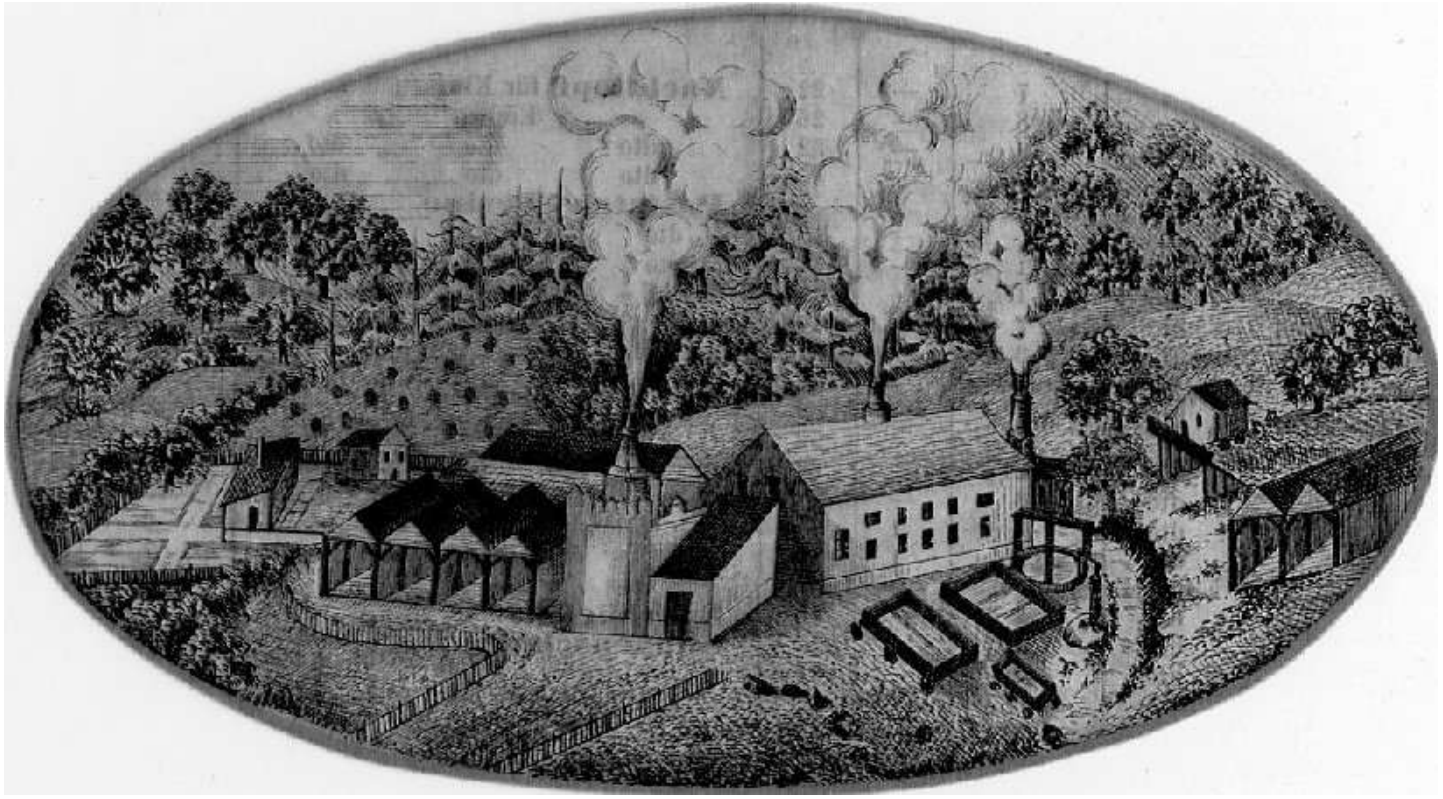
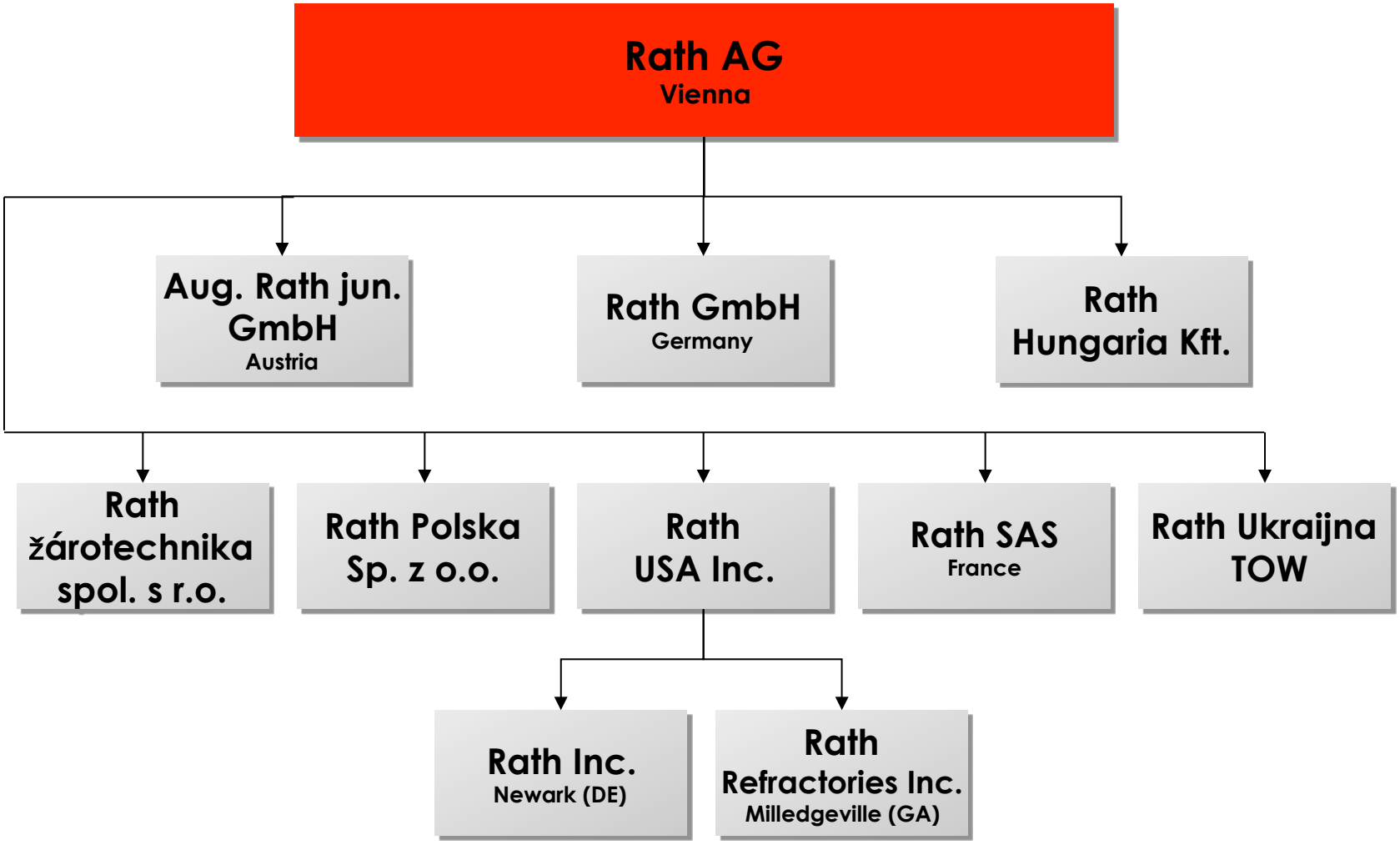
Profile of the Rath Group

