

Tailor-made solutions for the glass industry.

Top quality refractory materials.



RATH

Specialist for top technology in high temperature.

**Quality with an optimum
price-performance ratio.**

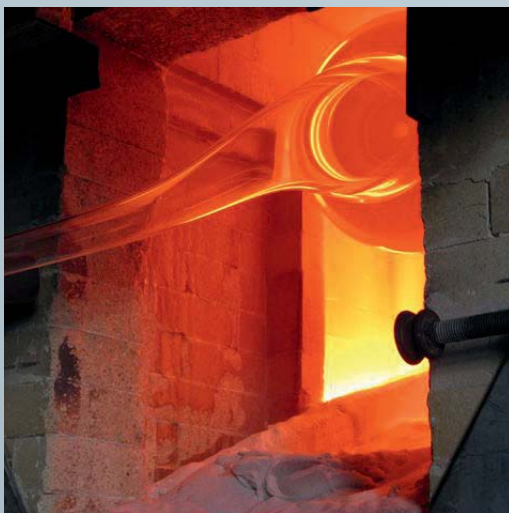


The Rath sales team

Rath offers the ideal combination of tradition and innovation. The result: optimum refractory solutions for a wide range of applications. All items in our broad product portfolio are manufactured in-house. With carefully selected materials and precision processing techniques, we can guarantee top quality.

The Rath sales teams are focussed on the sector and familiar with its specific requirements; our technical offices provide the necessary engineering and assembly know-how. This means we can offer our customers individual, complete refractory solutions with an optimal price-performance ratio.

Efficient production: a crystal-clear goal.



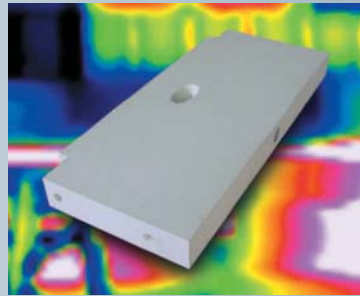
Danner system

The window letting in the light; the wine bottle preserving the bouquet; the mirror which “examines” us each day: glass is a key element of our daily lives. Great expertise is needed to produce it and the energy costs are high. The quality of the refractory material is a key factor, both technical and economic, in this complex process.

Rath offers a wide range of refractory and insulating products for all types of glass melting tanks, regenerative U-flame or cross-fired furnaces, recuperative furnaces, oxy-fuel or electro furnaces as well as complete forehearth channels.

A flexible company for special requirements.

We are always able to react flexibly to customer demands thanks to optimised structures and production processes within the Rath Group. No matter if production deadlines, single pieces or special applications, our quality-oriented customer services can satisfy all your requirements.



Feeder cover block

Our product portfolio ranges from dense refractory bricks and cast components to refractory, insulating and gunning castables, insulating bricks and other insulation

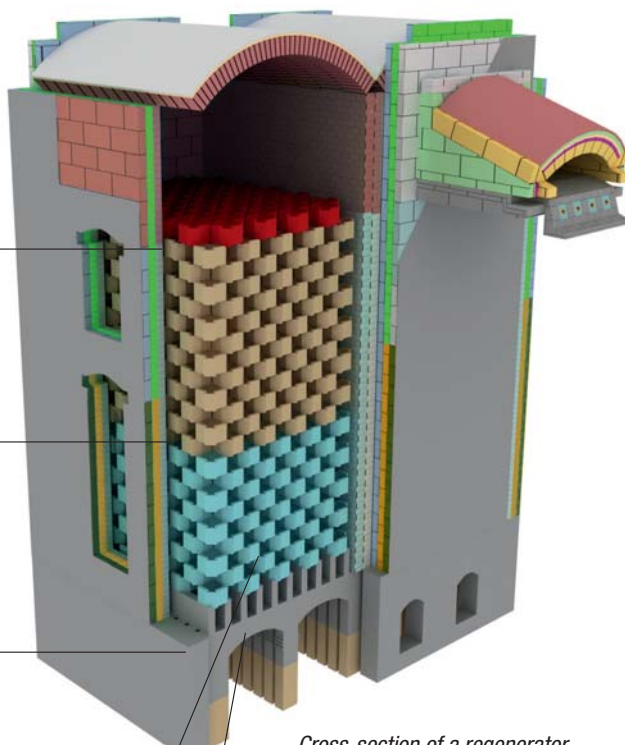
materials such as high temperature wool, vacuum-formed and micro porous products.

