

3M Advanced Materials Division

# 3M™ Flame Retardant Additive FR-2025

## High Temperature Stable Flame Retardant for Clear Polycarbonate

### Introduction

3M™ Flame Retardant Additive FR-2025 has been found to be an effective flame retardant in polycarbonate at use levels as low as 0.06% to 0.10% by weight. It is chemically and thermally stable to temperatures greater than 450°C – making it ideal for use in engineering resins that require high processing temperatures – and provides excellent performance without affecting the processability of the resin.

One advantage of the low use levels necessary to provide effective flame retardance is that FR-2025 flame retardant additive can be formulated to produce optically-clear, haze-free grades of polycarbonate for extrusion and molding. What's more, FR-2025 additive does not contain any bromine or chlorine and has been found effective as a flame retardant without the use of synergists.

### Material Description

(Not for specification purposes.)

Properties	FR-2025
Appearance	White Powder
Chemical Name	Potassium Perfluorobutane Sulfonate $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$

### Typical Physical Properties

(Not for specification purposes.)

Properties	FR-2025
Molecular Weight	338
Melting Point – by DSC	271-273°C
Decomposition Temp – by TGA/N <sub>2</sub> purge	499°C
Bulk Density – kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	900-945 (56-59)
Solubility in Water – wt% at 25°C	5%

### Perkin-Elmer Thermal Analysis (10°C/minute under N<sub>2</sub>)

1% Weight Loss	460°C
5% Weight Loss	480°C
10% Weight Loss	485°C
50% Weight Loss	505°C
90% Weight Loss	>800°C

### Applications and Compounding

3M flame retardant additive FR-2025 is extremely effective as a flame retardant additive with premium performance in polycarbonate at very low additive levels. For most effective incorporation it is recommended that the additive be initially dispersed into a 10% or more masterbatch and then compounded into the final plastic blend. Dispersion can be achieved effectively with typical polycarbonate processing equipment without the use of synergists.

### UL 94 Rating

- V0 in clear polycarbonate at 1/8" (3mm) thickness and 0.6 wt%
- V0 in PC and PC/ABS

### Packaging

FR-2025 flame retardant additive is available in 5 kg and 20 kg plastic pails.

### Safety and Handling

Before using product, please read and follow all applicable precautions and directions for use contained in the product label and the Safety Data Sheet. The Safety Data Sheet for this product is available from 3M Customer Service at 1-800-367-8905 or from your local 3M representative.

### Regulatory

- TSCA Listed
- REACH Compliant
- On the chemical inventories of Australia, Canada, China, Europe, Japan, Korea, the Philippines and the U.S.

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