



SAINT-GOBAIN PERFORMANCE CERAMICS & REFRACTORIES

DuraFORM™ CERAMIC ROLLERS FOR HOT STAMPING APPLICATIONS





PAIN POINTS

1. BREAKAGES

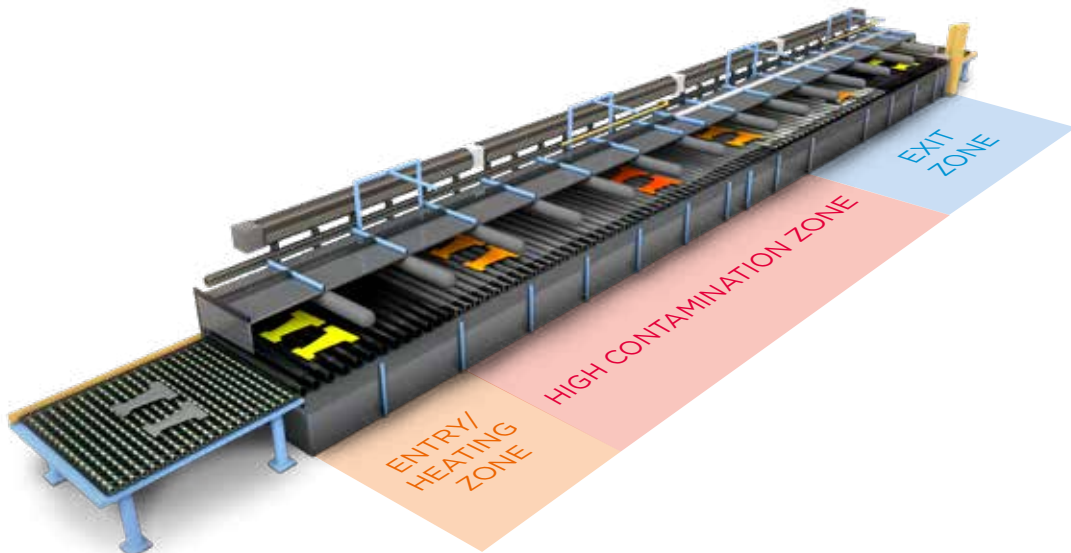
ENTRY / HEATING / HIGH CONTAMINATION / EXIT ZONE



Mullite rollers after six months

2. AISI CONTAMINATION

HIGH CONTAMINATION ZONE



YOUR CHALLENGES

In the direct hot stamping process, a well-controlled roller hearth furnace plays an important role with regards to the productivity of the whole line. In view of the light-weighting and EV trends, the subject is gaining in significant importance.

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

This phenomena is the cause of several difficulties like:

- 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

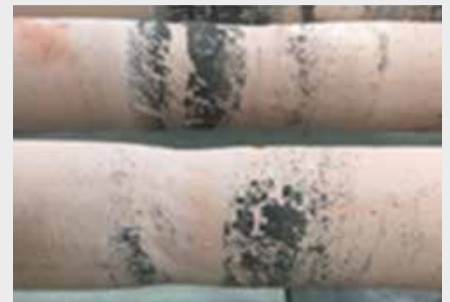
AISI contamination of base material



Strong AISI build-up & sticking



Deflection / bending / warpage of rollers



FREQUENT DOWNTIME

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



HIGHER & UNPREDICTABLE MAINTENANCE COSTS

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



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

SiC ROLLER WITH PROPRIETARY COATING

We understand the challenges with hot stamping coated steels. Therefore, we provide 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. By applying them to your roller hearth furnace, they will support your performance and OEE objectives.