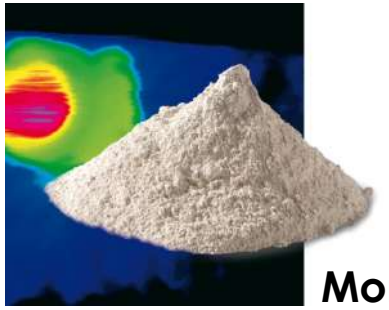
Top technology for individual refractory solutions!

Plant Krummnußbaum (1891)

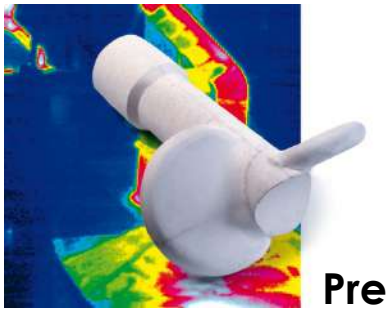



Rath AG
Vienna
Aug. Rath jun. GmbH
Austria
Rath GmbH
Germany
Rath Hungaria Kft.
Rath žárotechnika spol. s r.o.
Rath Polska Sp. z o.o.
Rath USA Inc.
Rath SAS
France
Rath Ukraijna TOW
Rath Inc.
Newark (DE)
Rath Refractories Inc.
Milledgeville (GA)

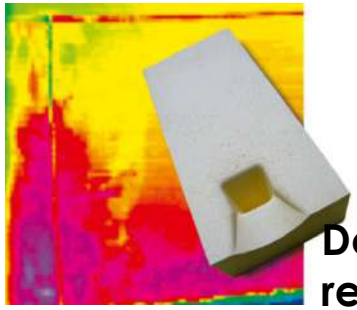
Product range



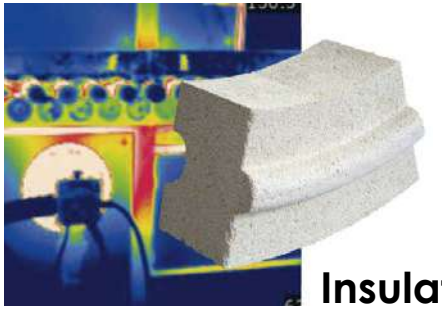
Monolithics



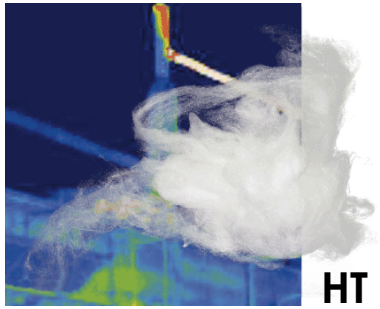
Pre-cast blocks



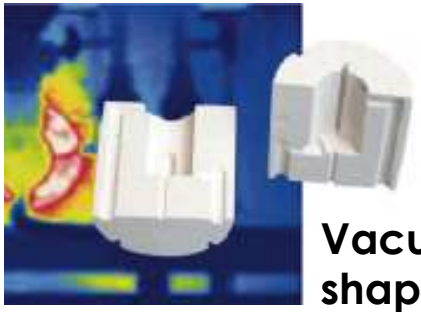
Dense
refractory bricks



Insulating fire bricks



HT insulating wool



Vacuum-formed
shapes

Service

Engineering

- Forehearths and distributors
- Furnaces: lighting glass, technical glass, frits
- Furnace audits: refractory condition, energy efficiency, glass quality

Supervision

Installation

Manufacturing plant

Krummnußbaum,
Austria

- **25,000 t/a bricks and monolithics**
- **500 t/a Vacuum-formed products**

Meißen, Germany

- **400 t/a vacuum-formed products**
- **400 t/a**
  Sliding-gates

Manufacturing plant

Budapest,
Hungary

- **20,000 t/a bricks and monolithics**
- **1000 t/a pre-casted products**

Milledgeville,
(GA) USA

- **8,000 t/a dense bricks**

Manufacturing plant

Bennewitz, Germany

- **5.0 m insulating fire bricks**

Mönchen-gladbach, Germany

- **2,500 t/a**
  aluminum- silicate, aluminium-oxide, and biosoluble wool

Newark, (DE)
USA

- **150 t/a vacuum-formed products**
- **HTIW-shapes**

Manufacturing Units, Sales Offices and Agencies of Rath-Group - worldwide

Austria
- Krumnussbaum

Hungary
- Budapest

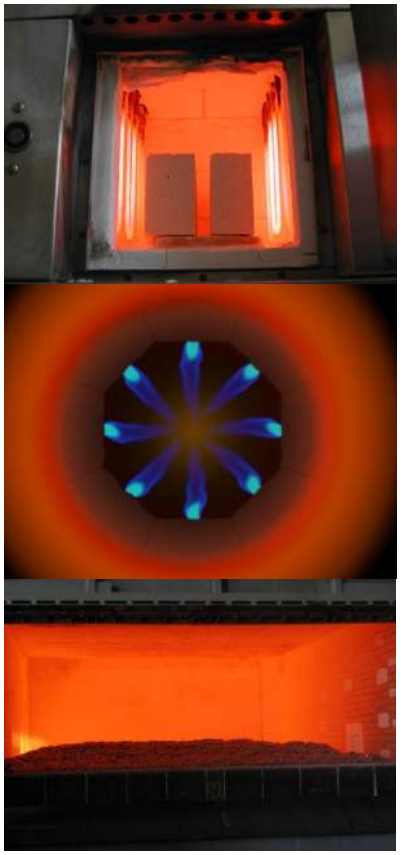
Germany
- Wirges
- Meissen
- Bennewitz
- Mönchengladbach

