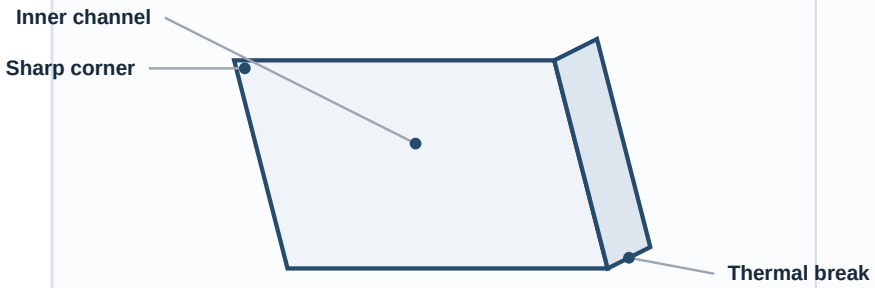
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Architectural Aluminium Profile (Extrusion) — Continuous UV, weathering, urban/marine chlorides and an expectation of colour and gloss stability over decades. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — ARCHITECTURAL ALUMINIUM PROFILE (EXTRUSION)



COATING CROSS-SECTION



Five questions define a coating system

1 MATERIAL
Extruded aluminium (EN AW-6060 / 6063 T5-T6), wall thickness ~1.2–3 mm; heat-treated, aged temper. Its low thermal mass makes it heat up and cool down quickly in the oven.

2 SURFACE
Extrusion oil, drawing residues and the natural oxide layer must be removed; for Qualicoat, acidic/alkaline etching must remove at least 1 g/m² (2 g/m² for seaside class).

3 GEOMETRY
Closed inner channels and deep grooves form a Faraday cage; sharp extrusion corners carry a risk of edge pull-back and low film build.

4 SERVICE CONDITIONS
Continuous UV, weathering, urban/marine chlorides and an expectation of colour and gloss stability over decades

5 PRODUCTION TARGET
Vertical or horizontal line for long profiles (6–7 m), with high throughput and low colour-change loss.

CONCLUSION: For the Architectural Aluminium Profile, the goal is not just a good-looking finish; it is a Qualicoat-class superdurable powder-coated surface, fully covered including the edges, that keeps its colour and gloss for decades under UV and marine atmosphere.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Architectural Aluminium Profile cannot be coated like just any part. A sound process needs measurement, pretreatment, the right coating selection, application and verification to work together.

01 **ANALYSIS** Substrate + surface
02 **PRETREATMENT** Cleaning + conversion
03 **COATING** Chemistry + film
04 **APPLICATION** Electrostatics + flow
05 **CURING** Time + temperature
06 **VERIFICATION** Test + record

A. Surface Characterisation

The condition of the substrate surface (cleanliness, roughness, oxide/scale and any weld zones) is determined. The right process starts with the right definition of the surface.

MEASURABLE INPUTS
Surface cleanliness • roughness • weld marks

B. Pretreatment Design

Degreasing, acidic/alkaline etching, rinsing and a chrome-free (Ti/Zr-based) or yellow-chromate-free conversion coating; the Qualicoat/seaside etch weight is verified and the sequence closes with a deionised rinse.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

For facades, a Qualicoat class 2 superdurable polyester powder is selected; high gloss retention and colour stability under Florida exposure are targeted.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Electrostatic powder coating, 60–80 µm; low-to-medium corona current, reduced powder output and double-sided gun arrays on the vertical line overcome the Faraday effect in closed channels and deep grooves.