Alurath M 701
Porrath FL 28-09
Porrath FL 24-06
Alporit AP 23-li
Alsitra Mat 1300

Alurath M 701
Porrath FL 28-09
Porrath FL 25-10
Porrath 900
Kerform KVS 081

Silrath AK 65
Porrath FL 26-08
Alporit AP 23-li
Porrath 900
Kerform KVS 081

Silrath AK 60
Alporit AP 23-li
Porrath 900
Kerform KVS 081



Cross-section of a regenerator

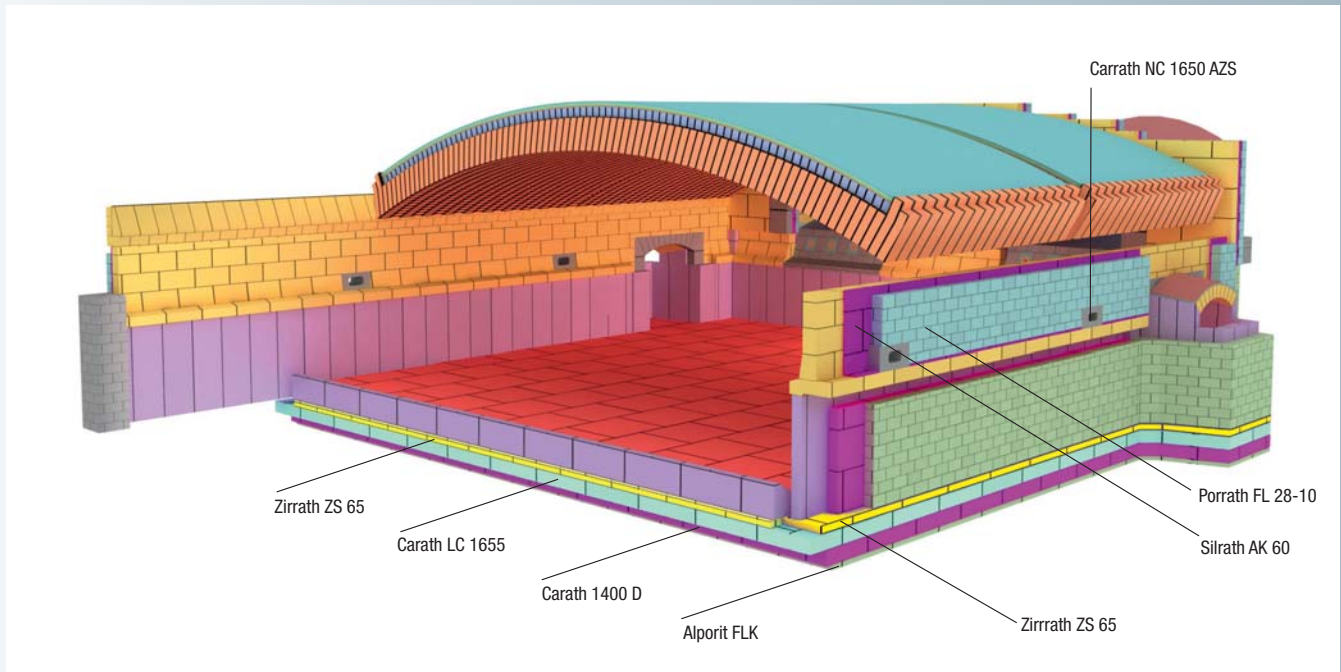
Silrath AK 60 M

Carath LC 1655

Look no further.

Our wide range of products covers all regenerative glass furnace requirements – almost everything you need for regenerative brickwork, superstructure, machined and pre-assembled sillimanite rider arches and multi-layered insulating regenerator lining.

A kaleidoscope of refractory products. Including yours.



Cross section of a melting furnace

Best “ingredients” guaranteed – right down to the sandwich.

