Industry
Characteristics
Standard Materials
Nomenclature of material grades

Our carbon and graphite materials are processed under strictly defined manufacturing processes using specified raw or treated materials. For more information on the manufacture, design and application of these materials, follow the QR-Code located on the back of this brochure, or visit www.schunk-group.com.

Schunk offers three different groups of carbon materials for mechanical applications. These groups are identified by the two initial letters of the grade code:

- **FH** ... carbon graphite
- **FE**... electrographite
- **FF**... resin bonded carbon

The two figures following these initial letters identify the different grades within the material groups. Examples: FH42, FE45, FF52

A third figure indicates special molding processes:

- ...1 pressing to size or partially pressing to size
- ...9 isostatic pressing (only applies to FH and FE grades)

Examples: FH421, FE679, FF521

Additional processing steps such as impregnations with metals, resins or special salts are indicated by a final letter or letter/figure combination:

- **A** antimony impregnation
- **C** copper impregnation
- **Z2, Z5** impregnation with phenolic resin
- **ZH2, ZH5** impregnation with phenolic resin for applications up to 260 °C
- **ZP2, ZP5** impregnation with polyester resin
  (Schunk patents DE 2832048, EP 0007606)
- **S, Y2, Y3, Y5** redensification with carbon
- **Q, PS, M** inorganic salt impregnation

Examples: FH82A, FH44C, FH42Z2/Z5, FH82ZH2/ZH5, FH42ZP2/ZP5, FE45S, FH42Y2, FE679Q, FE679PS

- **Z2, ZH2, ZP2:** low residual porosity
- **Z5, ZH5, ZP5:** dense, gas leakage test on demand

The following table shows the physical data of a selection of Schunk materials for mechanical applications. For special applications a multitude of other materials are available. One of these materials is **SiC30**. This unique silicon carbide / graphite composite material is problem solver or even already standard in various critical applications, where it is able to substitute carbon and silicon carbide materials.
<table>
<thead>
<tr>
<th>Material type</th>
<th>Temperature limit</th>
<th>Compressive strength</th>
<th>Young’s modulus</th>
<th>Rockwell Hardness (HR)</th>
<th>Hardness Brinell</th>
<th>Bulk density</th>
<th>Porosity</th>
<th>Coefficient of thermal expansion (to the pressing direction)</th>
<th>Thermal conductivity</th>
<th>Typical application fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>resin bonded carbon</td>
<td>200–500 °C</td>
<td>250–600 °C</td>
<td>0.25–1.55</td>
<td>3.5</td>
<td>4.6</td>
<td>1.3</td>
<td>Segmental seal rings and carbon steel joint seals in larger dimensions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>silicon carbide / graphite composite</td>
<td>200–260 °C</td>
<td>140–140</td>
<td>2.65</td>
<td>3.0</td>
<td>4.0</td>
<td>1.25</td>
<td>See our brochure “SiC30 - Silicon Carbide / Graphite Composite Material”.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carbon graphite</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Consequently, such values are not guaranteed and are subject to change without notice.

* gas tightness inspection on request
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Schunk - A worldwide success. Always at your side.

Schunk is a global leading force in the development, production and use of carbon, ceramic, quartz and sintered solutions. Like no other, Schunk combines innovative strength and technological know-how with an extraordinary service orientation to supply a range of performances unique to the market. Schunk is a partner who offers you all the technological possibilities of a globally active company and can implement your ideas pragmatically and tailor-made to your requirements - whether these are for industrial large-volume markets or highly specialized niche markets.

The Schunk Group
The Schunk Group is a globally operating technology company with a global business unit structure. The company is a leading supplier of products made of high-tech materials - such as carbon, technical ceramics and sintered metal - as well as machines and systems - from environmental simulation and air conditioning to ultrasonic welding and optical machines. The Schunk Group has more than 9,500 employees in 29 countries and achieved sales of €1.28 billion in 2018.