UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Long / Large Structural Profile — Heavy outdoor/industrial corrosion (C3–C5 environments); high dry film thickness for long service life. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — LONG / LARGE STRUCTURAL PROFILE



COATING CROSS-SECTION



Five questions define a coating system

1. **MATERIAL**
   Welded structural steel beams, columns and large profiles (I/H sections, long box sections); length and mass that do not fit into ovens.

2. **SURFACE**
   Rust and scale are removed by grit blasting to Sa 2½; a defined surface profile (roughness) is created for the corrosion protection system.

3. **GEOMETRY**
   Very long and heavy sections; oven curing is not suitable, and sufficient film thickness on weld seams and edges (edge protection) is critical.

4. **SERVICE CONDITIONS**
   Heavy outdoor/industrial corrosion (C3–C5 environments); high dry film thickness for long service life

5. **PRODUCTION TARGET**
   Project-based, low-medium volume; high dry film thickness and a verifiable corrosion class.

CONCLUSION: For the Long / Large Structural Profile, the goal is not just a good-looking finish; it is a paint system applied by airless wet spraying on large sections that do not fit an oven, meeting the target corrosion class with full protection at edges and welds.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Long / Large Structural 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 **PAINT** Chemistry + viscosity
04 **APPLICATION** Spraying + flow
05 **DRYING** 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

Surface preparation by Sa 2½ grit blasting; dust removal and salt/chloride control; a surface profile suited to a zinc-rich primer.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Coating System Selection

For parts that do not fit an oven, a multi-coat wet (liquid) system with ambient/low-bake cure: zinc-rich epoxy primer + epoxy intermediate coat + polyurethane topcoat; the dry film thickness is set by corrosion class.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Wet paint is applied by airless spraying; a stripe coat (brushed pre-coat) is applied on weld seams and edges, and wet film thickness is monitored with a comb gauge to reach the target dry film thickness.

GEOMETRY EFFECT
Weld seam • Edge/corner • Large surface

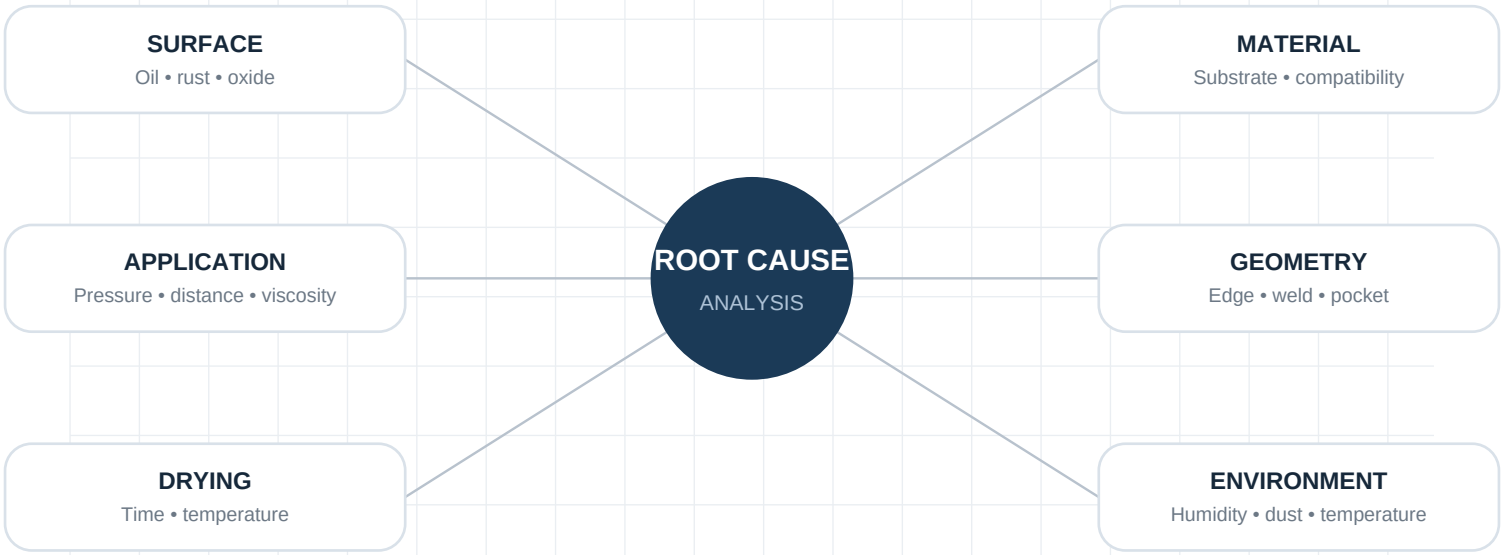
Managing the process with data, not by eye

µm — **DRY FILM** — Coating uniformity
µm — **WET FILM** — Thickness at application
s — **VISCOSITY** — Flow and spray quality
°C / %RH — **ENVIRONMENT** — Drying condition

ENGINEERING PRINCIPLE In the Long / Large Structural 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

Paint defects rarely come from a single setting. The same symptom may stem from surface preparation, the substrate, viscosity, film thickness or drying.



Common defects and diagnostic approach

POOR ADHESION

The paint detaches from the surface or fails in testing.

CHECK: cleaning / pretreatment / primer

RUNS / SAGS

Paint runs on vertical surfaces and forms drips.

CHECK: thickness / viscosity / distance

ORANGE PEEL

Uneven flow; the surface looks wavy.

CHECK: viscosity / pressure / distance

CRATER

Local pits and openings form on the surface.

CHECK: oil / silicone / air quality

BLISTERING

Solvent blisters form during drying.

CHECK: coat thickness / drying / temperature

UNEVEN THICKNESS

Thin film at edges and welds, thick on flat areas.

CHECK: motion / distance / stripe coat

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 Long / Large Structural Profile.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Long / Large Structural Profile, production volume drives the equipment choice. At low and medium volume, manual systems give flexibility; in series production, a conveyorised line repeats the same process on every part.

LOW / MEDIUM VOLUME

Manual application



Dry-Filter Wet Paint Booth

A clean application environment for manual spraying.



Positive Pressure Paint Room

A controlled environment protected from dust and dirt.



Curing Oven

Controlled drying and curing of large parts.

SERIES PRODUCTION

Automatic line



Conveyorised Line-Type Wet Paint Booth

Spraying on a continuous line.



Wet Paint Dip Line

Series application by dipping.



Spray Pretreatment

Surface preparation before painting.



Curing oven for large parts

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