HexWeb® Honeycomb
Selector Guide

HexWeb® honeycomb provides exceptional stiffness and strength with little added weight for aerospace and industrial applications.
Honeycomb is a lightweight core material for structural stiffening applications. This versatile material is widely used in the construction of aircraft components such as floors, interior paneling and helicopter rotor blade aerofoils. Other applications include railway carriage doors and ceiling panels, marine bulkheads and furniture. Honeycomb is also the ideal material for energy absorption (bumpers/fenders, lift shaft bases), for RF shielding and fluid and light directionalization.

This guide has been compiled to assist with the selection of the best type of honeycomb for a particular application. More detailed information is included in the individual product data sheets.

**Metallic**

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Strength</th>
<th>Stiffness</th>
<th>Dielectric Performance</th>
<th>Max Service Temp. °C (°F)</th>
<th>Thermal Conductivity/Characteristics</th>
<th>Product Form</th>
<th>Density Range kg/m³ (lb/cf)</th>
<th>Recommended for Energy Absorption</th>
<th>Treatment Options</th>
<th>Environmental Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR-PAA/CRIII 5052 Aerospace Grade Aluminium Honeycomb</td>
<td>High</td>
<td>Very High</td>
<td>Low Transmission</td>
<td>175 (350)</td>
<td>Hexagonal cell</td>
<td>16 to 192 (1 to 12)</td>
<td>Yes</td>
<td>CRIII Corrosion resistant coating that meets AMSC7438 Specifications</td>
<td>Excellent</td>
<td>Good</td>
</tr>
<tr>
<td>CR-PAA/CRIII 5056 Aerospace Grade High Performance Aluminium Honeycomb</td>
<td>High</td>
<td>Very High</td>
<td>Low Transmission</td>
<td>175 (350)</td>
<td>Hexagonal cell</td>
<td>16 to 147 (1 to 9)</td>
<td>Yes</td>
<td>CRIII Corrosion resistant coating that meets AMSC7438 Specifications</td>
<td>Excellent</td>
<td>Good</td>
</tr>
</tbody>
</table>
### Non-Metallic

<table>
<thead>
<tr>
<th>Product Form</th>
<th>Product Type</th>
<th>Density Range kg/m³</th>
<th>Max Service Temp. °C (°F)</th>
<th>Thermal Conductivity Characteristic</th>
<th>Strength</th>
<th>Stiffness</th>
<th>Dielectric Performance</th>
<th>Max Service Temp. °C (°F)</th>
<th>Environmental Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexagonal cell</td>
<td>HRH-10 / A1 Aerospace Grade Aramid/Phenolic</td>
<td>24 to 144 (1.5 to 9)</td>
<td>175 (350)</td>
<td>Low</td>
<td>High</td>
<td>Low Good Transmission</td>
<td>Hexagonal cell</td>
<td>Excellent</td>
<td></td>
</tr>
<tr>
<td>Flex-Core</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29 to 72 (1.8 to 4.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40 to 88 (2.5 to 5.5)</td>
<td></td>
</tr>
<tr>
<td>HX cell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29 to 80 (1.8 to 4.5)</td>
<td></td>
</tr>
<tr>
<td>HRH-310 Aramid/Polyimide</td>
<td>High Low Excellent Transmission</td>
<td>29 to 80 (1.8 to 5)</td>
<td>175 (350)</td>
<td>Low</td>
<td>Hexagonal cell</td>
<td>High</td>
<td>Low Good Transmission</td>
<td>Hexagonal cell</td>
<td>Excellent</td>
</tr>
<tr>
<td>HRH-36 Woven Kevlar®/Epoxy</td>
<td>High High Excellent Transmission</td>
<td>24 to 96 (1.5 to 6)</td>
<td>175 (350)</td>
<td>Low</td>
<td>Hexagonal cell</td>
<td>High</td>
<td>High Good Transmission</td>
<td>Hexagonal cell</td>
<td>Excellent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32 to 48 (2 to 3.0)</td>
<td></td>
</tr>
<tr>
<td>HRH-49 Woven Kevlar®/Epoxy</td>
<td>High Low Good Transmission</td>
<td>34 (2.1)</td>
<td>175 (350)</td>
<td>Very Low</td>
<td>Hexagonal cell</td>
<td>High</td>
<td>Low Good Transmission</td>
<td>Hexagonal cell</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

*Kevlar is a registered trademark of E.I. du Pont de Nemours and Company*
Honeycomb Configurations

**Hexagonal Core**
The standard hexagonal honeycomb is the basic and most common cellular honeycomb configuration, and is currently available in all metallic and non-metallic materials.

**OX-Core®**
The “OX” configuration is a hexagonal honeycomb that has been over-expanded in the “W” direction, providing a rectangular cell configuration that facilitates curving or forming in the “L” direction. The OX process increases “W” shear properties and decreases “L” shear properties when compared to hexagonal honeycomb.

**Flex-Core®**
The Flex-Core cell configuration provides for exceptional formability in compound curvatures with reduced anticlastic curvature and without buckling the cell walls. Curvatures of very tight radii are easily formed. When formed into tight radii, Flex-Core provides higher shear strengths than comparable hexagonal core of equivalent density. Flex-Core is manufactured from aluminum, aramid papers and fiberglass substrates.

**Double-Flex®**
Double-Flex is a unique large cell Aluminum Flex-Core with excellent formability and high specific compression properties. Double-Flex formability is similar to standard Flex-Core®.

**Reinforced Hexagonal**
Reinforced honeycomb has a sheet of substrate material placed along the nodes in the ribbon direction to increase the mechanical properties. The Reinforced Hexagonal configuration provides a heavy density honeycomb suitable for high load areas such as attachment points.

**Other Configurations**
The standard honeycomb configurations described above will meet almost all requirements. Hexcel can design and fabricate special cell geometries in response to specific needs.

For more information
Hexcel is a leading worldwide supplier of composite materials to aerospace and industrial markets. Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax™ multiaxial reinforcements
- HexPly® prepregs
- HexMC® molding compounds
- HexFlow® RTM resins
- Redux® adhesives
- HexTool® tooling materials
- HexWeb® honeycombs
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products

For US quotes, orders and product information call toll-free 1-888-611-4038. For other worldwide sales office telephone numbers and a full address list, please go to:
http://www.hexcel.com/contact/salesoffice

©2016 Hexcel Corporation – All rights reserved. Hexcel Corporation and its subsidiaries (“Hexcel”) believe that the technical data and other information provided herein was materially accurate as of the date this document was issued. Hexcel reserves the right to update, revise or modify such technical data and information at any time. Any performance values provided are considered representative but do not and should not constitute a substitute for your own testing of the suitability of our products for your particular purpose. **Hexcel makes no warranty or representation, express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, and disclaims any liability arising out of or related to, the use of or reliance upon any of the technical data or information contained in this document.**