

FACT SHEET RoHS REVIEW

Alternatives to Brominated and Chlorinated Flame Retardants in EEE products

There are a wide range of non-brominated and non-chlorinated chemical alternatives available for most electronics applications. Virtually every major supplier of engineering compounds for electronic applications has introduced non-halogenated alternatives, many with improved technical properties. Many have as many as two or three years of field testing¹.

To accomplish this, companies have employed a range of green design strategies that include product re-design, increased use of inherently fire-resistant materials, such as metal enclosures, and substitution of brominated and chlorinated chemicals with safer alternatives. This has led to the development of new materials and chemicals that have a lower impact on human health and the environment.

Halogen-free flame retardants cover a diverse range of chemicals which can be classified as:

- Inorganic flame retardants: This category includes mainly metal hydroxides like aluminium hydroxide and magnesium hydroxide.
- Phosphorus based flame retardants: This category includes organic and inorganic phosphates, phosphonates and phosphinates, covering a wide range of phosphorus compounds with different oxidation states.
- Nitrogen based flame retardants: This category includes melamine and melamine derivatives. They are often used in combination with phosphorus based flame retardants.

CHEMICAL INDUSTRY RESPONSE: PINFA

The chemical industry has responded to the demand for safer flame retardants through a new association called PINFA

(Phosphorus, Inorganic, Nitrogen Flame Retardants Association), formed in March 2009. PINFA is dedicated to produce flame retardants that have improved environmental and human health profile. In contrary to brominated and chlorinated flame retardants, these alternative flame retardants are not persistent or bio-accumulative.

STUDIES ON ALTERNATIVES

In response to policy and market-based restrictions on brominated and chlorinated flame retardants (BFRs and CFRs), over the last years, government agencies, for example German UBA and Washington State Department of Health, as well as technical experts in the non-profit sector, have assessed the hazard characteristics and potential potential human health and environment concerns for alternative flame retardants. Collectively, these studies provide in-depth research on the hazard profiles of chemicals that can be effectively used to flame retard electronic products.

In conclusion, a number of assessments made by government agencies as well as NGOs indicate that a number of non-halogenated flame retardants are safer alternatives to brominated and chlorinated flame retardants.^{2,3}

¹ <http://www.designnews.com> New Chemistries Emerge for Flame-Retardant Applications, May 2009

² Washington State Department of Health (2008): Alternatives to Deca-BDE in Televisions and Computers and Residential Upholstered Furniture. Department of Ecology State Washington

³ German UBA 2001: Substituting Environmentally Relevant Flame Retardants: Assessment Fundamentals Volume 1: Results and summary overview.

For more information on these studies see “Studies on Alternatives to Brominated and Chlorinated Substances” from ChemSec available at www.chemsec.org/rohs/reports-and-documents

For further information and questions on how ChemSec engages with policy-makers, industry and public interest organisations on RoHS, please visit www.chemsec.org/rohs

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