WHAT ARE WE ACTUALLY DOING IN THE STEEL INDUSTRY?

The iron and steel industry is the world’s largest consumer for refractory materials. Something that’s immediately apparent to anyone who has ever visited a steel plant is that everything there is big, noisy, extremely heavy and above all: hot! From the pre-processing of raw materials, the smelting in the blast furnace, the melting of the steel and the metallurgical treatment, to the casting and post-casting process and finally forming and heat treating of the steel products - every stage of the manufacturing process occurs at high temperatures.

The diverse requirements of this key industry, with its specialised production and processing plants, mean every supplier of refractories must offer a comprehensive range of materials, lining technologies and expertise. We supply refractory solutions for every stage of the production process - from plants used for pre-processing the raw materials, sintering plants and pelletisers in coke plants, the various processes used to manufacture pig iron, to convert pig iron into steel and ultimately refine and form the steel in rolling mills and forges.

Performance, efficiency, durability, resilience, service life – these are the criteria by which refractory linings are judged. In order to meet these requirements, we are continually improving our refractory linings while simultaneously keeping an eye on optimising the manufacturing processes and maximising plant availability.

Our manufacturing programme comprises refractory bricks based on a variety of raw materials, such as refractory clay, andalusite, bauxite and corundum, including chromium, zirconia, magnesia and SiC materials, as well as unformed products, like mortars and concretes. Having our own manufacturing facilities staffed by qualified specialists in the fields of mould making and manufacturing affords us a great deal of flexibility. We can fulfil all requirements, from large-volume production to individual shaped bricks, to complete lining systems using both plastic forming and dry press methods.

We develop a comprehensive refractory concept for each plant based on the steel construction drawings and process data provided. Our scope of services includes the creation of installation drawings, performing process simulations and thermal conductivity calculations including heating-up recommendations as well as on-site installation and supervision.

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REFRACTORY BRICKS: Whether based on aluminium silicate, magnesium oxide or silicon carbide, whether ceramic, chemically or reaction-bonded, whether solid or insulating – STEULER-KCH supplies refractory bricks using a wide variety of raw materials and bonding methods.

REFRACTORY MONOLITHICS: Whether mortars or concretes, whether for casting, ramming or gunning, whether dense or insulating – we supply unshaped materials too.

PREFABRICATED ELEMENTS: No geometry is too complicated, no component too heavy. Whatever cannot be pressed is stamped or cast.

REFRACTORY ACCESSORIES: Metallic anchors or ceramic fibres – everything for everything that is related to the use of refractories.

If you would like to find out more, please contact one of our staff. We would be more than happy to discuss the backgrounds and details with you.

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FIND OUT MORE
The blast furnace is the heart of the steelworks, and the symbol of its steelmaking process. The heart of the blast furnace is the combustion chamber, where a mixture of primary fuels is burned to generate the necessary heat to generate the carbon necessary for the production of steel.

The blast furnace work in close collaboration with many renowned plant engineering firms. The blast furnace is both at the heart of, and symbolic of, the steel industry. Blast furnaces are characterised by excellent resistance to reducing atmospheres.

In the case of ingot casting, moulds (ingot moulds) are filled with liquid steel via a refractory channel system, generally from below (bottom teeming) or, in rare cases, from above (top teeming). New ceramic duct and distribution systems are constructed for each cast. We offer high-alumina duct systems for ingot casting.

The smelting zone of the blast furnace is exposed to extreme thermal stresses. For this special and highly stressed area, we supply shaped bricks made from refractory clay and andalusite. The bottom of the blast furnace, the hearth, is lined with multiple layers of carbon bricks. In order to protect this material from the pig iron, we provide andalusite grades.

The bottom of the coke oven is lined with fire clay bricks or silica bricks. Owing to their extremely high mechanical strength, Steuler K-Plates have become established in many plants by heating coal in an oxygen-deficient atmosphere. The inside of the coke oven is lined with fire clay materials required for blast furnace peripheral plants, such as Cowper stoves, hot blast flue gas ducts too.

The most important source of carbon used in the production of iron is furnace coke. This is generated in coking plants by heating coal in an oxygen-deficient atmosphere. The inside of the coke oven is lined with fire clay.

In the throat of the blast furnace, into which ore, coke and flux are added, the mechanical stresses are withstood by highly wear-resistant corundum and andalusite bricks that are CHARACTERISED BY EXCELLENT RESISTANCE TO REDUCING ATMOSPHERES.

Steel ladles are used to transport the hot metal from the blast furnace to the converters and Arc furnaces, where steel is produced from iron ore and coke. The converters are used to further refine the steel produced in the blast furnace. They are characterised by the ability to withstand extremely high temperatures and the ability to handle large volumes of liquid steel.

The converter is where the majority of the carbon contained in the pig iron is burnt off by blowing oxygen through it, and impurities, such as silicon, sulphur and phosphorous, are removed. The converter is connected to the Arc furnace, where additional refining takes place. The steel from the Arc furnace is then cooled and cast into slabs or blooms for further processing.

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