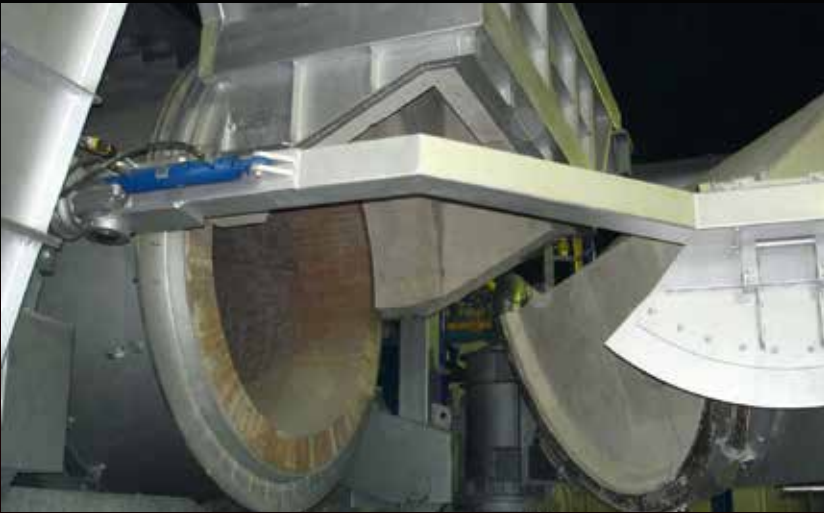




Refractory Systems | **Non-ferrous Metallurgy**

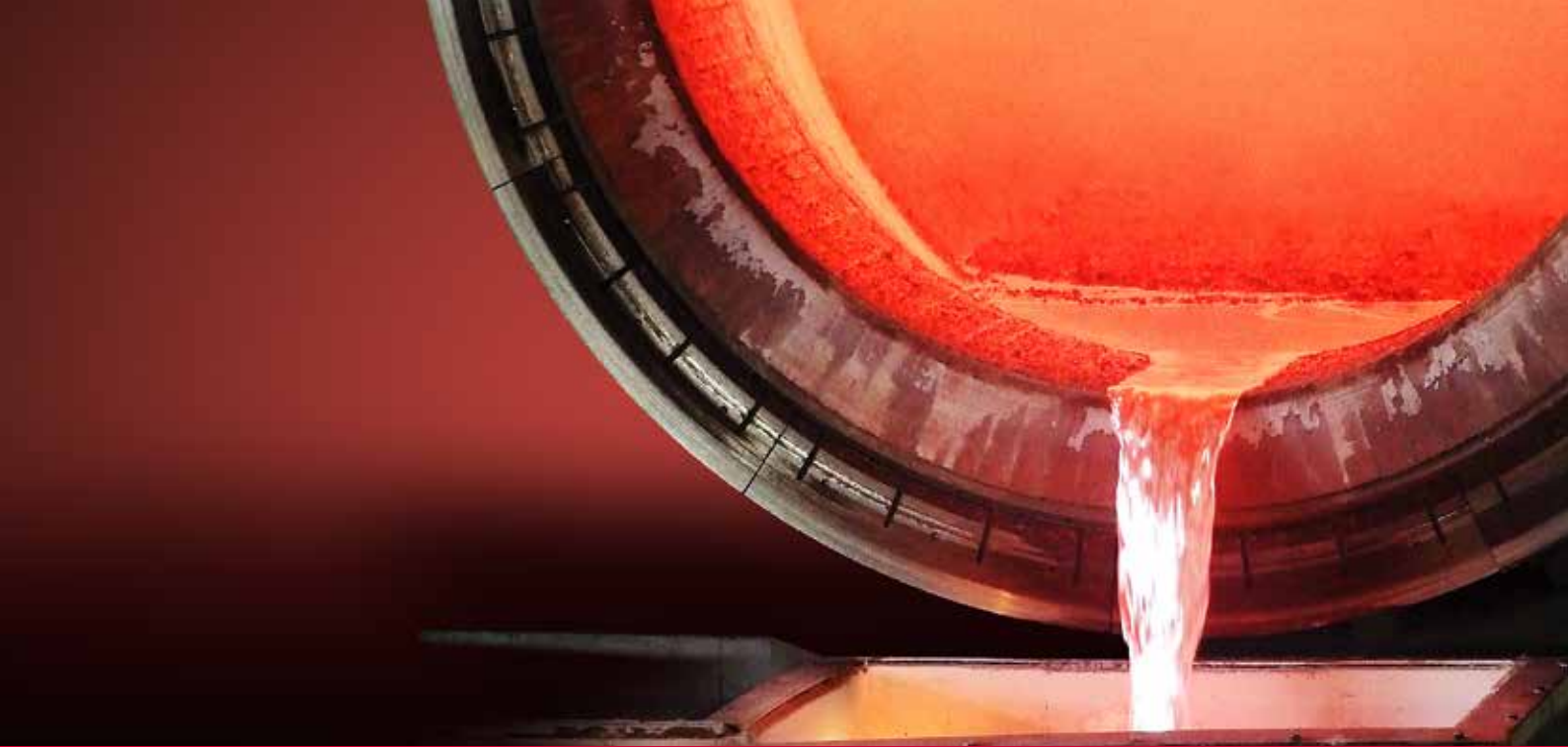


**Left:** Rotary tilting furnace for recycling under usage of salts

## Refractory linings for non-ferrous metallurgy

The Refractory Division of STEULER-KCH designs, produces and supplies a very diverse range of lining materials for the non-ferrous metal industry, e.g. for copper and aluminium melting and treatment furnaces.

These materials have to resist not only thermal stresses but also aggressive abrasive and chemical attacks. For roasting and melting furnaces and also for holding and casting facilities in the non-ferrous metal industry, refractory linings are supplied from the company's own production. These linings withstand extremely aggressive chemical conditions – refractory materials and engineering from STEULER-KCH are also well established in these applications.



### **Long service life in copper shaft furnaces**

In the secondary copper industry, ceramic bonded SiC materials provide long service life in shaft- and casting furnaces. Also chromium-corundum bricks are successfully used in this application. Different production processes also enable STEULER-KCH to produce large scale segment bricks for the lining of shaft kilns with a stable high grade quality.

