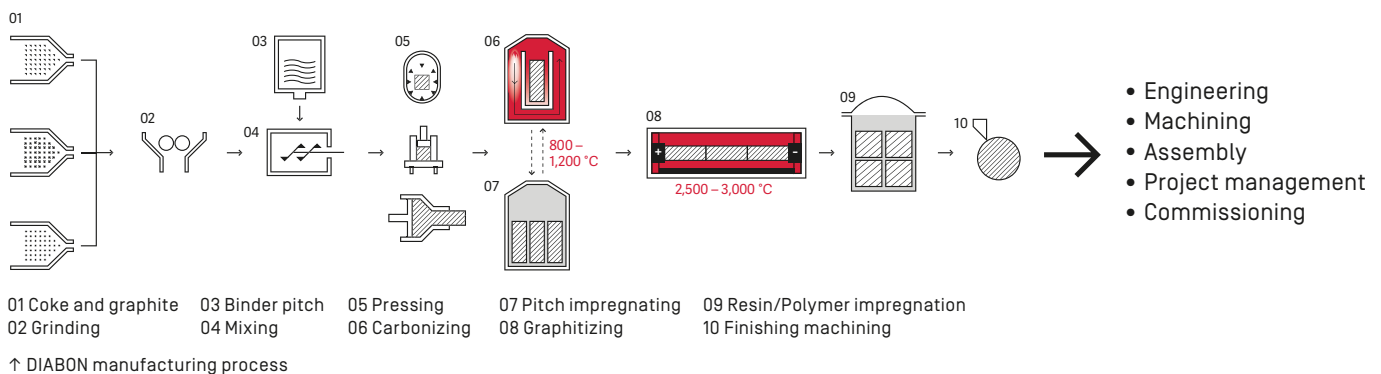


DIABON® impervious graphite materials



SGL Carbon is the global market leader for graphite based process equipment, systems and parts. DIABON is our trade-name for impervious graphite materials used for engineered solutions in corrosive applications. Based on application know-how of the largest equipment reference base on market and more than 70 years of design and manufacturing expertise, DIABON materials are continuously improved and globally considered as quality benchmark for corrosive applications.

DIABON materials

SGL Carbon is fully backward integrated and manufacture graphite materials in its own facilities. Thus, full control on material properties can be ensured in order to provide constant and high quality levels. The basic production process is shown above.

DIABON is a composite material made of

- a porous graphite base material
- impregnated with a resin or a fluoropolymer to make it impervious.

We developed a range of DIABON grades to provide economic and specialized materials depending on individual customer requirements. All grades are based on an optimized graphite recipe and impregnation method to ensure a perfect balance between efficiency, mechanical strength and corrosion resistance.

Customer benefits

- **Long lifetime and safety:** An optimized grain size distribution ensures a balance between brittleness and ductility. A better resistance against e. g. mechanical overstress vs. ultra fine grain graphite is the result.
- **High plant availability:** Excellent corrosion resistance by use of first class synthetic resins/fluoropolymers in combination with a proven full material impregnation ensure highest corrosion resistance.
- **Compactness:** High heat conductivities up to $140 \text{ Wm}^{-1}\text{K}^{-1}$ ensure efficient and economic process equipment with less space requirements.

Material upgrade options

- **CARBOGUARD®:** A carbon fiber reinforcement of graphite and silicon carbide parts e. g. tubes, tubesheets, headers, columns etc.. An increase of operational reliability and safety are the benefits. It extends the range of application under high-stress conditions like temperature or pressure shocks.
- **Resin-layer-free design:** Tubes can be manufactured without a resin layer on the inside. This design is beneficial for very clean requirements or for falling film applications.

By the way: DIABON phenolic resin impregnated graphite is certified by FDA (Food and Drug Administration)

Material base data of DIABON® graphite

Typical properties	Units	DIABON
Impregnation media		Phenolic resin/Fluoropolymer
Max. material temperature	°C	up to 220*
Bulk density	g/cm ³	> 1.85
Flexural strength	MPa	> 20
Compressive strength	MPa	> 40
Tensile strength	MPa	> 14
Thermal conductivity	Wm ⁻¹ K ⁻¹	up to 140

DIABON® blocks/plates

	Standard grades			Special grades		
	N	NS1	NS2	F100	CT	NS+
Impregnation media	Phenolic resin	Phenolic resin	Phenolic resin	Fluoropolymer	Fluoropolymer	Phenolic resin
Typical applications	All equipment and parts	All equipment and parts	All equipment and parts	Plate heat exchanger	Block heat exchanger	Special equipment and parts
Customer benefits	Reliable base performance	Compactness	Compactness Higher corrosion resistance Higher temperature resistance	Highest corrosion resistance Cleanness Reduced fouling	Compactness Highest corrosion resistance	Isotrop mechanical properties by isostatic pressing technology
Max. material temperature	200 °C	200 °C	220 °C*	140 °C	200 °C	200 °C
Corrosion resistance	Good performance	High performance	Excellent performance; up to 30 % better vs. NS1 grade	Highest performance; e. g. for mixed acids, solvents etc.	Highest performance; e. g. for mixed acids, solvents etc.	High performance

DIABON® tubes

	NK1	NS1	NS2
Impregnation media	Phenolic resin	Phenolic resin	Phenolic resin
Typical applications	Shell and tube heat exchanger	Shell and tube heat exchanger	Shell and tube heat exchanger
Customer benefits	Reliable base performance	Compactness (up to + 40 % more efficient)	Compactness (up to + 40 % more efficient) Higher corrosion resistance Higher temperature resistance
Max. service temperature	200 °C	200 °C	200 °C
Corrosion resistance	High performance	High performance	Excellent performance; up to 30 % better vs. NK1 and NS1 grade

* max. temperature of 220 °C approved by 3rd party TÜV acc. PED/AD-Merkblatt N2



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