## Materials Property Chart

### Crystal Size Average

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Alumina</th>
<th>Alumina/Alumina</th>
<th>High Purity Alumina</th>
<th>Zirconia Toughened Alumina</th>
<th>Zirconia</th>
<th>Zirconia, Cordierite</th>
<th>Silicate</th>
<th>Cordierite</th>
<th>Mullite</th>
<th>L-5 Cordierite Mullite</th>
<th>Stabilized Zirconia</th>
<th>Stabilized Zirconia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystal Size Average</td>
<td>Thin Section</td>
<td>Microns</td>
<td>13 11 8 7 6 6 2</td>
<td>&lt; 2 &lt; 2 6 3</td>
<td>13 11 8 7 6 6 2</td>
<td>&lt; 2 &lt; 2 6 3</td>
<td>13 11 8 7 6 6 2</td>
<td>&lt; 2 &lt; 2 6 3</td>
<td>13 11 8 7 6 6 2</td>
<td>&lt; 2 &lt; 2 6 3</td>
<td>13 11 8 7 6 6 2</td>
<td>&lt; 2 &lt; 2 6 3</td>
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</tr>
</tbody>
</table>

### Electrical Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Alumina</th>
<th>Alumina/Alumina</th>
<th>High Purity Alumina</th>
<th>Zirconia Toughened Alumina</th>
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<th>Stabilized Zirconia</th>
<th>Stabilized Zirconia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Resistivity</td>
<td>25°C</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Volume Resistivity</td>
<td>500°C</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Volume Resistivity</td>
<td>1000°C</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

### Thermal Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Alumina</th>
<th>Alumina/Alumina</th>
<th>High Purity Alumina</th>
<th>Zirconia Toughened Alumina</th>
<th>Zirconia</th>
<th>Zirconia, Cordierite</th>
<th>Silicate</th>
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<th>Mullite</th>
<th>L-5 Cordierite Mullite</th>
<th>Stabilized Zirconia</th>
<th>Stabilized Zirconia</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTE 25 - 100°C</td>
<td>PPM/C</td>
<td>6.3</td>
<td>7.7</td>
<td>7.5</td>
<td>7.6</td>
<td>7.6</td>
<td>8.1</td>
<td>8.3</td>
<td>7.1</td>
<td>7.1</td>
<td>10.0</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td>CTE 250°C - 900°C</td>
<td>PPM/C</td>
<td>6.9</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>6.9</td>
<td>10.0</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td>CTE 500°C - 1400°C</td>
<td>PPM/C</td>
<td>7.4</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>7.0</td>
<td>7.4</td>
<td>6.1</td>
<td>10.5</td>
<td>10.5</td>
</tr>
</tbody>
</table>

### Mechanical Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Alumina</th>
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<th>Stabilized Zirconia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>R45N</td>
<td>78</td>
<td>79</td>
<td>81</td>
<td>81</td>
<td>82</td>
<td>86</td>
<td>90</td>
<td>81</td>
<td>82</td>
<td>78</td>
<td>80</td>
<td>79</td>
</tr>
<tr>
<td>Hardness</td>
<td>R45N</td>
<td>57</td>
<td>57</td>
<td>50</td>
<td>78</td>
<td>42</td>
<td>57</td>
<td>50</td>
<td>78</td>
<td>42</td>
<td>57</td>
<td>50</td>
<td>78</td>
</tr>
<tr>
<td>Fracture Toughness</td>
<td>KJ/m²</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>MPa</td>
<td>241</td>
<td>240</td>
<td>230</td>
<td>220</td>
<td>210</td>
<td>200</td>
<td>190</td>
<td>200</td>
<td>190</td>
<td>180</td>
<td>170</td>
<td>160</td>
</tr>
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<td>Compressive Strength</td>
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<td>241</td>
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<td>230</td>
<td>220</td>
<td>210</td>
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<td>190</td>
<td>200</td>
<td>190</td>
<td>180</td>
<td>170</td>
<td>160</td>
</tr>
</tbody>
</table>

### Notes
- The values provided are approximate and may vary depending on the specific properties and conditions.
- Consult our technical staff for appropriate material and specific test results.
- STC has performed ASTM testing qualification for certain compositions, in accordance with ASTM D2442.

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**Alumina**

- 98% Alumina
- 99% Alumina
- 99.5% Alumina
- Alumina Nitride

**Alumina/Alumina**

- 95% Alumina
- 98% Alumina/Alumina

**High Purity Alumina**

- 99% High Purity Alumina
- 99.5% High Purity Alumina

**Zirconia Toughened Alumina**

- 98% Zirconia/Alumina
- 99% Zirconia/Alumina

**Zirconia**

- 94% Zirconia
- 99.5% Zirconia

**Niobate**

- 98% Niobate

**Cordierite**

- 98% Cordierite
- 99% Cordierite

**L-5 Cordierite Mullite**

- 98% L-5 Cordierite Mullite
- 99% L-5 Cordierite Mullite

**Stabilized Zirconia**

- 98% Stabilized Zirconia
- 99% Stabilized Zirconia

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**Properties**

- **Crystal Size Average**
- **Electrical Property**
- **Thermal Property**
- **Mechanical Property**

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**Materials**

- **Alumina**
- **Alumina/Alumina**
- **High Purity Alumina**
- **Zirconia Toughened Alumina**
- **Zirconia**
- **Niobate**
- **Cordierite**
- **L-5 Cordierite Mullite**
- **Stabilized Zirconia**

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**Consult Us**

- For more information or to discuss your specific application requirements.

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**Contact Information**

- STC Ceramic Technologies
- 123 Industrial Drive, Suite 5
- Anytown, USA 12345
- Phone: 123-456-7890
- Email: info@stcceramic.com

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**Disclaimer**

- The information provided is for general guidance and should not be considered as substitute advice.
- Please consult our technical representatives for specific recommendations.

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**Note**

- Consult our technical staff for appropriate material and specific test results. Please contact us for any questions or technical requirements that may not be shown above.

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**Additional Information**

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Delivers...

CERAMIC ENGINEERING INSIGHT

We proudly bring over 120 years of engineering experience to our customers since our humble beginnings in 1898. We are strengthened in our ability to service all aspects of our customers’ demanding engineering needs no matter whether it is a one piece prototype or a high volume mature product. This includes material selection, part design and form, fit and function considerations. Always keeping our customers’ cost needs in mind sets us apart from most of our competition both domestic and international.

TOTAL PROCESS CONTROL

The quality of all ceramic components begins with the care and control of the starting raw materials. STC prides itself in the fact that we have control of the material portion of the ceramic component equation. Powders are produced with strict process controls to assure that the unique properties of the final components are realized. This same approach is implemented in the forming, green machining, metering and post fired grinding, coating and assembling of the components built throughout our entire operation. Our AS9100 and ISO:9001 Quality Management System is the foundation for all that we do and how we do it.

CUSTOMER SERVICE FOCUS

STC never forgets its business philosophy of “the customer comes first”. It serves as a constant reminder of how important our customers are to our ultimate mission. We pride ourselves on providing our customers quick and direct access to our key staff members as required. This includes the entire spectrum of our staff from sales and customer service all the way to the heart of our materials, production, engineering and R&D departments. We are recognized worldwide as a mid-sized Vermont company that provides world class technical ceramic solutions to our customers’ challenging and demanding applications.

CONTACT US

STC looks forward to working closely with you on your quest for a ceramic material solution to any challenging application you may have. We are certain that you will find STC’s full service staff an ideal partner to undertake your ceramic component projects.

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Materials Property Chart