

glass-reinforced materials, thin materials can have twice the instability than their thicker counterparts. When testing materials are reinforced with other materials designed for dimensional stability, thinness has little effect on the observed test values.

Flammability. The flammability test measures the ability of a material to extinguish a flame when it is applied in a controlled environment. The interesting difference between the observed values of thick and thin flame resistant materials is the fact that the thinner materials burn for less time, but burn up more of the sample than their thicker counterparts. Typically, these thin materials become part of the overall composite of the PWB, and in combination with other thin materials, become thick again.

Arc Resistance. The arc resistance test measures the materials' ability to withstand pulsed high voltage arcing (12,500 VAC) across a 0.250" gap on the materi-

al's surface. The result of the test is measured in seconds until material breakdown. When looking at the actual results between thick and thin materials, thin materials experience breakdown in about half the time of their thicker counterparts.

A Thin Moral to a Thick Story

It may seem that I'm warning that thin materials are "bad" and won't perform. I don't believe that at all. I am simply asserting that they are misunderstood. I wanted to draw attention to this issue because many people are out there waving the "similarity" flag, and designers are arbitrarily placing requirements on their drawings without truly examining the consequences of their actions. If both the PWB designer and manufacturer plan for these unique attributes, thin materials can bring amazing results in increased density while reducing some of the problems associated with z-axis

expansion and plating aspect ratios. In many of today's designs, board voltages never get above a few volts; the consequences and reliability issues where this applies are almost non-existent. I have also seen failures directly associated with the misapplication of thin materials where the attributes of the materials used were incapable of meeting the design requirements.

Thin materials will become common, dominating the future of our industry. Every materials supplier is convinced of this, and is developing new and better material to fit this need. Every major revolution in our industry had considerable problems associated with it (rivets/PTHs, two-sided/multilayer, electroless/direct deposit, etc.), and we, as an industry, overcame the obstacles. The model for success is there. However, I caution you to be on the leading—and not the bleeding—edge of this revolution.