United States of America
- Newark, DE
- Milledgeville, GA

Customer categories

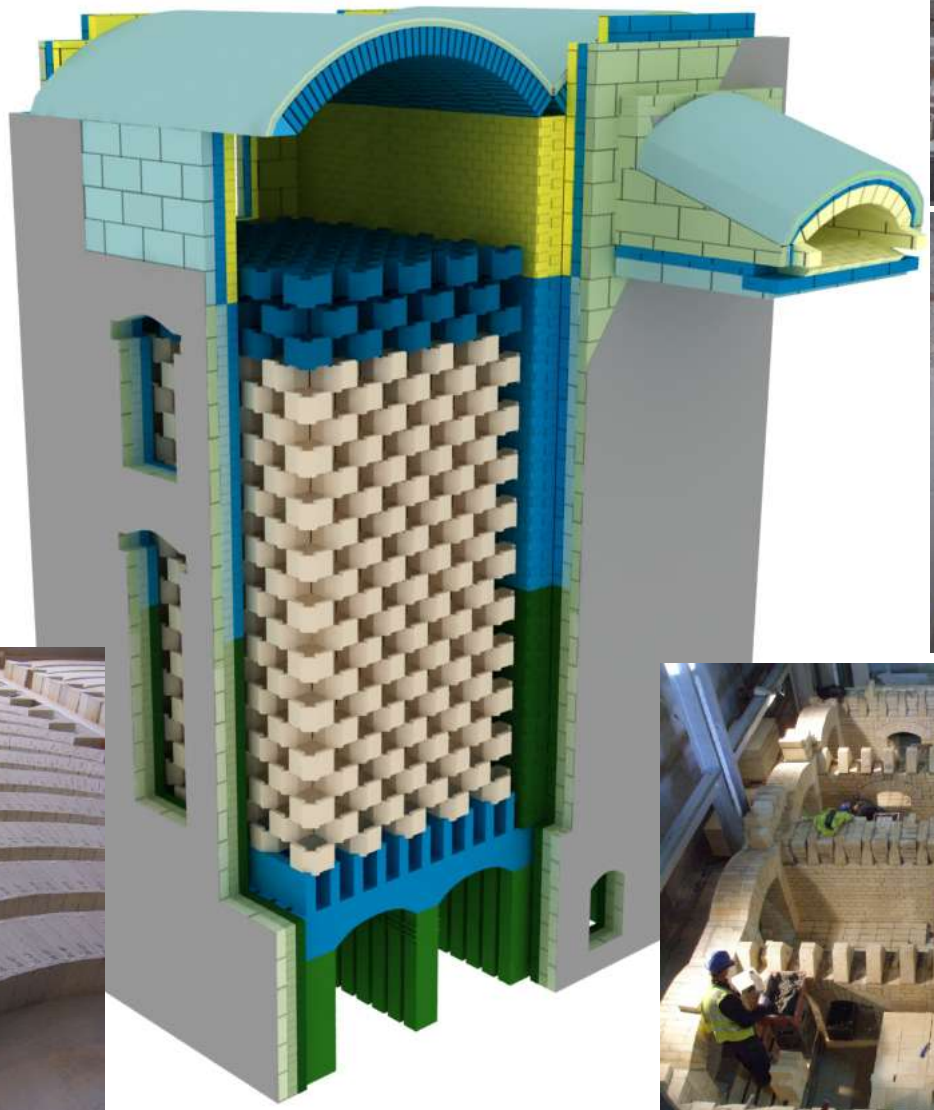
- Iron and Steel industry
- Ceramic industry
- Energy generation and environmental technology
- Petrochemical and chemical industry
- Glass industry
- Non-ferrous industry

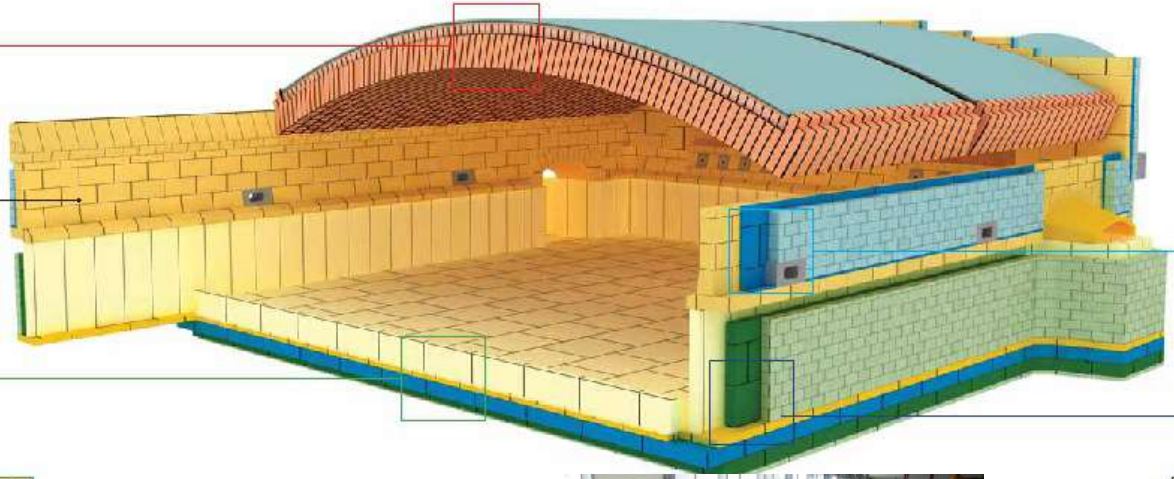
- Plant construction
- Furnace builder
- Domestic fireplace builder

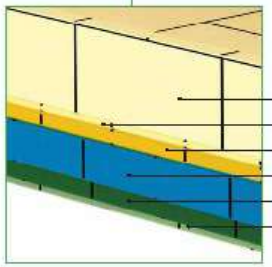


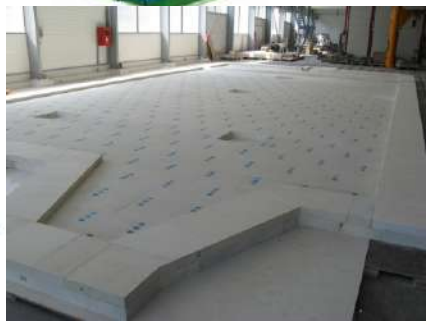
International customers glass industry

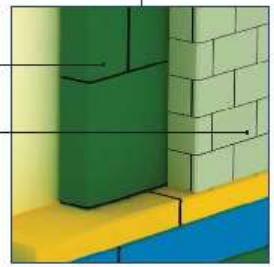
- Nicolaus Sorg GmbH, Germany
- Horn Glasindustries AG, Germany
- Saint-Gobain, France
- General Electric, USA/Hungary
- Swarowski, Austria
- Asfour Crystal, Egypt
- Heinz Glas, Germany
- Sisecam, Turkey



