NOVEL CURATIVE SYSTEMS FOR HIGH STRENGTH, LOW THERMAL CONDUCTIVITY EPOXY-BASED SYNTACTIC FOAMS

Borys Schafran, Evonik Corporation,
borys.schafran@evonik.com
Karana Shah, Dixie Chemical Company
Benjamin Willis, University of Alabama at Birmingham
Jeff Dimmit, Evonik Corporation
Brian Pillay, University of Alabama at Brimingham
Gary M. Gladysz, Empyreus Solutions

Key Words: epoxy, dianhydride, monoanhydride, syntactic foam.

Epoxies cured with anhydrides form crosslinked thermoset networks that exhibit good chemical, electrical, thermal, and mechanical behavior. Past studies on epoxy-based curative systems for syntactic foam focused on monoanhydrides and monoanhydride blends to optimize performance and processibility. There have been very few investigations incorporating dianhydrides as curatives in these syntactic foams despite the fact that they can lead to higher performance. In this present study we investigate novel mono/dianhydride blends as curative systems for epoxy-based syntactic foams. Mechanical, thermal and processibility data for syntactic foams are presented and compared to monoanhydride-based curatives. We discuss this data in relation to the material design of deep-sea thermal insulation.