Laminated Bus Bar

Laminated busbars reduce inductance by alternating the positive and negative busbar layers between multi-conducting layers of thin dielectric insulation. Multi conductor connectors of all makes and sizes, including IGCTs and capacitors, are connected to the structure. Inductance is reduced, electromagnetic interference is eliminated, and systems switch faster and cleaner, with less energy loss. The image to the right illustrates how Storm engineers supported the transformation of a spaghetti harness into an integrated multi-layer bus system that you plug in and forget—along with a complex wiring assembly, and costly installation errors.

Inductance, Capacitance, and Impedance in Laminated Bus Assemblies

Advantages of laminated bus products are to locate, shape, and route conducting points in a way that ensures the multi-layered current flow in opposite directions and in equal strength. The key aspect of this design concept, is to generate opposing voltages proportional to the rate of current change in a circuit, which in turn enables the opposing magnetic fields to cancel each other's ticket. This eliminates a free ride for extra inductance.

Selecting the Best Geometries & Insulation Materials

With the guidance from our Insulation and Coating Center team, engineers can be confident that they will make the right choice in insulating material and conductor (raw or plated) thickness. You'll be able to explore design considerations from material to edge seals.

Edge Fills Offered by Storm Power Components:

Open Edge

Lamination extends beyond conductor farther than pinched or epoxy-filled edges.
- less tooling lowers costs
- yet maintains minimal creepage
- with less robust edges

Laminated Sealed Edge

Lamination extends past conductor with 100% sealed edges
- good for harsh environments
- but laminations are limited by the thickness and number of conductors

Epoxy-Filled Edge

Lamination extends less than other options to reduce footprint
- edges 100% epoxy sealed by hand
- good for harsh environments

LAMINATED BUS BAR - Insulation Materials Table

Selection of the proper internal dielectric insulations can depend on capacitance, inductance, voltage potentials and operating environment. The following table lists the most common insulating materials:

<table>
<thead>
<tr>
<th>Insulation Materials</th>
<th>Continuous Use Temp. °C</th>
<th>Dielectric Constant ASTM D150</th>
<th>Dielectric Strength ASTM D149</th>
<th>Flammability Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoxy Glass (FR4)</td>
<td>140</td>
<td>4.3</td>
<td>1250</td>
<td>UL 94 V-0</td>
</tr>
<tr>
<td>Mylar (PET)</td>
<td>105</td>
<td>3.3</td>
<td>3500</td>
<td>UL 94 VTM-0</td>
</tr>
<tr>
<td>Tedlar (PVF)</td>
<td>105</td>
<td>4.0</td>
<td>3500</td>
<td>UL 94 HB</td>
</tr>
<tr>
<td>Teonex (PEN)</td>
<td>180</td>
<td>3.4</td>
<td>5000</td>
<td>UL 94 VTM-0</td>
</tr>
<tr>
<td>Nomex</td>
<td>220</td>
<td>1.6</td>
<td>430-845</td>
<td>UL 94 V-0</td>
</tr>
<tr>
<td>Kapton</td>
<td>200</td>
<td>3.7</td>
<td>5000</td>
<td>UL 94 VTM-0</td>
</tr>
<tr>
<td>Epoxy Powder Coating</td>
<td>130</td>
<td>4.0</td>
<td>800</td>
<td>UL 94 V-0</td>
</tr>
</tbody>
</table>

* Note: Values may vary based on application