

Ceramic Systems

for the
Sanitaryware Industry

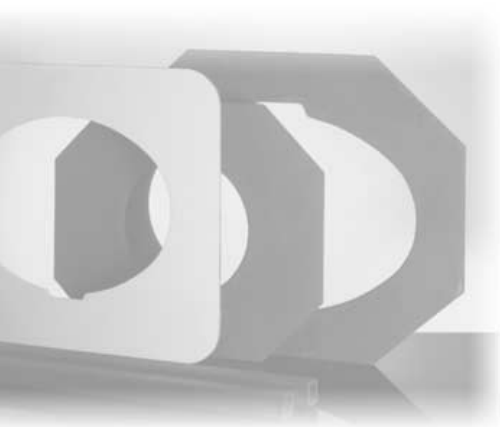


Ceramic Systems for the Sanitaryware Industry

Saint-Gobain provides kiln furniture for all sanitaryware firing systems. Large-size ceramic products are fired single and multi-deck. For these applications beams and profiles are used out of Silit® SK, for single supports as well as superstructure systems. Especially for multi-

deck systems, up to a 50% increase in fill can be achieved due to a higher setting density. Stable beam constructions allow the use of thinner slabs or vanity basin setters. Lightweight multi-positional SiC pillars have been developed for multi-deck structures, reducing the

kiln furniture mass by up to 50%. The improved temperature distribution and the faster firing cycles guarantee higher productivity, less rejects and reduced energy consumption.



Advantages of SiC firing systems:

- Weight reduction through light and stable sub-structure with Silit® SK beams
- Excellent circulation of fired products
- Improved service-life of beams and lav setters without significant bending
- Higher flexibility
- Increased capacity
- Increased profitability and efficiency

Kiln furniture for sanitaryware

Our SiC kiln furniture for the sanitaryware industry is produced via different manufacturing processes according to the conditions of

the application. It is possible to make complicated hollow parts by our slip-casting process. Special extrusion machines also enable us to

meet the special fine dimensions of construction components, such as support posts, beams and rollers.

Typical products for this application include:

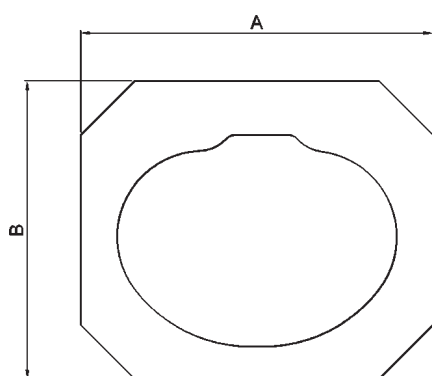
- Vanity basin setters (Lav setter)
- Batts
- Beams
- Supports
- Rollers

Lav Setter for firing vanity basins

In the sanitaryware industry lav setters are used for the horizontal firing of vanity basins. The use of lav setters guarantees the flatness of fired products. We select the

optimum geometry of the lav setters according to the customer's requirements. These specially designed slabs eliminate costly machining of the support line

and improve overall product quality. By using coated lav setters, sticking of the fired products can be effectively eliminated.



Product	A (mm)	B (mm)	d (mm)
Lav setter	300 - 800	300 - 600	8

Profiles - Beams - Support Posts in the sanitaryware industry

The use of load-bearing construction components in sanitaryware firing systems requires careful and accurate calculations. We are always

at your disposal to make these calculations and to ensure the proper cross-section for profiles, beams and supports. Maximum

length for beams in Silit® SK is L=3.5 m.

Typical construction components include:

- Supports with windows
- Beams

Standard dimensions and tolerances of Silit® SK beams and profiles*

Cross section		Tolerance X (mm)	Wall thickness s (mm)	Max. Length L ± 2 (mm)
Height H ± X (mm)	Width B ± X (mm)			
20	20	± 1.0	6.0	1500
25	25	± 1.0	6.0	2000
30	20	± 1.0	6.0	2000
30	30	± 1.0	6.0	2000
35	35	± 1.0	6.0	2000
40	20	± 1.0	6.0	2000
40	30	± 1.0	6.0	3000
40	40	± 1.0	6.0	3500
50	30	± 1.0	6.0	3000
50	40	± 1.0	6.3	3500
50	50	± 1.0	6.3	3500
50.8	44.5	± 1.0	6.3	2700
60	40	± 1.0	6.8	3500
60	50	± 1.2	6.8	3500
60	60	± 1.2	7.3	3500
70	50	± 1.4	7.5	2500
76.2	38.1	± 1.4	7.5	2500
80	40	± 1.4	8.0	2500
80	60	± 1.4	8.5	2500
80	80	± 1.4	9.0	2500

*) Technical data, right of correction reserved

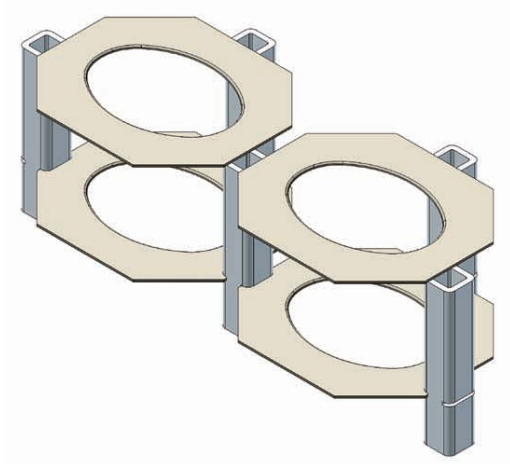
Typical constructions for firing sanitaryware

Firing systems for sanitaryware show excellent results for single or multiple decks and feature low mass with high flexibility. The use of long and hollow SiC supports and beams enables the construction of single or multi-deck superstructures over

