**ROHACELL®** foams offer outstanding performance and processing benefits for applications where electromagnetic transparency or attenuation is needed.

Featuring highly homogeneous properties, superior transparency and the potential to build the lightest and highest performing systems, **ROHACELL®** is the best structural core material available on the market today for radar transparent applications.

### **ROHACELL® Dielectric Constants**

<table>
<thead>
<tr>
<th>Standard ROHACELL® grades (non-absorptive)</th>
<th>Dielectric constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 kg/m³</td>
<td>1.05</td>
</tr>
<tr>
<td>51 kg/m³</td>
<td>1.07</td>
</tr>
<tr>
<td>71 kg/m³</td>
<td>1.09</td>
</tr>
<tr>
<td>110 kg/m³</td>
<td>1.14</td>
</tr>
</tbody>
</table>

*Typical values; valid for frequencies 0 to 110 GHz*

### **The Non-Dispersive Foam Core**

**ROHACELL®** polymethacrylimide (PMI) foam core material is characterized by its highly consistent dielectric performance. **ROHACELL®** is a non-dispersive material, meaning its permittivity does not change with changes in frequency.

Testing confirms the dielectric properties are consistent and isotropic across the entire foam core sheet – a benefit typically not found in other core materials.

### **Lightweight, Plus RF Transparency**

Due to the foam’s closed cell structure, resin absorption during bonding processes can be precisely controlled and minimized with our range of tailored cell sizes. Since resin only enters the cut surface cells, weight is kept to a minimum and a robust bond is formed, while undesirable dielectric effects are eliminated.

The permittivity values of standard **ROHACELL®** grades are very comparable at similar densities and are an order of magnitude lower than those of typical PCB (Printed Circuit Board) materials.

Although there are no significant differences in permittivity, **ROHACELL® HF** is particularly well suited for antenna applications. The perfectly tailored cell structure minimizes resin interface between the core and the substrate, and the foam has unrestricted compatibility with metallic materials.

### **Our Special Homogeneous Lossy Foam Grade – **ROHACELL®** EC**

With **ROHACELL® EC**, we introduce a high surface area carbon black. This gives lossy properties to the foam while maintaining superior thermomechanical performance. **ROHACELL® EC** can be processed at high temperatures and pressures if needed – a rare find in this material application.

Properties were tested in varied locations throughout multiple 12” x 12” sheets of **ROHACELL® EC**. (see below) The results showed no significant deviations within the same sheet of foam and confirmed the material behaved identically. This can be attributed to uniform distribution of carbon black throughout the sheet.

### **Uniform Behavior of **ROHACELL®** EC**

(see below) Combined Real and Imaginary Permittivity test curves of 32 individual sheets tested at frequencies ranging from 4.00 to 32.00 GHz.
PROCESSING EFFICIENCY

ROHACELL® foams can withstand the most demanding curing and processing conditions up to 180 °C (356 °F) and 7 bars (100 psi) depending on material grade and density. They are compatible with both common and state-of-the-art curing processes, including vacuum infusion, resin transfer molding and pre-preg / autoclave, as well as traditional hand lay-up.

RECOMMENDED PROTECTION MEASURES

ROHACELL® foams should be protected from environmental moisture, humidity and exposure to aggressive liquids (including alkalines, cleaning agents, saltwater). This is especially true when in service. Antenna assemblies should always be encapsulated with face sheets or coated with paint or resin if there is a risk of exposure to any aggressive substances or unconditioned environments.

FOR MORE INFORMATION, PRODUCT SELECTION AND TECHNICAL SUPPORT

Your local representative can assist you in finding the ROHACELL® foam grade that delivers your required exact balance between unparalleled electromagnetic transparency and optimal mechanical performance.