



UK & Ireland

Guidance Note - No.3

Guide to use of powder coated aluminium in coastal regions

May 2023

Scope

These recommendations cover guidance of painted aluminium extrusions and curtain wall panels when used in coastal areas. This guide is intended to assist specifiers who wish to use powder coated, architectural and aluminium extrusions such as window frames, door frames, railings and trim as well as curtain wall panels, column covers, spandrels, mullions, louvres, vertical trim, etc.

Purpose

These recommendations are intended to assist architects, contractors, owners and building managers who are concerned with the correct specification of painted, architectural aluminium.

General

Powder coating was introduced into the UK in the early 1970's and is the youngest of the surface finishing techniques in common use today. The finish is commonly used in various applications including white goods, automotive, and engineering as well as in construction.

Powder coating is the technique of applying dry paint to a part in the form of a fine powder which is electrically charged. The part is electrically 'earthed' so the powder is attracted to the part and stays in place through static electricity. The part is then placed in an oven and is subject to temperature which melts the polyester and allows the finish to flow and cure before the part is cooled and ready to use.

Powder coating differs from 'wet paints' which typically use a solvent where the solids are in suspension in a liquid carrier which must fully evaporate before the finish is ready to use.

The main advantage of using powder coating is the reduced impact to the environment as powder coating uses no solvents in the application process.

Polyester powder coating is the most commonly used system when coating architectural aluminium.

Coastal Conditions

Coastal regions, for the purposes of this guide, can be determined as within five kilometres from any coast or tidal estuary.

There are two issues which determine the life expectancy of powder coating within these regions:

- Abrasion due to airborne sand particles
- The increased level of marine salts in the atmosphere

Abrasion

Whilst polyester powder coating is a strong and long lasting durable finish in most climates, the presence of additional airborne particles such as silica have an abrasive effect on the surface finish. The level of abrasion increases the nearer to the coast the material is situated and also depends on the coastal topography.

The effects of abrasion are seen normally as a slight loss of surface gloss on profiles with specific levels of gloss, matt finishes are less likely to be affected. Normally this is the only abrasion problem encountered. In extreme cases the loss of coating over several years wear will require remedial action.

Salts

Polyester powder coat finishes have a high level of resistance to salts and airborne pollution even in coastal areas, however, as no coating is 100% impervious to water, some pollutants can affect the pre-treatment and in certain circumstances, where these pollutants are found in high concentrations, can cause failure of the coating adhesion.

Other pollutants such as chlorine found in higher concentrations as in swimming pools also fall under the guidance of this document. Projects which are exposed to other industrial pollutants, where close to for example chemical works are also covered by this guide.



Procedure

To ensure that a suitable guarantee can be provided for the project based on its location, the applicator of the powder coating must be consulted. A form is normally provided for the specifier to complete.

From a database of information, the applicator will advise the specifier of the guarantee available and any additional cleaning routine which may be necessary. The application may require to be applied in a different manner and this is referred to as 'Seaside' class.

Process

Aluminium supplied direct from the extrusion process is often contaminated with oil and other residues which will affect the longevity of the final coating. Unfinished aluminium supplied from stock will have traces of natural oxidation on the surface. It is vital therefore that the pretreatment is correctly carried out to a very high standard.

The vast majority of powder coat failures can be put down to poor or inconsistent pre-treatment methods. The pre-treatment offers two main benefits:

- An air and watertight 'seal' to the aluminium
- A good 'key' surface to the powder to adhere to

Pre-treatment consists, amongst other procedures, an etch and a chromate or chrome free conversion. In normal powder coating the etch on the aluminium is a minimum of 1 g/m².

When applying powder coating to meet the 'Seaside' class the etch is increased to 2 g/m². This can be an acid etch, known as 'Type A' or a combination of acid and alkaline etch, known as 'Type AA'.

Alternatively a thin anodised finish can be specified of approximately 5 microns in thickness. Left unsealed and powder coated within a short time of anodising, this alternative pretreatment is available for specification.

The powder coat applicator will choose the most appropriate pre-treatment procedure and offer a project specific guarantee to cover the coating.

Specifiers will be provided with this guarantee upon completion of the project.

How to Specify

For projects that fall within the location described in this guide, please ensure that the 'Seaside' class is written in the specification, for example:

'Architectural powder coating to QUALICOAT 'Seaside' class standard from approved supplier'

Further guidance on the use of the 'Seaside' class standard is available from any approved QUALICOAT member.

As with the standard QUALICOAT powder coat finish, members will be routinely and independently tested for the 'Seaside' class and samples will be taken away for analysis at IFO.

The new optional Seaside Class offers unparalleled quality assurance surpassing the normal QUALICOAT specification and British Standard BS EN 12206-1:2021.

The new standard confirms QUALICOAT's commitment to developing, testing and maintaining the highest possible standards for architectural aluminium fenestration.

Further Information

Current approved powder coaters can be found at:
www.qualicoatuki.org

Current QUALICOAT standards and updates from the European website at:
www.qualicoat.net

Disclaimer

The information provided in this document is for guidance only and is not intended to replace any manufacturers recommended procedures. QUALICOAT UK & Ireland strongly recommend that a qualified member of the association is contacted and underwrites any procedures which apply to powder coated finishes.

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