GEOMETRY EFFECT
Inner channel • Thermal break • Sharp corner

Managing the process with data, not by eye

µm
FILM THICKNESS
Coating uniformity

°C
PART TEMPERATURE
Actual cure condition

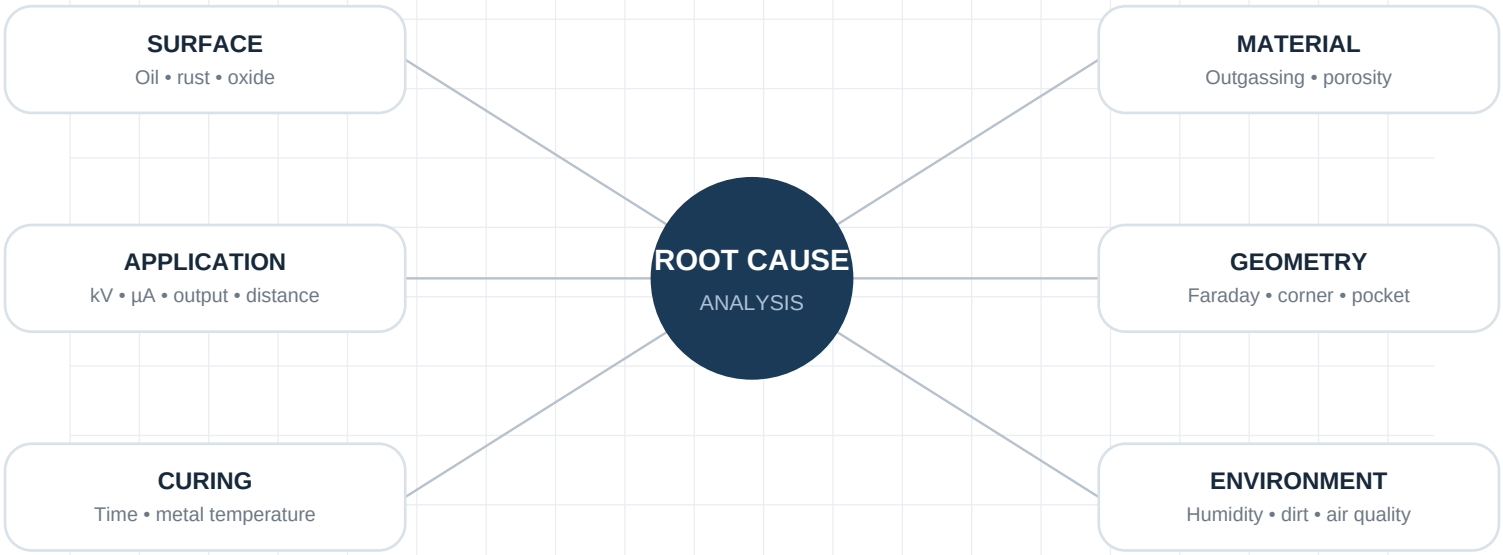
kV / µA
ELECTROSTATIC CHARGE
Transfer and penetration

Ω
GROUNDING
Charge dissipation and stability

ENGINEERING PRINCIPLE In the Architectural Aluminium Profile process, we define a process window rather than a single parameter. The aim is to reproduce the same surface quality across different shifts and part conditions.

A SURFACE DEFECT IS A SYMPTOM, NOT THE ROOT CAUSE

Coating defects rarely come from a single setting. The same symptom may stem from surface preparation, material, electrostatic behaviour, film thickness or curing.



Common defects and diagnostic approach

POOR ADHESION

The coating detaches from the surface or fails in testing.

CHECK: cleaning / pretreatment / cure

ORANGE PEEL

Uneven flow; the surface looks wavy or rough.

CHECK: film / flow / temperature

PINHOLE / CRATER

Pinholes or local craters form on the surface.

CHECK: dirt / gas / humidity / oven

FARADAY ZONE

Insufficient penetration in deep corners and pockets.

CHECK: geometry / kV-µA / air

BACK-IONIZATION

Star/blister defects from overcharging.

CHECK: current / distance / thickness

UNEVEN THICKNESS

Thin and thick areas on the same part.

CHECK: position / motion / output

DIAGNOSTIC PROTOCOL

1 Define the symptom → **2** Measure the data → **3** Isolate the cause → **4** Test one variable → **5** Standardise

A GOOD SURFACE PROCESS must be measurable • repeatable • traceable • optimisable. This approach is the basis of part-specific application guides for parts such as the Architectural Aluminium Profile.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Architectural Aluminium Profile, production volume drives the equipment choice. At low and medium volume, manual systems give flexibility; in series production, automatic systems apply the same recipe to every part.

LOW / MEDIUM VOLUME

Manual application



Elite / Elite Plus

Manual powder coating units; kV, µA and air settings.



Smart AI

Suggests settings for the part; guides the operator in manual work.



Manual Powder Coating Gun

Light, ergonomic hand gun.



Manual Powder Booth

Manual application and powder recovery.



Box Oven

Curing in batch production.

SERIES PRODUCTION

Automatic line



Automatic Powder Coating Gun

Series application in fixed or moving arrays.



OWL + Smart AI

Recipe-based, zone-by-zone application in difficult areas.



Single / Two-Axis Reciprocator

Automates the gun motion.



PVC Monocyclone Booth

Fast cleaning and powder recovery.



Powder Center

Fast colour change on automatic lines.



Conveyor Oven & Pretreatment

Surface preparation and curing on a continuous line.

OWL INTEGRATION In difficult areas such as inner channel, thermal break, sharp corner, OWL applies targeted, zone-by-zone coating with a Smart AI recipe. For details, see the “OWL — Profile & Pipe” application sheet.

PROJECT SUPPORT Share your line, your part and your production target, and we will define the equipment selection and the booth, oven and conveyor layout together. strong3000.com · info@strong3000.com · WhatsApp +90 537 353 54 19