fastRise™ Multilayer Non-Reinforced Prepreg

fastRise™ is designed to bond all manner of circuit boards together with the lowest possible loss of any thermosetting prepreg available today. fastRise™ enables 77 GHz automotive radar.

fastRise™ is non-reinforced and eliminates skew/ variation in high speed digital/RF circuits. fastRise™ is based on ceramic, thermost and PTFE and is ideal for use with Taconic’s TSM-DS3b, TSM-DS3M and EZ-IO-F.

fastRise™ can be foil laminated, laser ablated, and sequentially laminated to yield layers of stacked or staggered microvias. Please consult with a technical sales person for microvia design and reliability testing data. The low temperature lamination leads to less variation when resistive foils are used. fastRise™ is flexible enough in the prepreg stage for lasing and impregnation with conductive paste for interconnecting between subassemblies. When combined with stable dielectric materials like EZ-IO-F, fastRise™ passes reliability testing including IST, HATS and CAF.

The low 420°F lamination temperature enables 5+ sequential laminations at temperatures lower than those normally used for FEP and PFA in military constructions.

The fastRise™ family (fastRise,™ FREZ, and EZpure) bonds to PTFE, epoxy, low-flow epoxy, LCP, polyimide, and hydrocarbon materials.

Benefits & Applications:
- Df= 0.0014 / 0.0017 (10/40 GHz)
- Laser ablatable, HDI ready
- Low Dk enables reduced thickness of ATE boards
- Low temperature alternative to thermoplastic films in military designs
- Multilayer prepreg for high layer count high speed digital
- Stable Dk over temperature
- Fiberglass free prepreg
- Enables 5+ sequential laminations
- Compatible with conductive pastes between subassemblies
- Filters & Couplers
- Military, Avionics, Space
- Automotive Radar
- Beam Steerable Antennas
- Flexible Circuits

An ISO 9001 Registered Company
www.taconic-add.com
Commercial and Government Entity (CAGE) Code: 1C6Q9
There are many fastRise™ part numbers due to the diverse number of tasks that a prepreg must fulfill. For doing sequential laminations where the intent is to flow and fill copper that has been plated up to 2-3 mils, high resin content and high flow is required from the prepreg. For applications where you do not want the prepreg flowing into cavities, a low flow prepreg is desirable. Extremely high flow is needed for filling blind or buried vias or milled out cavities. In some coupler designs, a very thin prepreg is desirable for maximum coupling between the overlay couplers and sufficient flow is only needed to bond artwork with 0.5 oz. copper. Low flow prepregs are best for doing foil laminations. Flow and fill requirements don’t exist in a foil lamination so a low flow prepreg is appropriate whereas a high flow prepreg might be more prone to cosmetic defects. Taconic has found that low flow prepregs are most suitable for microvia formation following a foil lamination (the microvia cross sections below are courtesy of Hughes Circuits). Taconic’s low flow prepregs have a much better lased hole quality than the high flow prepregs.

In a high layer count PWB, often there are many layers of overlapping edge-coupled traces. High layer count PWBs are susceptible to lamination voids due to areas of high and low pressure. For all of these reasons it is best to consult the fastRise™ design guide or talk to a Taconic applications engineer to design with the most suitable prepreg.

### Standard fastRise™ Part Numbers

<table>
<thead>
<tr>
<th>Product</th>
<th>Stripline with 1 oz. Cu</th>
<th>High Layer Count PWBs</th>
<th>Between Plated Up Subassemblies</th>
<th>Fill Blind/ Buried Vias</th>
<th>Resin Content</th>
<th>Microvia Formation/Foil Lamination</th>
<th>Drill Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR-27-0030-25 (F)</td>
<td>See below 2</td>
<td>Yes 1</td>
<td>No</td>
<td>No</td>
<td>Low</td>
<td>R</td>
<td>Best</td>
</tr>
<tr>
<td>FR-27-0040-43F</td>
<td>See below 2</td>
<td>Yes 1</td>
<td>See below 3</td>
<td>No</td>
<td>Medium</td>
<td>Best</td>
<td>Best</td>
</tr>
<tr>
<td>FR-27-0045-35</td>
<td>See below 2</td>
<td>Yes 1</td>
<td>No</td>
<td>No</td>
<td>High</td>
<td>R</td>
<td>Best</td>
</tr>
<tr>
<td>FR-28-0040-50 (S,F)</td>
<td>Yes</td>
<td>Yes</td>
<td>See below 3</td>
<td>No</td>
<td>High</td>
<td>R</td>
<td>Best</td>
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<tr>
<td>FR-27-0050-40 (S)</td>
<td>Yes</td>
<td>Yes</td>
<td>See below 3</td>
<td>No</td>
<td>High</td>
<td>R</td>
<td>Best</td>
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</table>

### Specialty fastRise™ Part Numbers

<table>
<thead>
<tr>
<th>Product</th>
<th>Stripline with 1 oz. Cu</th>
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<th>Between Plated Up Subassemblies</th>
<th>Fill Blind/ Buried Vias</th>
<th>Resin Content</th>
<th>Microvia Formation/Foil Lamination</th>
<th>Drill Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR-25-0021-45 (F)</td>
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<td>No 1</td>
<td>No</td>
<td>No</td>
<td>Low</td>
<td>No</td>
<td>Susceptible 4</td>
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<tr>
<td>FR-26-0025-60</td>
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<td>Yes 1</td>
<td>See below 3</td>
<td>No</td>
<td>High</td>
<td>No</td>
<td>Susceptible 4</td>
</tr>
<tr>
<td>FR-27-0035-66</td>
<td>Yes</td>
<td>Yes 1</td>
<td>Yes</td>
<td>Yes</td>
<td>Highest</td>
<td>No</td>
<td>Susceptible 4</td>
</tr>
<tr>
<td>FR-27-0042-75</td>
<td>Yes</td>
<td>Yes 1</td>
<td>Yes</td>
<td>Yes</td>
<td>Highest</td>
<td>No</td>
<td>Susceptible 4</td>
</tr>
</tbody>
</table>

1 Some layers only
2 FR-27-0030-25, FR-27-0040-43F and FR-27-0045-35 can be used with 1 oz. copper on low layer count PWBs but should not be used where many layers are bonded together in a single lamination due to the risk of low pressure areas during lamination.
3 Plated up subassemblies can vary in the ultimate copper thickness. A discussion with a Taconic Applications Engineer is advised.
4 Susceptible to common PTFE drilling defects
R = Recommended

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Laser Ablation: **Hughes Circuits** - FR-28-0040-50

Foil Lamination Surface Smoothness
FR-27-0045-35
All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.
Because of the large number of possible applications for the fastRise™ prepreg series and the complexity of many multilayer printed circuit designs, Taconic does not warranty or guarantee the performance of fastRise™ when combined with any supplier’s core materials. It is the responsibility of the end user to determine the suitability of fastRise™ for any application.

Click here to view the fastRise™ process guideline.

Taconic’s fastRise™ 25/26 materials meet the requirements of IPC-4103B/520 and IPC-4103B/530 for fastRise™ 27/28.

fastRise™ Used at 77 GHz for Automotive Radar

fastRise™ prepreg between subassemblies w/copper paste