

The logo for Commercial Products USA features a stylized circular emblem composed of overlapping, curved lines in shades of red, orange, yellow, and white, creating a sense of motion and energy.

Commercial Products USA

# Next Generation, Non-Halogen Flame Retardants

Smartphones: **Click-to-Call!** [+1973-427-6887](tel:+19734276887) (Tom, Extension 13)

**Click to E-mail!** [GreenFR60@aol.com](mailto:GreenFR60@aol.com)

[Watch Our Video!](#)

[www.totallygreenflameretardant.com](http://www.totallygreenflameretardant.com)

Designed to replace Brominated Flame Retardants by offering equal or better performance at comparable loading levels, competitively priced, and environmentally friendly for manufacturers and consumers.

# History of Commercial Products USA

- Commercial Products has been in business since 1944, and currently has 4 Manufacturing & Production Locations in the USA with over 80,000,000lbs of Annual Capacity.
- Commercial Products has strategic growth & expansion plans for increasing capacity globally over the next 5 years.
- Commercial Products has been manufacturing Polymers, Additives, and Auxiliaries primarily for the Plastics, Coatings, & Textiles Markets in North America for the past 69 years, including many Tier 1 and ISO 9000 Certified Customers supplying the Automotive Industry.
- Due to the migration of the Textiles Market from North America to Asia and Central America, Commercial Products identified the Flame Retardant Market as a major growth market over the next 10 years, due to major regulatory changes regarding the harmful carcinogens currently used in a majority of FR Applications worldwide.
- Commercial Products combined innovative technical expertise on Textile Applications with in-depth knowledge of related Flame Test requirements, and launched a 6 Year Research & Development Project to develop new, Non-Halogen alternatives to the Brominated Fire Retardant Chemistry that is currently being outlawed (in various phases) worldwide.
- Commercial Products has developed and patented these Next-Generation APP and Proprietary Synergist Blends that perform better than any other FR in the market at similar loading levels.
- Commercial Products has been selling the ENFLAME Series for over 5 years with an excellent QC track record.
- Commercial Products has Worldwide Distribution & Supply Chain Management with Local Representatives in over 50 Countries.

## Powder Blends

- ENFLAME Series is a Next-Generation Ammonium Polyphosphate and Synergist Blend. It is manufactured by micro-encapsulation with proprietary resin compounds according to Commercial Products own method.
- A fine-particle white powder with very low solubility in water, even at elevated temperatures. It is completely insoluble in organic solvents. The product is non-hygroscopic and non-flammable.
- The incorporation of the proprietary Synergist in concert with Next-Generation APP results in superior performance versus standard APP. (For Example, Char Formation is 60-100x better than standard APP thus providing substrate retention).
- ENFLAME has comparable performance to Halogenated FRs: DecaBrom/Antimony Oxide FR Systems & Chlorinated FR Systems that are in the process of being removed from the market through regulatory mandates. In addition to the comparable performance versus Brominated and Chlorinated FRs, the formulator has the option to control and improve physical properties such as Char Formation, Smoke Suppressant, UV Stability, After-Glow, and Long Term Dispersion Stability versus the competition.
- ENFLAME Series is the best known alternative to Halogenated FRs or Standard APP for performance, price, supply capacity, and most importantly for the environment and consumers.
- Micro-encapsulated for Non-Leaching (No Salt Rings)

## Applications

- Plastics: Masterbatch, Compounding, & Extrusion
- Textiles
- Foam (PU and Latex)
- Intumescent Coatings
- NYLON: Compounding & Extrusion
- Adhesives & Sealants
- Paper
- Wood
- Casting
- Construction Materials
- Auto Upholstery
- Leather
- Composites
- Metalized Foil
- Polyester Film
- PVC & ABS Cable
- Many More

## Achievable Fire Ratings with ENFLAME

- MVSS-302
- UL94 V-0, V-1, V-2
- DIN 4102 - Germany
- NF P 92501 - France
- BS 476 - UK
- EN 13823 (SBI) - Europe
- ASTM E-84 - US
- ASTM E-119 - US
- ASTM E-162 – US
- E-84 Tunnel Test
- FMVSS 302 (ISO 3795) - Automotive
- TS 45545 - Trains EU
- DIN 5510 - Trains DE
- NF F 16101 & 16102: M&F class - Trains FR
- BS 6853 - Trains UK
- FAR 25.853 - Aircraft US
- ABD 031 - Aircraft EU
- ASTM E-662 (NBS Smoke Box)
- 25.823
- BS 5852 (crib 5) - UK & Ireland
- EN 1021 part 1/ part 2 - EU cigarette & match test
- California TB 117 - California Furniture
- California TB 603 - California Mattresses
- FAA 701
- Many Others





# Commercial Products USA

## Typically, our ENFLAME Series is comprised of 3 components:

- An acid source which forms during the combustion, an impermeable semisolid layer essentially composed of polyphosphoric acid that activates the process of char formation.
- A carbonization agent which is dehydrated by the acid released and forms an insulated cellular solid layer between the polymer and flame.
- A blowing agent which expands to form a swollen multi cellular char by releasing non flammable gas and to expand the melting point of a system to give greater flame retardancy than conventional systems.

## ENFLAME effect on the properties of Plastics

- The mechanical properties of plastics are slightly altered by addition of ENFLAME . The following table shows the effect of this product on the mechanical properties of a PP based compounds, it should be noted that the melting index value of the modified polymer remains closely to that of the base polymer. Loadings should be in the 22-28% index

	<u>PP</u>	<u>PP with ENFLAME</u>
Melt Index	12	11.3
Tensile Modulus	1550	2810
Tension Yield Stress	35	36
Elongation at break	>50	11
Notched Impact Strength	3	3

\*V-O Class according to UL-94

## Processing Instructions

- The processing temperature remains the same as that of the PP, the melt temperature should not exceed 250 °C, to avoid decomposition and yellowing. Pre-drying Enflame is not generally necessary.

# Commercial Products USA



## Why Test ENFLAME?

When the products are tested, the performance will speak for itself, and if the Formulator is motivated to move away from Brominated FRs or other FR Systems, then this is simply the best alternative for all of the right reasons:

- Environmentally Safe/Non-Halogen
- Performs Better
- Priced Better
- Stable Supply Chain