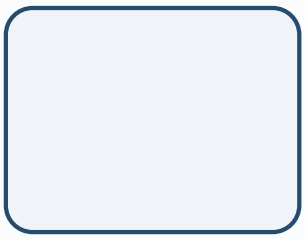
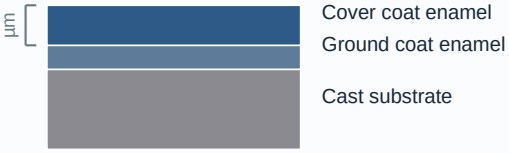
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Cast Iron Stove Body & Door Panels — Direct body heating, continuous thermal cycling and mechanical impact/wear. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — CAST IRON STOVE BODY & DOOR PANELS



COATING CROSS-SECTION



Five questions define a coating system

1. **MATERIAL**
   Grey cast iron (GJL/GG), heavy and profiled sections. High carbon and casting porosity make it prone to outgassing during firing.

2. **SURFACE**
   The casting surface is opened by grit blasting; sand, oil and casting residues are removed, followed by annealing/preheating to reduce outgassing.

3. **GEOMETRY**
   Decorative reliefs, heavy-thin section transitions and casting pores; in wet enamel, risk of runs/pooling and outgassing (boiling/blisters) from pores.

4. **SERVICE CONDITIONS**
   Direct body heating, continuous thermal cycling and mechanical impact/wear

5. **PRODUCTION TARGET**
   Medium volume; a consistent, pore-free and decorative look in majolica/matt colours.

CONCLUSION: For the Cast Iron Stove Body & Door Panels, the goal is not just a good-looking finish; it is a decorative enamel surface, pore-free despite casting porosity, that withstands direct heating and repeated thermal cycling.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Cast Iron Stove Body & Door 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**	**ENAMEL**	**APPLICATION**	**FIRING**	**VERIFICATION**
Substrate + surface	Cleaning + surface	Slip + density	Dipping / spraying	Drying + furnace	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

Grit blasting opens the casting skin; controlled annealing and preheating release gas trapped in casting pores.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Enamel System Selection

A ground coat + cover coat wet (slip) enamel system resistant to high body temperature and thermal cycling is selected; a well-adhering chemistry matched to the CTE of cast iron is targeted.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Wet (slip) enamel is applied by dipping, flow-coating or spraying; slip viscosity, dip-and-drain geometry and staged drying-firing are set to prevent runs/pooling on reliefs and heavy sections.

GEOMETRY EFFECT
Casting pore • Decorative relief • Heavy section

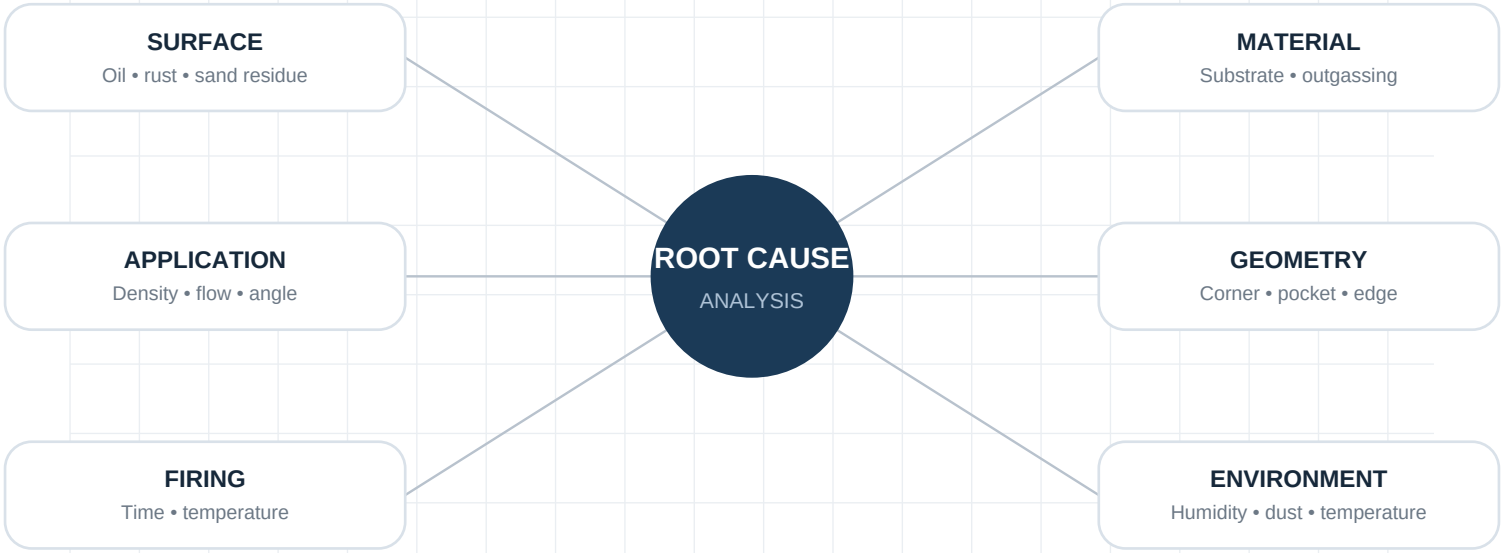
Managing the process with data, not by eye

µm	g/cm³	°C	%RH
COAT THICKNESS	**SLIP DENSITY**	**FIRING TEMPERATURE**	**AMBIENT HUMIDITY**
Enamel coat uniformity	Coat weight and coverage	Actual firing condition	Drying and surface quality

ENGINEERING PRINCIPLE In the Cast Iron Stove Body & Door 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

Enamel defects rarely come from a single setting. The same symptom may stem from surface preparation, the substrate, slip density, coat thickness or firing.



Common defects and diagnostic approach

POOR ADHESION

The enamel detaches from the substrate or chips on impact.

CHECK: surface / ground coat / firing

FISH-SCALING

Scale-shaped enamel spalling appears after firing.

CHECK: substrate / hydrogen / firing

PINHOLE / BLISTER

Pinholes or blisters form on the surface.

CHECK: gas / thickness / firing

RUNS & BUILD-UP

Thick build-up forms at edges and lower areas.

CHECK: density / draining / angle

CRACKING

Hairline cracks in thick coats or on rapid cooling.

CHECK: thickness / firing / cooling

UNCOVERED AREA

Thin or bare areas in corners and pockets.

CHECK: geometry / dipping angle

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 Cast Iron Stove Body & Door Panels.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Cast Iron Stove Body & Door Panels, 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



Manual Booth with Turntable

Wet enamel with a manual gun in a dry-filter booth.



Box Enamel Furnace

Firing in batch production.

SERIES PRODUCTION

Automatic line



Conveyorised Line-Type Booth

Automatic wet enamel application on an overhead conveyor.



U-Type Furnace

Firing on a continuous line.



STRONG3000 wet enamel 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