

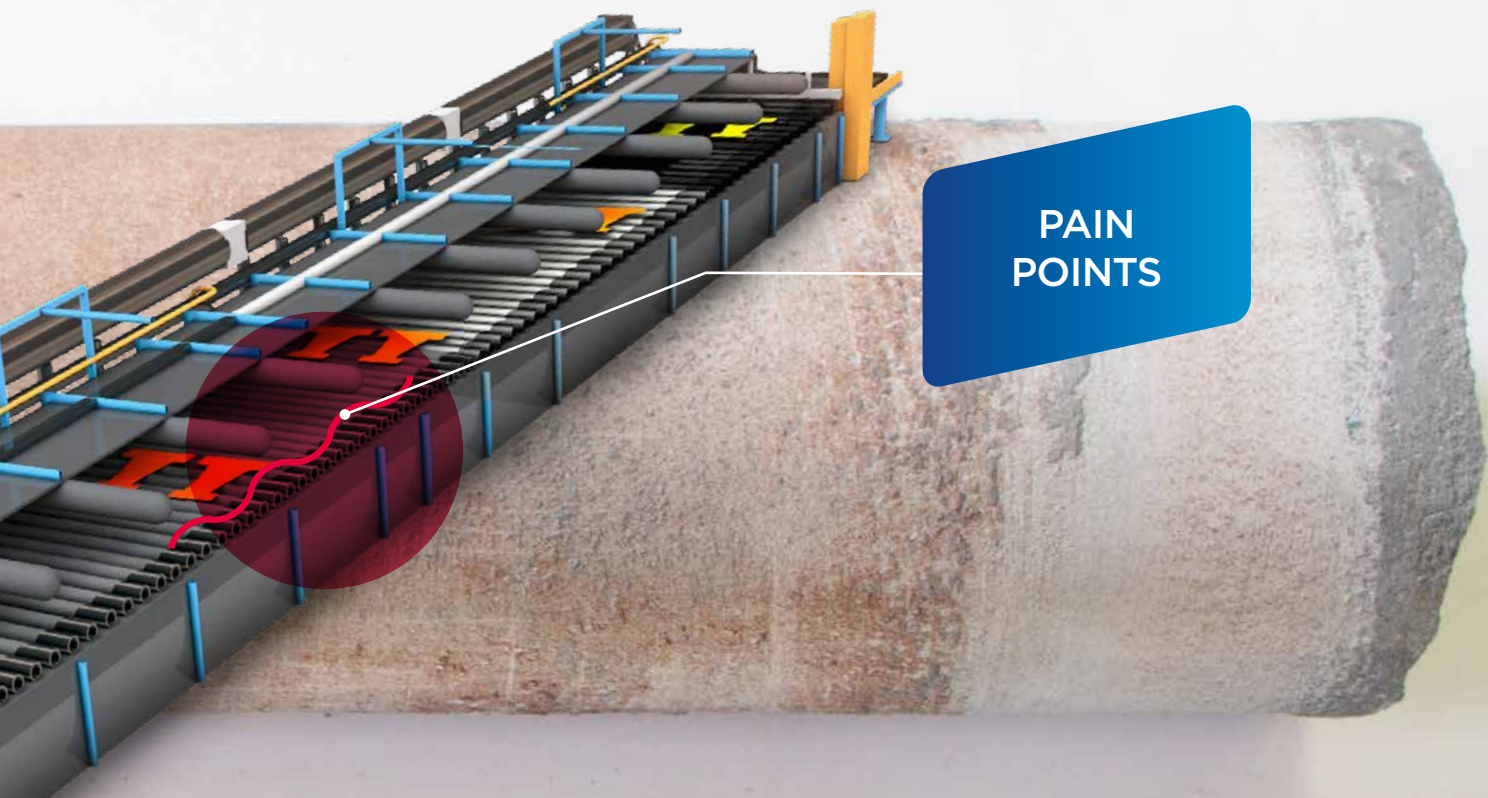
SAINT-GOBAIN PERFORMANCE CERAMICS & REFRACTORIES

DURAFORM® CERAMIC ROLLERS

FOR HOT STAMPING
APPLICATIONS




SAINT-GOBAIN



1. BREAKAGES

ENTRY

HEATING

HIGH CONTAMINATION

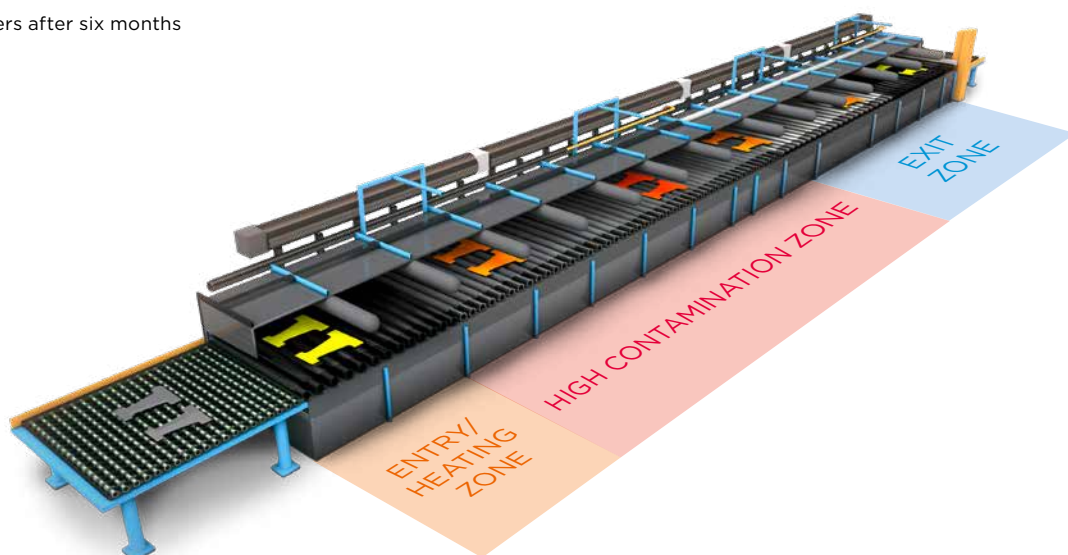
EXIT ZONE



Mullite rollers after six months

2. ALSI CONTAMINATION

HIGH CONTAMINATION



YOUR CHALLENGES

In the direct hot stamping process, a well-controlled roller hearth furnace plays a key role regarding the productivity of the whole line. Greater importance is given to the reliability of this production step as a result of recent trends of vehicle light-weighting and the transition to EVs.

Coated metal blanks experience a partial melting of the coating in the contamination zone. This melted coating subsequently transfers onto the rollers where it penetrates the ceramic and accumulates.

This phenomenon results in the following operational challenges:

- Frequent, unexpected downtime
- Increased maintenance
- Reduced throughput
- Uneven path for sheets in furnace - Automation problem
- High stock level of spare rollers needed

HOT STAMPING LINES

DRAWBACKS WITH EXISTING TECHNOLOGIES FOR CERAMIC ROLLERS

AlSi contamination of base material



FREQUENT DOWNTIME

to clean and replace broken rollers (particularly during heating and cooling)

Strong AlSi build-up & sticking



HIGHER & UNPREDICTABLE MAINTENANCE COSTS

of rollers when shifting production to different alloy grades, blanks and types of coating

Deflection / bending / warpage of rollers



LOSS OF PRODUCTIVITY

due to drifting / misalignment of metal blanks in the furnace

OUR SOLUTION

We offer our total furnace solution that specifically addresses pain points in the effected zones. It consists of innovative ceramic materials designed to meet your needs:



PRODUCTIVITY



QUALITY



SUSTAINABILITY

OUR SOLUTION

SiC ROLLER WITH A PROPRIETARY COATING

We understand your challenges associated with hot stamping coated steels. This experience enables us to provide tailored solutions combining several high-performance ceramics, saving you time and money. Our DuraFORM® silicon carbide rollers enable you to achieve greater levels of productivity while reducing operational costs associated with downtime for maintenance and repairs. The use of this technology in your roller hearth furnaces will support your performance and OEE objectives.

