Tasscell® PMI Foam

I. Properties
PMI rigid foam is a kind of high performance and quality structure foam material. With the high strength, modulus and heat resistance, PMI rigid foam is superior to honeycomb core and other foams. And it has been widely used in the high performance fiber composite material as the core material of sandwich structure. Which is effective to solve the problem of deliquescence and debonding.

PMI rigid foam has excellent performance and first-class quality, which has been successfully used in the helicopter rotor, high performance UAV (Unmanned Aerial Vehicle), aerospace equipment and shuttle radar etc.

The advantage of Tasscell PMI rigid foam:

**High mechanical properties:** PMI rigid foam is an isotropic material, with a high strength and modulus. On the same density, tensile strength, compression strength, bending strength, shear strength and various strength indexes are far higher than polyurethane, polyvinyl chloride, polyethylene terephthalate and other foams. PMI rigid foam can significantly improve the strength and rigidity, and can reduce the weight of the structure.

**High heat resistant performance:** With the unique cross-linked structure and imide ring structure, PMI rigid foam has a good high-temperature stability. Its heat distortion temperature is more than 200°C, which can meet the requirement of the process, such as the process of vacuum autoclave or high-temperature molded co-cure. It greatly shortened the process time, improved the production efficiency as well as the performance of structures.

**High closed porosity:** Its closed porosity reached to 95%~98%. Used for composite sandwich structure, can effectively prevent the absorption of moisture and debonding of honeycomb core. It improved the safety performance and prolonged the service life. Owing to its high closed porosity and water pressure resistance, it can be used as underwater buoyancy materials. Its high porosity and fine cells brought the material a good performance of sound insulation, thermal insulation and moisture resistance.

**High Bonding Strength:** Apply to epoxy, unsaturated polyester and all kinds of resins.

**Easy Processing:** Easy of machining. It can be molded under heat for a variety of curved surfaces, which improved design freedom.

**Resistance to fatigue performance:** A unique molecular structure gives it excellent resistance to fatigue performance. It is especially suitable for dynamic load sandwich structure.

**Aluminum equivalent and dielectric through wave properties:** PMI has a low aluminum equivalent and it’s suitable for the medical equipment industry. PMI is a low density and closed-cell foam. Within a wide frequency range, with a low dielectric constant, dielectric loss and superior insulation performance, it can be widely used on radio and electronic industry.
II. Model classifications

**Pore**: It has an excellent mechanical property and a good surface bonding property, which is mainly used for carbon fiber prepreg vacuum autoclave molding. Its model identification is “XKnominal density”.

**Thick hole**: It has a better machinability and surface bonding property, which is mainly used for carbon fiber prepreg molding. Its model identification is “CKnominal density”.

**Superfine pore**: It has an extremely low gel content, which is mainly used for buoy, water equipment and light UAV. Its model identification is “CX nominal density”.

III. Typical properties of Tasscell®

<table>
<thead>
<tr>
<th>Tasscell® PMI foam</th>
<th>Density (kg/m³)</th>
<th>Comp. strength (MPa)</th>
<th>Comp. modulus (MPa)</th>
<th>Tensile strength (MPa)</th>
<th>Tensile modulus (MPa)</th>
<th>Shear strength (MPa)</th>
<th>Shear modulus (MPa)</th>
<th>130°C Comp. strength (MPa)</th>
<th>130°C Comp. modulus (MPa)</th>
<th>Dielectric constant</th>
<th>Dielectric loss tangent×10⁻³</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td>23 44 72 119 263 37 57 20 40 101 208</td>
<td>0.8 1.7 2.6 4.1 8.3 1.4 2.2 0.81 1 1.5 1.9</td>
<td>47 74 120 200 443 74 110 39 51 76 103</td>
<td>0.3 0.71 1.1 1.7 3.6 0.6 1.2 0.35 0.65 1.4 2.6</td>
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<td>0.4 0.92 1.6 2.7 7 1.1 1.6 0.48 0.45 1.2 2</td>
<td>13 23 30 70 168 32 42 13 14 27 62</td>
<td>1.0 1.08 1.1 1.15 1.2 1.08 1.1 1.06 1.07 1.1 1.15</td>
</tr>
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IV. Typical Applications

Tasscell PMI rigid foam is a kind of high performance sandwich core material with a high strength, modulus, closed porosity and heat resistance. It is suitable for fiber prepreg molding, autoclave molding and other processes. It has been successfully used in helicopters, unmanned aerial vehicles (UAV), sports equipment, medical equipment, high-speed ships and other new equipment in manufacturing industry. And it holds out unlimited prospect in aviation, aerospace and navigation.