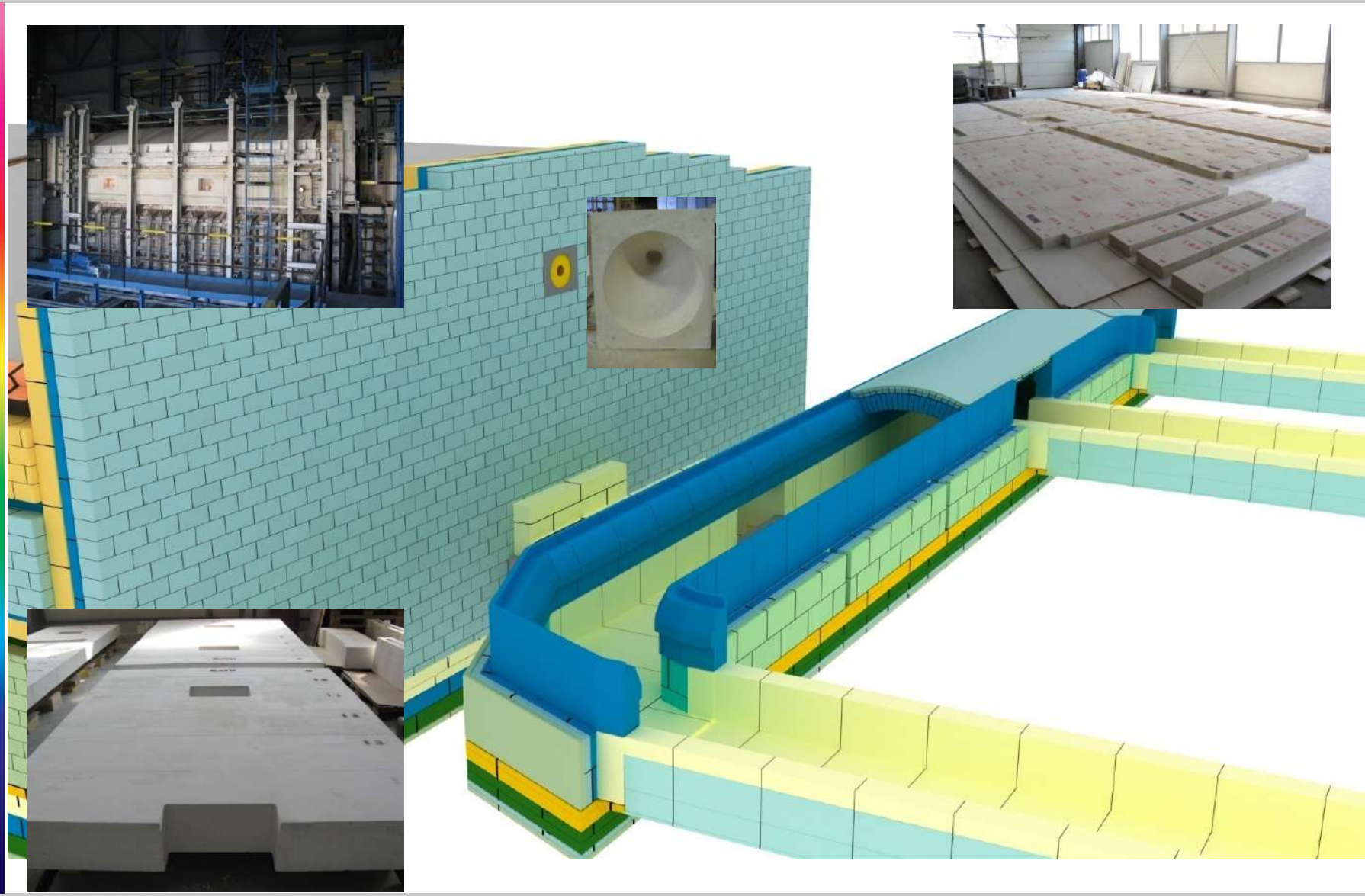




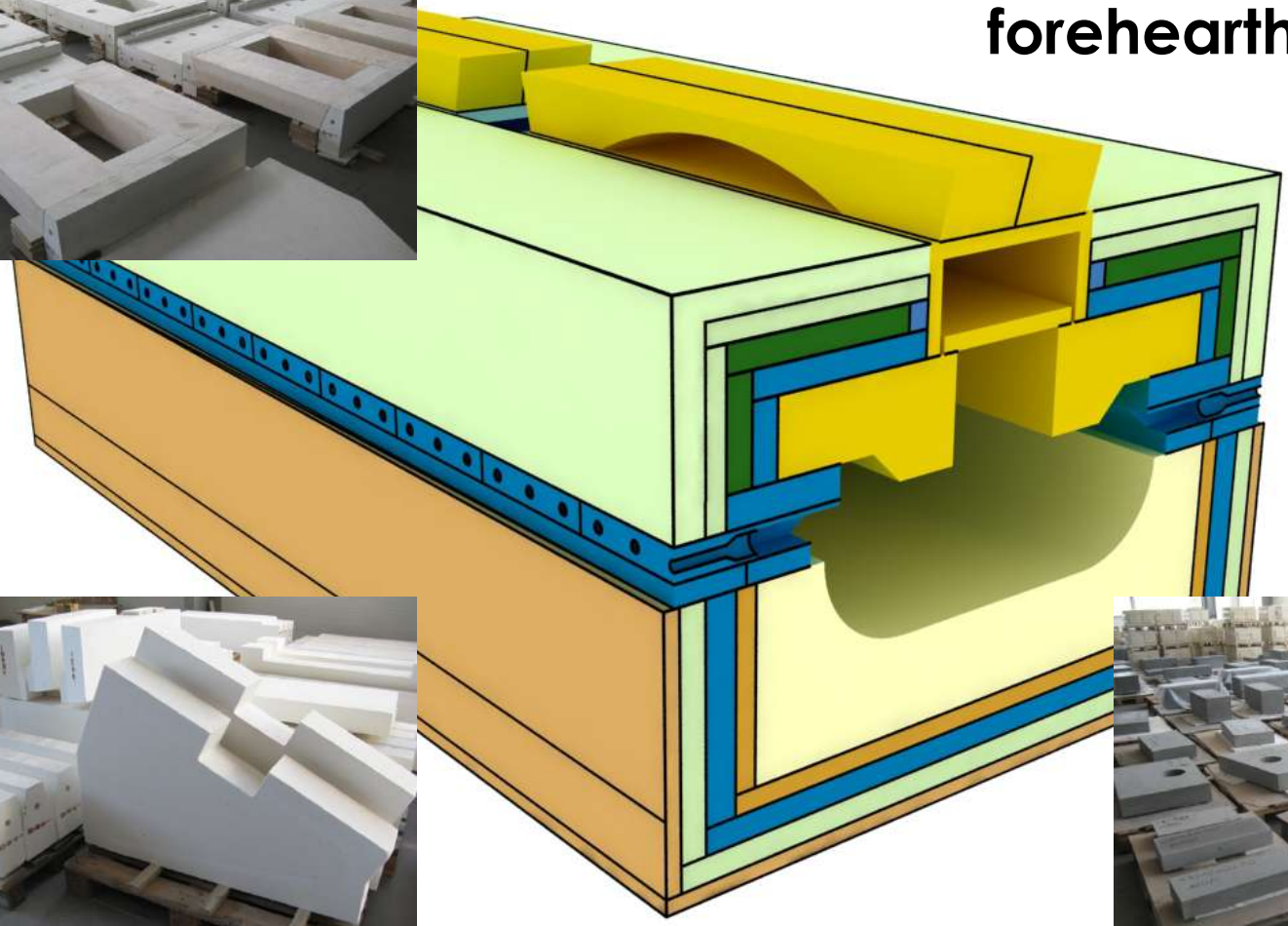




GLASS MELTING FURNACE



Complete forehearth channels



Top technology for individual refractory solutions!

Tailor-made pre-casted refractories, the Vibrorath AK70M

Applications: melting tank, distributor and forehearth area - pre-casted shapes

Vibrorath AK70M

- Based on sinter and fused mullite raw materials
- Exceptional glass corrosion resistance
- Exceptional glass infiltration resistance
- No glass defects
- Low iron-oxide content
- High refractoriness
- Low thermal conductivity, better thermal insulation
- Competitive price

Main parameters of Vibrorath AK70M

Chemical composition (%)

Al_2O_3	68
SiO_2	30
Fe_2O_3	< 0,6

Physical parameters

Bulk density (g/cm3)	2,5
Open porosity (%)	< 20
Cold crushing strength (MPa)	80
Refractoriness under load T_A (°C)	1700

The values given herein are typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for specification purposes.

Figure 1: Forehearth superstructures, Vibrorath AK70M

Figure 2: Chimney cover block in operation, Vibrorath AK70M

Figure 3: Forehearth installed with Vibrorath AK70M superstructure

Figure 4: Chimney cover blocks, Vibrorath AK70M

Figure 5: Distributor channel superstructure blocks, Vibrorath AK70M (with 2000x400x300 mm sizes)

Figure 6: Cup test with borosilicate hard glass, 96h/1300 °C, University of Pannonia, www.uni-pannon.hu

- Less than 1 mm glass corrosion
- Less than 1.2 mm glass infiltration
- No glass defects
- No glass colouring effects

Figure 7: Cup test with soda-lime glass, 96h/1300 °C, University of Pannonia, www.uni-pannon.hu

- Less than 1.7 mm glass corrosion
- Less than 1.5 mm glass infiltration
- No glass defects
- No glass colouring effects

Top technology for individual refractory solutions!

Tailor-made pre-casted refractories, the Carath 1650ULC-AZS

