FR Eco-Additive™ 20, 25 & 30

Fire Retardant Additive

Product Description	Bromine, antimony, and magnesium free fire retardant and smoke suppressing, polymeric additive. Provides an effective thermal barrier upon exposure to open flame or high radiant heat. This additive is a mixture comprised of TSWB™ and crystalline graphite.	
Intended Uses	Designed and engineered to be incorporated within composite laminate structures and other polymer binder mediums to provide fire protection and thermal insulation properties, as well as, smoke suppression	
Practical Information	**Appearance**	Free flowing charcoal gray powder
	pH	6.7-7.9 (10% aqueous slurry)
	Solubility	Trace if any in either aqueous or solvent systems
	Product Density	Approx. 1.90 g/cc.
	Avg. Particle size (µ)	Contact Avtec for sieve analysis.
	Toxicity	Minimal
	Maximum Processing Temp.	<340°F Recommended 380+°F Max (Discoloration and / or expansion reaction may occur.)

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Product Features	**Superior Performance**:	Extremely effective at the proper loading against open flame and high radiant heat, even in severe fires with high velocity combustion fronts.
	Climate Survivability	Resistant to water, weather, sea spray, chemical attack and protects over a wide range of operational temperatures when incorporated into composite structural resins.
	Versatile	Effective for use in a wide range of ambient fabrication methods and elevated temperature curing; thermoforming; and molding processes as high as 360^{o}F.
	Heat Barrier	This thermally non-conductive and infrared reflective insulating material can extend substrate time to failure by as much as 900% verses unprotected substrates.
	Environmentally Friendly	Suppresses smoke normally generated by polymeric resins. ***Contains no bromine, antimony or magnesium***. No PBDEs, PBDDs, PBDFs or other toxins can be formed from this product.
	Ease of Application	Easily incorporates with sheer into a wide variety of thermoset resins. Is easily compounded; heat pressed molded; or thermoformed in pre-produced cast film into a wide range of thermoplastics. Forms an excellent mechanical bond with finished thermoset substrates and thermoplastic mediums.

Methods of Application

FR Eco-Additive can be incorporated into a medium by a number of methods:

- Addition into the polymer resin en masse prior to process fabrication.
- May be positioned at the outer surfaces of the laminate/polymer structure by "doping" surfacing veil.
- Spraying a filled slurry.
- Applying a highly filled pre-impregnated reinforcement.
- Applying a thin highly filled thermoplastic cast film to maximize the physical characteristics of the underlying laminate resin or thermoplastic/reinforcement matrices.
- May be blended with a variety of commercially available paints, resins and surface coatings for application onto wood, metal, and plastic.

Cautionary Notes

PEROXIDE INITIATOR USE WITH TSWB™

Unsaturated resins are cured using a variety of initiators, depending upon temperature, used for the process. The reactivity of the resin and the use of modifiers, promoters, accelerators, as well as **additives**, greatly influence the choice of the proper and most correct initiator**. Fire Retardants and Smoke Suppressants** may each affect the type and concentration of initiator, or initiators required. The selection of initiator, or initiator system, is based upon the rate of cure desired, the extent of working time required (pre-gel time), and the necessary storage time of the resin/initiator-additive mix (pot-life).

When fabricating at ambient temperature (i.e. room temperature) with polyester, or vinyl ester resin [**NOTE**: this might include-Open Molding; Closed/clamshell molding; Resin Transfer Molding; Casting; Filament winding; Vacuum Bagging; etc.]:

- FR Eco-Additive is not affected by MEKP (Methyl Ethyl Ketone Peroxide)/Metal Carboxylate (i.e. Cobalt Napthanate) initiator/accelerator systems.

Cautionary Notes

When fabricating with FR Eco-Additive at elevated tempratures with polyester, or vinyl ester resin: (**NOTE**: This could include: Pultrusion; Filament Winding; Compression / Bulk Molding; Elevated Sheet Molding; Pre-Preg; etc.)

- Peroxydicarbonate (Ex.: AKZO's "Perkadox 16") is often included in a resin system to " initiate" the peroxide blend decomposition cycle and is acceptable with this composition.
- AVTEC recommends the use of Peroxyesters. Specifically T-Amyl-Peroctoate (Molding temperatures of 210-280°F), typically 75% liquid concentration in a Plastisizer Solution.
- Peroxyesters, such as T-Butly-Perbenzoate (Molding temperatures 275-325°F), used to "finish" the part to achieve a complete, hard cure is also recommended. This TBPB peroxide is the favored Perester for good surface characteristics.
- Peroxyketals, such as Peroxy-Cyclohexanes (Molding temperatures 265-310F), have very low sensitivity to compounding ingredients and are recommended for use in the intermediate phase of the thermal initiation process to optimize a thorough cure and are acceptable.

AVTEC Industries encourages the systematic screening of peroxide initiator candidates and related cure promoter/accelerators to optimize process performance.

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Safety Precautions	This Product is intended for use by professional fabricators in industrial situations in accordance with the advice given on this sheet, and the Material Safety Data Sheet (MSDS) that Avtec Industries provides to its customers. All work involving the fabrication and use of this product should be performed in compliance with all relevant, Health, Safety & Environmental Standards and Regulations. If in doubt regarding the suitability of use of this product, consult ***AVTEC INDUSTRIES*** for further advice.

Standard Packaging: 100 lb. and 300 lb. Fiber Drums
Store in a cool dry place

REV 02/05

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