ESTAL
European association for Surface Treatment on Aluminium

Aluminium and Surface treatment on Aluminium

Aluminium

(From the brochure Sustainability of Aluminium in Buildings, © European Aluminium Association)

Aluminium is a very young metal, extracted for the first time in 1854. First commercially produced as a precious metal, its industrial production for civil applications took off in the 1950's.

Aluminium is now utilized for a host of applications in building and construction and is the material of choice for curtain walling, window frames and other glazed structures. It is extensively used for Venetian blinds, doors, exterior cladding and roofing, suspended ceilings, wall panels and partitions, heating and ventilation equipment, solar shading devices, light reflectors and complete prefabricated buildings.

Bauxite, the ore from which primary aluminium is produced, originates mainly from Australia but also China, India, Brazil, Guinea and Jamaica. More than half of the aluminium currently produced in the European Union originates from recycled aluminium and this trend is on the increase. As the energy required to recycle aluminium is about 5% of that needed for primary production, the ecological benefits or recycling aluminium are obvious.

Aluminium combines many advantages:
- Wide choice of alloys
- Design flexibility
- Long service life
- Low maintenance
- High strength to weight ratio
- Corrosion resistance
- High reflectivity
- Heat conductivity
- Fire safety
- No release of dangerous substances
- Optimal security
- Hundreds of surface finishes

Aluminium plays a key role in the sustainability of new buildings and the renovation of existing ones. Thanks to its properties, aluminium contributes significantly to the energy performance, safety and comfort of new buildings.

Aluminium's versatility also allows for easy upgrade of existing buildings, including historic ones. At the end of its very long lifespan, the high intrinsic value of aluminium is a major economic incentive for its recycling, securing its cradle-to-cradle life cycle and associated environmental benefits.

Surface treatment on aluminium

Aluminium is one of only a few metals that can be left in their natural state without surface protection.
When an aluminium surface is exposed to the atmosphere, a chemical reaction occurs which results in the formation of a protective oxide layer. The presence of this layer means that the structural integrity of the metal is unaffected by the atmosphere.

There are many options available for the surface treatment (finishing) of aluminium which is why it is such a popular construction material. The question of which finish to apply is not always an easy decision because of all the options available.

Aluminium can be coated by a variety of finishing processes when colours or textures are required to enhance the building's appearance or when greater protection is required.

Selection of a coating is usually focused on the appearance requirements, quality performance and costs. There are several coating options that are available for the aluminum architectural market. Common coatings used for architectural aluminum include anodising, PVDF (polyvinylidene fluoride), liquid paint and powder coating.

Liquid paints include solvent-based acrylics, polyesters and polyurethanes but are not so widespread in Europe for architectural applications (they are more popular in North America). They are rather low cost and suitable for mass market applications where cost is of the highest importance.

The choice of finish is mostly determined by the application. Therefore customers should communicate their needs to the aluminium finishers.

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