



STAINLESS STEEL INFORMATION

25 August 2014

Stainless Steel & Tea Staining

GRADES OF STAINLESS STEEL:

Two of the most commonly used grades of stainless Steel are Grade 304 and Grade 316.

- GRADE 304 has good corrosion resistance and is most commonly used for in-door applications.
- GRADE 316 has a higher level of corrosion and resistance. The grade 316 is often referred to as "marine grade" and typical applications include boat fittings and architectural components in exposed coastal locations and other salt water environments.

Note: Neither grade offers corrosion resistance if submerged in salt water.

CORROSION RESISTANCE: Both 304 and 316 have a good to excellent resistance to corrosion. It is often held belief that steel is "stain free" and "maintenance free". This however is not necessarily correct and all grades will require periodic cleaning. Stainless steel does suffer from localized corrosion and discolouration called Tea staining. Tea staining is a cosmetic problem and will not create structural problems with the stainless steel.

The visual performance of outdoor stainless steel depends on five interrelated factors:

- Surface finish – smooth and clean and free of crevices. (difficult on wire ropes)
- Grade selection – appropriate for environment. (Grade 304 or Grade 316)
- Good design – rain washing and uniform draining.
- Maintenance program – regular cleaning.
- End user expectations.

A number of these options relate to the design and selection stage of the stainless steel construction, but the maintenance and customer expectations are post design and construction.

Stainless Steel Maintenance:

Routine removal of grime

- Stainless steel holds its appearance best if it is washed regularly. When washing, use soap or detergent or 1% ammonia solution in warm, low chloride water with cloths or soft brushed to avoid scratching the surface. NEVER USE LIQUIDS CONTAINING HYDRCHLORIC ACID.
- Smears will be reduced if the surface is dried afterwards. This treatment applies to bare stainless steel but care should be taken with coloured surfaces.
- Coloured and very smooth finish surfaces subjected to excessive brushing or rubbing may lose gloss or even become scratched. Bleaches are not recommended.
- Simply wiping with a damp cloth is not adequate as it smears corrosive deposits without removing them.

Table 1 from ASSDA 'Tea Staining' Technical Bulletin provides a guide to the recommended frequency for cleaning exterior stainless steel.

Recommended cleaning intervals for stainless steel wire rope and handrails.				
Building Element	Washed by clean rain(no salts)		Not washed by rain or washed by salted rain	
	No deposits	Deposits accumulate	No deposits	Deposits accumulate
Cleaning* in rural, suburban & residential areas	1 / year	1 / year	1-2 / year	2-12 / year
Cleaning* for seaside, industrial & severe areas	2 / year	2-3 / year	3-4 / year	4-12 / year
Cleaning involved washing with potable, low chloride water or washing with a neutral detergent followed by rinsing with potable water				

Grease, oily films and other organic contamination

- Oils and grease may be removed by alkaline formulations or hot water and detergents or, if necessary, by hydrocarbon solvents such as alcohol, acetone or thinners or eucalyptus oil.

In all cases the surface should be rinsed with clean water and preferably dried.

For all directionally grit polished finishes, wiping along the polish direction with very hot clean water and a soft, absorbent cloth is a good final step to reduce smears.

Heat from a hair dryer or glue gun may soften adhesive remnants from labels or protective films for removal. **DO NOT OVERHEAT THE STAINLESS STEEL MATERIAL AS IT WILL DISCOLOUR.**

After exposure to UV degradation from sunlight, adhesives may require similar treatment to grease stains or even abrasion, with the probability of a bright or scratched spot.

If consideration of the aforementioned steps indicates an uneconomic result, the stainless steel can be painted.

Paint systems using lacquers and polyurethane top coats are available and have been used successfully, but care and understanding is required. Consult a qualified paint specialist. Painting the stainless steel is a step that should only be used as a last option as it is irreversible.

Disclaimer:

(1) The above information is only given as a guide or general information. If the information given is insufficient, or if you are not satisfied, or certain, we suggest you seek further advice from a professional metallurgist.

(2) For safety, structural and strategic applications, independent engineering or specialist advice should be sought from the relevant authorities/experts. Based on this advice, our sales consultants can assist with the supply of related fittings for these applications as recommended/nominated by your professional, qualified engineer. Under no circumstances is Coastal Staircases or its staff authorised or qualified to make any recommendations whatsoever regarding design or selection fittings for such applications.

(3) Coastal Staircases makes no recommendations or claims for the performance and mechanical properties of Stainless Steel and accepts no responsibility or liability whatsoever for any unsatisfactory outcome or unsuitable application of these products when directed by the client.

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