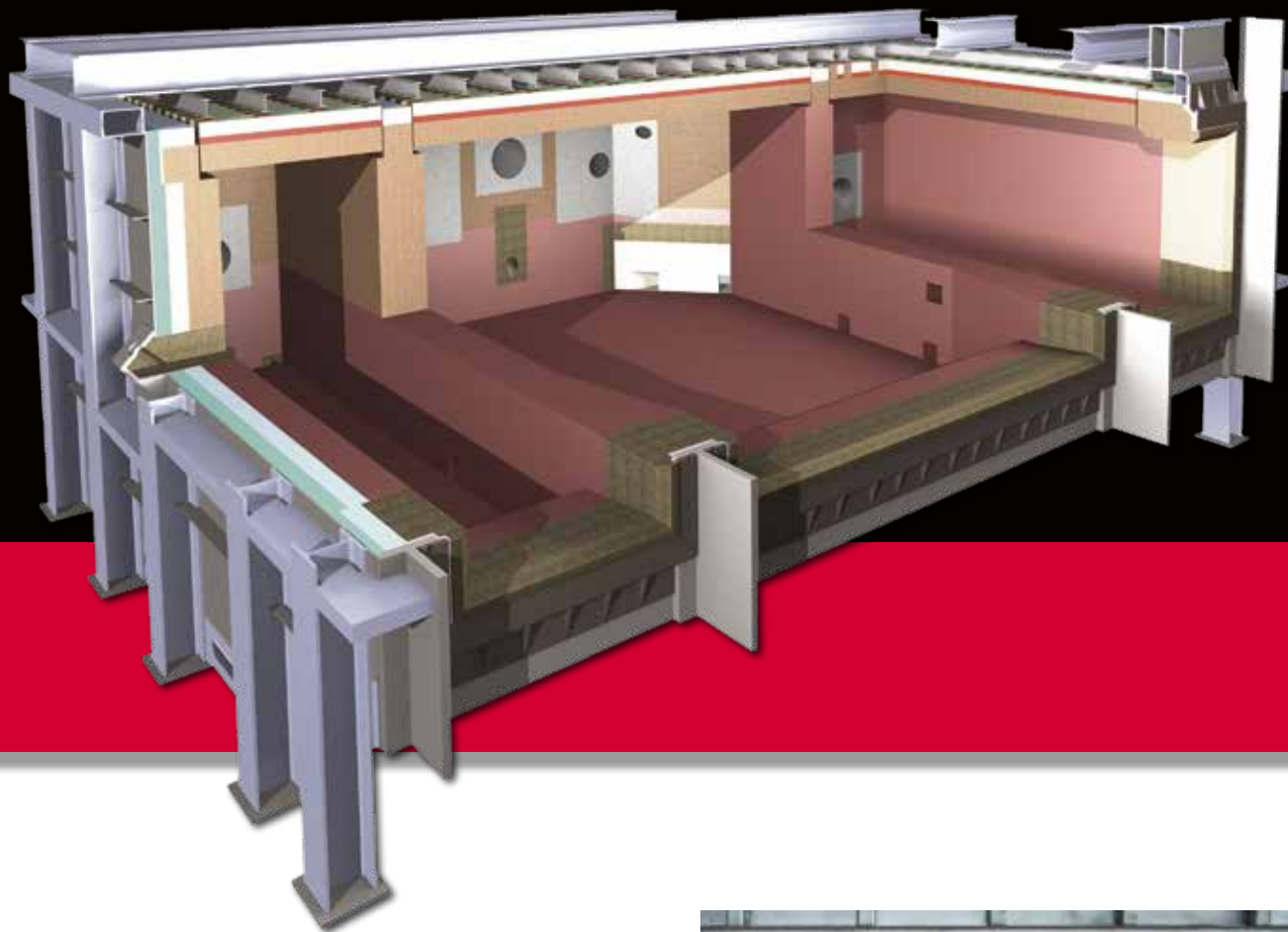
### **Special qualities for the aluminium industry**

For the melting and holding furnaces of the aluminium industry, Steuler has developed special phosphate-bonded bauxite grades for the application in the upper bath area. The company offers high-quality fire clay and andalusite grades for use in the bath area itself and for the burners. In this area, STEULER-KCH offers lining concepts which are tailored to the specific application, combining brick- and monolithic linings.



**Right:** STEULER-KCH lines cathode shaft furnaces in the copper industry with SiC materials.

**Below:** Three-chamber melting-holding-casting furnace in combined brick and monolithic lining



**With phosphate-bonded bauxite materials, STEULER-KCH produces refractory materials which are able to satisfy the demands and withstand the changing operating conditions in the aluminium industry.**

Formats which are specially matched to the different furnace types ensure a proper and professional installation of the refractory lining – the infiltration-resistant grades prevent premature wear of the linings. Materials based on andalusite or low-iron fireclays along with unshaped materials such as casting and ramming masses round out the range of materials offered.



