

## Cleaning and care for stainless steel

These notes are intended as a guide only, and do not constitute any guarantee or basis for compensation for damages.

### General

Steel alloys referred to as “stainless steel” are highly resistant against corrosion due to their chemical composition forming a protective layer known as a “passive film” on the surface. However, stainless-steel surfaces do require a certain amount of care in order to remove deposits that may affect the corrosion resistance under certain circumstances, and also to maintain the metal’s healthy visual appearance.

### Basic cleaning

The initial basic cleaning usually takes place before the building is transferred to the owner. Basic cleaning on stainless-steel components is no different from later cleaning during maintenance as long as the construction parts involved have been suitably protected from soiling. Diluted phosphoric acid is suitable for removing lime and cement splashes, after which the component should be thoroughly rinsed in clear water. Demineralised water may further counteract the formation of lime stains. A variety of manufacturers supply speciality care products for this purpose.

Never use cement remover for ceramic tiles or diluted hydrochloric acid. Immediately remove any such chemicals that inadvertently reach the stainless-steel surface using copious amounts of clear water. Construction workers in other disciplines, such as tilers, are not always aware of the damage to stainless steel that cement removers containing hydrochloric acid can cause, and should be specifically briefed accordingly. The ideal solution is to arrange the fitting out process such that stainless-steel components are not installed until after the ceramic work has been completed.

Iron particles from tools, scaffolding and transport hardware must be removed immediately. Grinding dust, swarf and welding spatter deposited on stainless steel after working on structural steel may accelerate rusting on nearby stainless steel installations.

These particles may penetrate the passive film on the stainless steel, causing pitting corrosion. If detected in time, these contaminants can be removed using common household (ferrite-free) cleaning sponges or specialised cleaners. Mechanical surface treatment or (preferably) pickling will be inevitable if corrosion has already taken place; pickling pastes are also available for local application. Pickling completely restores the original corrosion resistance of stainless steel, but may cause visual changes to the surface requiring restoration by grinding and polishing. We therefore recommend avoiding contamination from stray iron from the outset such as by applying protective film, or by installing stainless-steel components after structural steel work has been completed.

### Maintenance cleaning

The cleaning effect of rainfall is generally sufficient for preventing harmful deposits from accumulating on outdoor installations. It is advisable to clean areas not reached by the rain to prevent deposits from air pollution. Note that cleaning is especially important in coastal or industrial environments with potentially heavier concentrations of airborne chlorides or sulphur dioxide.

Cleaning especially involves removing fingerprints on indoor installations. Fingerprints are a problem at the beginning of the part’s service life on components with popular brushed and polished finishes, and noticeably disappear after a few cleaning sessions.

### Cleaning agents

A detergent solution is usually enough to remove fingerprints. Some manufacturers of cleaning agents supply specialised products with care ingredients to augment the cleaning effect. These products remove fingerprints thoroughly, and also leave a thin film to give the surfaces treated a uniform appearance. Buff up the surfaces using a dry cloth after applying the cleaning product. Standard household cleansers are suitable for more stubborn soiling, and also remove traces of lime scale and slight stains. Rinse the surface in clear water after cleaning.

Final rinsing with demineralized water as available in supermarkets and used in steam irons reduces lime scale formation on drying. After that, wipe the surface dry. Scouring powders are unsuitable as they will scratch the surface. Cleaning agents or solvents such as spirits, isopropyl alcohol or acetone are ideal for removing very oily or greasy deposits and safe to use on stainless steel.

However, take care to avoid spreading dissolved contaminants around a large area on the surface while cleaning – clean as many times as needed using a fresh cloth until all traces have been removed. There are specialised alkaline and solvent-based cleaners for removing traces of paint and graffiti. Avoid blades and scrapers as they will scratch the metal surface.

Cleaning agents to be avoided on stainless steel are:

- Any agents containing chlorides, especially hydrochloric acid
- Bleaches – rinse thoroughly using clear water if you inadvertently spill bleach onto stainless steel
- Silver polish

### Cleaning utensils

A damp cloth or chamois should be enough to remove fingerprints. Use a normal household (non-ferrous) sponge on more stubborn stains. Never use ferrous scouring pads, steel wool or steel brushes as they will leave stray iron particles prone to rust on the stainless-steel surface. Soft nylon brushes are suitable for cleaning pattern-rolled surfaces. Steel brushes – especially if made of carbon steel – will damage the stainless-steel surface.

Wipe the surfaces dry to avoid the formation of lime deposits after cleaning with clear water, especially if you have hard water in your area. You can avoid this issue by using demineralised water. Do not use cleaning utensils previously used on “normal” steel as they will transfer stray iron particles. We recommend keeping separate cleaning utensils on hand for stainless-steel surfaces.

### Cleaning intervals

Cleaning intervals for indoor stainless-steel installations do not differ fundamentally from those of other surfaces. The intervals should be set so as to prevent larger amounts of soiling from accumulating to keep effort and costs as low as possible. Outdoor stainless-steel installations may be exposed to a variety of corrosives such as:

- Coastal atmosphere
- Industrial fumes
- Salt-containing splash water
- Air pollution and traffic fumes

These may lead to discoloration in the long term. Phosphoric acid-containing cleaners are reliable at removing discoloration. Experience has shown that the cleaning intervals for stainless-steel surfaces should be the same as for glass surfaces.

**Maintenance cleaning should be carried while the environment is less polluted at intervals of 6 to 12 months, or 3 to 6 months for heavier contamination.**

### Notes specific to areas around swimming pools

Stainless steel installed in or around swimming pools may show brownish discoloration with insufficient care. This may be caused by chlorinated condensation on the surfaces without regular cleaning. The heavy concentrations of chlorine and acidic compounds in the air may cause widespread brown discoloration, pitting and caving, even in high-alloy stainless steel. Pitting corrosion involves breaks in the passive film on the stainless steel at specific points. The steel surface may show caving and pitting caused by halogen ions, especially chlorides. Residues from evaporated chlorinated solutions may also serve as an initial cause for pitting, so make sure residues and deposits are removed regularly. Include stainless-steel components in a careful and thorough maintenance cleaning regime for the swimming pool. Tap water is suitable for rinsing away most deposits, but more stubborn chloride deposits will require manual removal. Remember to clean less accessible parts as well.

Failing to remove chloride deposits carefully will inevitably lead to rust at some point in the future.

Permissible limits for material 1.4301 (V2A):

Chlorine content: 150 mg/l

pH value: 7.0 to 7.8

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