust-removing solution over all rust spots.
4. Let the mixture set for about 15-20 minutes. Take a lightly aggressive cleaning pad and scrub lightly, following the grain of the brushed stainless steel.

Important: Always scrub in same direction as the brushing applied to your unit.

Note: Be sure to wipe cleaning solutions off any silk-screened item right away. Do not scrub the silk screen.

5. If stains are deep, this process may need to be performed more than once.
6. Rinse with clean water and dry with a clean towel.
7. Spray unit with stainless steel cleaner and wipe it down.

Note: Stainless steel cleaner should keep rust from building up if the unit is wiped down quarterly. If stains come back sooner, you may need to spray it more often. Environmental contaminants may determine how frequently units need to be maintained.

Saltwater and “Salt Air” Corrosion

One of the biggest enemies of almost any steel alloy, including stainless steel options is salt, most notably saltwater and what is commonly known as “salt air” in coastal communities. Direct exposure to saltwater or close proximity to bodies of saltwater can wreak havoc on stainless steel surfaces.

Why is salt so corrosive to stainless steel?

To fully comprehend why something called stainless steel can corrode due to salt exposure, you need to first understand some of the basic science behind salt, steel, & stainless steel.

Steel, in its most basic form, is an alloy which is made up of carbon & iron. Stainless steels are alloys that are also comprised of carbon & iron, along with chromium. In order for a steel alloy to be considered “stainless”, it must be made up of at least 10.5% chromium & less than 1.2% carbon. The presence of chromium in stainless steel creates a surface layer of chromium-oxide, which gives stainless steel its resistance properties compared to that of your typical steel. Steel rusts because when it is exposed to moisture, the iron atoms in it react with oxygen molecules, creating iron oxide, aka rust. When chromium is present in a steel alloy, it combines with the oxygen molecules before the iron atoms can, which prevents the iron-oxide from forming.

There are over 100 different grades of stainless steel available in the global marketplace, all of which have different alloy compositions resulting in a laundry list of different resistances and reactions to chemicals & elements. One of the key points to take away is that iron and carbon are present within stainless steel, no matter how it is manufactured.

