AS SEEN IN "MODERN PLASTICS WORLDWIDE"

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Bio-based modifier provides FR, enhanced properties

A group of patent-pending bio-based polymer modifiers reportedly enhance flame retardancy and add flexibility to otherwise rigid plastic products. JEMINI 100 is the first in a line of non-halogen flame-retardant additives that are RoHS, WEEE and REACH compliant. Described as an "agri-derived liquid", JEMINI 100 modifiers are ignition resistant, thermally stable up to 280^{o}C, and allow high loadings of fillers in compounds, many of which cannot be processed without the addition of a modifier.

Bill Hamilton of JEMINI developer JJI Technologies, told **MPW** that he couldn't divulge the exact composition of JEMINI 100, but said that more than 90% of it is derived from naturally occurring substances. "While it is not a flame retardant itself, it does not add to the fuel load like other polymer modifiers, which are mineral based," Hamilton explains.

While mineral-based flame retardants can impact physical properties, making compounds brittle in some instances, JEMINI 100 is said to improve elongation, flex modulus, and impact resistance due to its plasticizing effect. The JEMINI line was originally developed as a way to impart superior flexibility to non-halogen flame retarded polypropylene wire and cables, without compromising the flame rating or other key properties.

Hamilton says the modifiers have thus far been used with PE and PP, with the liquid injected directly into the barrel, although JJI believes it could also be added at the feedthroat. Letdown rations have ranged from 2-5%, depending on the application and desired result, whether it's process improvement or enhanced magnesium hydroxide flame retardant performance.

Speaking to **MPW** in early November, 2009, Hamilton said JEMINI 100 was at that time in the final stages of commercialization. Several companies were using it in scale-up situations involving highly filled materials such as magnesium hydroxide, he added.

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