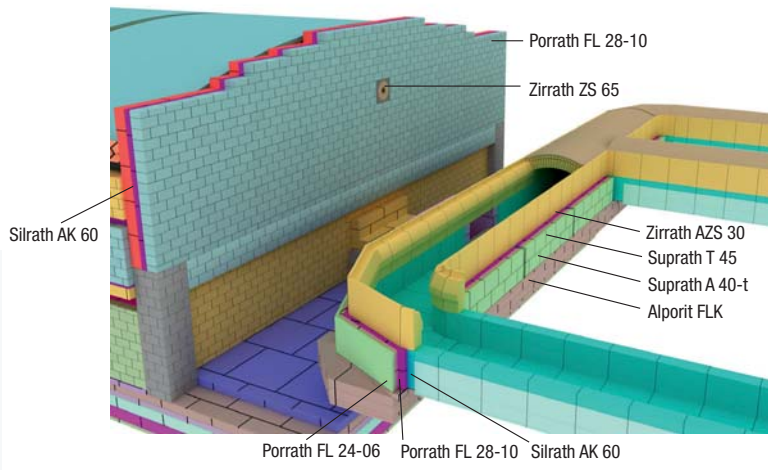


Regenerator



Melting furnace

Another feature of our special range, especially for furnaces for the glass industry are the products for the safety layer and insulating fire bricks installed under the tank blocks. The barrier material is available pressed or cast, these bricks are produced from fireclay or sillimanite, fired, machined and pre-assembled by us. So-called sandwich bricks are also available. These are dense and refractory on the tank block side; the lower section is made of insulating castable material.



Cross section of melting furnace with connecting feeder

Insulating bricks: endless versatility.

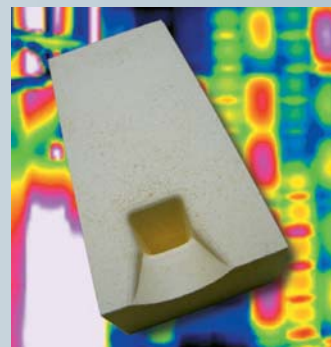
Insulating bricks come in densities of 0.45 to 1.4 g/cm³ for service temperatures from 900°C of up to 1840°C. Large calibre and floor components are also available, as are tailor-made designs for special applications.

Our products are always one step ahead.

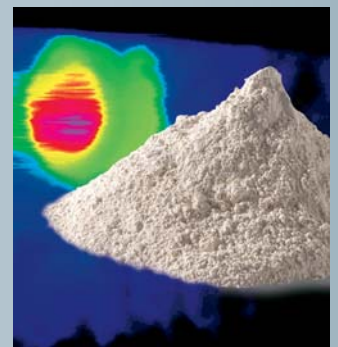
If you trust Rath, why not opt for state-of-the-art products which set the quality and technological standards for the sector. Rath offers the ideal refractory and insulating material for constructing and operating all types of melting furnaces and

connecting units in all areas of glass production:

- flat glass
- container glass
- glass fibre
- crystal
- tableware



Brick



Masses

Dense bricks*

Name	Suprath A 40-t	Suprath T 45	Silrath AK 60	Alurath M 701	Zirrath AZS 20	Zirrath AZS 30	Zirrath ZS 65
Raw material	Fireclay	Fireclay with high mullite content	Andalusite	Mullite	Zircon-mullite	Zircon-mullite	Zircon
Bulk density [g/cm ³]	2.35	2.3	2.6	2.6	2.8	3.2	3.5
Cold crushing strength [MPa]	≥ 60	≥ 40	100	> 130	100	50	110
Porosity [Vol.-%]	≤ 15	≤ 14	≤ 13	15	16	13	14
Chemical analysis [%]							
Al ₂ O ₃	≥ 42	46	61	74	56	48	-
Fe ₂ O ₃	2.10	1.50	1.00	0.50	0.50	0.50	0.15
ZrO ₂	-	-	-	-	20	30	63

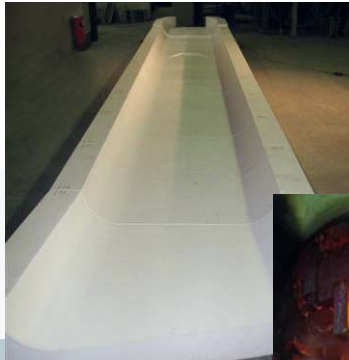
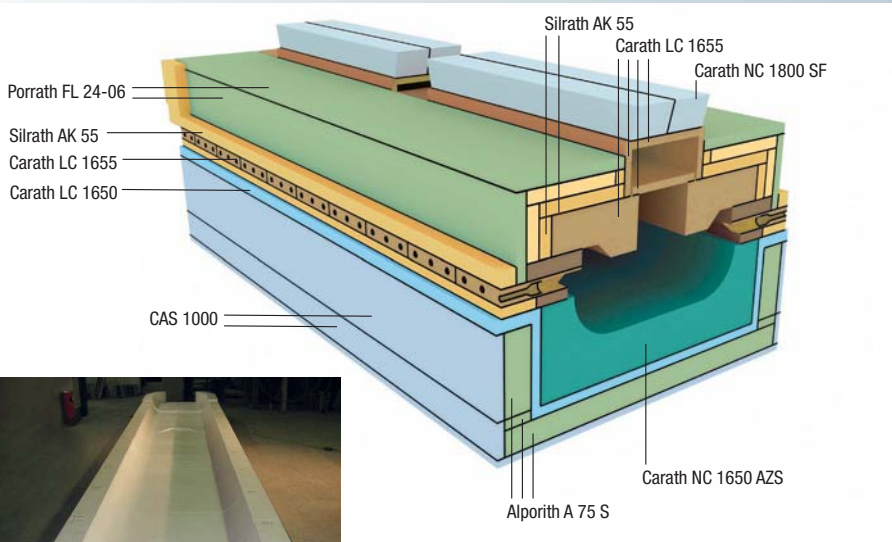
Unshaped refractories / Precast shapes*