TAILOR-MADE MATERIALS & SOLUTIONS



BENEFITS



Extended service life



Reduced maintenance cost/time for cleaning/replacement (OEE+)



Reduced waste & cost - Reusable after refurbishment at Saint-Gobain



Reduced breakage during heating and cooling



Reduced sticking of blank coating on roller & low diffusion into the base material



Reduced bending/warpage/deflection

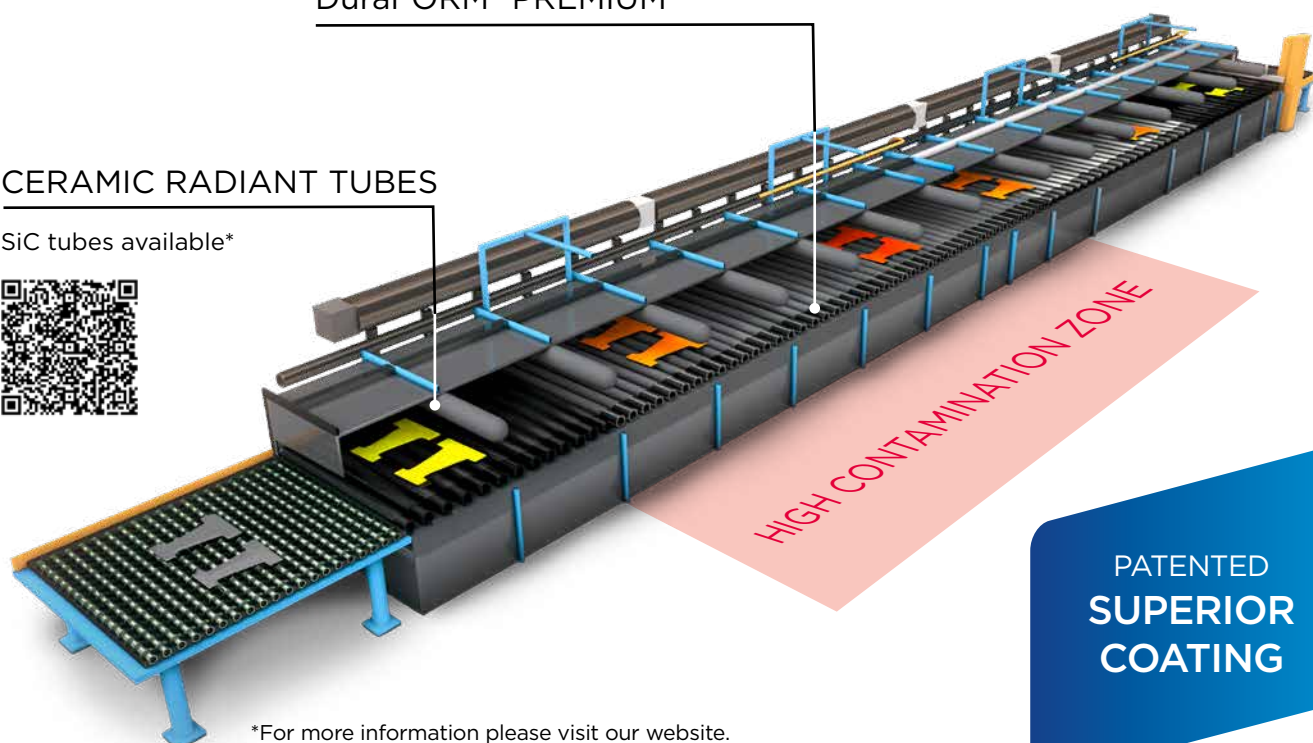


No oscillation required

DuraFORM® PREMIUM

CERAMIC RADIANT TUBES

SiC tubes available*



*For more information please visit our website.

