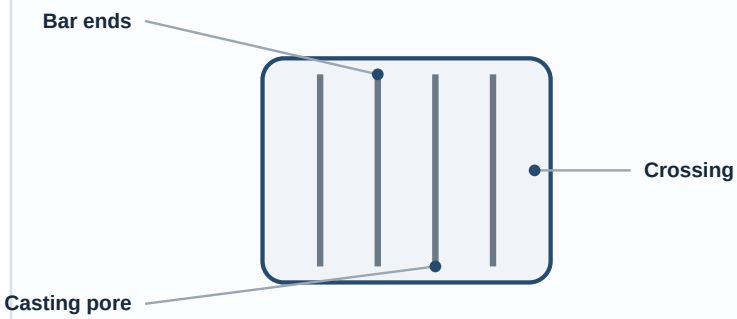
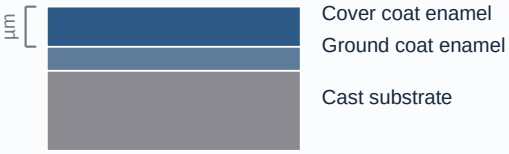
UNDERSTAND THE SURFACE BEFORE DESIGNING THE COATING.

Barbecue Cooking Grate & Pan Supports — Direct exposure to open flame, food contact, thermal shock and wear from metal spatulas/brushes. Before designing the right coating, we evaluate the material chemistry, the geometry and the service conditions together.

PART DIAGRAM — BARBECUE COOKING GRATE & PAN SUPPORTS



COATING CROSS-SECTION



Five questions define a coating system

1. **MATERIAL**
   Grey cast iron (GJL) or cast steel grate; heavy-section bars and crossings. A food-contact surface exposed to wear.

2. **SURFACE**
   The casting surface is opened by grit blasting; sand, oil and residues are removed, and preheating reduces outgassing.

3. **GEOMETRY**
   Round bars, crossing points and sharp ends; in wet enamel, risk of runs/drip build-up and outgassing from casting pores.

4. **SERVICE CONDITIONS**
   Direct exposure to open flame, food contact, thermal shock and wear from metal spatulas/brushes

5. **PRODUCTION TARGET**
   Medium-high volume; a food-safe, wear-resistant and consistent matt/gloss black enamel look.

CONCLUSION: For the Barbecue Cooking Grate & Pan Supports, the goal is not just a good-looking finish; it is a pore-free enamel surface with good adhesion against wear that withstands open flame, thermal shock and food contact.

FROM SURFACE TO PROCESS ENGINEERING FLOW

The Barbecue Cooking Grate & Pan Supports 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 + surface
03 **ENAMEL** Slip + density
04 **APPLICATION** Dipping / spraying
05 **FIRING** Drying + furnace
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

Grit blasting + annealing open the casting skin and release gas from pores; controlled preheating before dipping.

CORE TARGET
Clean, active, uniform, repeatable surface

C. Enamel System Selection

A well-adhering wet (slip) enamel suited to open flame, thermal shock and food contact is selected; high adhesion and low chipping tendency against impact/wear are targeted.

DECISION CRITERIA
Durability • appearance • service life • cost

D. Application Engineering

Wet (slip) enamel is applied by dipping/spraying; dip-and-drain geometry, rotation and drain time are set to prevent runs and pooling at bar ends and crossings, followed by fusion firing.

GEOMETRY EFFECT
Bar ends • Crossing • Casting pore

Managing the process with data, not by eye

µm
COAT THICKNESS
Enamel coat uniformity

g/cm³
SLIP DENSITY
Coat weight and coverage

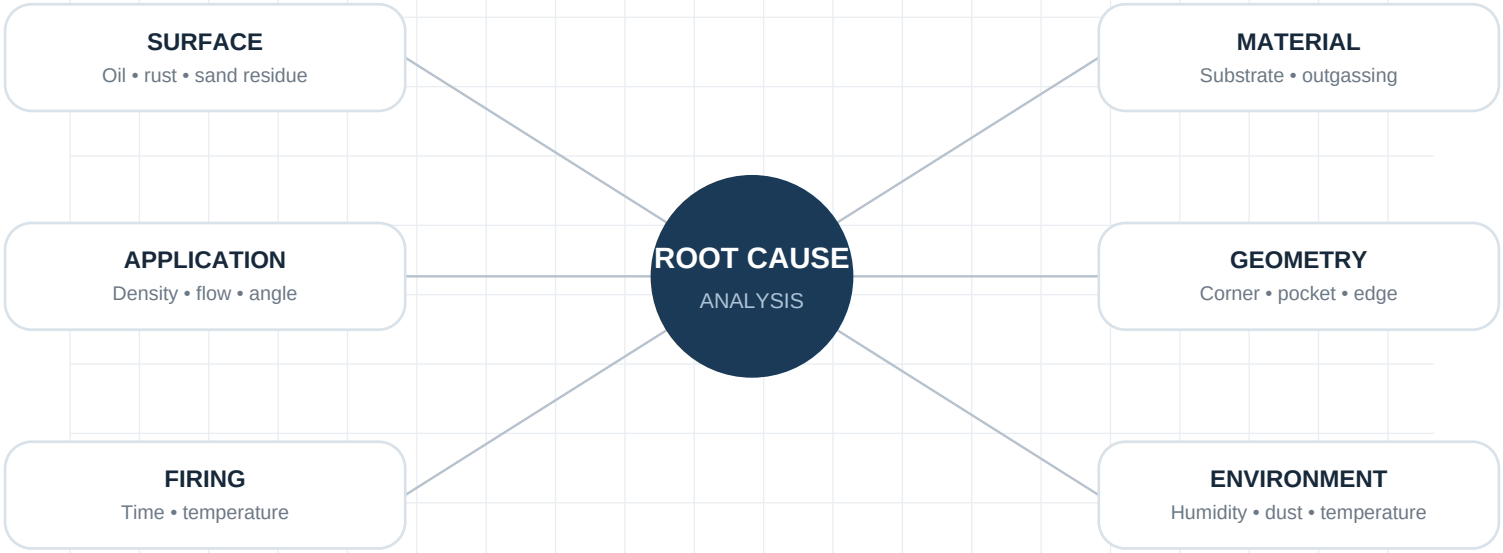
°C
FIRING TEMPERATURE
Actual firing condition

%RH
AMBIENT HUMIDITY
Drying and surface quality

ENGINEERING PRINCIPLE In the Barbecue Cooking Grate & Pan Supports 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 Barbecue Cooking Grate & Pan Supports.

THE RIGHT EQUIPMENT, AT THE RIGHT SCALE.

For the Barbecue Cooking Grate & Pan Supports, 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