	Dense castables	Low-cement castables			No-cement castables			Insulating castables
Name	Carath D 1400	Carath LC 1650	Carath LC 1655	Carath LC 1750	Carath NC 1600 ZS-SF	Carath NC 1650 AZS	Carath NC 1800 SF	Carath FL 1401
Raw material	Fireclay	Tabular alumina	Andalusite	Corundum	Zircon	Zircon-mullite	Corundum	Lightweight fireclay
Material required [kg/m ³]	2250	3000	2550	3000	3500	3200	2850	1400
Cold crushing strength [MPa]	40	100	75	65	110	50	45	25
Service temperature [°C]	1400	1650	1650	1750	1600	1650	1800	1400
Chemical analysis [%]								
Al ₂ O ₃	46	93	63	97	-	48	92	45
ZrO ₂	-	-	-	-	63	30	-	-

* This table contains only an extract of the wide Rath product range.

All from one single source. Everything OK.

Cross section of a feeder



Feeder



Glass drops



Insulating fire brick

Rath can supply its customers with complete forehearts thanks to its extensive product portfolio. This includes zircon-mullite or high alumina foreheart components and construction with foreheart safety and insulating layers (zircon-mullite, sillimanite or mullite).

The channel blocks are machined and pre-assembled. Produced in one of the newest and most modern components precast lines: partially automated with vibration technology. Adherence to the strictest possible quality criteria goes without saying.

Insulating fire bricks*

Name	Insulating fire bricks					Boards	Vacuum-formed products	High temperature wool
	Alporit AP 23-li	Porrath FL 24-06	Alporit FLK	Porrath FL 26-08	Porrath FL 28-09	CAS 1000	Kerform KVS 141	Altra Mat 72
Raw material	Aluminium silicate	Aluminium silicate	Aluminium silicate	Aluminium silicate	Aluminium silicate	Calcium silicate	Aluminium silicate	Aluminium oxide
Classification temperature [°C]	1260	1350	1320	1430	1540	1000	1400	1650
Bulk density [g/cm ³]	0.54	0.64	1.05	0.8	0.90	0.24	0.3	0.06-0.12
Cold crushing strength [MPa]	1.5	1.2	10	3.5	4	1.3	0.3	-
Chemical analysis [%]								
Al ₂ O ₃	40	37	37	52	63	-	55	72
SiO ₂	43	56	55	44	33	50	44	28
CaO	11	-	-	-	-	49	-	-

* This table contains only an extract of the wide Rath product range.

Production in our own factories.

There is one very special feature of Rath: we can always fully guarantee the quality of our highly refractory products, as we manufacture them all ourselves.

State-of-the-art production processes are used in our plants in Europe and the USA. We constantly adapt these processes in line with technical and technological developments as we strive to provide you with top quality.

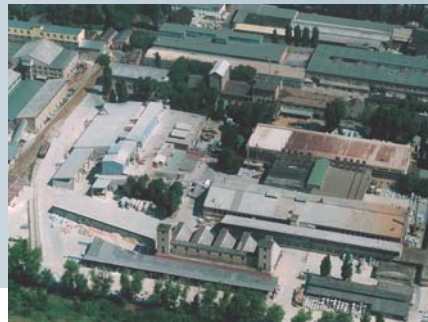
Our approach benefits our customers: high quality products ensure operational safety and reliability over a long period of time. This means less repairs, less breaks in production and lower costs.



Krummnußbaum



Bennewitz



Budapest

Rath meets all ISO criteria.

Quality in production can be measured – with ISO 9001/9002. All companies in the Rath Group are certified according to the strict criteria for this standard. We are doing everything to build constantly on this quality standard.

Our products undergo rigorous testing in our own company laboratories. We also regularly have externally government-authorized test centres which check material characteristics.

Our customers can rest assured that all our products are up to date – and provide, in practice, everything that we have promised.

The Rath Group.

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