

Grade	Carbon	Silicon	Manganese	Phosphorous	Sulphur	Nickel	Chromium	Molybdenum
304 DIN 1.4301	<=0.08	<=1.00	<=2.00	<=0.035	<=0.035	8.00 - 10.50	18.00 - 20.00	-
316 DIN 1.4401	<=0.09	<=1.00	<=2.00	<=0.035	<=0.035	10.00 - 14.00	16.00 - 18.00	2.00 - 3.00

There are many grades of stainless steel, but the majority of stainless steel items in this catalogue are 304 and 316.

Grade 304 is the most common stainless steel, and satisfies a broad demand for adequate performance at an affordable price. It has good corrosion resistance in a wide variety of environments. It is the best choice for indoor use (except swimming pools).

Grade 316 has a higher level of corrosion resistance and is often referred to as marine grade. Typical applications are architectural components where they are exposed to extreme weather conditions and climatic conditions, such as near the coast, near heavy industrial sites or in/around swimming pools.

Stainless steel is not maintenance free but maintenance friendly and when using stainless steel material outdoors, you need to clean periodically, especially in aggressive environments like coastal areas or swimming

pools. The chlorine rich atmosphere driven in from the sea can affect in-land stainless as far as 20 miles from the coast.

Choosing the correct grade can dramatically improve the corrosion resistance against chlorine, but other things should be taken into consideration.

Surface finish is a critical element in the battle against corrosion. The British Stainless Steel Association (BSSA) recommend that a surface finish of no less than 0.5µm Ra (320 Grit) is used on all applications subjected to a chlorine rich environment. A surface any rougher than this will retain corrosive particles and rust will inevitably follow.

STANDARDS RELEVANT TO SURFACE FINISH - BS 1449

Part 1 - 1991 (Sections 1.1 to 1.15 replaced by EN 1088) - This standard specifies the properties of various stainless steels, and includes a general reference of six mechanically polished surfaces of different nominal grit sizes.

Part 2 - 1983 (Amended in 1985 & 1991 and 683/13 Euronorm 88)

Nominal Grit Size	BS 1449 Pt 2	EN 1088	Description
80 -100	3A	1G/2G	Ground Ra nom 2.5 µm
180	3B	2J	Ground Ra nom 1.25 µm
240	4	1J/2J	Dull Polish Ra nom 0.6 µm
320	5	1K/2K	Satin Polish Ra > 0.5 µm
590 - 630	7	2P	Bright Polish Ra nom 0.05 µm
800	8	1P/2P	Mirror Finish Ra nom 0.05 µm

Degreasing

Dirt left on the surface after a fabrication process can have a serious affect on the corrosion resistance of stainless steel. Not only will it prevent the steel from oxidizing, it can contain corrosive particles, which will start rusting at a later date.

Pickling

Pickling requires the use of strong chemicals (hydrofluoric acid and nitric acid) to dissolve the surface of the steel. This process completely removes any surface contaminants and will help to restore the chromium level to the weld affected areas.

The heat from the welding process drives chromium away from the weld area. The area adjacent to the weld is often low in chromium and high in iron. These areas are always the most susceptible to corrosion once the component is in use.

Iron dissolves more readily than chromium, therefore, the pickling process leaves the surface chromium-rich and in a condition where it can form a dense oxide layer.

Passivation

Stainless steel will passivate in the open atmosphere - assuming that it is spotlessly clean to begin with and so is the air it is sat in. It is a slow process and, depending on the grade of stainless, can take between 24-48 hours to occur.

The chromium-oxide layer that protects stainless from corrosion is relatively fragile. It can be broken or damaged during fabrication, if scratched and/or surface contamination is allowed to settle on the surface.

The most effective way to form the passive layer is to force it by subjecting the steel to an oxidizing chemical. These are typically acid solutions containing nitric acid or citric acid. This process speeds up the reaction time and typically takes around 2-3 hours contact time to fully form a dense and effective layer.

Simply cleaning a corroded piece of stainless steel with a stainless steel cleaner and a scouring pad (usually phosphoric acid or citric acid based) does not passivate it. These acids will help to dissolve the corrosion (iron oxides) and leave the surface in a condition in which it can self-passivate.

