EDM graphite: a complete range of graphite and services

Increase your productivity, optimize your costs and time
Introduction

Why choose graphite?
Graphite’s extraordinary characteristics make it the perfect material for electrodes. Graphite is largely used for electrical discharge machining (EDM) in production and other applications fields like mold making, general engineering and micro machining. It offers many advantages, including low wear, easy machining and thermostability to provide very high cost-effectiveness.

Graphite manufacturing process

Graphite used in the EDM machining process is the same as in ceramics production. In a first step, raw materials are milled, then mixed with a binding agent to produce a homogeneous product. Next is isostatic pressing to shape the blocks. EDM graphite is made only by isostatic presses, resulting in large, homogeneous and isotropic semi-finished graphite blocks, which are then baked. The final step is graphitization to transform carbon into crystalline graphite. In electrode projection, a big benefit is uniformity of the material throughout the entire graphite block.

Graphite features and benefits

Easy and quick machining, no deburring
Excellent machinability combined with high resistance and dimensional stability result in high cutting speed rate and time savings in electrode production. In contrast to copper electrodes, graphite electrodes require no additional deburring operation.

Higher removal rate and high resistance to wear compared to copper
Optimal erosion time and minimal electrode wear results in both cost and time savings.

Light weight with density four times lower than copper
Graphite’s light weight makes it easier to manage and handle large electrodes and optimize electrode costs.

High thermal stability and high resistant to thermal shock
Electrode dimensions remain stable during the erosion process and high current densities are maintained. This results in highly precise machining results, so you achieve very fine geometries.
Grades and specifications

GF Machining Solutions offers various grades of graphite with a wide range of performance characteristics. Each grade can be dedicated to a specific range of applications.

Five different grades of graphite

<table>
<thead>
<tr>
<th>GF MS Graphite</th>
<th>Grain size (µm)</th>
<th>Density (g/cm³)</th>
<th>Hardness (Shore)</th>
<th>Electrical resistivity (µΩm)</th>
<th>Flexural strength (MPa)</th>
<th>CTE (10^-6K^-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC-K900</td>
<td>2</td>
<td>1.77</td>
<td>78</td>
<td>15.0</td>
<td>80</td>
<td>4.9</td>
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<tr>
<td>AC-K800</td>
<td>4</td>
<td>1.78</td>
<td>72</td>
<td>14.0</td>
<td>73</td>
<td>5.0</td>
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<tr>
<td>AC-K700</td>
<td>6</td>
<td>1.80</td>
<td>70</td>
<td>13.0</td>
<td>60</td>
<td>5.1</td>
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<tr>
<td>AC-K600</td>
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<td>1.78</td>
<td>63</td>
<td>13.4</td>
<td>52</td>
<td>5.6</td>
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<tr>
<td>AC-K500</td>
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<td>1.78</td>
<td>55</td>
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<td>4.6</td>
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</table>

Achievable surface qualities

<table>
<thead>
<tr>
<th>Ra max. (µm)</th>
<th>12.50</th>
<th>9.00</th>
<th>6.30</th>
<th>4.50</th>
<th>3.15</th>
<th>2.24</th>
<th>1.60</th>
<th>1.12</th>
<th>0.80</th>
<th>0.56</th>
<th>0.40</th>
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<tbody>
<tr>
<td>VDI</td>
<td>42</td>
<td>39</td>
<td>36</td>
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<td>30</td>
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<td>24</td>
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<td>18</td>
<td>15</td>
<td>12</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>

Product range and services

Saw-cut service
- We can cut your graphite block to the size you need and in the grade that best fits your application.
- Contact your local partner to discuss your desired dimensions and graphite grade.

Special requests service
- We can support you with special graphite preparation for tool holders (System 3R, Erowa, Hirschmann), and with milling and grinding services for specific manufacturing needs.
- Contact your local partner to discuss how we can support you with your special request.

Visit our online catalog to discover our full range of graphite and services.
At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Additive Manufacturing, Spindle, Tooling and Automation solutions. A comprehensive package of Customer Services completes our proposition.

www.gfms.com