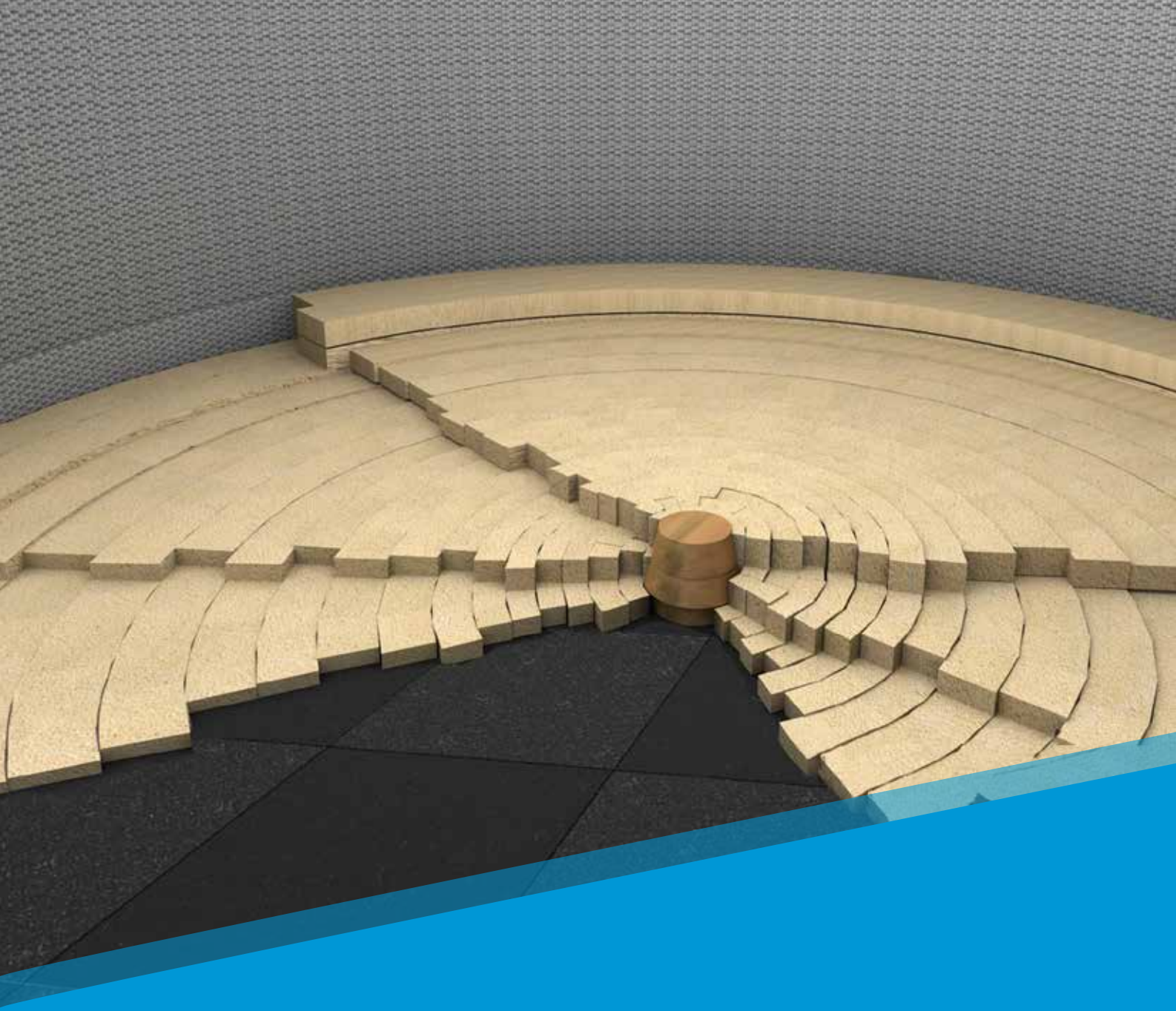


SAINT-GOBAIN PERFORMANCE CERAMICS & REFRACTORIES

Coranit SlagR

NEXT GENERATION CERAMIC CUP

SAINT-GOBAIN

Coranit SlagR ceramic cup wall extends the life of your blast furnace hearth

Saint-Gobain has been a pioneer in ceramic cup technology for the hearth since 1982. It's SiAlON bonded Al203 product was specifically designed to withstand severe conditions inside the hearth of a blast furnace.

Coranit SlagR is the newest of a 3rd generation ceramic cup designed with increased capabilities for resistance to molten iron and slag which thereby reduces the wear of the hearth lining. The 2nd generation ceramic cup is proven to last from 8 to 11 years, while the 3rd generation ceramic cup is expected to increase hearth lining wear an additional 2 to 5 years.

Improved Resistance

Due to its improved resistance to iron, slag, and alkali corrosion, Coranit SlagR ceramic cups perform at high temperatures, even better than traditional alumina products.

