



## Stainless Steel Product Care

The window and door industry worldwide manufactures a significant amount of hardware from various grades of stainless steel. Much has been said about stainless steel its suitable applications. The intent of this bulletin, 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. In more recent years '316' marine grade stainless steel has gained popularity due to its improved ability to resist pitting and crevice corrosion.

Brio® extensively uses '316' marine grade cast stainless steel, stainless steel sealed bearings and architectural '304' grade stainless steel components in our product range. 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. In addition to these extra processes, Brio offers two PVD finishes, PVD Black and PVD Brass. PVD (Physical Vapour Deposition) is a coating process that produces a thin, hard coating that has exceptional wear and corrosion resistance.



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

### SURFACE DISCOLORATION "TEA STAINING"

Stainless steels are very resistant to corrosion; however this does not mean that they are impervious to it. Sometimes stainless steel products will develop corrosion or discolouration (tea staining) due to environmental and installation conditions.

Tea staining is the visually brown discolouration of the surface of stainless steels that is a relatively common occurrence in coastal and marine environments or when in contact with water containing significant chlorides. Higher temperatures, humidity, wind and salt deposits from intermittent 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 discolouration 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

### 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 proper maintenance, stainless steel will maintain its lustre and appearance indefinitely.

If the environmental conditions can not be removed (i.e. salt in the air, chlorine in the air in a pool environment), 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.





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### 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 stain 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 lead to pitting if left for long periods of time. Polished finishes such as Polished Stainless and PVD Brass have less risk of contaminants adhering to the smooth surface area. However, they must be routinely kept clean.

Following the manufacturer's association advice, 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 client / end user requests or insists on using stain stainless steel finishes in coastal environments then they must be made aware of the need for regular routine cleaning following care and maintenance recommendations.



Electro polished 316 Marine Grade Castings with Stainless Steel precision bearings

### 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. In coastal or marine environments Brio® recommends applying a light application of corrosion preventative such as CRC Marine 66 WD40 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.

### 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 Brio® stainless steel products.



### REFERENCES AND ACKNOWLEDGEMENTS

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