Applications: melting tank, distributor and forehearth area - pre-casted shapes

Carath 1650ULC-AZS

- Based on zircon-mullite raw material
- Exceptional glass corrosion resistance
- Exceptional glass infiltration resistance
- Exceptional alkali resistance
- High refractoriness
- High creep resistance
- High thermal shock resistance
- Competitive price

Main parameters of Carat 1650ULC-AZS

Chemical composition (%)

Al_2O_3	56
SiO_2	16
Fe_2O_3	-
$ZrO2$	26

Physical parameters

Bulk density (g/cm3)	3.00
Open porosity (%)	< 19
Cold crushing strength (MPa)	110
Refractoriness under load T_A (°C)	>1600

The values given herein are typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for

Figure 1: Forehearth superstructure blocks, Carath 1650ULC-AZS

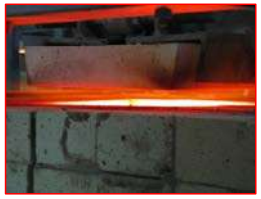


Figure 2 and 3: Forehearth refractory applications, Carath 1650 ULC-AZS

Figure 4: Camera block, melting furnace, Carath 1650 ULC-AZS

Further applications in melting tanks:

- Peep hole blocks
- Burner blocks
- Doghouse protection arch – see figure 6.

Figure 6: Cup test with soda-lime glass, 96h/1300 °C, University of Pannonia, www.uni-pannon.hu

- Less than 0.8 mm glass corrosion
- Less than 1 mm glass infiltration
- No glass defects
- No glass colouring effects

Figure 5 and 6: Distributor superstructure, doghouse protection arch

Further applications in distributors and forehearths:

- Zone dividing blocks
- Cover blocks
- Stirrer cover blocks…etc.

For more information, please contact: Robert Nusszer, Sales Manager

robert.nusszer@rath-group.com; Mobile: +36-30-438-7787; www.rath-group.com;

Glass industrial applications - regenerator

Pre-assembled rider arches - Silrath AK65

Transition course bricks – Silrath AK70

Low iron oxide fireclay bricks (Suprath A40e) for lower regenerator walls

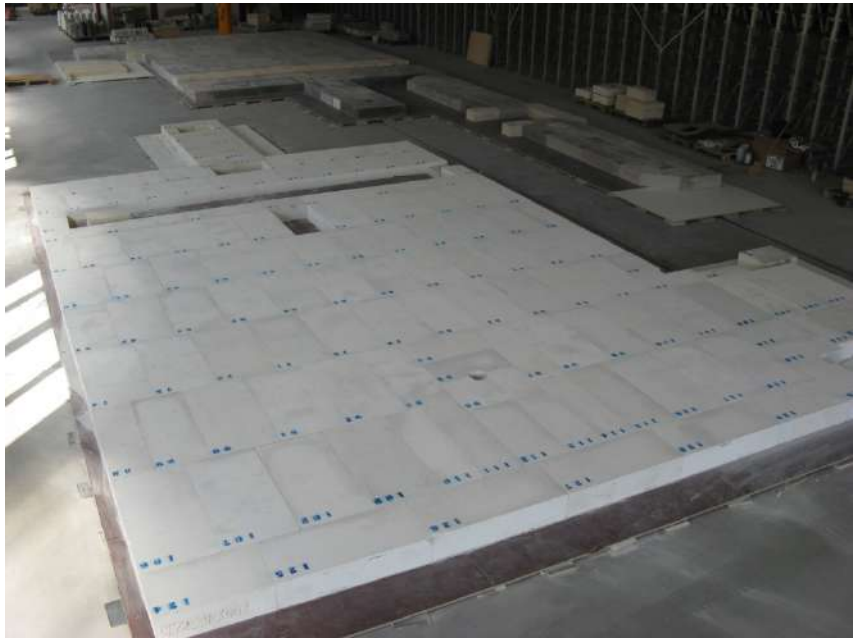
Glass industrial applications - regenerator

