Crucible Liners for E-Beam Sources

Applications

• E-Beam evaporation of a wide range of materials
• Applications including but not limited to optical thin films and semiconductor

Features

• Proprietary carbon modification treatment by Poco Graphite Inc.
• Nonporous surface
• Reduces “wetting” or the ability of liquid metal to climb or creep on the surface
• High strength
• Extended life
• High purity
• Suitable for use with many materials

Manufacturing Process

• High quality graphite - Fine-grained, high strength, excellent machinability
• Precision machining to near-final dimensions
• Rinsed thoroughly with DI water to remove particulates
• Purification
• Undergoes an amorphous carbon treatment - Infiltrates and locks onto graphite - Creates a grain-free, hard, thin coating (0.0001” - 0.0002”)
• Cleaning and final packaging - Cleaned for immediate use in vacuum - Protected from environmental contaminants - Ensures protection during shipping

Options

• 30+ standard sizes
• Custom dimensions available upon request
• Taller models available - May interfere with rotation in multi-hearth e-beam guns
• Thicker wall dimensions available - Reduces fill volume, material cost for gold, platinum and other expensive materials

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Specifications

Typical Analysis - 99.9995% (5N5) Purity
Metallc Impurities, ppm by weight

<table>
<thead>
<tr>
<th>Na</th>
<th>Mg</th>
<th>Al</th>
<th>K</th>
<th>Ca</th>
<th>Ti</th>
<th>V</th>
<th>Mn</th>
<th>Fe</th>
<th>Ni</th>
<th>Cu</th>
<th>Zn</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.005</td>
<td>&lt;0.005</td>
<td>0.09</td>
<td>&lt;0.005</td>
<td>&lt;0.005</td>
<td>0.02</td>
<td>0.002</td>
<td>&lt;0.001</td>
<td>0.03</td>
<td>0.01</td>
<td>&lt;0.001</td>
<td>&lt;0.005</td>
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Theoretical Density 2.26 g/cm³
Relative Density ~80%
Average Grain Size <5µm
Electrical Resistivity (20°C) ~1.35 x 10⁻³Ω.cm
Thermal Conductivity (20°C) 121 W/m-K
Thermal Expansion (25-200°C) 8.4 x 10⁻⁶/K
Thermal Stability 2500°C (inert atmosphere); 510°C (presence of oxygen)
Compressive Strength 1.52 x 10⁸ kPa
Flexural Strength 8.96 x 10⁴ kPa
Tensile Strength 6.89 x 10⁴ kPa
Appearance Dark Gray

Compatible Evaporation Materials (including but not limited to):
Ag, Al, AlF₃, Al₂O₃, Al/Si, As, Au, B, B₂C, Be, Bi, CdS, CeO₂, Cr, Cu, Fe*, Ga, GaAs, Ge, GeO₂, In, ITO, La₂O₃, Mg, MgF₂, MgO, Mo, NaF, Nb, Ni*, Ni/Fe*, Pb, Pd, Pt, Rh, Se, Si*, SiO, SiO₂, Sn, Ta, Ta₂O₅, Tb, Te, Th, Ti, TiO, TiO₂, Ti₃O₅, WC, Y₂O₃, Zn, ZrO₂.  *One run material. Crucible liner may not survive subsequent runs.

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