Empa
Materials Science and Technology

Polyurethanes (PU) are inherently flammable, and their flammability is generally reduced by the addition of flame retardants. The need to replace toxic halogenated flame retardants has led to a rapid increase in the development of safe and effective alternative flame retardants.

Phosphorous based flame retardant used in polyurethane applications

UL-94, horizontal burning test for HB classification

FR in PU applications

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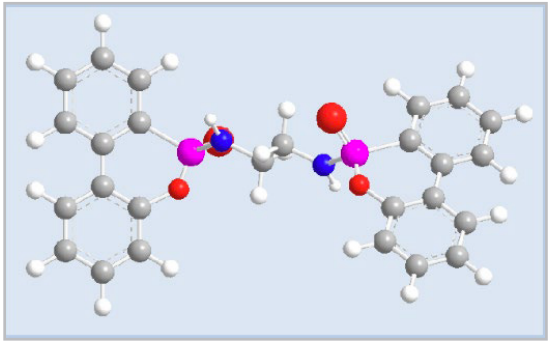

EDA-DOPO, a halogen free flameretardant

PU based back-coating for carpets containing flame retardants

In recent years, more and more halogenated flame retardants such as TCPP (tris-2-chloropropyl phosphate) and other polybrominated diphenyl ethers have been banned by various authorities or withdrawn from use by chemical manufacturers due to serious environmental and health concerns. The requirements for non-toxicity of not only the flame retardant itself, but also the smoke produced by the flame retardants have increased. Researchers are now looking for alternative flame retardants, including the chemistry group at Empa›s Advanced Fibers Laboratory. It has been working on the synthesis of various DOPO derivatives and studying the mechanism and burning behavior of different materials using the newly developed flame retardants. EDA-DOPO is one of the flame retardant developed at Empa. The effect of this bridged DOPO-based phosphonamidate compound on PU flexible foams and back coatings on textiles has been reported in various publications. EDA-DOPO is registered in Europe under REACH and is currently manufactured by SVS Interchem, India. This FR is not only used for PU flexible foams, but is also compatible with all synthetic textiles, polyamides, polyolefins and epoxy resins, etc.