VEAFLAME

THE HEALTHY & ENVIRONMENTAL SUSTAINABLE SOLUTION FOR FIRE PROTECTION

INNOVATION IN FIRE PROTECTION

⇒ Halogen and Antimony free synergistic blends

⇒ Boosting effect on existing flame retardant systems

⇒ Highly effective in char promoting and dripping suppression

⇒ Available in easy handling pellet form

⇒ No regulatory concern and friendly ecotox profile

⇒ Customizable according to meet specific requests

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ANTIMONY-HALOGEN-BORATE SYSTEMS: HIGH PERFORMANCES BUT SEVERE CONCERN ON SAFETY & ENVIRONMENT

The currently used flame retardant systems take advantage of the synergy between antimony trioxide and halogenated molecules. During combustion the volatile antimony oxide fragments react with the halogens giving oxy-halogenated radicals being hugely effective to extinguish the flame. However the toxicity of Antimony trioxide is a serious issue: **it has been added since long time in the SVHC list and it is classified and labelled as suspected of causing cancer (risk phrase H351).** In some applications Borate Salts (Zinc or Calcium) are added as coadiuvants in smoke reduction and char formation, but their toxicological and pollutant profiles are very heavy (**H360 & H361: reprotoxic**)

VEAFLAME: A NEW CLASS OF FIRE SUPPRESSORS

⇒ **VEAFLAME** work according the strategy of the *"Heat Induced Surface Protection"*. They consist in synergistic blends of activators and fillers able to promote the fire suppression by the formation of a diffuse, structured and compact char on the surface of the burning article.

⇒ **VEAFLAME** grades are suitable to be used together Aluminum Trioxide in halogen free formulations.

⇒ **VEAFLAME** can be used, if needed, as effective booster in conventional Antimony/ halogen system to enhanche the flame resistance.

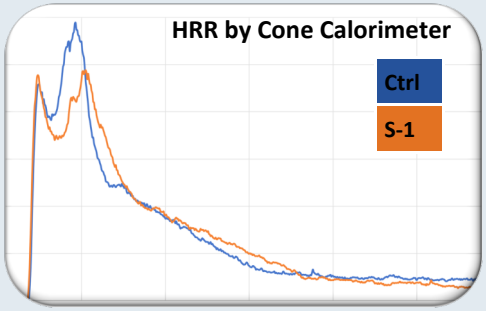
⇒ Different grades are available basing on the requirements to be matched

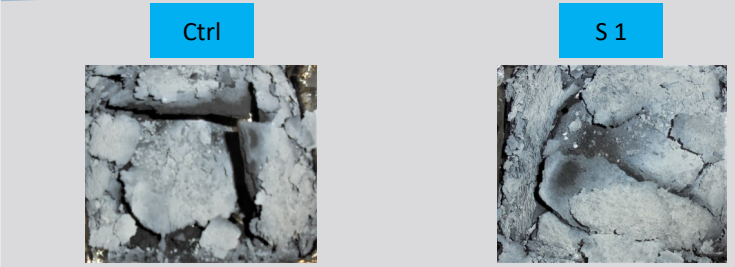
VEAFLAME 12	No interaction with foaming. Reccomended for sponge and foamed hoses
VEAFLAME 13	Extremely effective in char promoting. Low interaction with foaming. Reccomended for solid rubber.
VEAFLAME 30	Enhanced by an intumescent effect. Particularly suitable when a delayed ingnition is required

Case 3: VEAFLAME in safety shoe soles

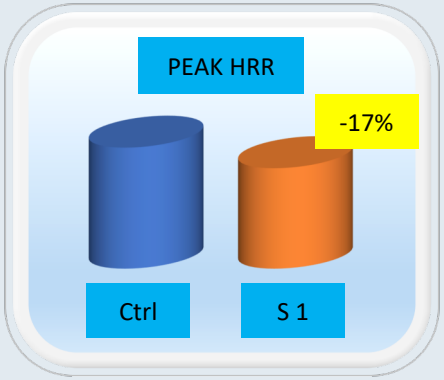
Nowadays the frire resistance in shoe sole compounds are ususally achieved by using halogen/Sb/Borate formulations. However due the harmful of the system, ever more players are shifting to much safer options. The trial is challenging because high loadings of oxides and filler have bad impact on elasticity and abrasion. The use of VEAFLAME increase the ability of the articles to auto-extinguish the flame thanks to the formation of a structured char.

