

Technical and maintenance sheet

Stainless steel

Allegion's stainless steel products are generally fabricated from grade 304 stainless steel which has a minimum of 18% chromium and 8% nickel, combined with a maximum of 0.08% carbon. Grade 304 stainless steel is utilised because of its forming and welding properties, its corrosion resistance and durability and its ease of cleaning and beauty of appearance.

Although stainless steel is very resistant to corrosion, factors exist that cause stainless steel to stain or discolour, impairing the overall look. This brown discolouration, also known as tea staining, does not affect the structural integrity or the longevity of the material and it can be controlled.

Where or how does discolouration/tea staining occur?

The following are common factors that cause corrosion or discoloration:

- **Coastal environment** – One of the main causes of discolouration/tea staining is salt deposited on the surface. Due to the high salt content of coastal environments, discolouration/tea staining is most likely to occur up to five kilometres from a surf beach or a few hundred metres from still marine waters. There is no hard and fast rule: wind and weather conditions play a big part and the severity of the conditions increases sharply as you approach the surf.
- **Muriatic (Hydrochloric) acid** – Commonly used to clean cement or mortar residues. This acid should never be used on or near stainless steel – it will frost the surface and usually causes pitting.
- **Chloride** – Mostly found in cleaners such as bleach and other cleaners that have bleach as an ingredient (cleaning salts).
- **Iron** – Contact with materials containing iron such as steel wool, machining chips and iron residue/dust from installation or cleaning of other steel products.

How do I control discolouration/tea staining?

Any discolouration should be removed immediately or permanent discoloration and pitting of the surface could occur. In most cases, if attended to immediately, the product can be restored to its original condition. The following are recommendations to prevent and/or remove discolouration:

- **Wash regularly** – In coastal or caustic environments stainless steel finishes may tea stain if not washed regularly to remove salt. Cleaning involves washing with filtered, low chloride water or washing with a neutral detergent followed by rinsing with filtered water. If products are not regularly washed, pits may develop and the surface may be permanently damaged.

If the environmental conditions cannot be removed, stainless steel protective treatments should be applied to protect the surface by creating a repellent film to reduce the corrosive build-up of salts.

- **Cleaning** – Most discolouration can be removed with a mild cleaner (e.g. Ajax, White Lily, Bon Ami) or a specialist stainless steel cleaner (e.g. 3M Stainless Steel Cleaner, Goddard's Stainless Steel Cleaner, Revere Ware Stainless Steel Cleaner) and a non-scratch cleaning sponge or cloth.

Apply filtered, clean water with the cleaning sponge and rub gently. If the mark does not shift, apply the specialist stainless steel cleaner and rub gently. An old toothbrush can be used to get into any difficult areas. The surface should then be thoroughly rinsed with filtered, clean water and buffed with a soft cloth.

NEVER rub across the grain as the finish may be spoiled, the stainless may lose its shine and the finish may pull threads from the cloth which may be difficult to remove.

NEVER use steel wool to clean stainless steel. Steel wool is usually made from carbon steel and the fragments left behind, as well as scratching the surface, will rust onto the stainless steel surface causing further damage. If a scourer is to be used, use a plastic scourer such as Scotchbrite or a stainless steel wool scourer.

With proper maintenance, the lustre and appearance of stainless steel can be preserved indefinitely.

Please note:

The information provided in this technical and maintenance sheet has been prepared from extracts from BHP technical reports and Australian Stainless Steel Development Association (ASSDA) bulletins. Adherence to the recommendations outlined may improve the cosmetic appearance of affected surfaces and minimise the risk in new applications.

However, research into the causes of, and treatment for discolouration/tea staining have not to date resulted in definitive processes or recommendations for cure and prevention.

Allegion accepts no responsibility for any opinion or recommendation expressed, for any error or omission occurring herein or for the failure of any recommendation contained in this sheet to achieve a satisfactory result in any particular application.