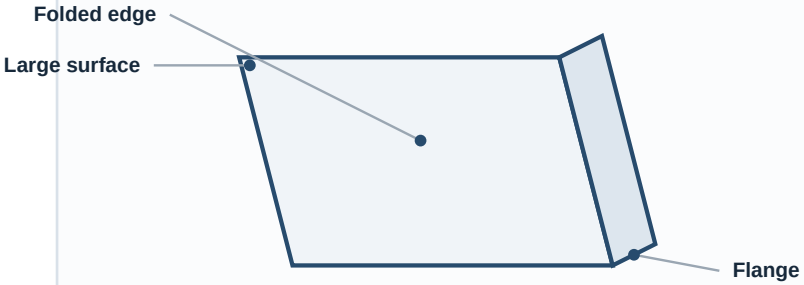
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Stove Outer Casing & Decorative Panels (Steel) — Mild-to-medium surface temperature from radiant heat, indoor humidity/cleaning and expectations for visible surface quality. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — STOVE OUTER CASING & DECORATIVE PANELS (STEEL)



COATING CROSS-SECTION



Five questions define a coating system

1 MATERIAL
Cold-rolled or galvanised steel sheet, 0.6–1.2 mm; visible outer surfaces insulated from the flame/combustion chamber, operating at medium temperature.

2 SURFACE
Oil and machining residues are removed; a uniform, clean substrate on large visible surfaces.

3 GEOMETRY
Faraday cage at folded edges and flanges; risk of colour/gloss and orange peel deviation on large flat surfaces.

4 SERVICE CONDITIONS
Mild-to-medium surface temperature from radiant heat, indoor humidity/cleaning and expectations for visible surface quality

5 PRODUCTION TARGET
High volume; a fast line with colour consistency, low scrap and decorative finish quality.

CONCLUSION: For the Stove Outer Casing & Decorative Panels, the goal is not just a good-looking finish; it is a decorative, durable powder-coated surface, consistent in colour and gloss across large surfaces, that withstands radiant heat and indoor use.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Stove Outer Casing & Decorative Panels cannot be coated like just any part. A sound process needs measurement, pretreatment, the right coating selection, application and verification to work together.

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

Nano-ceramic or phosphate conversion coating; uniform pretreatment for corrosion resistance and powder adhesion.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

A thermoset powder for decorative appearance, heat-resistant (silicone-based) in areas approaching high service temperature, is selected; colour and gloss stability 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 flanges, and a uniform oven profile at ~180–200 °C (higher for heat-resistant systems).

GEOMETRY EFFECT
Folded edge • Flange • Large surface

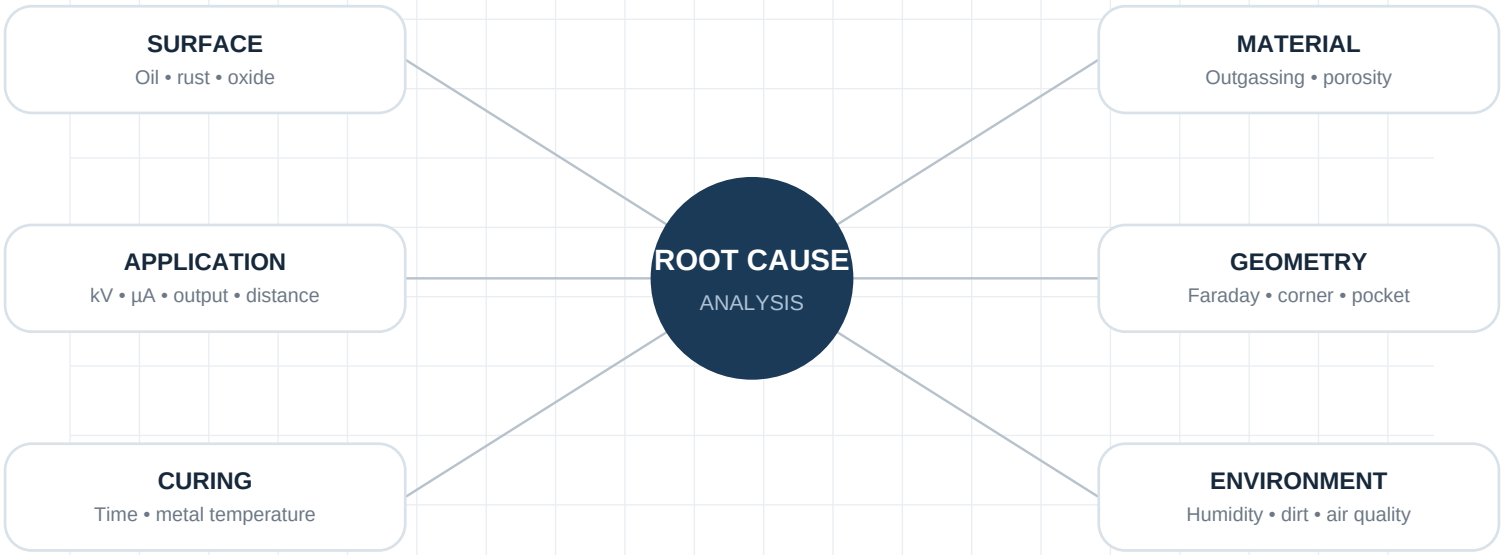
Managing the process with data, not by eye

µm	°C	kV / µA	Ω
FILM THICKNESS	**PART TEMPERATURE**	**ELECTROSTATIC CHARGE**	**GROUNDING**
Coating uniformity	Actual cure condition	Transfer and penetration	Charge dissipation and stability

ENGINEERING PRINCIPLE In the Stove Outer Casing & Decorative Panels 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 Stove Outer Casing & Decorative Panels.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Stove Outer Casing & Decorative Panels, 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