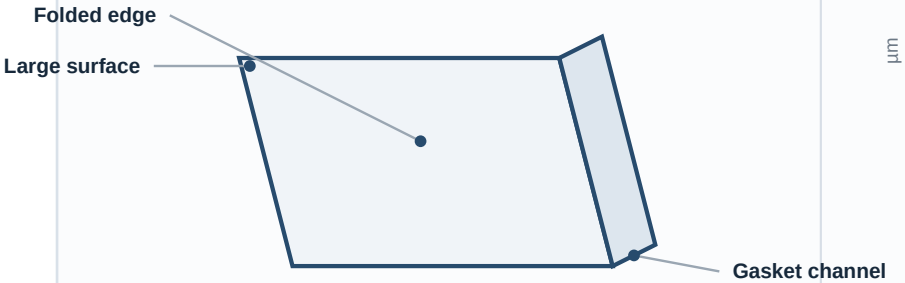
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Covers, Doors & Frames — Visible front surface; frequent touching and cleaning, indoor humidity or outdoor UV exposure. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — COVERS, DOORS & FRAMES



COATING CROSS-SECTION



Five questions define a coating system

1 MATERIAL
Cold-rolled steel or galvanised sheet, 1.2–2.0 mm; front panels and doors with folded edges, guide grooves and gasket channels.

2 SURFACE
Oil and machining residues are removed; as a visible surface, a uniform, clean and smooth substrate is essential.

3 GEOMETRY
Faraday effect at folded edges and flanges and powder build-up in gasket channels; colour/gloss and texture consistency on the large visible surface is critical.

4 SERVICE CONDITIONS
Visible front surface; frequent touching and cleaning, indoor humidity or outdoor UV exposure

5 PRODUCTION TARGET
High volume; a fast line with colour/texture consistency, low scrap and visible surface quality.

CONCLUSION: For the Covers, Doors & Frames, the goal is not just a good-looking finish; it is a decorative, durable powder-coated surface with uniform coverage including folded edges and consistent colour and texture.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Covers, Doors & Frames 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

Alkaline degreasing + rinsing + nano-ceramic/phosphate conversion coating; fast, uniform preparation on thin sheet that secures adhesion.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

Epoxy-hybrid powder indoors and polyester powder outdoors; a decorative look, scratch and impact resistance and RAL colour consistency are targeted.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Electrostatic powder coating, 60–90 µm; gun/charge settings to reach folded edges and gasket channels, a constant gun distance on the large surface and a uniform oven profile give a smooth finish.

GEOMETRY EFFECT
Folded edge • Gasket channel • Large surface

Managing the process with data, not by eye

µm
FILM THICKNESS
Coating uniformity

°C
PART TEMPERATURE
Actual cure condition

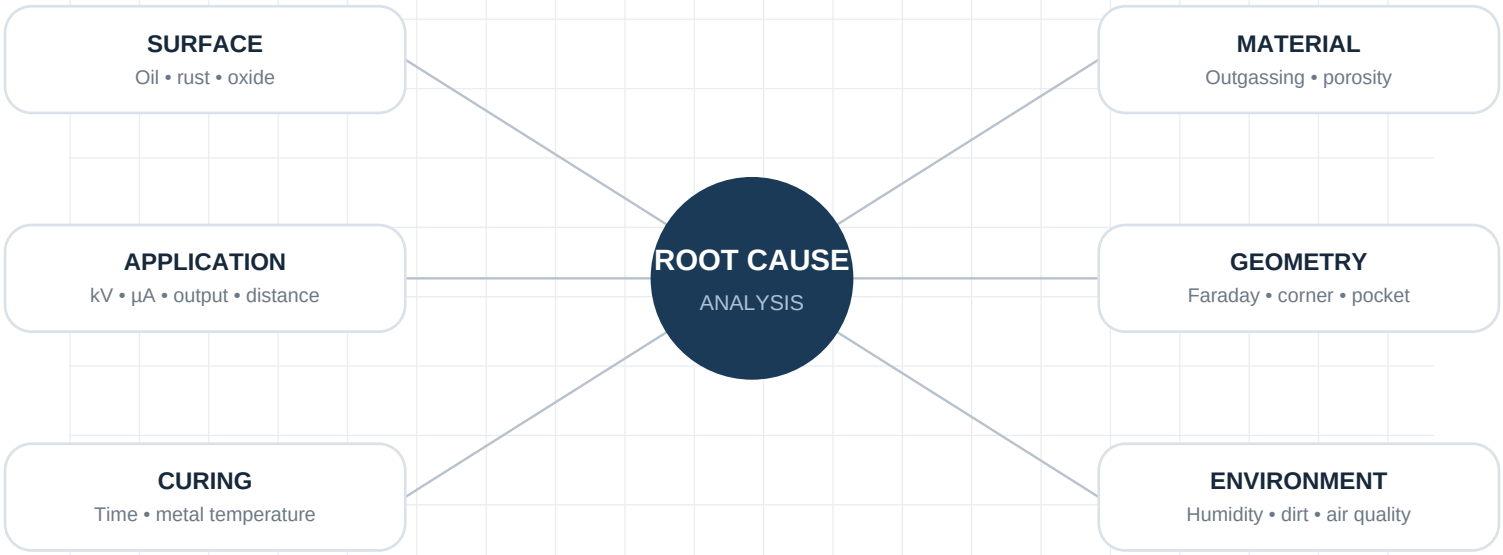
kV / µA
ELECTROSTATIC CHARGE
Transfer and penetration

Ω
GROUNDING
Charge dissipation and stability

ENGINEERING PRINCIPLE In the Covers, Doors & Frames 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 Covers, Doors & Frames.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Covers, Doors & Frames, 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.



Smart AI

The same application on every part, by recipe.



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.

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