Stainless Steel, Present in our lives, all over the world

As a construction material, Stainless Steel naturally appeals to architects for its many surfaces and aesthetics. Widely used in our everyday life, it is recognised for its signature on many iconic buildings all over the world.

One of the earliest architectural applications of stainless steel is the cladding atop of New York’s Chrysler building, designed by William Van Allen and completed in 1929. Closer to home and celebrating its 25th anniversary, the Thames Flood Barrier is an iconic London landmark displaying the durability and low maintenance benefits afforded by Stainless Steel.

The difference of Stainless Steel

Steel alloys which contain a minimum of 10.5% Chromium are classified as Stainless Steel. To these two elements, other alloying components such as Nickel or Molybdenum can be added to form specific grades thus enhancing the specific properties of the metal.

The Intrinsic quality of stainless steel is its corrosion resistance achieved due to the presence of a thin yet durable passive layer on the surfaces of the metal formed through the reaction of chromium with oxygen. Self healing this layer reforms spontaneously if broken, continuing the protection. The main types of Stainless Steel are Austenitic, Martensitic, Ferritic.

Austenitic is historically and commonly referred to by architects as 304 and 316L grades. The 1:4301 (304) grade contains Chromium and Nickel. Adding Molybdenum to create the 1:4404 (316L) grade increases its corrosionary distance and allows stainless steel use in the more aggressive environments found in heavy-industrial or marine locations.

Making the correct choice of grade is of key importance and depends on the type of environment to which the building will be exposed. All grades of stainless steel have different mechanical, physical and corrosion-resistance properties. It is important to seek professional advice when selecting the appropriate grade.

Most metals rely on the natural formation of a protective layer, a patina. Natural rain washing is essential to accelerate this weathering process which is, in the case of most metals a protection against the corrosion from pollutants or condensates. Stainless Steel, with its passive layer is not reliant on such a patina for defence. With a stable and unchanging surface, maintenance of Stainless Steel is therefore kept to a minimum.

Terne Coated takes up the challenge

Environmental pressure to find a replacement for traditionally used roofing and flashing products has increased demand for terne coated Stainless Steel. With an ability to adapt and take on a matt grey surface colour, the visual appearance of heritage projects, terne coated Stainless Steel provides benefits including those of a lightweight metal, durability of a 316 grade and eliminating risk associated with other metals from underside corrosion.

Life cycle Cost

Stainless Steel may have a reputation as an expensive material. However if you look at the life-cycle cost it becomes much more affordable. In part, this is due to the longevity of the material, its low maintenance and the benefit to the overall build-up of the supporting structure. As a metal, it does not suffer from underside corrosion and therefore is non reliant for ventilation to its underside surface. Warm-roof design is increasing but there is no risk to Stainless Steel.

Future investment

Stainless Steel has no corrosion products forming on its surface, there is no toxic run-off or contaminating bi-product, making rainwater simple to harvest and reuse. In fact Stainless Steel is commonly used in the manufacture of fixing clips used in conjunction with modern roofing and cladding metals, proof of its compatibility with other metals and construction materials and superior mechanical properties.

Stainless Steel is fully recyclable after its lifetime of use; in fact it is a rebirth from its conception with approximately 75% of the initial melting being made up of scrap iron and steel along with in-house off-cuts from its own manufacturing processes.