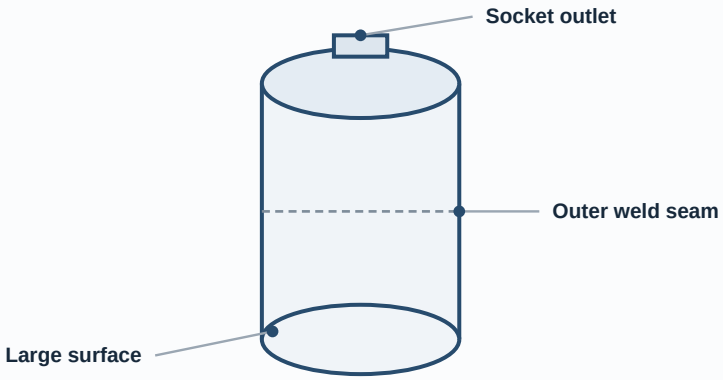
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Buffer / Storage Tank Body (Non-Enamel Line) — Closed-circuit heating installation environment; indoor humidity, heat and installation service load. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — BUFFER / STORAGE TANK BODY (NON-ENAMEL LINE)



COATING CROSS-SECTION



Five questions define a coating system

1. **MATERIAL**
   Carbon steel buffer / heating-water storage tank body, 2–4 mm welded cylinder; in contact with water in a closed circuit, with a painted outer surface.

2. **SURFACE**
   Weld spatter, scale and oil must be removed; a uniform surface across the large outer surface and along the weld seams.

3. **GEOMETRY**
   A large-diameter cylinder outer surface, many welded socket/fitting outlets and outer weld seams; Faraday effect at socket roots and difficulty in thickness uniformity on the large surface.

4. **SERVICE CONDITIONS**
   Closed-circuit heating installation environment; indoor humidity, heat and installation service load

5. **PRODUCTION TARGET**
   Medium volume, many variants; a durable outer finish with corrosion resistance and uniform film thickness.

CONCLUSION: For the Buffer / Storage Tank Body, the goal is not just a good-looking finish; it is a uniform powder-coated surface, even at socket roots and weld seams, resistant to corrosion in indoor conditions.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Buffer / Storage Tank Body 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 + phosphate/nano-ceramic conversion coating; preparation for uniform coating on the large body and around sockets.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

A thermoset powder with high crosslink density, suited to indoor conditions and installation heat, is selected.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Electrostatic powder coating, 70–100 µm; a low ramp rate, suitable gun angles and a uniform oven profile give penetration at socket roots and weld seams.

GEOMETRY EFFECT
Outer weld seam • Socket outlet • Large surface

Managing the process with data, not by eye

µm
FILM THICKNESS
Coating uniformity

°C
PART TEMPERATURE
Actual cure condition

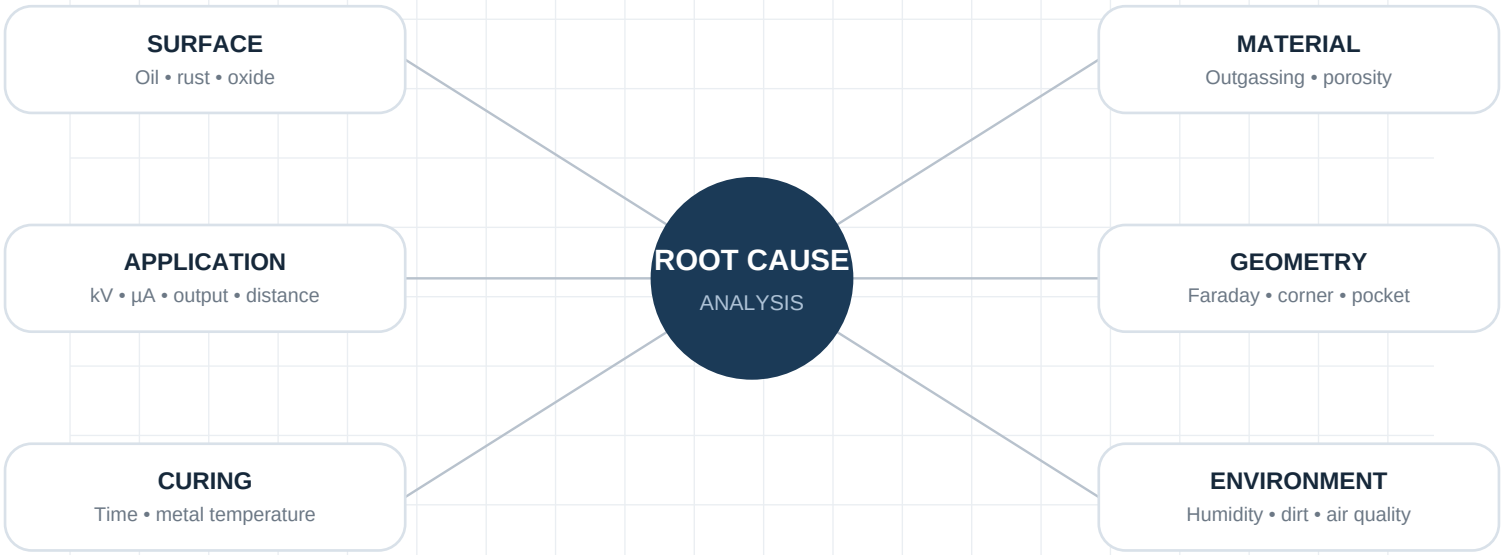
kV / µA
ELECTROSTATIC CHARGE
Transfer and penetration

Ω
GROUNDING
Charge dissipation and stability

ENGINEERING PRINCIPLE In the Buffer / Storage Tank Body 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 Buffer / Storage Tank Body.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Buffer / Storage Tank Body, 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