Construction of the fireclay/downpart regenerator – Suprath A40t, Suprath T45

Glass industrial applications – melting tank

Doghouse protection arch from andalusite dense bricks; bassin insulation with Suprath and Porrath bricks

Glass industrial applications – melting tank

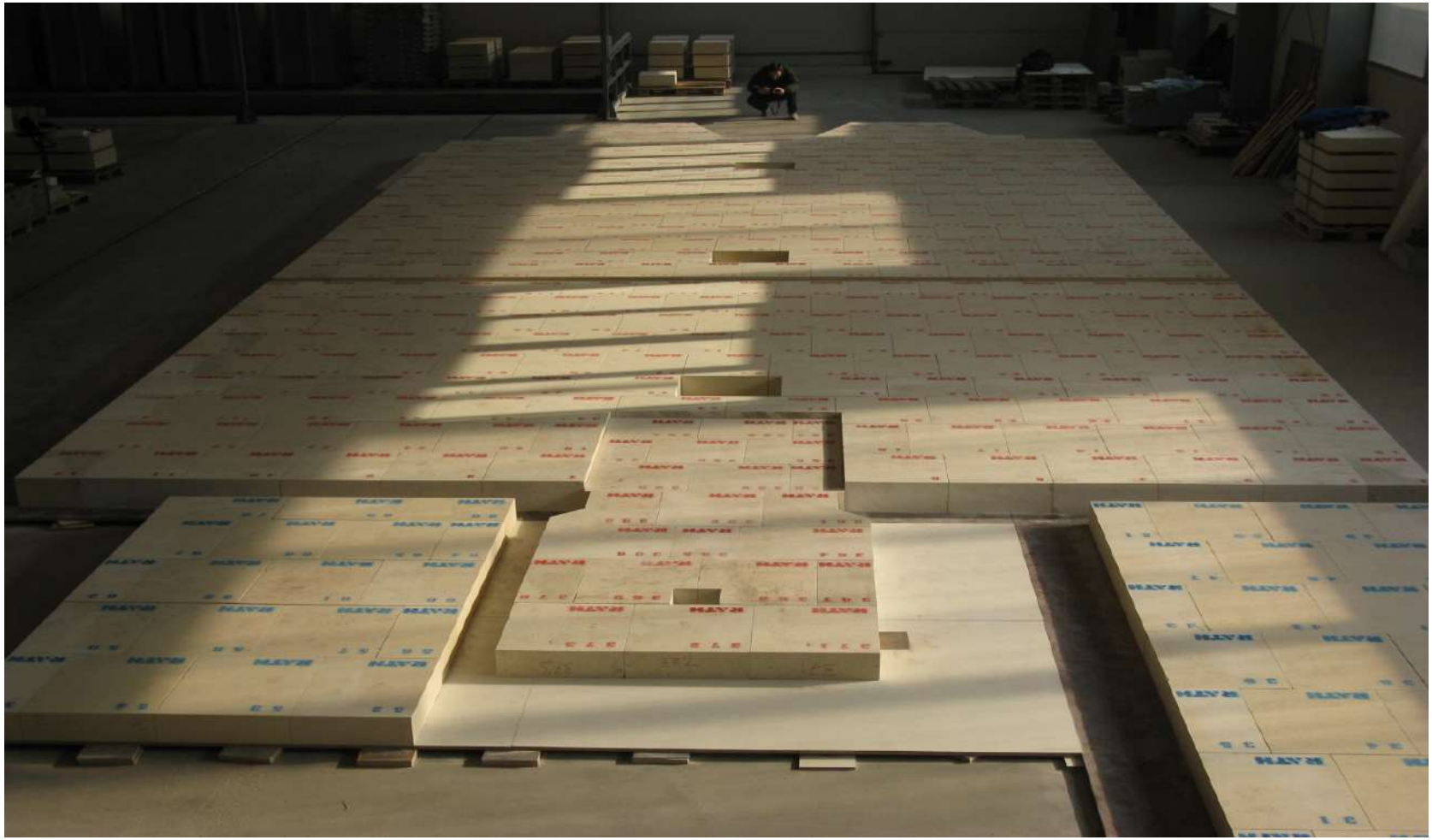


60%- Al_2O_3 – Andalusite (Carath 1650LC-SF)

and 40% Al_2O_3 – Fireclay ME bottom layers (Carath 1360LC)

40% Al_2O_3 insulating bottom layer ME (Porrath FLZ16)

Glass industrial applications – melting tank



Melting tank – andalusite bottom from Silrath AK60

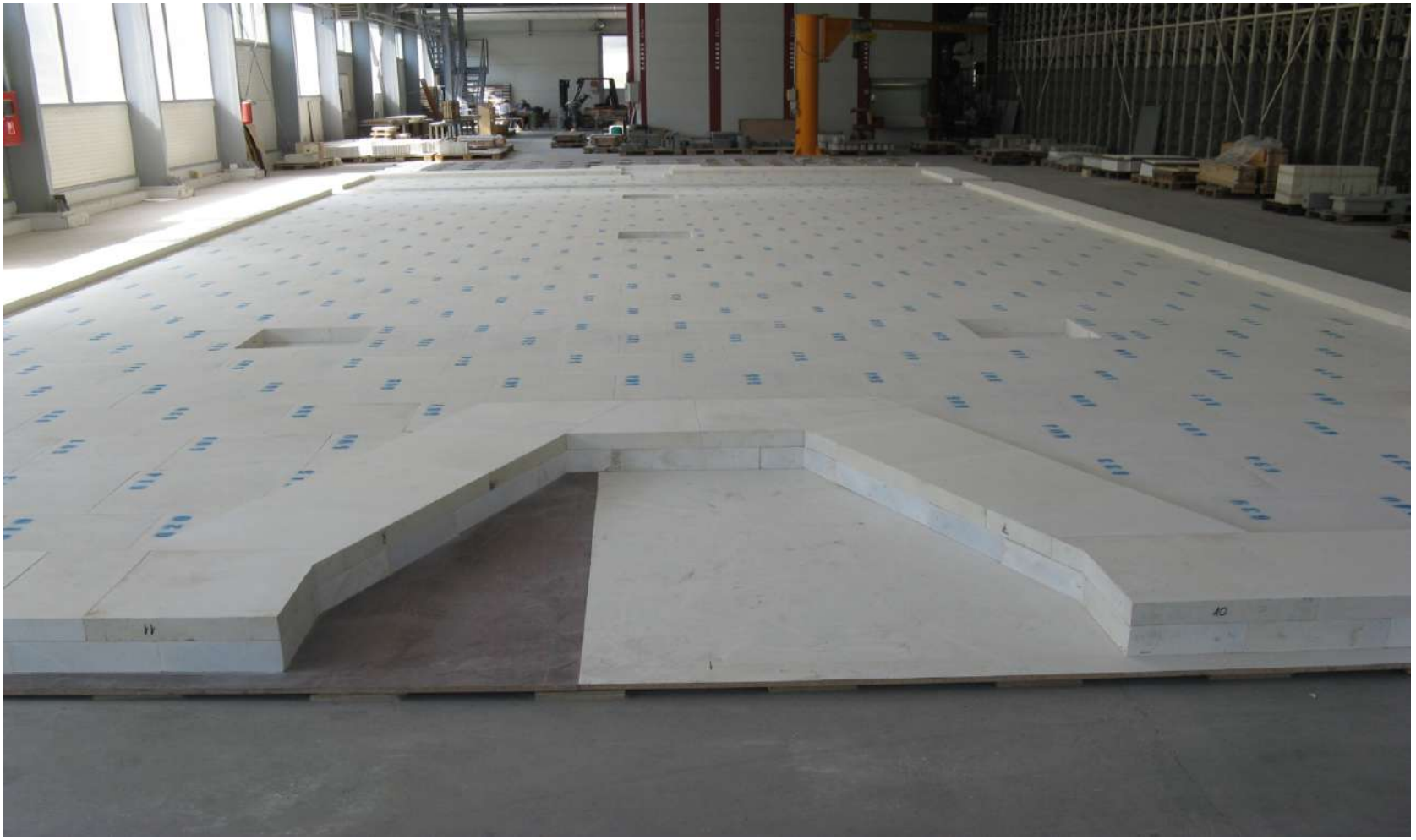
Glass industrial applications – melting tank

