

Huntsman's halogen-free laminates help electronics industry solve environmental concerns

Makers of print circuit boards (PCBs) are making the move to more environmentally friendly halogen-free laminates and Huntsman's Azyral® benzoxazine resins are helping them achieve their performance and sustainability goals.

Laminate is the basic substrate material for PCBs found in telecom equipment, medical measurement devices, information technology equipment, automobile parts, cell phones and other electronic consumer products. Halogen, made up of fluorine, chlorine, bromine, iodine and astatine, has been the material of choice to create PCBs. Though not harmful during its lifetime, there is concern about what happens to halogenated products once they have reached end of life.

"Studies by European countries and Japan show that the incineration of electronic devices containing halogen releases carcinogenic materials like polybrominated dibenzo dioxins and polybrominated dibenzo furans, which can contribute to smog and toxic air concerns," says Meising Ho, Technology Director, Research and Technology, Asia Pacific. "Polybrominated dibenzo dioxins and polybrominated dibenzo furans also have been shown to be present in increasing levels in soil and groundwater. Other studies have shown burning halogen materials can affect human immunity and hormone secretion systems and influence people's reproduction and development."

The environmental concern has led to legislation in the European Union on the Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (<http://www.rohs-guide.com/>) and the prevention of Waste Electrical and Electronic Equipment (WEEE) (<http://free.weee-guide.com/weee-directive.html>). Similar legislation exists in Japan and China.

Huntsman is a pioneer and leader in developing benzoxazines as the technology solution for halogen-free resins for laminate. "We are one of the first companies to successfully manufacture benzoxazines on a commercial scale," Ho says. Huntsman began producing benzoxazine resins at its McIntosh, Alabama, site in 2000 and its Monthey, Switzerland, site in 2002, and in China at its Panyu site in 2007.

Azyral® received the Green Product Innovation of the Year award in 2007 from Frost & Sullivan (<http://www.frost.com/prod/servlet/frost-home.pag>), a research and best-practice consulting firm for Global 1000 companies. The resins were recognized for anticipating and addressing ongoing environmental concerns, supporting manufacturers in their effort to comply with RoHS and WEEE directives and providing cost-efficient solutions to the electronics industry.

"In addition to environmental benefits, Azyral® provides improvements in thermo-mechanical and electrical properties and water resistance," Ho says. "Our long-term goal is to continue our research and process development work to make benzoxazine resins cost-competitive with halogen-containing materials and provide even better performance."

Benefits of Azyral® resins

- Halogen-free to meet environment concerns
- Excellent thermal resistance up to 250 degrees C
- Flame retardant
- Better electrical properties and water resistance than halogen materials