Flexible Waveguides

RF Com Flexible Waveguides are designed to isolate vibration and eliminate installation difficulties caused by misalignment. To provide a simple aid to positioning and alignment of antennas.

Both flexible/twist and flexible only are made from a helically wound waveguide core and additional mechanical support is offered from a variety of protective jackets.

We can also supply a range of high performance double ridge flexible and flexible / twistable waveguides.

Design and Manufacturing are approved to ISO 9001:2008.

Pre-formed and hybrid flexible waveguide assemblies

A “Pre-formed” waveguide assembly is formed into the desired shape during the manufacturing process. Pre-forming can reduce the stress on the waveguide and the joints, and it is recommended in waveguides that will be bent close to the minimum static bend radius.

Pre-forming may be carried out on all Flexible Waveguides and on Side Seam and Seamless waveguides. If a permanent twist is required the Flexible Only Waveguides may be manufactured with a set twist. Pre-formed waveguides offer a defined and measured electrical performance for the installed shape.

A “Hybrid” waveguide run can contain both rigid and flexible sections. Flangeless low profile joints offer the following advantages:

- Eliminate EMC issues associated with flange interfaces
- Gas tight joints
- Lower overall mass and lower profile
- Lower insertion loss

Wherever possible, formed sections will be used in preference to cast or machined sections to ensure the best possible insertion loss and match specifications.

Both pre-formed and hybrid waveguides can be supplied on a keeper plate, if required, to maintain the shape during storage/shipping.

Jacketing of Preformed and hybrid waveguides

In some cases, it is possible to use hot pressure cured rubbers to jacket waveguides that have been preformed, but this will require specific mould tooling. Where this is not desirable a range of cold cure jackets are available.
Core Types
Flexible/Twistable and Flexible Only core is manufactured by a process of helical winding a silver coated, brass strip to form a continuous, uniform rectangular tube.

**Flex/Twist**
Flexible/Twistable is sealed electrically via a friction joint. This construction has the best twistable performance of all waveguides. The Twistable waveguide will hold limited pressure, but relies on the jacket for pressure sealing. Flex/Twist is not recommended for low PIM applications - use seamless core.

**Flex Only**
Flexible Only core is wound with a solder fillet in the Interlock, thus eliminating any RF and Pressure Leakage. Flex/Only will flex in the E and H planes only, although pre-set twists can be incorporated during manufacture.

**Seamless**
This is manufactured by convoluting and forming a metal tube so it will flex in the E and H planes only. Seamless offers the best PIM performance when used in conjunction with the appropriate flanges.

**Side Seam**
This is similar in construction to seamless but made from sheet and brazed together.

Operating Temperature Ranges
The table shown below gives the thermal characteristics for the different core types.

<table>
<thead>
<tr>
<th>Core Type</th>
<th>Operating temperature range</th>
<th>Environmental protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible/Twistable</td>
<td>-55 to +145</td>
<td></td>
</tr>
<tr>
<td>Flexible only</td>
<td>-55 to +145</td>
<td></td>
</tr>
<tr>
<td>Seamless Brass/BeCu</td>
<td>-55 to +145</td>
<td></td>
</tr>
<tr>
<td>Side seam silver plated</td>
<td>-55 to +145</td>
<td></td>
</tr>
<tr>
<td>Side seam Brass/BeCu</td>
<td>-70 to +260</td>
<td></td>
</tr>
</tbody>
</table>

As standard, high melting point lead free solder is used to attach the flanges (operating temperature range -55 to +181). Silver solder (operating temperature range -196 to +254) may also be used in some applications.

Jacket Types
We offer a range of different protective coverings to suit most requirements.

**Vulcanised Jackets**
Neoprene, silicone, and high conductivity silicone jackets are vulcanized to the waveguide using thermal compression techniques and have a high resistance to ozone attack. The jacket provides support to the convolutions during flexing and the pressure seal in Flexible / Twistable waveguides. Neoprene is the standard jackets for flexible waveguides.

**Cold Cure Jackets**
Where preformed flexible waveguides are required or vulcanizing is not viable, The Waveguide Solution offer a variety of cold cure jackets in both silicone or (Urethane) Devcon. Enamel or epoxy painting may be offered as an alternative to a moulded jacket if required, but should be offered only after consulting with RF Com.

Operating Temperature Ranges
When operating at elevated temperatures, care should be taken to ensure that the correct jackets and solders have been requested. The table shown below gives the thermal characteristics for the different jackets available with flexible waveguides.

<table>
<thead>
<tr>
<th>Jacket type</th>
<th>Operating temperature range</th>
<th>Environmental protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoprene</td>
<td>-55 to +100</td>
<td>Oil, Ozone</td>
</tr>
<tr>
<td>Silicone</td>
<td>-70 to 200</td>
<td>Skydrol</td>
</tr>
<tr>
<td>Floro Silicon</td>
<td>-100 to +200</td>
<td>Skydrol</td>
</tr>
<tr>
<td>Cold Cure Silicone</td>
<td>-65 to +260</td>
<td>Good environmental</td>
</tr>
<tr>
<td>Cold Cure Urethane, Devcon</td>
<td>-25 to +100</td>
<td>Good environmental</td>
</tr>
</tbody>
</table>