Fluon+ mPEEK - 2200 Series Product Information

Description
Fluon+ mPEEK are a series of PEEK products which have been modified using AGC’s proprietary fluoropolymer and compounding technology. The fluoropolymer modification improves the impact and wear resistance of the PEEK resin, as well as improving the physical and electrical properties.
Fluon+ mPEEK can be processed via conventional PEEK molding methods, such as extrusion or injection molding. Potential applications may be hose or tube, wire and cable, gears, sealing, or other markets where high temperature and chemical resistance are required.

Material Features
- Impact resistance
- Wear resistance
- Flexibility
- Electrical performance
- Dimensional stability
- Chemical resistance

Applications
- Extruded moldings
  - Film for electrical insulation
  - Wire and cable
  - Tube
- Injection moldings
  - Gear member
  - Bearing retainer
  - Casing
  - Case body
- Gaskets Cutting and processing
  - Plate / Sheet
  - Round / Cylindrical bar

Processing
Fluon+ mPEEK can be processed via conventional PEEK molding techniques
- Extrusion molding
- Injection molding
- Pressure molding
## Fluon+ mPEEK Typical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Units</th>
<th>PEEK (unannealed)</th>
<th>Modified PEEK Increasing Modification --→</th>
<th>KB-2220</th>
<th>KB-2230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength (23 °C)</td>
<td>ASTM D638</td>
<td>MPa</td>
<td>100</td>
<td>78</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength (200 °C)</td>
<td>ASTM D638</td>
<td>MPa</td>
<td>33</td>
<td>40</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Tensile Elongation (23 °C)</td>
<td>ASTM D638</td>
<td>%</td>
<td>111</td>
<td>99</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Tensile Elongation (200 °C)</td>
<td>ASTM D638</td>
<td>%</td>
<td>90</td>
<td>455</td>
<td>362</td>
<td></td>
</tr>
<tr>
<td>Flexural Strength (23 °C, 5% strain)</td>
<td>ASTM D790</td>
<td>MPa</td>
<td>125</td>
<td>105</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>Flexural Modulus (23 °C)</td>
<td>ASTM D790</td>
<td>GPa</td>
<td>3.3</td>
<td>3.0</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Impact Strength (23 °C)</td>
<td>ASTM D256</td>
<td>J/m</td>
<td>108</td>
<td>NB</td>
<td>NB</td>
<td></td>
</tr>
<tr>
<td>Impact Strength (-40 °C)</td>
<td>ASTM D256</td>
<td>J/m</td>
<td>70</td>
<td>95</td>
<td>NB</td>
<td></td>
</tr>
<tr>
<td>MIT Flex Life</td>
<td>JIS P8115</td>
<td>Cycles</td>
<td>122</td>
<td>1800</td>
<td>2390</td>
<td></td>
</tr>
<tr>
<td>Heat Deflection Temperature</td>
<td>JIS F07191</td>
<td>Deg C</td>
<td>141</td>
<td>147</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>Dielectric Constant (23 °C)</td>
<td>ASTM D2520</td>
<td></td>
<td>3.1</td>
<td>3.0</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

## Chemical Resistance

**Modified PEEK shows similar or better chemical resistance to PEEK**

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Immersion Condition</th>
<th>Tensile Strength Retention (%)</th>
<th>Elongation Retention (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PEEK</td>
<td>KB-2220</td>
</tr>
<tr>
<td>IRM-903</td>
<td>150 °C 3 Weeks</td>
<td>88</td>
<td>96</td>
</tr>
<tr>
<td>Diesel No. 2</td>
<td>150 °C 3 Weeks</td>
<td>92</td>
<td>101</td>
</tr>
<tr>
<td>Steam</td>
<td>260 °C 3 Weeks</td>
<td>97</td>
<td>106</td>
</tr>
</tbody>
</table>
Wear Property Data

Loss of material during abrasion testing significantly reduced with the addition of fluoropolymer modification.
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**Flexural Property Data**

Flex resistance via MIT increased with fluoropolymer modification

![Flex Modulus & Strength](chart1)

![MIT Flex](chart2)
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Electrical Properties

![Bar chart showing electrical properties of PEEK, low-modified mPEEK, mid-modified mPEEK, and high-modified PEEK. The chart compares dielectric constant and dielectric loss tangent.]

Tensile Properties

![Line chart showing tensile strength and elongation for PEEK, low-modified mPEEK, mid-modified mPEEK, and high-modified PEEK.]

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Coefficient of Thermal Expansion
Dimensional stability across the operating temperature improved with fluoropolymer modification

![Graph showing coefficient of thermal expansion of Fluon+ mPEEK and PEEK](image-url)
Handling and Storage

Heating Fluon® products in excess of 750°F (399°C) can produce toxic fumes. It is, therefore, necessary to provide local exhaust ventilation in areas where Fluon® products are exposed to high temperatures. Avoid breathing fumes or contaminating smoking tobacco with fumes, powder, or dust.

Thermal decomposition of this product will generate hydrogen fluoride, which is corrosive. Corrosion resistance materials are required for prolonged contact with molten resin.

Fluon+ mPLASTICS products should be stored in their original containers. This will be either in re-sealable plastic pails, or in drums with the liner bags and chime rings securely re-fastened.

Products should be stored indoors at nominal conditions of 23 C and 50% relative humidity. Products should be dried prior to use.

Safe Handling Information

A summary of the hazards, as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200 for this product are:

Physical hazards: None

Health hazards: None

FOR ADDITIONAL INFORMATION AND HANDLING INSTRUCTIONS READ AGC CHEMICALS AMERICAS, INC. MATERIAL SAFETY DATA SHEET.
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