PATENTED
SUPERIOR
COATING

DURAFORM® PREMIUM

There are two key elements to our solution: the engineered base material and the proprietary coating. This combination provides a strong SiC matrix that is protected by a patented coating, reducing sticking and buildup of the blanks' coating and the diffusion into the roller.

ADVANCED BASE MATERIAL

- ✓ Reduced unexpected breakage due to thermal shock
- ✓ Reduced bending and deformation due to strong SiC matrix
- ☆ Structural integrity maintained during operation & maintenance

PATENTED COATING SOLUTION

- ✓ Contamination of AlSi to the base material avoided
- ↑ % Easy removal of surface AlSi
- ↩ ✓ Saint-Gobain roller refurbishment offered, reducing cost

USEFUL
IN ALL
ZONES



CASE STUDY

The entire furnace of a leading car manufacturer was equipped with DuraFORM® Premium rollers.

RESULT

Superficial contamination with no penetration to the body.

100% NITRIDE BONDED SiC



SiC ROLLERS AFTER 12 MONTHS



Before



After

WHY SILICON CARBIDE?

Silicon carbide, often abbreviated to SiC, is an engineered technical ceramic renowned for its outstanding thermomechanical characteristics. High-temperature strength and excellent thermal shock resistance combine to give silicon carbide ceramics the leading edge in extremely demanding thermal processes; among these is the hot stamping of automobile components.

FEATURES



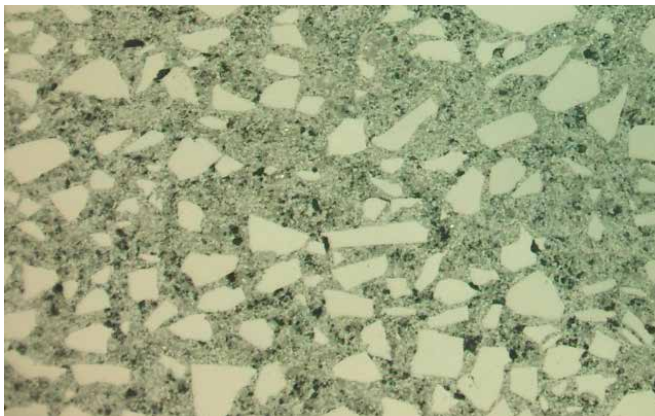
High thermal shock resistance



Max. service temperature up to 1450°C



High mechanical strength up to 180 MPa



Microscopic image of nitride bonded SiC at 100x magnification

NITRIDE BONDED SiC

14

Si₃

SILICON

28.085

7

N₄

NITROGEN

14.007

OUR MATERIALS DELIVER VALUE

With over 125 years of experience with silicon carbide, today we leverage production capability in North America, Europe and Asia to support customers globally. Our material capabilities include:

- Sintered Silicon Carbide (SSiC)
- Siliconized Silicon Carbide (SiSiC)
- Recrystallized Silicon Carbide (ReSiC)
- Nitride-Bonded Silicon Carbide (N-SiC)
- Oxide-Bonded Silicon Carbide (O-SiC)
- Mullite
- Fused Alumina and Magnesia

SAINT-GOBAIN 2023

Derwent
Top 100
Global Innovator
2023

Clarivate
Analytics



1 IN 4

PRODUCTS
did not exist 5 years ago



160,000

EMPLOYEES



47.9 BILLION

SALES IN 2023



REPRESENTED IN 76

COUNTRIES



-34 %

**CARBON EMISSIONS
REDUCTION**
(vs. 2017 on scope 1+2)



3

MAIN R&D CENTRES

OUR PURPOSE

MAKING THE WORLD A BETTER HOME.

OUR MISSION

Saint-Gobain designs, manufactures and distributes materials and solutions which are key ingredients in the well-being of each of us and the future of all.