**Above:** Trolley melt furnace with brickwork wear lining



**Above:** Special shaped bricks in the non-ferrous metals industry



**Above:** Dry suspended ceiling for aluminium melting and holding furnace



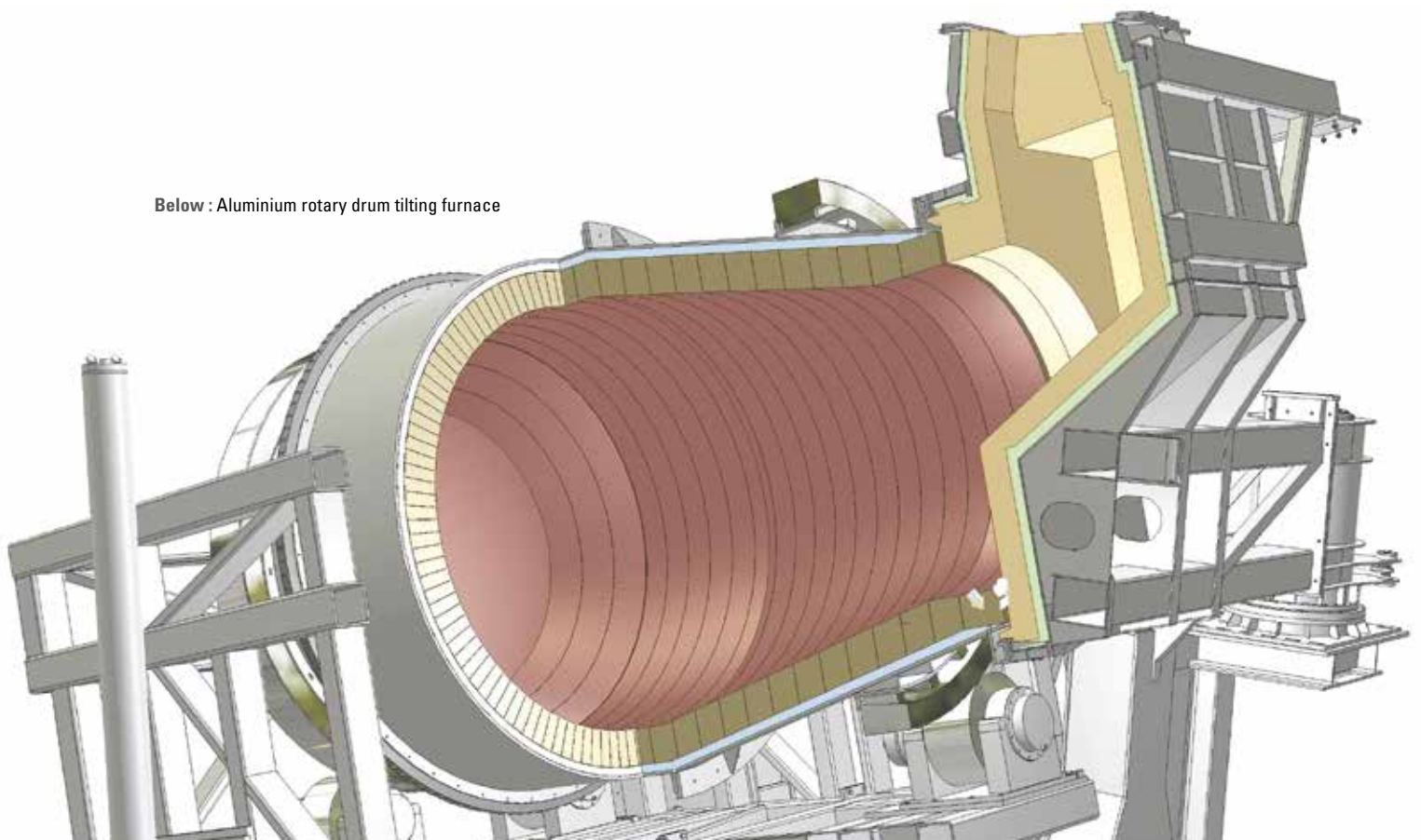
## Highly wear-resistant and infiltration-resistant refractory linings

