Heat Insulating Plates Characteristics

**Characteristics of Insulation Plate**

MISUMI insulation plates provide excellent heat insulation. These plates are laminated heat resistance sheets which are made of the glass fiber (that is forming frame) and the highly heat resistant combined material.

- **Standard Grade**: It can be used as heat resistant structural material in rougher higher temperatures and has a cost-effectiveness that is the same level.
- **High Strength Grade**: Excellent compressive and bending strength properties are obtained and is suitable as a heat insulating material for the outside of heating furnaces.
- **High Temperature Resistant Grade**: It maintain compression strength property under high temperature and is suitable for use as heat-resisting and insulating material for the outside of electric furnaces.
- **High Temperature Insulating Grade**: As both of low heat conductivity and high strength were realized, it provides excellent heat insulation effect with thinner thickness of plate.
- **High Temperature Super Insulating Grade**: Low temperature conductivity, lightweight and high strength in high temperature provide excellent insulating effect.

- **Very High Temperature Resistant Grade**: Excellent heat insulation up to 1000°C. Suitable for use in furnaces with high temperature.
- **Free-Cutting Grade**: It has excellent mechanical strength and dimensional stability, which can be used as an electric insulating material.

**MISUMI heat insulating plates provide excellent heat insulation. These plates are laminated heat resistance sheets which are made of the glass fiber (that is forming frame) and the highly heat resistant combined material.**

- **Free Cutting Grade**: It has excellent mechanical strength and dimension stability. It can be used as cement board for electric insulation.

- **Very High Temperature Resistant Grade**: Excellent heat resistant up to 1000°C. Usable for heating furnaces with high temperature.

- **High Temperature Super Insulating Grade**: Low temperature conductivity, lightweight and high strength in high temperature provide excellent insulating effect.

- **High Temperature Insulating Grade**: As both of low heat conductivity and high strength were realized, it provides excellent heat insulation effect with thinner thickness of plate.

- **Heat Resistant Grade**: It can be used as heat resisting structural material in much higher temperature and is more cost-effective than the standard grade.

**Testing method conforms to JIS K6911.**

The Heat Insulation Plates make it possible to improve operational environment such as heat reservation of equipment and prevention of burns at a low cost.

**Heat Insulating Plates Characteristics**

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard Grade</th>
<th>High Strength Grade</th>
<th>Very High Temperature Resistant Grade</th>
<th>High Temperature Resistant Grade</th>
<th>High Temperature Super Insulating Grade</th>
<th>High Temperature Insulating Grade</th>
<th>Heat Resistant Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleavage Strength (kN)</td>
<td>2.6~3.4</td>
<td>2.0~2.4</td>
<td>7.8~10.8</td>
<td>3.1</td>
<td>4.2</td>
<td>2.6</td>
<td>- -</td>
</tr>
<tr>
<td>Arc Resistance (sec)</td>
<td>180~240</td>
<td>240~360</td>
<td>630~940</td>
<td>345</td>
<td>75</td>
<td>250</td>
<td>240~370</td>
</tr>
<tr>
<td>Thermal Conductivity (W/m·K)</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.34</td>
<td>0.12</td>
<td>0.06</td>
<td>0.26</td>
</tr>
<tr>
<td>Expansion Coefficient (10°/°C)</td>
<td>6.0 (1~5%)</td>
<td>6.0 (1~5%)</td>
<td>3.0 (1~5%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moisture Absorption (%</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Others**

- **Mechanical Characteristic**

**Note 1** “Recommended Operating Temperature” is the temperature in which some long-term use does not reduce the quality rapidly. (Refer to next page “Insulation Plates Characteristics Graphs”)

**Note 2** “Dissociation Temperature” is a temperature where carbonates, cements, and materials will depolymerize.

**Note 3** “Compression Strength” of Thermal Plate (HPCA) is the value by 3% deformation.

**Note 4** Condition for “Volume Resistance” of Free-cutting Grade (HPMFA) is 24/121°C.

**Note 5** Values of “Surface Resistance” and “Bending Strength” of Free-cutting Grade (HPMA) are those after drying.

**Notes on Usage of Insulating Plate and Thermal Plate**

- The heat control is to be enhanced with a high thermal control. The insulating plate may become softer when the fact is highly intensified too. Especially, thermal plate (HPCA) may be softened with care because of its softness. (Fig. A)
- Do not use in places where there may be the possibility of water, chemicals, insulating plates that have been absorbed moisture are the most likely to be cracked or rapidly degraded in performance due to the drop in temperature. Especially, Free Cutting Grade (HPMFA) is more likely to absorb moisture and water and thus, must be dried sufficiently before use.
- They are laminated products, so do not apply load in the direction of the layer (lamination direction).
- When using the heat resistant grade (HPMA) and thermal plate (HPCA) over 107°C (higher limits include slight edge) may occur. i.e. thermal plates (HPMA) may lose slight rigidity but is not necessarily harmful. In such case, take the usual measures so as to avoid any smear action, such as ventilating and keeping away from the values.

**High Temperature Insulating Grade** has a tendency to provide excellent heat insulation. They may have less on the surface, but this does not affect the property and heat insulating effect.

**Notes on Machining of Insulating Plate and Thermal Plate**

When machining, it is necessary to制定 a cutting condition that will not reduce the performance (Fig. B–C).

- Be sure to firmly fix a Insulating Plate on the bench because it is soft.

- Be sure to firmly fix a Insulating Plate on the bench because it is soft.

- When machining, vacuum dust into a dust collector so that it will not scatter. (Figure B–C)

- When machining, vacuum dust into a dust collector so that it will not scatter. (Figure B–C)

**Machinable Ceramic Process Conditions**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cutting Speed</th>
<th>Feed</th>
<th>Cutting Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ~ 200</td>
<td>0.1 ~ 0.2 mm/rev</td>
<td>0.1 ~ 0.5 mm</td>
<td>0.3 ~ 2.0 mm</td>
</tr>
</tbody>
</table>

**Heat Insulating Plate Characteristic Graph**

The above values are references only.

Because insulating plates and thermal plates are very fragile in periods when drilling is interrupted, be sure to use under cutting.

For Plastic Plates, see P.953. Available in “Material Shop 24” as well.

**Selection Steps**

1. **Selecting Specifications**
   - Maximum Operating Temperature, Size, Quantity, Heat Machining
2. **Auto Product Extraction**
   - List up MISUMI Part Numbers, Days to Ship and Prices
3. **Selecting How to Order**
   - First Print Ordering Sheet
   - Online — P.172

**MISUMI's Insulating Plates / Thermal Plates are available in the catalog or “Material Shop 24”.**

- **Material Shop 24 / Insulating Plates / Thermal Plates Website Content**

- **Selectable from 10 types of Insulating Plates / Thermal Plates**

- **MISUMI part numbers, lead times and prices are automatically generated after selecting the specifications, and the order can be placed directly from the web site.**

*Please register with "MISUMI Ec Service ID Registration" and "WSG-U Registration" to use WSG.*