

## **From graphite material to process equipment and complex systems**

Dr.-Ing. Marcus Franz, SGL Group, BU Process Equipment

Electrographite is known as material with very special properties, such as high electrical and thermal conductivity, very good mechanical stability, yet at high temperatures, and very good thermal shock resistance. Thanks to its excellent machinability, graphite it is widely used in industry for refractory linings, crucibles, and heaters.

But there are more than the typical applications. – With outstanding corrosion resistance, graphite is the material of choice for manufacture of process equipment, which is used not only in chemical industry, but also in the steel, fertilizer, environmental, and pharmaceutical industries. For these applications, a gas-proof and liquid-tight material is required.

The need for impermeability leads to the need for impregnation of the porous graphite material. Phenolic resin, as it is the case for Diabon®, is used as an impregnation resin, because of its very good corrosion resistance and its temperature stability up to 200°C.

Typical products made from impregnated graphite are heat-exchangers and thermal process equipment, e.g. absorbers, desorbers, distillation columns, and many more. Applications of industrial standard of today in thermal processing, that are solved by graphite equipment, refine hydrochloric acid, sulphuric acid, and phosphoric acid – be they pure, in aqueous solution, or in organic mixtures. Since not only equipment, but also systems can be offered, the customer can be assured to buy a solution and not only parts.

Due to the fact, that heat exchangers and columns are usually operated under pressure, their sizing has to be done in conformity with pressure vessel codes, e.g. AD Merkblatt or ASME code. Such standardised design rules require strict quality systems. Diabon® graphite is known as the material with all the necessary certifications that are stipulated by common pressure vessel codes.