

**ADDITIVES & COLORS FOR THE  
PLASTICS INDUSTRY**

## **Flame Retardant Solutions for Polycarbonate**



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Transparent plastic sheets are increasingly being integrated in place of glass in an ever-growing range of applications: roofing for malls, swimming pools and train stations; lighting fixtures in public transport vehicles; electrical components in appliances; and even DIY. The most commonly used option is polycarbonate (PC) sheets, which are produced in solid, multiwall or corrugated form.

International standards require that PC sheets be non-flammable, so that they would both be able to withstand a fire, and not themselves be a source of ignition. Although pure PC resin has an inherent degree of flame retardancy (25% of LOI value and UL-94 V-2 rating), it is still not suitable for use in harsh applications that require a more stringent flame-retardant rating.

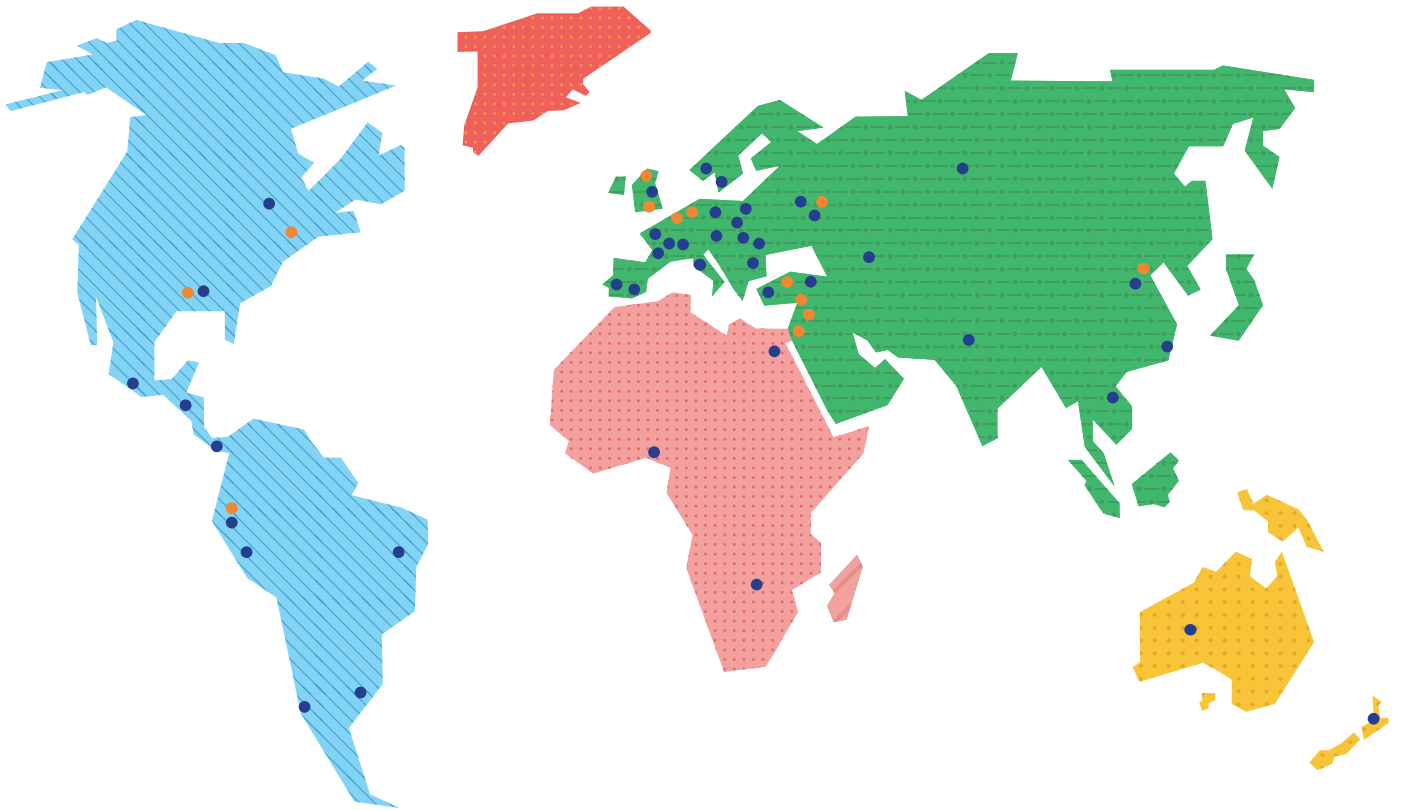
Hence the need for flame-retardant additives.

In PC sheets, the main challenge in adding additives is the effect they have on the original transparency of the polycarbonate material. At Tosaf, we have developed several flame- retardant solutions that have minimal effect on the sheets' transparency, causing no reduction in light transmission and an increase of only 1-2% in the original haze value. Based on halogenated additives or halogen free (HFFR), they are available in either masterbatch or ready-to-use compound form.

Product	Rating	Usage Level	Remarks
FR3997PC EU	UL 94 V0 @ 2.0mm & 3.2mm	7%-10%	Halogen based
	BS EN ISO 11925-2 and BS EN 13823 (3mm) – Bs1d0	7%-10%	Easy to use
	IEC-60695-2-11 Glow Wire @ 960°C for electrical parts 1.5mm pass.	7%-10%	Thermally stable
	L.O.I – BS2782 @ 3mm 42%	8%	No effect on process parameters No effect on optical properties
FR7607PC EU	UL 94 V0 @1.5mm	8%	Halogen based
	UL 94 V0 @ 0.8mm*	12%	Easy to use Thermally stable No effect on process parameters No effect on optical properties
FR7683PC EU	UL 94 V0 @1.5mm	7%	Halogen Free
	UL 94 V0 @ 0.8mm	10%	Milky color

Product	Rating	Usage Level	Remarks
FR3412PC	UL 94 @ 3.0mm	Compound	Halogen base No effect on optical properties Injection molding flow
FR3642PC	UL 94 @ 3.0mm	8%-10%	Halogen Free No effect on optical properties
FR4612PCW	UL 94 @ 2.0mm	Ready-to-use White Compound	Halogen base Injection molding flow
FR7762PC EU	The results based on EN 45545-2 standard show that transparent FR7762PC with a thickness of 2 mm and of 3 mm is classified as a R4 – HL3 hazard level.	Ready to use Clear Compound	Complies with EN 45545-2, the European Union standard for fire testing of railway materials and components. The compound has been officially approved by an independent European laboratory fully accredited to ISO 17025

\* Must be mixed with low MI branched grade. For example, Lexan 1332T.



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