

Friday, May 10

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## SIDEBAR ONE

### Taconic, Partners Bet on 'Enlightened Self Interest'

One news announcement that garnered a lot of attention at the show is Taconic's plan to develop a platform for specialty materials. The company announced an alliance between itself, DuPont, Isola, and Teradyne to create an industry platform for the implementation of low loss materials produced in high volume for the electronics industry. Isola and Taconic will develop and produce substrate materials for high-speed, digital printed circuitry applications, while Teradyne will use TacPreg in the production of its large scale PWB applications..

Jim O'Keefe, co-CEO of Taconic, believes that the new product platform will resonate with allied companies and OEMs because it stems from an "enlightened self interest." Both Taconic and Isola gain from this partnership. The alliance leverages Taconic's product development core competency in the very high frequency microwave domain and Isola's strengths in PWB fabricator technical support and worldwide volume manufacturing to develop and produce substrate materials for high-speed digital applications. O'Keefe said, "Unlike the enhanced epoxy materials introduced to the marketplace over the past few years, fluoropolymer substrates offer designers a technology platform to deliver backplane and daughter card solutions at 5 Gbps and beyond: a platform for the next decade, not just a single design cycle." The alliance hopes to provide the standard product and dependability of supply manufacturers currently enjoy with FR-4.

What makes the TacPreg material unique? According to Dr. Tom McCarthy, who developed the material, "For the first time, high-layer-count structures are possible with a PTFE-based material." O'Keefe also touted the fact that "unlike the exotic modified-epoxy materials currently offered, PTFE laminates enjoy over a decade of production history at major fabricators around the world. What is different is that for the first time, multilayer daughter cards and backplanes are possible [using] TacPreg-derivative laminates."

When asked how OEMs will benefit from this industry platform for specialty materials, O'Keefe explained, "OEMs will benefit because . . . there will be an industry-accepted platform for high-speed digital design. [This] is a material solution not only for the current design cycle, but for the next decade of high-speed digital design? TacPreg is based on a PTFE/ceramic matrix where loss is flat over frequency beyond 10 Gbps. The benefit to fabricators and OEMs alike is they will not have to qualify a new material for every design cycle as application speeds increase up to and beyond 10 Gbps."

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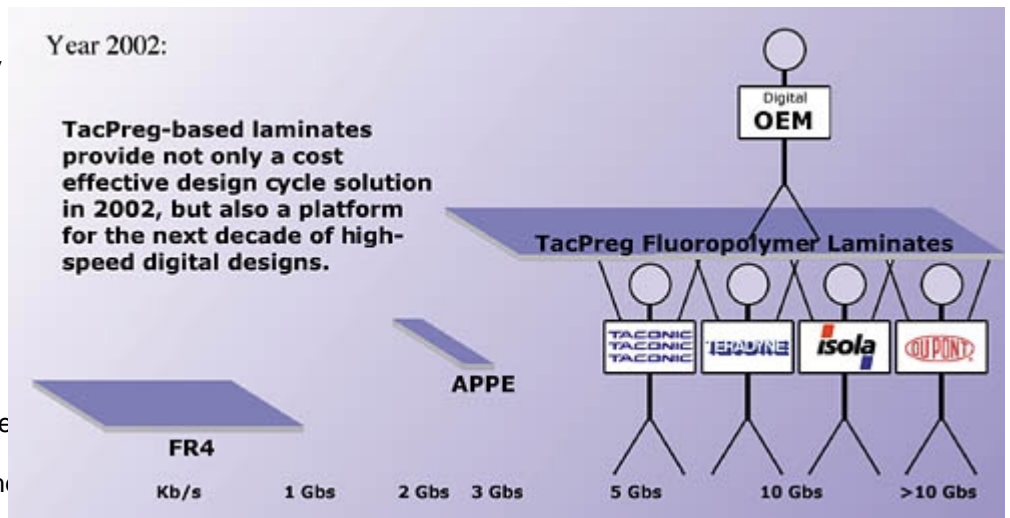
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Looking at the company names attached to this new alliance, one wonders where the idea was germinated. Taconic approached DuPont, "who

was just adding new PTFE (Teflon) dispersion capacity to obtain a commitment in the event volumes increased substantially," said O'Keefe. It also approached Isola last autumn, understanding that Isola's global footprint would be a key to gaining industry acceptance. "When Taconic developed the TacPreg technology," explained O'Keefe, "we recognized that a single product or a single company does not a platform make. For that reason, we have asked a



number of industry leaders to support the fluoropolymer laminate platform. Due to the economies of scale that Isola contributes, and the raw material agreements with DuPont, this product will be competitive with other substrate materials in the high-speed market."

Teradyne is seeking material solutions for high speed back plane/connector/daughter card interconnects. They developed high speed connectors designed for 10 Giga bites, but the system speed (daughter card-connector- back-plane-connector-daughter card) is bottlenecked by the dielectric properties of back planes and daughter cards. PTFE-based materials hold promise to increase the system speed. Taconic's PTFE-based materials were first incorporated in a back plane test vehicle, to be extended to PTFE-based daughter cards next.

The back plane signal integrity test vehicle is a 20 layer board, about 10 by 24 inches in size, and approximately 170 mil thick. The prepreg was TacPreg which is a woven glass, ceramic filled PTFE-epoxy composite. The individual cores were also Taconic material, namely RF-35 which is ceramic filled, glass weave PTFE. Multilayer lamination used standard FR-4 processing and lamination equipment (standard hydraulic press, 200-300 psi, about 350 degrees F). Hole drilling quality and productivity was comparable to that of other high performance laminates. Hole wall preparation was done by plasma. Performance testing included solder shock and eye pattern tests the results of which exceeded expectations.

Teradyne has already manufactured several successive test lots of the Taconic material. Dave Anderson, Teradyne's Technology Manager for PCBs, said "Each new release has incorporated changes/improvements to both the Tacpreg material and our manufacturing process. As a result, the current builds meet standard PWB quality requirements. Teradyne will next manufacture larger volumes of high layer count PWBs to further characterize the material and optimize PWB processing. The electrical signal performance data on all builds has exceeded our expectations."

By getting all four of the industry alliance members to announce their support simultaneously at an Expo, O'Keefe believes they have taken the first steps necessary to establish TacPreg as a choice for high-speed digital applications in the near future. He's betting that the "enlightened self interest" that holds this alliance together will take hold in the OEM customer base.



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