Materials Information for Flex Designers and Fabricators

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A flexible circuit is more than just thin materials made into an interconnecting device. Understanding the characteristics of the materials and their properties versus circuit design type and requirements, are variables that circuit designers and fabricators should understand in order to build the best performing and cost effective alternatives for their customers. Sometimes the requirements of a design are only vaguely identified and the information requested from a materials supplier is not always the most applicable for the desired design and application. Over or under performance is designed in, requiring several iterations of building and testing to get to the most desired cost effective end result. Prototyping with one material type and then going to production with another material type also is cause of concern for the end user. Not all materials are the same, even when they are "generically" lumped into groups for convenience sake.

There are interactions in performance characteristics of the flexible base materials depending on the individual components they are made of. Knowing properties of the individual component variables such as the adhesive, polyimide film and copper foil types, is just the beginning. Industry "standard materials specifications" are mere performance guidelines and underscore the actual performance differences affected by changing any one variable from the individual component suppliers. Adhesiveless versus adhesive based laminates, versus adhesive and polyimide types or brands have a large impact on design and performance, even at the fabrication level. Understanding the performance characteristics a materials supplier is reporting and how the materials were tested to provide that information are also keys to consider in a circuits design and performance. Several examples of how flex materials properties are typically tested and how to use the information as well as what additional information should be asked of a materials supplier for a particular circuit design, are included in this presentation.

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