



Electro polished 316 Marine Grade Castings with Stainless Steel precision bearings



Passivation and electropolishing removes contaminants attributed to the onset of tea staining

## Stainless Steel Product Care

The window and door industry manufactures a significant amount of hardware from various grades of stainless steel. The intent of this document is to clarify and advise on the best practice for this increasingly popular material.

### Material Specification

Stainless steel is a low-carbon steel that contains at least 10 percent chromium. The addition of chromium gives the steel its unique corrosion-resisting properties. Most architectural stainless steel products are fabricated from '304' stainless steel, which contains 18- 20 percent chromium and 8-10 percent nickel. It is extremely durable, resists corrosion, stands up to many chemicals, and is easy to fabricate. '316' marine grade stainless steel is popular due to its improved ability to resist pitting and crevice corrosion.

All Brio stainless steel components are constructed using 300 series stainless steel, with cast items in 316 grade. To further safeguard against corrosion, Brio is one of only a few global companies to passivate all visual stainless steel surfaces and electro-polish all cast stainless steel components. This removes contaminants and greatly reduces the onset of surface rusting and discoloration. In addition to these extra processes, Brio also offers PVD (Physical Vapour Deposition) as a finish which is a coating process that produces a thin, hard surface layer with exceptional wear and corrosion resistance.

### Surface Discoloration "Tea Staining"

Stainless steels are very resistant to corrosion; however this does not mean they are impervious. Stainless steel products can develop corrosion or discoloration due to environmental and installation conditions.

Tea staining (brown discoloration on the surface of stainless steel) is a relatively common occurrence in coastal and marine environments or when in contact with water containing significant chlorides. High temperatures, humidity, wind and salt deposits from sea spray are all contributing factors to this staining that generally becomes progressively worse closer to the coast. Aesthetically unpleasant, tea staining does not affect the structural integrity, or longevity of the material.

The following is a list of common conditions that cause corrosion or discoloration of stainless steel and should be avoided:

- Chloride containing cleansers – this includes bleach and any bleach containing cleaners
- Muriatic acid (hydrochloric acid) – commonly used to clean up after tile / concrete installation
- Concentrated soap residue – chemical additives will cause discoloration
- Water with high iron content – can leave a rusty residue, especially if allowed to drip continuously
- Contact with iron materials – including steel wool, machining chips/swarf, and iron residue/dust from installation or cleaning of other steel products
- Trapped moisture between the product and another object
- Salts – contain chlorides



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## **Stainless Steel Care & Maintenance**

Any discolouration or corrosion should be removed as soon as possible or permanent discolouration and pitting of the surface could occur. Usually, the product can be restored to its original condition. Most of the discolouration can be removed with a mild cleaner (Ajax Powder, warm water mixture with baking powder) or stainless steel cleaners (Goddard's Stainless Steel Cleaner, CRC Xtra Shine etc.) and a Scotchbrite pad. The surface should then be thoroughly rinsed with clear water and dried with a soft cloth. With proper maintenance, stainless steel will maintain its lustre and appearance indefinitely.

If the environmental conditions cannot be removed (i.e. salt or chlorine in the air), the item should be cleaned often and rinsed with clear water to prevent permanent damage to the stainless steel.

In coastal or marine environments Brio recommends applying a light application of corrosion preventative such as CRC Marine 66 or Inox for Marine, to all surfaces and using a dry cloth to remove excess. When using lubricant or corrosion protection compounds, be careful to avoid the adjacent surfaces and always follow the manufacturer's instructions.

## **Finish Selection**

ASSDA (Australian Stainless Steel Development Association) recommends specifying polished stainless steel finished products in harsh applications such as pool, wet and coastal environments. This is simply because Satin Stainless finishes have a tendency to collect and trap salt, moisture, and other contaminants in the grains or crevices of the finish. If not removed this will lead to a "tea stain" appearance and may cause pitting if left for long periods of time. Smooth surfaces like mirror finishes, have less risk of contaminants adhering to the surface area however, they must be routinely kept clean.

Brio strongly recommends Polished Stainless steel or PVD Brass hardware is installed on coastal or marine applications within 5 kilometres of the coastline or high chloride environments. If the end user requests or insists on using Satin Stainless steel finishes in coastal environments then they must be made aware of the need for regular routine cleaning following care and maintenance recommendations.

## **Frequency**

As a guide, if a window or door requires washing, then wash the hardware; however we recommend for marine and industrial environments, a minimum period of every 3 months and 6 months for general environments.

## **Warranty**

The visual appearance and preservation of the surface finish of Brio stainless steel products is the responsibility of the end user or consumer to follow the above 'care and maintenance' recommendations. Brio's warranty does not cover the effects of tea staining on stainless steel products.

## **References and Acknowledgements**

ASSDA - Australian Stainless Steel Development Association [www.assda.asn.au](http://www.assda.asn.au)