		Coranit	Coranit Al	Coranit SlagR
Corrosion profile after iron/slag corrosion test [1550°C/Ar/4h/2 cm^{-1}/FT25/BF Slag]	Corrosion index in slag zone	100	118	65
	Corrosion index in iron/slag interface	100	97	80

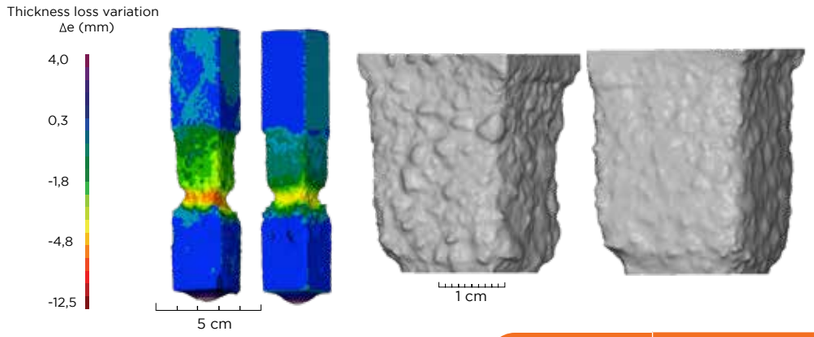


Figure 1: Corrosion profile after iron/slag corrosion test [1550°C/Ar/4h/2 cms^{-1}/FT25/BF Slag]

		Coranit	Coranit Al	Coranit SlagR
Alkali resistance	Length variation (%)	+0.2	+0.3	+0.05

Improved alkali resistance without the formation of a brittle layer. It provides **good dimensional stability** and **limited alkali permeation** in the microstructure.

		Coranit	Coranit Al	Coranit SlagR
Oxidation resistance	Length variation (%)	+0.3	+0.6	+0.25

A maximum oxidation resistance (ASTM C863) is delivered in case of internal leaking of furnace water cooling equipment. It leads to an excellent **dimensional stability** with limited oxidation inside the microstructure.

	Coranit	Coranit Al	Coranit SlagR
Abrasion test - ASTM C704 (volume loss in cm^3)	15-16	11-12	5-6
Abrasion index	140	100	50

A higher mechanical strength of Coranit SlagR enhances the **physical abrasion resistance** needed to counter the direct contact with circulating iron and slag.

Coranit SlagR ceramic cup

Product Information & Differentiation

The quality of our new SiAlON bonded corundum Coranit SlagR is designed to increase ceramic cup lifetime within your blast furnace hearth.

		Coranit	Coranit Al	Coranit SlagR
Typical chemical analysis	Al_2O_3 (%)	79-82	86-90	76-80
	SiO_2 (%)	11-15	8-12	18-22
	Nitrogen (%)	5-6	5-6	6-7
Cystallography	Corundum	80-84	82-87	69-75
	ß' - SiAlON	18-21	9-14	20-26

		Coranit	Coranit Al	Coranit SlagR
Properties and refractoriness	Density ($g.cm^{-3}$)	3.20	3.20	3.21
	Open porosity (%)	14.5	14.5	12.5
	Mean pore diameter [D50] (µ)	2	2	<1
	CCS (MPa)	150	150	250
	MOR at 20°C (MPa)	12	12	20
	Refractoriness under load [N2] to .5% (°C)	>1700	>1700	>1700
	Permanent linear change [5h/1500° C/N2]	0%	0%	0%
	Thermal conductivity [$W/(m^{-1}*K^{-1}$]	2.8	3.2	3.7
	Resistance to CO (g) (ASTM C288)	A	A	A

Benefit

While the salient product features help in extending the lifetime of the hearth Coranit SlagR ceramic cups also deliver:

1. Protection to carbon lining
2. Reduce fuel rate requirement by retaining heat*
3. Improved thermal reserve
4. Ensured stable restarts

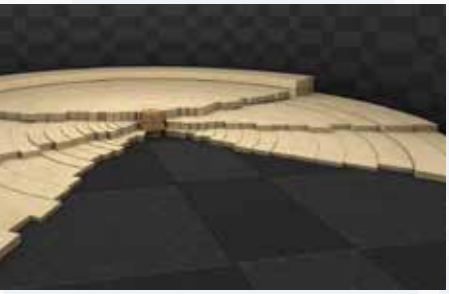
*These benefits lead to reducing the carbon footprint: standard operating condition estimates show if hot metal temperatures increase by 20°C due to Saint-Gobain ceramic cup insulating properties, it represents 0.35% Si reduction of 6 kg of coke. A blast furnace producing 3 million tons/yr could save over $7 million/yr.

SAINT-GOBAIN

Blast Furnace Solution

Saint-Gobain's R&D centers, manufacturing plants, and sales and application engineering specialists are positioned strategically across the globe to enhance our ability to deliver custom-made solutions for every application in the blast furnace.

- Products for every area – upper stack, lower stack, bosh, belly, tuyere belt and hearth
- Engineering design solutions including carbon
- Thermal calculations – thermal expansion, thermo-mechanical and heat flow
- Technical assistance
- Site installation supervision
- Flexible supply, with/without carbon



TOGETHER WE MAKE THE MATERIAL DIFFERENCE

Saint-Gobain is an international business group located in 68 countries. It is one of the 100 largest industrial companies in the world and has a leading position in all its strategic business areas.

Contact Us

Savoie Réfractaires

4, Rue de l'Industrie
69200 Vénissieux
France
Phone +33 (0) 4 78 78 14 38

Saint-Gobain IndustrieKeramik Rödental GmbH

Oeslauer Straße 35
96472 Rödental
Germany
Phone +49 (0) 9563 7240

www.ceramicsrefractories.saint-gobain.com

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