

STAINLESS STEEL SUSTAINABILITY



Since stainless steel was first discovered in the early part of the twentieth century, it has rapidly become the architects' material of choice for aesthetic reasons, due to the range of finishes available.

Macalloy has been using stainless steels for ground engineering applications since the mid-1980's and in tension structures since the late 1990's.



Highly polished tendons to Glass Facade

Unlike carbon steels, stainless steels have a natural resistance to corrosion. Due to the use of chromium as an alloying element, stainless steels form a resilient, self-repairing oxide layer, which protects the metal beneath from corrosion. This layer is thin and transparent, enhancing the natural appearance of the metal. This also means that the material can be exposed to the elements without

the need for other coatings being applied.

In addition to these aspects, stainless steel is a sustainable material in the environmental sense of the word; it is normally made with 60% recycled content, which provides savings in the form of lower energy costs and reduced CO₂ emissions within the manufacturing process.

Stainless steel is still widely perceived as an expensive material. However, Life Cycle Cost calculations have shown that using a corrosion resistant material to avoid future maintenance, downtime and replacement costs can produce economic benefits, which outweigh the higher initial costs.

Further information on Life Cycle Costing can be obtained from the British Stainless Steel Association – Article: Life Cycle Costing (LCC).

Macalloy has a diverse portfolio of products using a range of stainless steel alloys, selected for their properties, which best suit the application.

For Post-tensioning applications, Macalloy S1030 stainless is the precipitation hardened Martensitic Stainless Steel. It is selected for its extremely high strength and

superior corrosion resistance, to its carbon steel counterpart.

Macalloy 650 is a fully threaded, stainless steel alternative to threaded rebar and shutter ties, available in Grades 316 (1.4401) or 304 (1.4301).



316L Grade Stainless Steel tendons to bridge

For tension structure and architectural bracing applications, the stainless Macalloy 460 range is available as Grade 316; however, where stress-corrosion cracking is a potential issue (e.g. in swimming pool environments, Macalloy advise the use of Duplex or Super Duplex grades (1.4462 or 1.4410), as these are especially resistant to this type of attack.

Macalloy offers N3 Polished (220 Grit) as a standard finish on all architectural applications, however depending on requirements, there are many other finishes available including mirror finish, glass bead blasted and directionally brushed finishes.



Stainless Steel components polished to N3

Finally, when the components have reached the end of their service life, the high value of the alloying components (chromium, nickel and molybdenum), which give stainless steels their unique and desirable properties, make recovery and recycling economically viable due to their high scrap value. Recycling figures quoted by the International Stainless Steel Federation state that around 90% of end-of-life stainless steel is recyclable into new stainless steel, without loss of quality.