



# PRESS RELEASE

## FOR IMMEDIATE RELEASE

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### FRX Polymers Announces Availability of Nofia® Non-Halogenated Flame Retardants as Replacement for Antimony in Brominated Systems

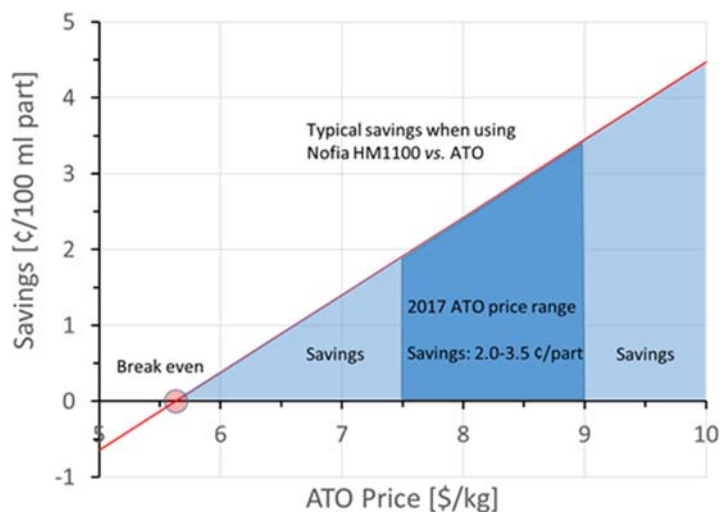
**CHELMSFORD, Mass., August 28, 2017** - FRX Polymers Inc., the global leader in polymeric halogen-free flame retardant solutions, has announced the availability of its Nofia® non-halogenated polyphosphonates as a replacement for antimony (ATO) in brominated flame retardant systems. Nofia flame retardants (FRs) serve as an excellent synergist in brominated flame retardant products, delivering lighter weight and reduced cost, according to the company.

“Our unique non-halogenated FR is winning broad support across a range of applications and this new use is another example where Nofia polyphosphonates’ versatility stands out,” said Dr. Jan-Pleun Lens, Vice President, Research and Applications, for FRX Polymers. Specifically, Lens noted that the replacement of ATO has been a longtime industry priority due to its high weight per volume (specific gravity) and consequently negative impact on final formulation costs. In addition, ATO is being scrutinized due to toxicity concerns. With ATO prices now increasing worldwide, replacement of ATO has once again become a high priority for many users. FRX Polymers has already validated Nofia FR’s effectiveness as an ATO replacement in glass-filled nylon 66, polybutylene terephthalate (PBT), polyethylene terephthalate (PET), and thermoplastic polyurethane (TPU).

Nofia FRs have a specific gravity of 1.2 and have the added advantage of being polymeric which means that they will not migrate or bleed out of the host plastic over time. ATO on the other hand has low molecular weight which means that it has a tendency to migrate out of the host plastic over time. It also has about five times higher specific gravity compared to Nofia FRs which means that one must use up to five times more ATO on a weight basis to achieve the same effectiveness compared to Nofia FRs. In typical formulations, the end customer will start to experience a savings per part when using Nofia versus ATO, when ATO prices are higher than about \$5.5/kg. (see accompanying diagram). In 2017, ATO prices have been on the rise and have so far fluctuated between \$7.5/kg up to \$9/kg. Customers who have converted to Nofia are typically saving between 2 to 3.5 cents per part this year. Moreover, using Nofia FR eliminates the health and environmental concerns associated with ATO and due to its polymeric nature, Nofia will deliver improved mechanical properties compared to ATO. Nofia FR’s transparency is another key benefit which is being explored in clear unfilled PVC systems.

Nofia FR as an ATO replacement is currently under extensive testing and commercial scale-up at many FRX Polymers customers.

FRX Polymers is the developer and producer of a new, environmentally friendly family of inherently flame retardant plastics and oligomers, trade named Nofia. The company is currently in the high growth phase of commercializing its unique family of polyphosphonate homopolymers, copolymers, and oligomers. These non-halogen flame retardants are tough and transparent, and possess high melt flow for use in consumer electronics, textiles, building and construction, and transportation markets. Nofia polyphosphonates replace halogenated flame retardants, which are being phased out due to toxicity concerns. They are being sold as polymeric flame retardant additives, flame retardant engineering plastics, and as reactive flame retardant additives for thermosetting resins.



Nofia phosphonates are produced using sustainable green chemistry principles such as a solvent-free production process, no waste by-products, and near 100% atom efficiency. FRX was awarded the U.S. Environmental Protection Agency's (EPA) sustainability award in 2014. FRX Polymers has an extensive and growing patent estate. To date, the company has nearly 200 patent applications, of which more than 100 applications have been granted.

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### About FRX Polymers

FRX Polymers, Inc. is the global leader in halogen-free polymeric flame retardant solutions, marketed under the Nofia<sup>®</sup> brand name. Nofia polymers and oligomers are inherently transparent, high flowing, and due to their high phosphorus content, are inherently flame retardant. These environmentally friendly FR solutions are targeted for use in electronics, textiles, building and construction, and transportation applications. Founded in 2007, FRX Polymers operates a pilot plant at its headquarters in Chelmsford, Mass. and a full-scale commercial plant in Antwerp, Belgium. For more information about its products, visit <http://www.frxpolymers.com/>.

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