Melting tank – andalusite bottom from Silrath AK60

Glass industrial applications – melting tank

Melting tank – andalusite-mullite bottom from Silrath AK60M

Glass industrial applications – melting tank

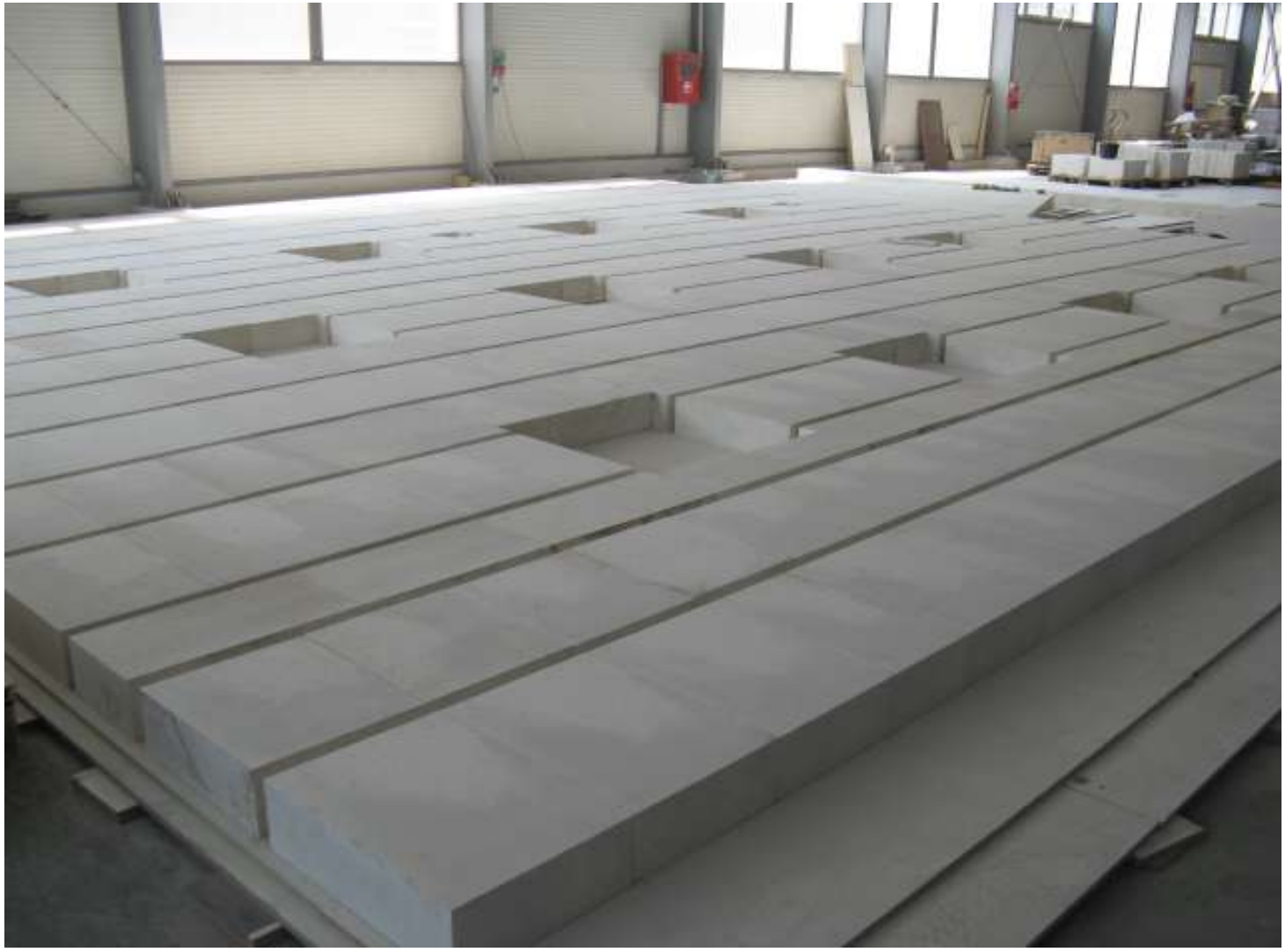


Melting tank – mullite bottom from Silrath AK75M

Glass industrial applications – melting tank

Melting tank, working end – fireclay bottom layer from Suprath T45

Glass industrial applications – melting tank

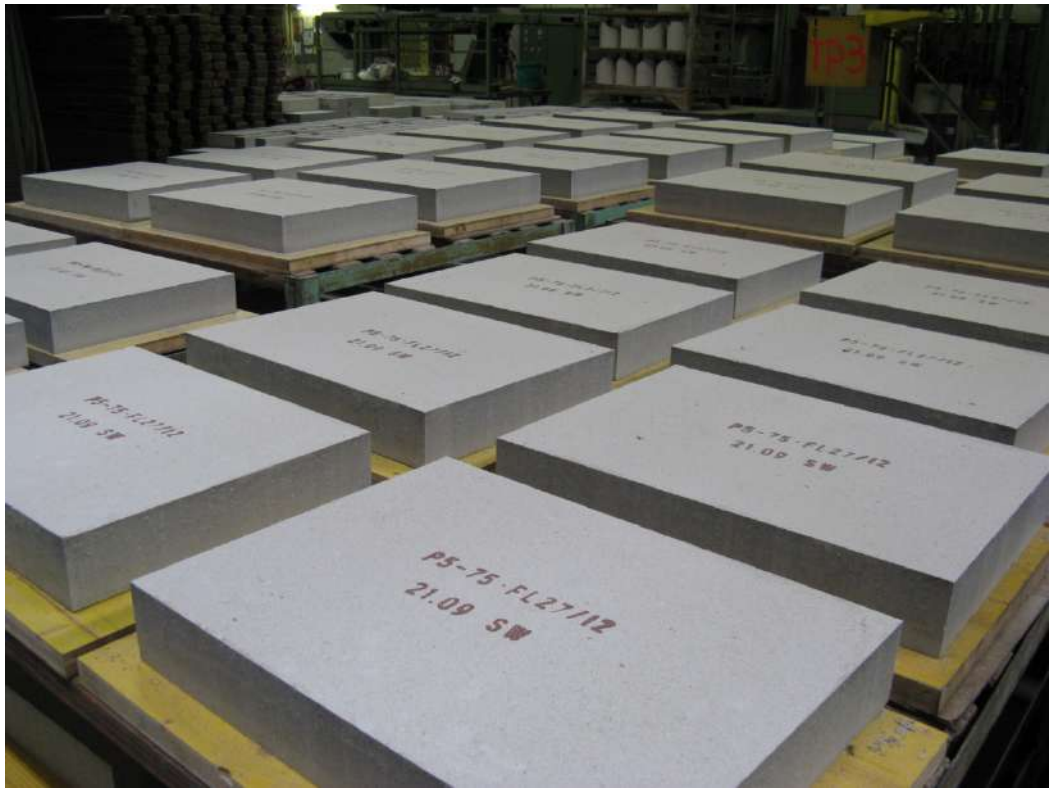


Glass industrial applications – melting tank

Melting tank bottom layers – tableware furnace

Glass industrial applications – melting tank

Glass industrial applications – melting tank



Bassin insulation blocks after pressing – Porrath FL27-12

Doghouse protection arch

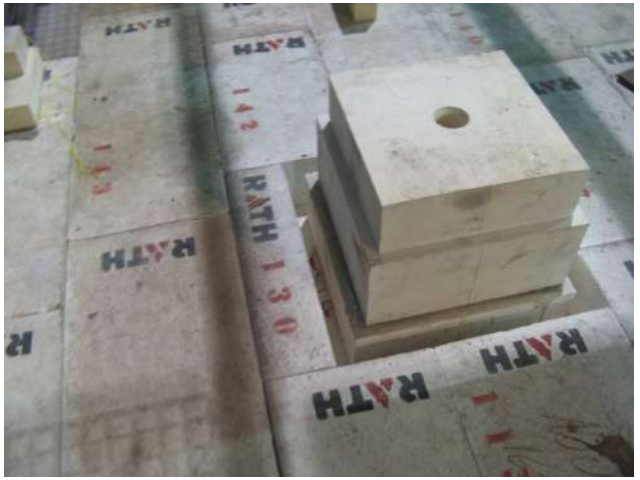
Insulating brick layers – melting end bottom

Glass industrial applications – melting tank

Double-layer working end insulating bottom from Porrath FL27-12

Melting end insulating bottom layer from Porrath FL27-12

Glass industrial applications – melting tank



Bassin insulation of melting end and working end, burner blocks, peep hole blocks, camera blocks

Glass industrial applications – melting tank

Glass industrial applications – working end

Glass industrial applications – working end