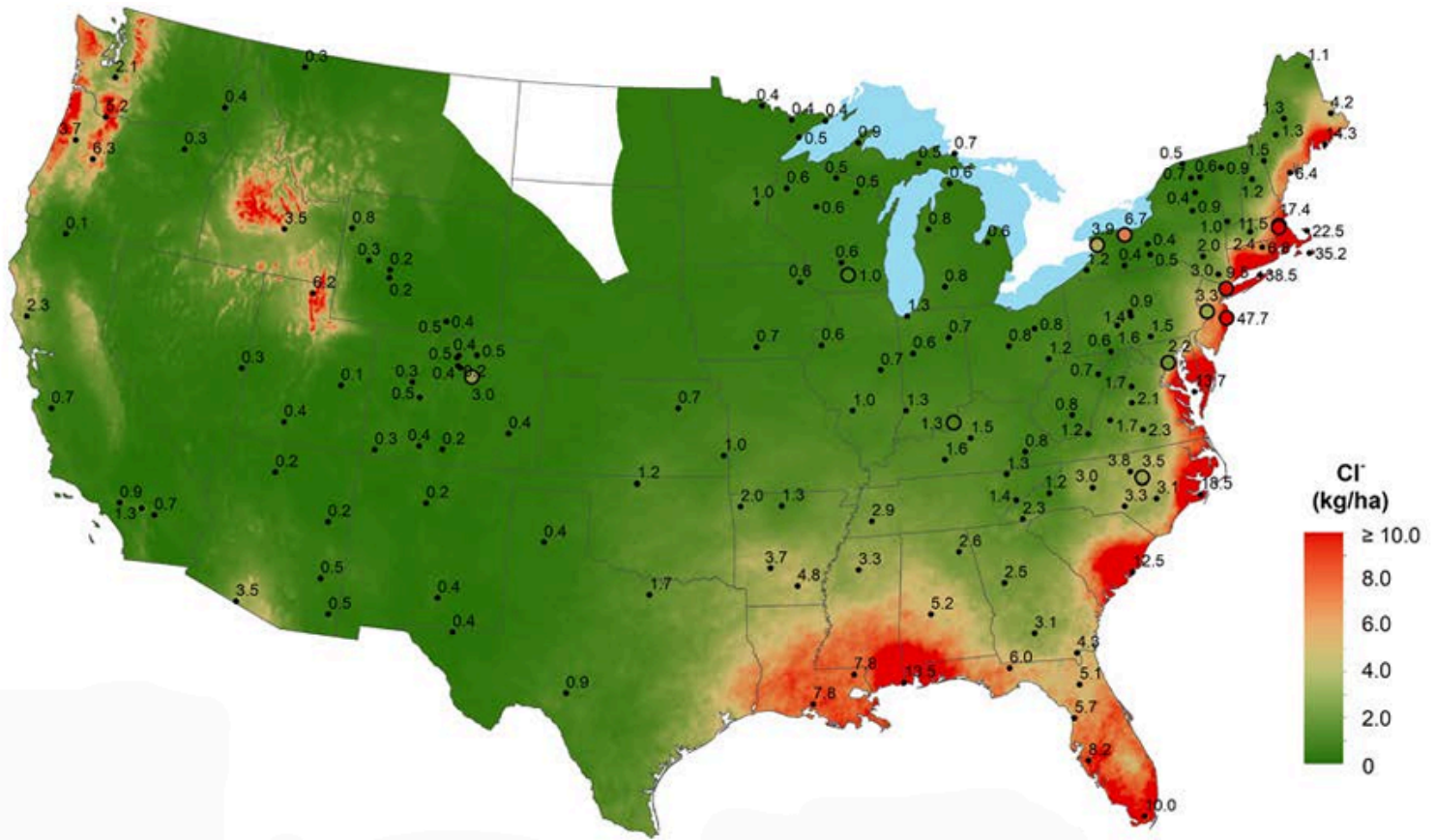
That brings us to salt. Salt itself is a corrosive compound because it is hygroscopic, meaning that it attracts water from the atmosphere & environment around it. Salt can be introduced to steel surfaces by direct exposure (e.g. ocean waves splashing on a Help Point® that is installed on a pier) or through the air via sea mist or salt air.

When saltwater is deposited on a stainless steel surface, three important things occur. First, chlorine ions are introduced to the mix, as it is a component of saltwater, which reacts with the chromium present in the stainless steel and begins breaking it down. The second step that takes place is the oxygen within the saltwater begins to react with the iron in the stainless steel. Lastly, the water on the surface will ultimately evaporate, leaving behind the salt. That remaining salt will then attract water in the air beginning this cycle all over again. This may seem like a lengthy process, however depending on the level of repeated exposure, corrosion and rust can begin appearing within weeks of install.

How far away from bodies of saltwater can “salt-air” still pose a problem?

The answer to this is ultimately determined by specific environmental factors such as local air pollution levels, wind speed & direction, coastal topography, and wave heights. While it is true that salt air corrosion decreases the further away from the coast, some studies warn that salt air can still have an impact on metal structures as far inland as 50 miles. Another common result many studies have shown is that accelerated corrosion from salt air can be significant in locations as far inland as 5-10 miles from the coast. The map below provides a visual representation of areas this impacts throughout the United States, with areas being the most problematic represented in red.

Chloride Ion Wet Deposition, 2022



Source: National Atmospheric Deposition Program <https://nadp.slh.wisc.edu/>

In locations with high exposure to saltwater or salt-air, it is always the recommendation of Code Blue to to configure your Help Point® enclosures and speakerphones with out standard wet coat paint along with our chemical resistant clear coat option to reduce the risk of corrosion.

To learn more about any of Code Blue’s products, call 800-205-7186 or visit codeblue.com.