

# Flame Retardants

# FlamEL™

High Quality | Halogen-free  
Non-Toxic | Environment-friendly

## What is FlamEL™

FlamEL is phosphorus based products with intumescent flame retardants.  
FlamEL is started from violet phosphorus with special technology.

The differences from other phosphorus based intumescent F.R. as below :

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High contents of phosphorus

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High hydrolysis resistance

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High thermal stability and low volatility

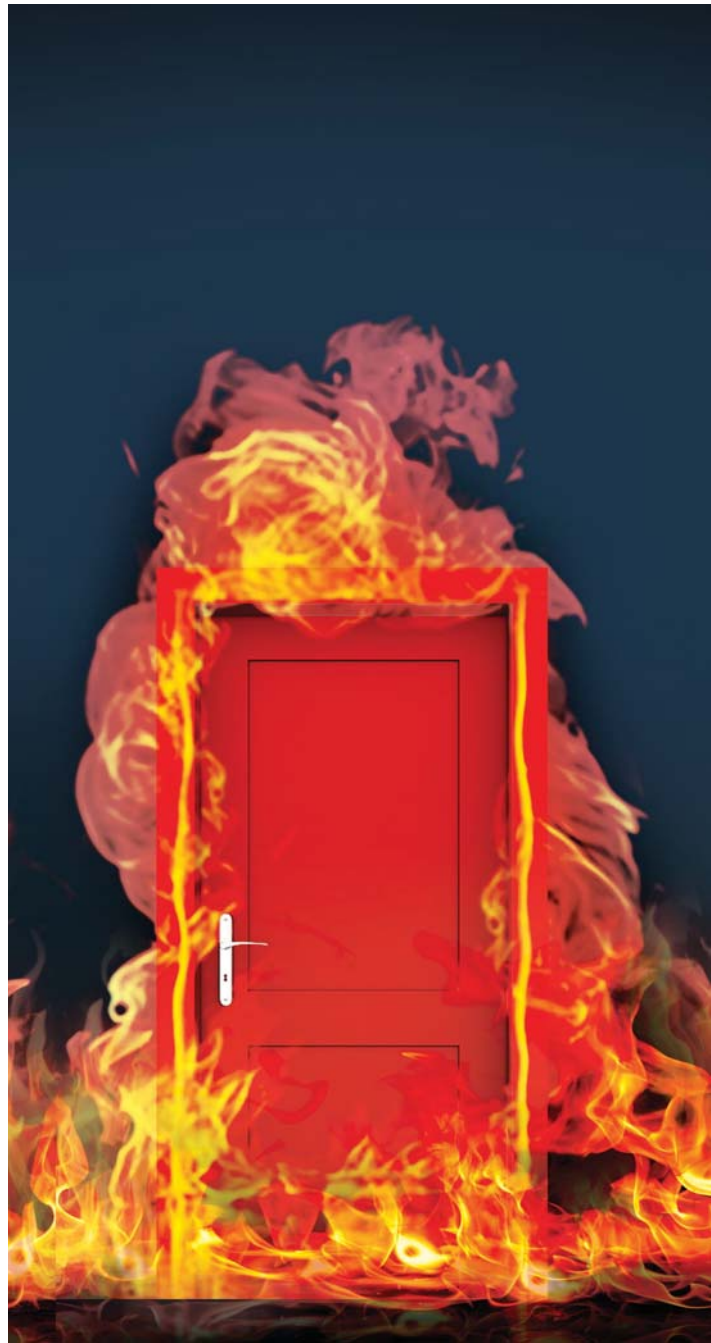
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Non-toxic, environment-friendly

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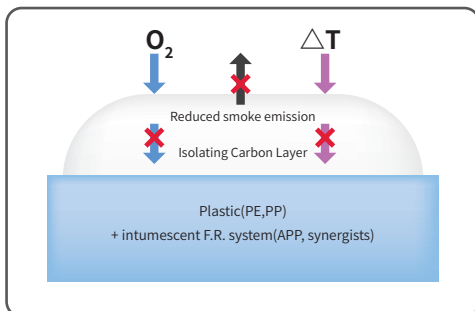
High performance with low dosing

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## FlamEL™ Mechanism

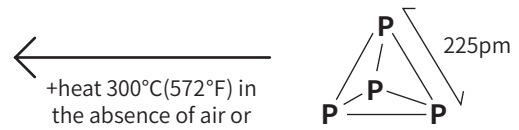
Violet phosphorus based  
intumescent Flame Retardant



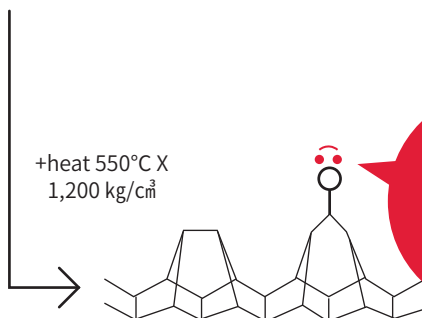
Mechanism of intumescent F.R.



Red phosphorus



White phosphorus



Violet phosphorus based FlamEL™

Special technology as capsulation on the oxygen radical to prevent of Hydrolysis, then polymerization by oligomeric ethyl ethylen.

## Product Details

### Key Properties

- Halogen-free
- Environment-friendly
- Non-toxic
- High thermo-stability
- Low volatility
- Dosage : 2 ~ 10%

### Application

- Steel painting
- Adhesives
- Polyurethane system (e.g. coating, potting compounds)
- Wood
- Artificial Leather

	<b>FlamEL™ RFL 2.2</b>	<b>FlamEL™ RFL 2.2T</b>	<b>FlamEL™ RFL 3.2</b>
Chem. Name	Triethyl phosphate polymer with oxirane and phosphorus oxide	Triethyl phosphate polymer with oxirane and phosphorus oxide	Triethyl phosphate polymer with oxirane and phosphorus oxide
CAS No.	184538-58-7	184538-58-7	184538-58-7
formulation	(C <sub>2</sub> H <sub>5</sub> ) <sub>n</sub> (PO <sub>4</sub> ) <sub>m</sub>	(C <sub>2</sub> H <sub>5</sub> ) <sub>n</sub> (PO <sub>4</sub> ) <sub>m</sub>	(C <sub>2</sub> H <sub>5</sub> ) <sub>n</sub> (PO <sub>4</sub> ) <sub>m</sub>
Appearance	Transparent liquid	Transparent liquid	Transparent liquid
Odor	Odorless	Odorless	Odorless
Moisture content	Less than 0.2%	Less than 0.2%	Less than 0.2%
Decomposition temperature	220°C	220°C	320°C
Viscosity (25°C)	6,000 ~ 7,000 cps	9,000 ~ 10,000 cps	25,000 ~ 35,000 cps
P-contents	19% min	21.5% min	21% min
PH value	4-5	6-7	6
Purity	100%	100%	100%
Shelf life	12 months	12 months	12 months