**WE ARE COMMITTED TO
ACHIEVING NET ZERO
CARBON EMISSIONS BY 2050**

SAINT-GOBAIN

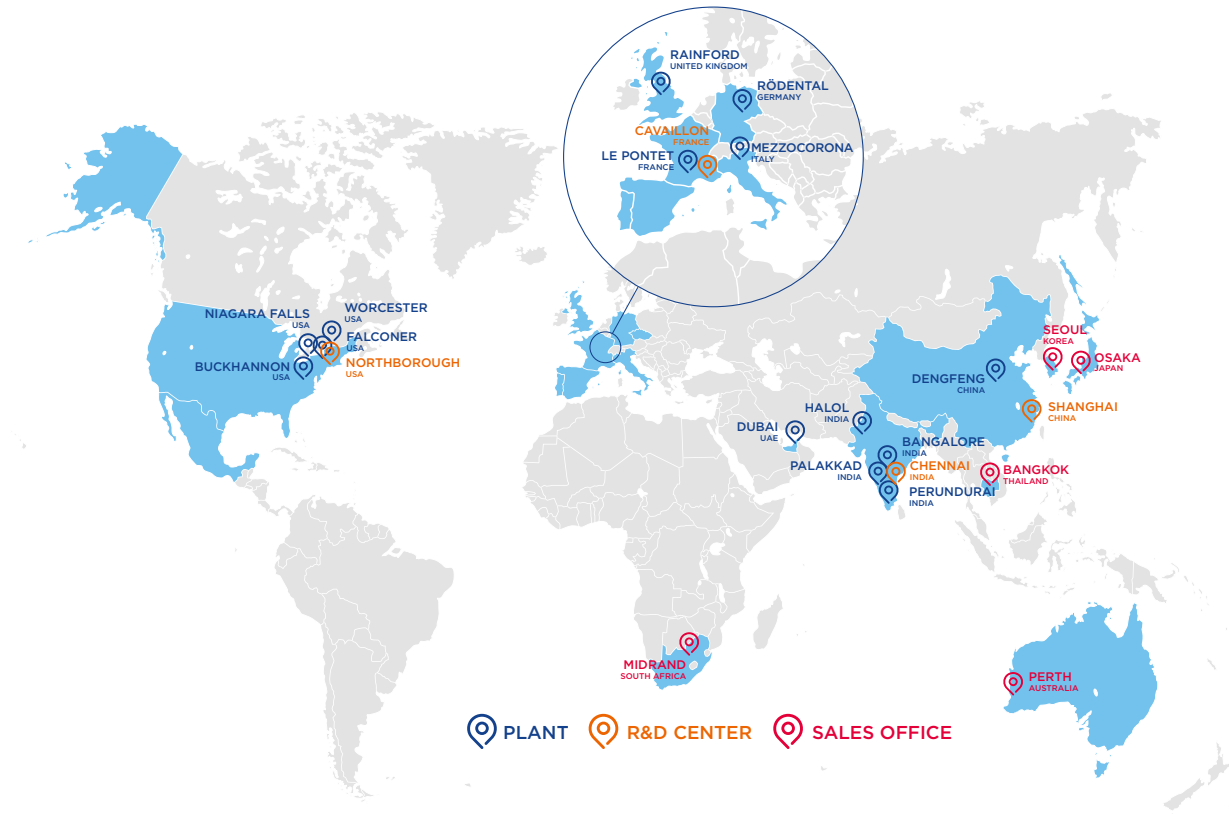
PERFORMANCE CERAMICS & REFRACTORIES

OUR MISSION

To design, develop and supply solutions and services for extreme operating industrial conditions. Our engineered ceramics and refractory products are manufactured to the highest industrial standards and deliver enhanced performance while minimizing environmental impact.

PIONEERING CERAMIC SOLUTIONS FOR EXTREME INDUSTRIAL APPLICATIONS AND A GREENER WORLD.

OUR GLOBAL PRESENCE



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