Pre-assambled working end superstructure from zircon-mullite quality

Glass industrial applications – forehearth

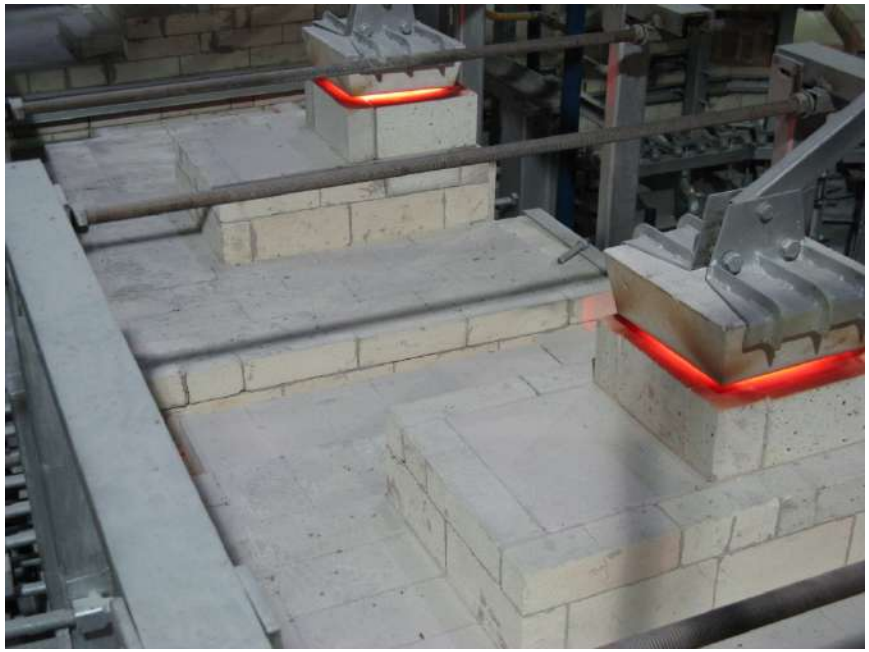
Forehearth sub-and superstructure refractories from zircon-mullite, andalusite, fireclay

Qualities: Alurath TK60, Silrath AK60, Vibrorath AK60M, Vibrorath AK70M, Carath ESK

Glass industrial applications – forehearth

Forehearth superstructure blocks and chimney cover blocks from Vibrorath AK70M; forehearth burner blocks from Carath 1650 LC-SF quality.

Glass industrial applications – forehearth



Forehearth sub-and superstructure refractories from zircon-mullite, andalusite, fireclay

Insulating materials for forehearth: insulating bricks, microporouse insulating boards, spout insulation

Zircon ramming mixes for substructure

Glass industrial applications – forehearth

Vibrorath AK70M forehearth cover blocks

Glass industrial applications – forehearts

Spout refractories: cover and burner blocks

Spout insulation: spout luting cement, microporouse spout insulation

Forehearth cover blocks, zone dividing blocks, chimney blocks, burner blocks – complete forehearth superstructure

Ramming masses, dense bricks, dense plates for substructure

Complete insulation of forehearth with insulating castables, insulating bricks, microporouse insulating boards

Feeder expendables !

Thank you for your attention!