	Halo/Sb free system	VEAFLAME 13
Ctrl	√	
S-1	√	5 phr



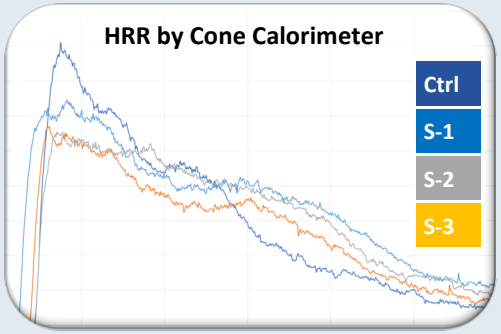


The char of the control sample is crumbly. The introduction of VEAFLAME 13 makes its structure denser, harder and compact



Case 1: VEAFLAME in NR antidamping compound

	Halo/Sb system	Sb free system	VEAFLA-ME 13	VEAFLA ME 30
Ctrl	√			
S-1	√		10 phr	
S-2	√		5 phr	5 phr
S-3		√	10 phr	



	Peak HRR (kW)	Smoke (m^2)	MAHRE (kW/m^2)
Ctrl	162	19	92
S-1	132	14	85
S-2	111	14	79
S-3	113	15	75

The structured char of the sample S-3. In Sb free system the main contribution to flame suppression is due to the compact shell of the char layer

1. S-1: The introduction of VEAFLAME 13 into a compound retarded with a conventional system provides high boosting effects :

-18% of HRR Peak	-26% in smoke production	-8% of MAHRE

2. S-2: A combination of VEAFLAME 13 and VEAFLAME 30 enhances even more the retardant properties of the system

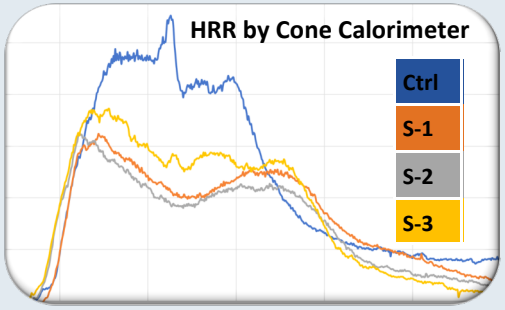
-31% of HRR Peak	-26% in smoke production	-18% of MAHRE

3. S-3: VEAFLAME system shows outstanding performances in Sb-free systems. Calorimeter data are much better than the control sample S-1

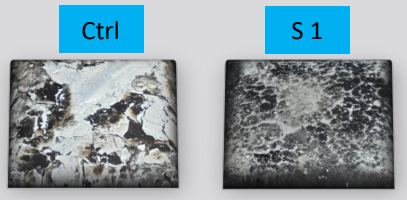
Case 2: VEAFLAME in cable compounds

Cable compounds are produced according the severe CPR rule. Many protocols do not allow to use flame retardants based on halogen system in order to avoid the emission of acid fumes during the fire event. VEAFLAME grades, even at low dosage, show an effective synergy with HFFR systems to enhance the fire resistance of the articles.

	Halo/Sb free system	VEAFLA-ME 13	VEAFLA ME 30
Ctrl	√		
S-1	√	10 phr	
S-2	√	5 phr	5 phr
S-3	√	4 phr	



	Peak HRR (kW)	Smoke (m^2)
Ctrl	276	9.3
S-1	162	8.6
S-2	162	8.7
S-3	186	8.9



Change in char structure by adding VEAFLAME system in a cable compound

	S1-VEAFLAME	S2-introduction of the	S3-VEAFLAME
Peak HRR	-41%	-41%	-33%
Smoke	-7.5%	-7.5%	-4.3%