

CASE STUDY: Stainless Steel 304 and Stainless Steel 316; what is the difference?

VUETRADE proudly supplies post supports that are manufactured in both Stainless Steel 304 and Stainless Steel 316 Marine Grade. Often in many cases Stainless Steel 316 are much preferred especially in marine environment where these post support are subjected to salt spray and brine. This is due to the excellent corrosion resistance of Marine Grade Stainless Steel 316 compared to Stainless Steel 304 with an addition of an important ingredient.

Stainless Steel 304

Stainless steel grade 304 is the most commonly used stainless steel in many applications due to the superior corrosion resistance. Generally SS304 has composition of 18% chromium and 8% nickel which provides good resistance to oxidation and corrosion, and is often used in kitchen equipment, storage tanks and timber connector hardware.

However, a downside to this stainless steel grade is that SS304 is still susceptible to corrosion attack in high salinity environment, usually from chloride solutions such as seawater and brine. Chloride ions from sea water often creates a localised area of corrosion in the stainless steel, which is known as 'pitting' and is able spread further under the protective layer of chromium causing further corrosion and compromising the internal structure. This renders stainless steel 304 as a less ideal material for products used close to or at marine environment.



Figure 1: Pitting corrosion on Stainless Steel

Source: Offshore Magazine "Pitting and crevice corrosion of offshore stainless steel tubing, 2013"

Marine Grade Stainless Steel 316

Marine Grade Stainless Steel 316 is similar to Stainless Steel 304 in the composition of chromium and nickel, however it contains **about 2 to 3 % of molybdenum** in addition which greatly **increases** corrosion resistance of the steel. The addition of molybdenum in stainless steel 316 provides better corrosion resistance compared to SS304 in highly corrosive environments subjected to sea spray and brine solutions, while retaining its properties in durability and give similar clean finish. As many communities in Australia are located on or near the coast, many buildings are subjected to this marine environment, making stainless steel 316 an essential material on many building materials such as post supports.

The exceptional corrosion resistance of stainless steel 316 however does costs a little more compared with SS304 due to the difference in material composition, however this investment saves much more in the long run in than the maintenance or replacement of a lesser grade stainless steel.

VUETRADE Marine Grade Stainless Steel 316 Connector Products

Our overseas facilities are not able to supply genuine Marine Grade Stainless Steel 316 with the correct properties as specified above, although it is called Marine Grade or 316, it does not have the correct properties as specified above to provide the correct corrosion resistance needed for coastal requirements. Therefore we manufacture locally in Australia to produce products using specific raw materials that have the correct properties. This process usually takes around 2 weeks to produce and guarantees genuine SS316 products with characteristic load capacities and raw materials.

VUETRADE recommends that all tradies/builders who intend or are required to use products manufactured in Marine Grade Stainless Steel 316 to contact us so that we can provide you with a genuine SS316 product backed with established characteristic load capacities and genuine SS316 raw material.