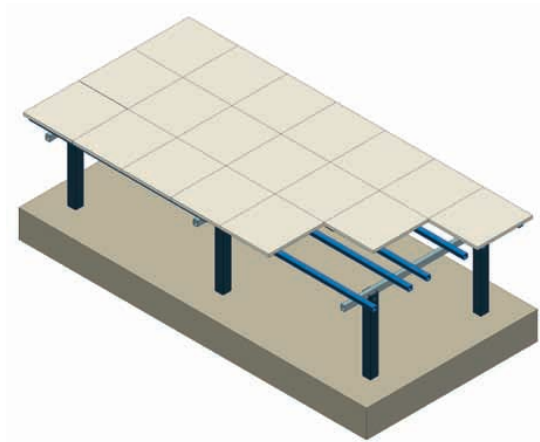
wide setting areas. Vertical support posts are reduced to a minimum and kiln car insulation can be optimized.



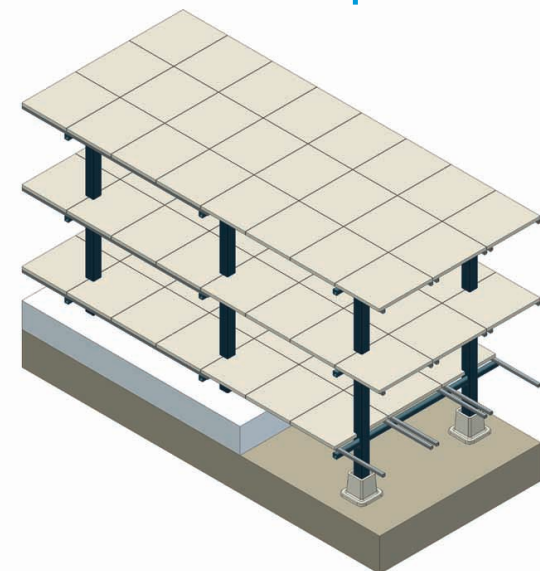
Lav setter system with stable sub-structure



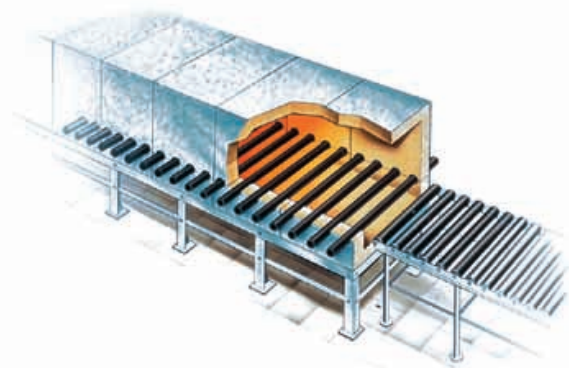
Single level superstructure



Multi-level superstructure



Rollers for firing sanitaryware



Standard dimensions and tolerances of Silit® SK rollers*

Diameter		Tolerance X (mm)	Max. Length L ± 2 (mm)
Outer D ± X (mm)	Inner d (mm)		
20	13	± 0.3	2000
25	18	± 0.3	2500
30	21	± 0.4	3000
31.7	22.5	± 0.4	3000
34	24	± 0.4	3550
35.5	25	± 0.5	3550
38.1	27.8	± 0.5	3550
40	30	± 0.5	3550
42	32	± 0.5	3550
45	34	± 0.6	3550
50.8	38.1	± 0.6	3550
55	43	± 0.9	3550
60	47	± 1.0	3550
63.5	50.8	± 1.2	3550
65	52	± 1.2	3550
70	56	± 1.2	2000
76	60	± 1.4	2000
80	65	± 1.4	2000
90	76	± 1.6	2000
96	80	± 1.8	2000

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Special machining on the rollers like holes, long holes or slots is available.

Material properties

Our materials are made from the hardest of all raw materials existing on the ceramic market - silicon carbide (SiC). The specific chemical composition, purity and ceramic

structure of this material fulfil all of the conditions for an all-round industrial application. We produce ceramic components made from oxide bonded SiC, R-SiC,

N-SiC and SiSiC. The surface of all ceramic products may be subjected to a treatment of glazing, polishing or grinding.

High performance SiC materials have the following advantages and characteristics:

- Excellent mechanical strength
- Excellent temperature stability
- Excellent chemical resistance
- Excellent thermal conductivity
- Excellent thermal shock resistance
- Excellent oxidation resistance
- Shape stability at high temperature

Material	Unit	Silit® SK	AnnaCarbid® 94	AnnaSicon® RTH	Advancer®	Crystar® 2000
SiC-content	%	81	> 90	66	68	> 99
Max. application temperature ¹⁾	°C	1350	1500	1550	1550	1600
Bulk density	kg/dm ³	3.0	2.5	2.8	2.8	2.7
Open porosity	Vol %	0	18	<1	<1	15
Modulus of rupture 20°C	MPa	260	-	160	160	80
1400°C	MPa	260 ²⁾	20	180	180	90
Modulus of elasticity 20°C	GPa	300	-	235	250	240
Thermal conductivity 1000°C	W/(m*K)	40	-	20	20	25
Thermal expansion (20°C...1100°C)	K ⁻¹ *10 ⁻⁶	4.5	5.0	4.4	4.4	4.8

1) dependant on the corresponding operation conditions, 2) measured at T=1200°C

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**Saint-Gobain IndustrieKeramik
Rödental GmbH**

PF 1144 · 96466 Rödental / Germany
Oeslauer Straße 35 · 96472 Rödental

 +49 (0) 9563 724 0

 +49 (0) 9563 724 356

 info@sgik.saint-gobain.de

www.refractories.saint-gobain.com