

## CHALLENGES AND NEW TECHNOLOGIES IN THE FIELD OF REFRACTORY MATERIALS

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Refractories are indispensable for industrial high-temperature production processes in key-industries like steel, cement, non-ferrous or glass industry. Depending on the field of application there are different requirements on refractory material and design or the need for particular refractory system solutions. Based on the specific operation conditions at the customer, important demands to achieve customized solutions are e.g. performance improvement, safety and ergonomics optimization, environmental issues, improvement of the customers product quality (e.g. by purging technologies), rise of customers production capacity (increase steel yield etc.). Also adaption of refractories to new processing technologies and products in the customers industries is a basic issue. Major elements to reach customer requirements are engineered microstructures, raw materials and additives, alternative bonding systems, materials with reinforced zones, shape design engineering and unique system solutions. Sophisticated laboratory testing methods including customer specific laboratory wear trials as well as computerized simulation methods (FEM, CFD, DEM, use of water modeling), completed by thermochemical simulations support target-oriented product and system development. Recycling as green technology represents another great opportunity for the refractory industry. A further focal point is development and application of non-destructive testing methods in line with quality assurance and R&D. Furthermore the use of Big Data approaches, digitalization and automation is strongly growing. The presentation outlines some examples for new technologies in the broad field of refractories.