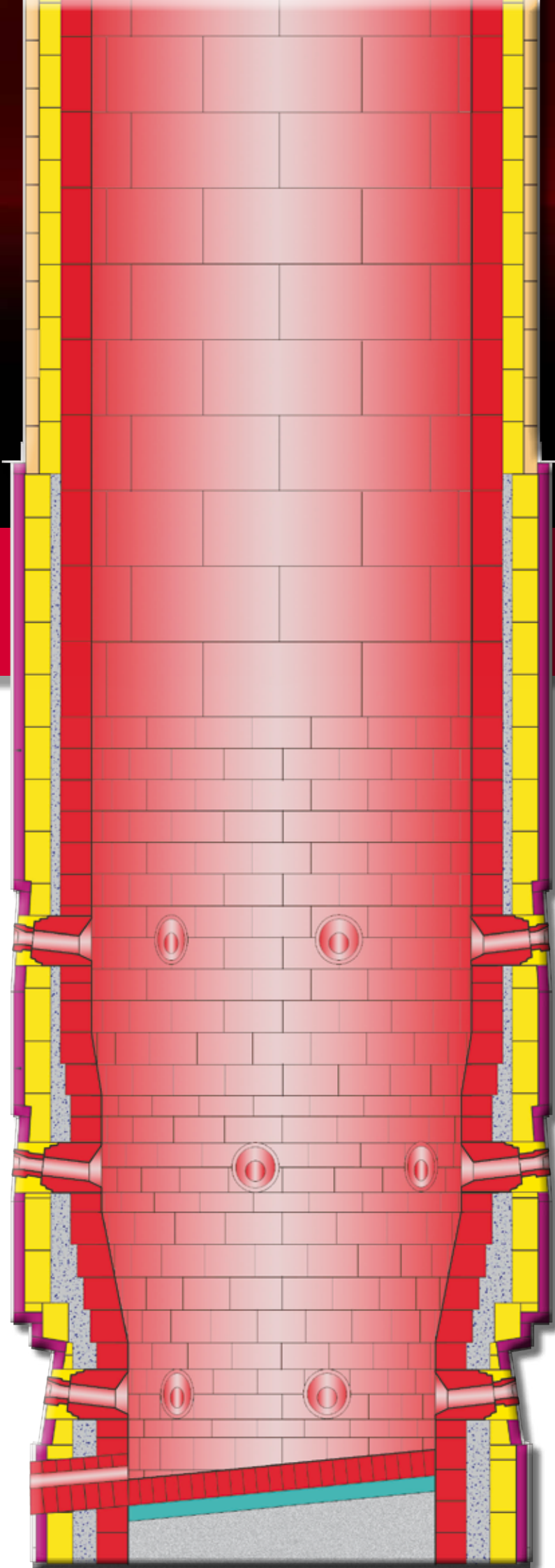
Complete, cohesive STEULER-KCH refractory concepts mean low downtimes and low maintenance costs, thereby ensuring a high level of furnace availability and profitability of the plants. With phosphate-bonded bauxite materials, STEULER-KCH produces refractory materials which are able to satisfy the demands and withstand the changing operating conditions in the aluminium industry.

Basic advantages of our materials include:

- **Low levels of contamination with oxides**
- **Easy cleaning of furnace brickwork lining**
- **Easy alloy changes**
- **Longer shelf lives**
- **Lower maintenance and repair costs**

Below : Aluminium rotary drum tilting furnace





**Left:** Schematic diagram of a shaped brickwork lining in a shaft furnace – wear lining in SiC 90 shaped bricks.

In secondary copper processing, melting furnaces, holding furnaces and treatment furnaces are lined with highly wear-resistant and oxidation-resistant interior linings. Most of these involve SiC, ceramically bonded silicon-carbide.

But other raw material variants are also used here, such as chromium corundum, mullite and andalusite. Grades and geometries of the furnace linings depend on the size of the furnace and on the stress caused by the actual process.



## Highly wear-resistant and oxidation-resistant materials

Lining concepts which are matched to one another are developed in collaboration with our customers and then the details are worked out in our own design department.

In the plants both standardised products and special shaped brick variants are used. The overall arrangement is completed by permanent linings with refractory masses and insulation made of rock or fibre materials.



Above: Holding furnace in a continuous casting plant for copper.

STEULER-KCH develops and produces special shaped bricks for an extremely wide range of plant types in the copper industry. This involves a specially coordinated format, primarily in SiC grade, for the respective application area.

At the present time, special shaped bricks are an indispensable addition to the standards. The SiC 90 grade, which was especially developed for the secondary copper sector, has been successfully used for many years now. It is used in all applicable types of plant requiring low wear and a high level of oxidation-resistance with a temperature profile of 1100 - 1400 °C.



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