Tungsten Carbide Grade AM WC701 is a high quality powder especially designed for the use in binder jetting technology for additive manufacturing. Both, at GTP’s customers and GTP’s in-house 3D binder jetting line, AM WC701 is used in large scale additive manufacturing on a regular basis.

### Powder characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>D10</th>
<th>D50</th>
<th>D90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle size (μm)</td>
<td>10-25</td>
<td>15-30</td>
<td>&gt;30</td>
</tr>
<tr>
<td>Hall Flow (s/200g)</td>
<td>&lt;20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>App. Density (g/cm³)</td>
<td>4-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co (%)</td>
<td>11-13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sintering conditions and properties

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sintering temperature (°C)</td>
<td>1485</td>
</tr>
<tr>
<td>Sintering time (min)</td>
<td>30</td>
</tr>
<tr>
<td>Sintering pressure (MPa)</td>
<td>1.83</td>
</tr>
<tr>
<td>Hardness (Ra)</td>
<td>88.6</td>
</tr>
<tr>
<td>Fracture toughness MNm⁻³/²</td>
<td>17±1</td>
</tr>
</tbody>
</table>

### Wear properties

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM B611 (mm³)</td>
<td>140.5±2.7</td>
</tr>
<tr>
<td>ASTM G65 (mm³)</td>
<td>3.7±0.7</td>
</tr>
<tr>
<td>ASTM G76 (mm³)</td>
<td>0.0026</td>
</tr>
</tbody>
</table>

All of our tungsten carbide powders provide high purity and a uniform particle size distribution. For decades Global Tungsten & Powders produced tungsten carbides for the hard metals industry and has the capability to tailor powder properties to customer needs. Whether starting from the tungsten concentrate or from secondary raw material our production process is entirely controlled in-house to provide constant high quality.
Tungsten Carbide for Binder Jetting Grade AM WC701

AM WC701 tungsten carbide powder for binder jetting displays similar values for hardness and fracture toughness compared to conventionally produced materials. Abrasion tests show volume loss for AM WC701 samples is 44% lower compared to a standard tungsten carbide of similar fracture toughness. This makes AM WC701 the ideal material to print wear parts in binder jetting technology.

Specimens of sintered AM WC701 tungsten carbide powder have been tested for wear properties using the ASTM B611, ASTM G65, and ASTM G76 methods. As shown in the graph AM WC701 shows significantly lower volume loss than tungsten carbides with similar fracture toughness.

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