ALUMINIUM IN BUILDING AND CONSTRUCTION

Introduction

Aluminium is well established as one of the most popular materials among builders, architects and designers. The sector now accounts approximately for 25% of all aluminium used in Europe.

According to forecasts, the planet's population will be 10 billion people by 2050; two-thirds of these people will live in cities, with land becoming scare and under pressure to grow food, buildings will grow skyward.

Longevity and natural corrosion resistance offer 80 year, virtually maintenance free, minimum design service lives. Simple and environmentally less damaging protection and aesthetic coatings can be achieved by anodisation using no volatile organic compounds. Aluminium can be used in any climatic conditions as it does not lose its properties in temperatures ranging between –80 °C and +150 °C. The low Youngs modulus of aluminium makes its high elasticity perfect for building in seismic active regions.

Low specific weight, aluminium plate and sheet can create structures with only 50% to 66% the weight of steel and only 15% the weight of reinforced concrete structures, all with the same bearing capacity. Aluminium lightweight structures require reduced shallower and simple foundations. Light weighting using aluminium has been extended into curtain walls, roofing and cladding, solar shading and even photovoltaic panels.

The high strength to weight ratio of aluminium Skyscrapers is the ultimate show case of modern architecture. Their floor-to-floor glass walls or translucent panes represent a combination of glass and Aluminium frames. All glass external area on a building makes it possible to let much more sunlight in and reduce the use of artificial lighting. Even more energy is saved on heating and air conditioning as unlike ordinary glass, which conducts heat both ways without hindrance, glass for translucent panes features low thermal conductivity, it reflects solar heat in summer and stops heat escape in winter.

Aluminium innovation can be seen in window frames, panels, domed roofs and other wide-span constructions, roofs, siding, translucent panes, window and doorframes, staircases, air conditioning systems, solar protection, heating systems and even internal furniture.

Lightweight aluminium compared with steel and concrete offers significant other reductions in energy and carbon footprint during transportation, erection and allied uses like scaffolding, ladders and signs.

At the end of long service lives, the buildings can be simply dismantled, without demolition and the aluminium recycled using only the 5% of the original energy, of primary smelting back into new architecture with no loss of properties. A truly circular economy.

Further information about aluminium and aluminium alloys, their production, fabrication and use in architecture can be obtained from:

- Aluminium Federation www.alfed.org.uk
- Council for Aluminium in Buildings www.c-a-b.org.uk
- European Aluminium Association in Brussels www.european-aluminium.eu
- International Aluminium Institute in London www.world-aluminium.org