TAILOR-MADE MATERIALS & SOLUTIONS



BENEFITS

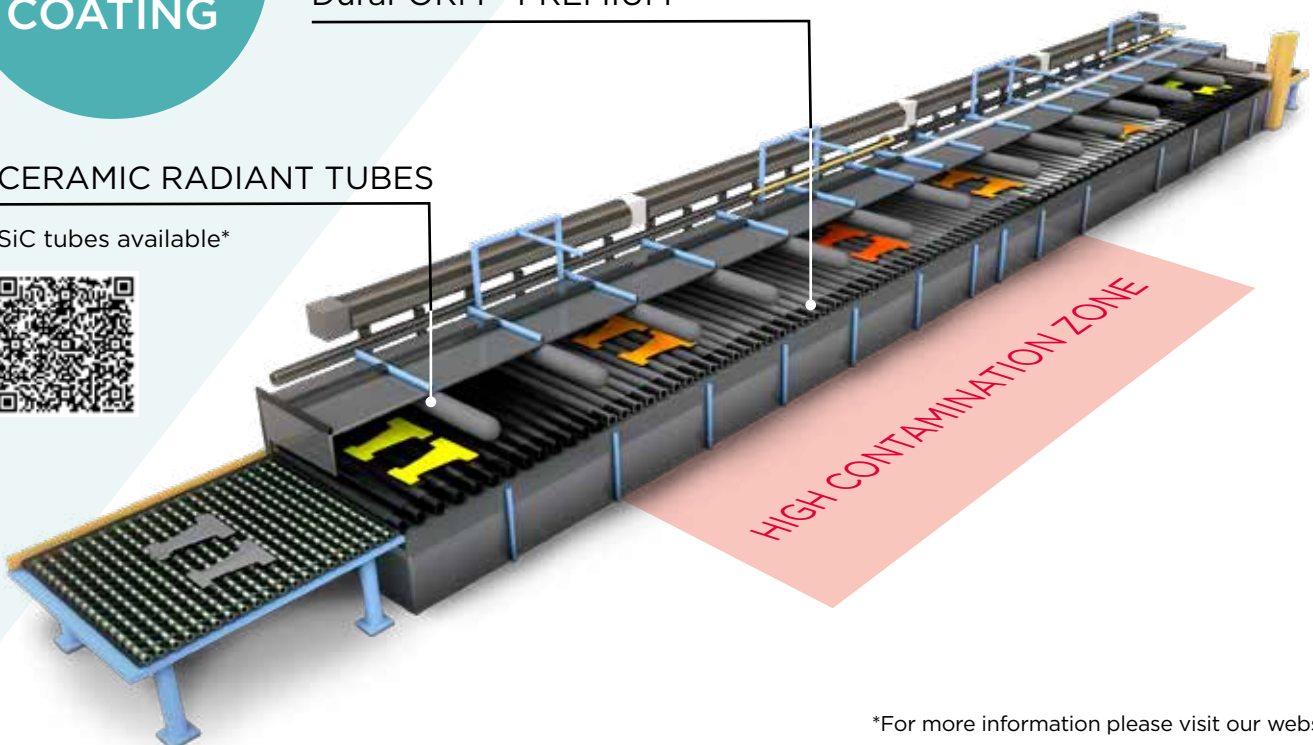
- Extended life time*
- No bending / warpage / deflection
- No oscillation required
- No breakage during heating and cooling
- Less sticking of blank coating on roller & low diffusion in the base material
- Reducing maintenance cost/time for cleaning/ replacement (OEE+)
- Reusable after refurbishment - waste & cost reduction

PATENTED SUPERIOR COATING

DuraFORM™ PREMIUM

CERAMIC RADIANT TUBES

SiC tubes available*



*For more information please visit our website.

DuraFORM™ PREMIUM

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



ADVANCED BASE MATERIAL

- ✓ No unexpected breakage due to thermal shock
- ✓ No bending and deformation due to strong SiC matrix
- ☆ Structural integrity during operations & maintenance

PATENTED COATING SOLUTION

- ✓ No contamination of AlSi to the base material
- ↑ % Easy removal of AlSi thereby reducing cleaning efforts
- ← ✓ Refurbishment available for even longer lifetime

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 a synthetic technical ceramic renowned for its outstanding thermodynamic 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 hot stamping of automobile components.

FEATURES



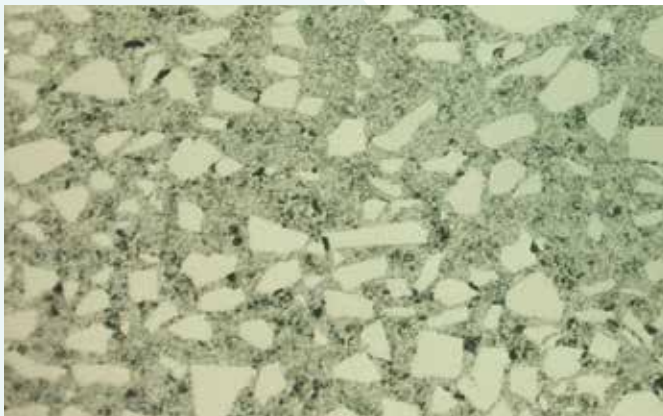
High thermal shock resistance



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:

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

SAINT-GOBAIN



1 in 4
did not exist 5 years ago



170.000
employees



sales of
€ 42.6 billion



represented in
70
countries



3.800
researchers



8
main R&D centres

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.

OUR PURPOSE

MAKING THE WORLD A BETTER HOME.



WE ARE COMMITTED TO BEING CARBON FREE BY 2050.

SAINT-GOBAIN

PERFORMANCE CERAMICS & REFRACTORIES

WHAT WE DO

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**.

GLOBAL PRESENCE



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