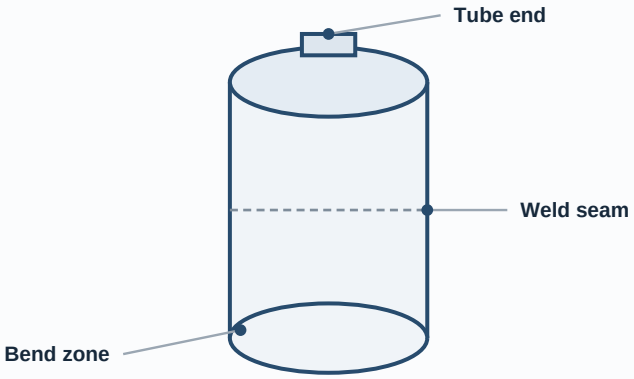
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Tube/Profile Furniture Legs & Continuous Line — Indoor use, humidity, repeated contact and a visible decorative surface. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — TUBE/PROFILE FURNITURE LEGS & CONTINUOUS LINE



COATING CROSS-SECTION



Five questions define a coating system

1. **MATERIAL**
   Welded/seamless steel tube and thin-walled profile (galvanised or black), 1–2 mm wall; table/chair legs and frames.

2. **SURFACE**
   Weld seam, drawing oil and oxide must be removed; fast, uniform pretreatment is required on thin-walled tube.

3. **GEOMETRY**
   Edge pull-back at tube ends, bend zones and weld seams; risk of fast heating in the oven and colour deviation due to the thin wall.

4. **SERVICE CONDITIONS**
   Indoor use, humidity, repeated contact and a visible decorative surface

5. **PRODUCTION TARGET**
   High volume; a repeatable film and low scrap on a continuous line/hanging system.

CONCLUSION: For the Tube/Profile Furniture Legs & Continuous Line, the goal is not just a good-looking finish; it is a decorative powder-coated surface, uniform on cylindrical surfaces, consistent in colour and durable indoors.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Tube/Profile Furniture Legs & Continuous Line 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

Degreasing + conversion coating; fast, uniform pretreatment and good rinsing on thin-walled tube.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

An epoxy-polyester (hybrid) or polyester powder is selected by decorative look and indoor durability; curing at ~160–200 °C.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Powder coating, 60–80 µm; part rotation/hanging geometry for uniform coverage of the cylindrical surface, charge and gun motion for tube ends and weld seams; uninterrupted coating with gun arrays on continuous lines.

GEOMETRY EFFECT
Weld seam • Tube end • Bend zone

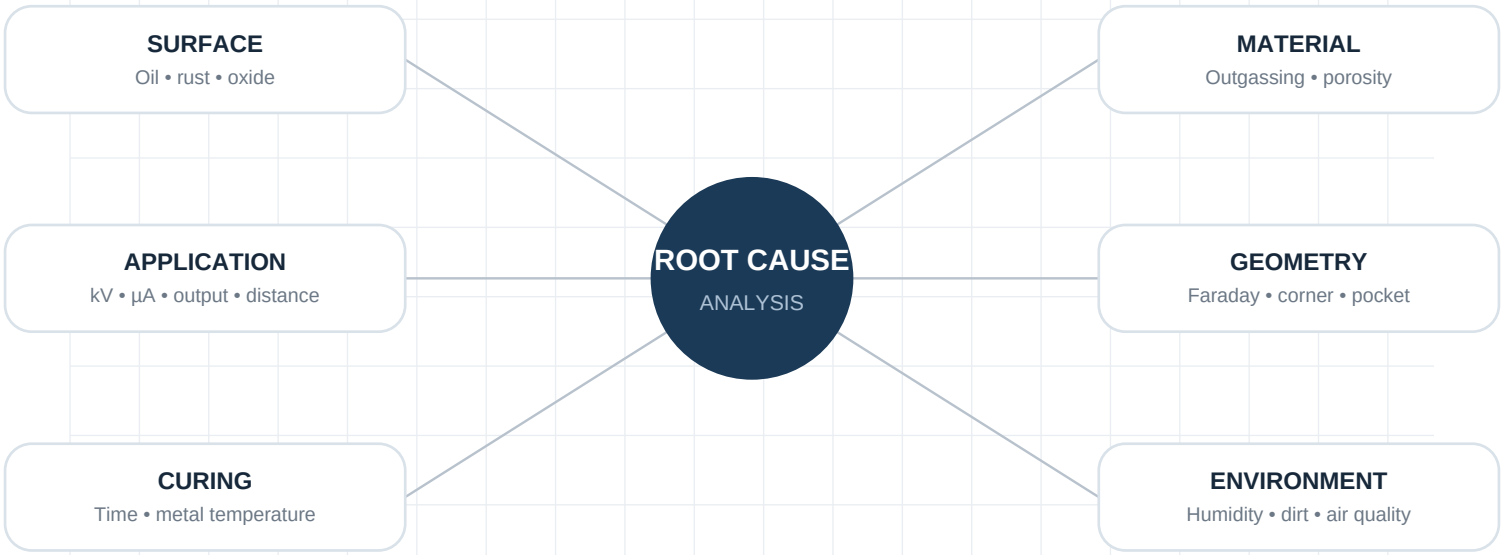
Managing the process with data, not by eye

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 Tube/Profile Furniture Legs & Continuous Line 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 Tube/Profile Furniture Legs & Continuous Line.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Tube/Profile Furniture Legs & Continuous Line, 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 weld seam, tube end, bend zone, 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