

SABIC's Inputs to the Public Consultation Comments to Annex XV PFAS Restriction Proposal

Question number 6: Missing uses - PTFE used as an Anti-Drip Additive in Thin-Wall, Flame Retardant Polycarbonate Resins

Executive Summary

Flame retardant polycarbonate resins used in thin-wall (thickness <1.0 mm) consumer electronics applications plays a critical role in consumer safety and requires the use of PTFE as an anti-drip additive. Thin walled parts reduce the amount of plastic used and therefore the amount of plastic waste produced during the manufacturing process as well as at the electronic devices' end of life. Before these tough thin-wall flame retardant polycarbonates were available, typical wall thicknesses in consumer electronics were 2-3 mm, which in comparison can lead to a 100% to 200% increase in resource consumption and solid waste generation, depending upon the electronic application design requirements. Thin-walled polycarbonate resins can also lead to lighter products which require less energy for transportation, which results in less CO₂ emissions.

Alongside many unique properties, polycarbonate is an inherently tough material which provides device integrity during and after an impact event, so that the electronic device can continue to function, and does not produce an electrical hazard (short circuit, shock hazard) or a fire hazard. There are no alternative engineering plastics available today that provide the necessary combination of impact resistance, ductility, and flammability properties for thin walled (<1 mm) electronic device parts.

To ensure that thin-walled polycarbonate resins have adequate flame retardancy, it is essential to use PTFE as the anti-drip agent. PTFE, in combination with flame retardant additives, increases the ignition resistance of the polycarbonate thereby lowering the probability of a fire event. If a flame event does occur, the unique properties of PTFE help prevent flames from spreading and allow individuals more time to escape a fire. Our extensive research has not found any alternatives that provide adequate flammability performance for thin-walled polycarbonate while also maintaining adequate impact resistance and ductility.

Given the absence of alternatives we feel it would be appropriate to allow for a 13.5-year derogation to have sufficient time to invent new materials or develop viable alternatives for PTFE used as an anti-drip additive in flame retardant polycarbonate resin formulations.

Substance Information:

Substance Name: Poly(1,1,2,2-tetrafluoroethylene)

Synonyms/Abbreviations: PTFE

Molecular formula: $(C_2F_4)_n$

EC/List no.: 618-337-2

CAS number: 9002-84-0

Type: Solid

Application: PTFE used as an anti-drip additive in thin-wall, flame retardant polycarbonate resin formulations