

# **A Viscoplastic Model for Removable Epoxy Foams\***

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Foams are often used in packaging to protect sensitive components from accidental impact and random vibration events. Removable epoxy foams were recently developed for electronic component packaging. These foams are attractive because they can be removed without destroying the electronic components; thus, allowing for rework. A series of experiments were initiated to characterize the mechanical response of these foams to large deformation. In these experiments the effects of load path, loading rate, and temperature were investigated. Results from these experiments indicate that the removable epoxy foams are very strain-rate and temperature dependent. Thus, a new viscoplastic foam model was developed to describe the response of these foams to large deformation at a variety of temperatures and strain rates. This new viscoplastic foam model may also be useful for describing the mechanical behavior of other, more common, packaging foams.

This presentation will include a description of the experiments and experimental findings. Next, the development of a new viscoplastic foam model will be described and response predictions generated using the new model will be compared with experimental results. Finally, the results from the transient dynamic analysis of an impact event in which removable epoxy foam is used for packaging will be presented.

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