Toray Carbon Fiber Paper “TGP-H”

Gas Diffusion Layer

Toray TGP-H is a Carbon-Carbon Composite Paper which has been used for PAFC and PEFC for decades and has proven durability. Its high mechanical strength, conductivity and gas permeability are suitable for use as a Gas Diffusion Layer (GDL) in fuel cell applications.

Characteristics

- High strength
- Excellent gas permeability and low electrical resistivity
- Good handling
- Minimal electrochemical corrosion

Structure

- TGP.H is made of PAN Carbon Fiber “TORAYCA” featuring high tensile strength and high modulus. Fibers are firmly connected by carbon.
- SEM (Scanning Electron Micrography) images on the right.

Standard Sizes

- Thickness: TGP-H-030, 0.11mm
  TGP-H-060, 0.19mm
  TGP-H-090, 0.28mm
  TGP-H-120, 0.37mm
  Thicker materials available on request.
- Dimensions: 15”x15”, 400mm x 400mm, 500mm x 500mm and 800mm x 800mm.
  800mm x 800mm board for TGP-H-030 is not available.
## Basic Data

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>mm</td>
<td>0.11</td>
<td>0.19</td>
<td>0.28</td>
<td>0.37</td>
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<tr>
<td>Bulk density</td>
<td>g/cm³</td>
<td>0.40</td>
<td>0.44</td>
<td>0.44</td>
<td>0.45</td>
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<tr>
<td>Porosity</td>
<td>%</td>
<td>80</td>
<td>78</td>
<td>78</td>
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<tr>
<td>Surface roughness Ra</td>
<td>µm</td>
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<tr>
<td>Gas permeability</td>
<td>ml·mm/(cm²·hr·mmHg)</td>
<td>2500</td>
<td>1900</td>
<td>1700</td>
<td>1500</td>
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<tr>
<td>Electrical resistivity</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>through plane</td>
<td>mΩcm</td>
<td>80</td>
<td>80</td>
<td>80</td>
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<tr>
<td>in plane</td>
<td>mΩcm</td>
<td>–</td>
<td>5.8</td>
<td>5.6</td>
<td>4.7</td>
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<tr>
<td>Thermal conductivity</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>through plane (room temp.)</td>
<td>W/(m·K)</td>
<td>–</td>
<td>(1.7)</td>
<td>(1.7)</td>
<td>(1.7)</td>
</tr>
<tr>
<td>inplane (room temp.)</td>
<td>W/(m·K)</td>
<td>–</td>
<td>21</td>
<td>21</td>
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</tr>
<tr>
<td>inplane (100°C)</td>
<td>W/(m·K)</td>
<td>–</td>
<td>23</td>
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<td>23</td>
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<tr>
<td>Coefficient of thermal expansion</td>
<td>x10⁻⁶/°C</td>
<td>-0.8</td>
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<td>Flexural strength</td>
<td>MPa</td>
<td>40</td>
<td>40</td>
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<td>Flexural modulus</td>
<td>GPa</td>
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<td>10</td>
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<td>Tensile strength</td>
<td>N/cm</td>
<td>–</td>
<td>50</td>
<td>70</td>
<td>90</td>
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</table>

*The above data are experimental values and are not guaranteed.*

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**'TORAY'**

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