Flame Retardant for PVC, Elastomer (TPU etc.)

FRAN CM series

Product lineup

Powder

Product	Component	Appearance	Particle size	Burning behavior	Recommended material	Decomposition temperature
FRAN CM-6R	Phosphorus and nitrogen compound	White powder	About 5 μm	Strong char	PVC Elastomer	About 300°C

Water dispersion

Product	Component	Appearance	Particle size	Burning behavior	рН	Ionicity
FRAN CM-DR	Phosphorus and nitrogen compound	White suspension (40%)	1∼2 μm	Strong char	4	Cationic
FRAN CM-DA1	Phosphorus and nitrogen compound	White suspension (40%)	5 μm	Strong char	4	Anionic

Our flame retardant "FRAN CM-6R"



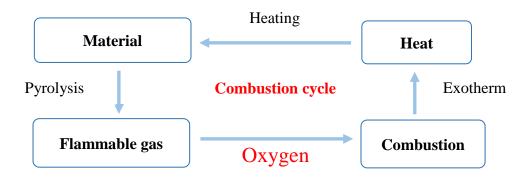


XTest with soft PVC sheet. Plasticizer 75 phr. Sample thickness: 2.5 mm.

What is a flame retardant?

Flame retardant is a chemical for improving the flammable properties of combustible such as fibers and plastics and making it less flammable. By properly processing the flame retardant, even if it comes in contact a small fire source, it cannot be easily ignited. Even after igniting, it cannot be easily burned out by self-extinguishing property.

Mechanism of flame retardant effect



Those which have an effect of cutting off any of the combustion cycles are effective as flame retardants. Our "FRAN" series also this principle, breaking the combustion cycle by cutting off the element of "oxygen" and stopping burn.

Regulation on Antimony trioxide

In EU, antimony trioxide is regulated as second priority under Article 6 of the RoHS Directive. It is likely to be regulated in other countries.

Characteristics of FRAN CM series



Strong Char

The FRAN CM series is characterized by "strong char" and it is different from other flame retardants. By "charring" only around the flame, it can prevent burning and maintain the shape of before burning.



Soft PVC sheet added CM-6R 30 phr. (Surface)



Soft PVC sheet added CM-6R 30 phr. (Back)



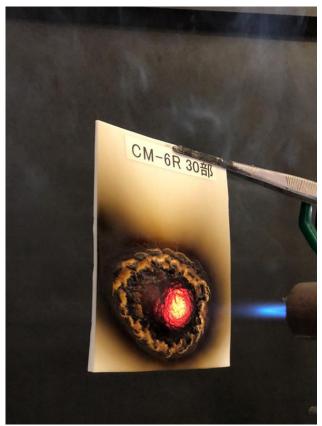
Non-Formalin, Non-Halogen, Non-Antimony

The FRAN CM series consists of flame retardant containing phosphorus and nitrogen compounds, and is a product of non-formalin, non- halogen, non-antimony.

It doesn't contain ingredients that cause serious damage to the human body. It can be used with security. Because it is prepared with water dispersion type, it is suitable for work improvement and measures against health damage due to dust.

3 Low Smoke

The FRAN CM series has less smoke than antimony trioxide and can significantly reduce health damage caused by fumes during fire.







Soft PVC sheet added antimony trioxide 20 phr.

Physical Property Evaluation Test of FRAN CM-6R

FRAN CM-6R is hard to influence properties of matter on the high load condition.

	Туре	Test method	Results (Change in before and after)	
		Appearance	Unchanged	
Hydrolytic resistance	, ,	FT-IR	Unchanged	
		TGA	Unchanged	
Bleed-out resistance	Synthetic	Appearance	Unchanged	
Hydrolytic resistance	leather	FMVSS No.302	No deterioration in fire retardant performance	

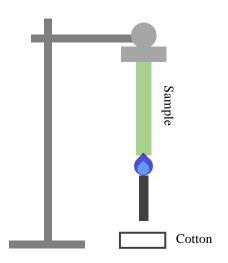
[·] Hydrolytic resistance:

Leave for 500 hours in an environment of 70°C and 90% relative humidity

• Bleed-out resistance: Iron at 200°C was heated for 30 seconds

Flame Retardant Test of FRAN CM series

Based on UL-94 V



- <Test method>
- ① Attach 125 mm x 13 mm sample vertically to the clamp.
- ② Adjust the flame to 20 mm and flame contact for 10 seconds twice.
- ③ Observe the burning behavior at that time.
- ④ Perform the same operation as in ② and ③ 5 times to make comprehensive judgment.

1. Test results of soft PVC sheet

Sample	Burning behavior	Judgment	
① FRAN CM-6R 30 phr.	Non drip (Strong char)	V-0	
② Antimony trioxide 20 phr.	Non drip (Weak char)	V-0	
③ Other company Phosphorus flame retardant 45 phr.	Drip (Burn to clamp)	Not classified (Ignition of cotton)	

Sample	1	2	3
PVC	100 phr.	100 phr.	100 phr.
Plasticizer	75 phr.	75 phr.	75 phr.
Flame retardant	30 phr.	20 phr.	45 phr.

Sample thickness: 2.5 mm

2. Test results of TPU sheet

Sample	Burning behavior	Judgment	
FRAN CM-6R 30 phr.	Non drip (Strong char)	V-0	
Other company Phosphorus flame retardant 30 phr.	Drip (Burn to clamp)	Not classified (Ignition of cotton)	

Sample	Blending ratio
TPU	100 phr.
Flame retardant	30 phr.

Sample thickness: 2 mm

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