Rain washing regularly will reduce the risk of tea staining (brown discolouration). This is a visual impairment only, and does not affect the structural integrity or longevity of the material. The best way to prevent it is to follow the cleaning chart below, but as a general rule of thumb the recommendation is that the stainless needs cleaning as often as the glass.

Remember bad design can result in poor performance e.g. partially sheltered systems will greatly reduce the benefit of natural washing by rain. Maintenance of stainless steel should be considered in the design process.

Recommended cleaning intervals for stainless steel handrail systems

Building	Roof or wall washed by rain		Eaves, Soffits or sheltered areas not washed by rain	
	No deposits	Deposits accumulate	No deposits	Deposits accumulate
Structure				
Cleaning in rural, suburban and residential areas	4/year	6/year	12/year	24/year
Cleaning for seaside, industrial and severe areas	8/year	12/year	24/year	52/year

Notes:

* cleaning frequency is dependant on surface finish, design details, environment, cleaning procedure and expectations of performance

** cleaning involves using Pro-Railing Enviro-Shield (189900902) - which comprises stainless steel cleaner, demineralised water and protection spray.

Stainless steel is not self-cleaning!

Problem	Cleaning Method	Comments
Standard cleaning	Soap and water	Sponge, rinse with clean water and wipe dry
Fingerprints	Soap and warm water or stainless steel cleaner (18990097063)	Rinse with clean water and wipe dry
Oil/grease marks, other stains and light discolouration	Pro-Railing Enviro-Shield (189900902)	Follow instructions on the box
Heavy discolouration	Stainless cleaning gel (18990094023)	Rinse well with clean water then use Pro-Railing Enviro-Shield (189900902)
Scratches on satin finish (Mirror finish will need repolishing properly)	<u>Slight scratches</u> Use fine polishing cloth (189901101) coated with stainless steel cleaner (18990097063) <u>Deeper scratches</u> Use coarse cloth (189901102) first then fine cloth with cleaner (as above)	Do not use steel based cleaning products (wire wool) as this will embed in the surface and will cause further surface damage and discolouration
Paint/Graffiti	Use a generic paint stripper dependant on type of paint	Use soft bristle brush and treat afterwards with Pro-Railing Enviro-Shield (189900902)

Polishing Cloths

For removal of light scratches on stainless tube and fittings



Code	Description
189901101	Fine (Grey)
189901102	Medium (Red)

Stainless Steel Cleaner (400ml)

Degreases & cleans surfaces ready for gluing



Code	Description
18990097063	Stainless Steel Cleaner

Stainless Cleaning Gel

Pickling gel helps remove rust, dirt and grime from stainless steel



Code	Description
18990094023	Stainless Cleaning Gel

After Care Tea Staining 3-Part Cleaner Kit

Keeps stainless handrail and fittings in top condition long after installation



Code	Description
189900902	3 Part Cleaner Kit

The following items should be considered and are available as part of the Pro-Glass range:

Latex Gloves Size 8



Code
185900101

The PGK10 glove from Marigold is based around a 10 gauge 100% Kevlar liner with a natural rubber latex crinkle coating that provides good grip in wet or dry conditions, abrasion and tear resistant. The thumb is fully coated to protect the most vulnerable part of the hand.

Protective Sleeve For Wrist 14"



Code
185900102

Granite 5 Solo, seamless knitted high cut resistant Tensilite Sleeves with thumb slot. Suitable for use in the glazing and steel industries. The unique yarn provides level 5 cut resistance. The yarn is made with a soft finish to provide exceptional comfort to the wearer.

Clear Protective Spectacles



Code
185900103

One piece clear polycarbonate lens with anti-mist treatment. Lightweight black nylon frame with built-in brow guard. Built-in side protection with integral nose bridge and adjustable temple length. Low energy impact protection with 400nm UV protection. Hang cord attachment points. Class 1.

Double Head Suction Cup 2 x 120mm diameter rubber suction cups. Max. lift: 70kg



Code
185900104

For use in hand lift applications only. Multiple vacuums used on a single load can only improve handling. If using more than one vacuum tool the ratio of maximum lift capacity does not increase. To lift heavier weights a larger vacuum must be used. All are fitted with a rubber suction which will not damage contact surface during the lifting action.