

Improving flame retardancy

Fluoropolymer (PTFE) anti-dripping additives

PRODUCT
INFORMATION

Fluoropolymer PTFE exhibits a unique characteristic known as fibrillation (fiber formation). By utilizing this property, it can be used to enhance the flame retardancy of resins in combination with flame retardants. PTFE is used as an "anti-dripping additive" in electronics and office automation equipment. Furthermore, there is potential for using PTFE anti-dripping additives in fields requiring enhanced flame retardancy, such as automotive, construction, and data centers.

What is Fibrillation of PTFE?

PTFE particles consist of multiple long fibers tangled together to form spherical particles. When subjected to shear forces, these particles transform into fibers and form a network structure. This rare character is known as fibrillation, a unique property of PTFE.

Fig. 1 Fibrillation structure of PTFE



Challenges in achieving flame retardancy

Resins that comply with flame retardant standards (UL standards) are widely used to prevent the fire in electronic appliances and OA devices. UL standards require that the resin does not drip while burning. However, it is difficult to completely prevent dripping with flame retardants alone, making anti-dripping properties essential.

Mechanism of anti-dripping

PTFE-containing-mold demonstrates anti-dripping properties with an effective addition level of less than 0.5%. Generally, resins melt and drip when burned, causing the fire spread. However, by adding anti-dripping additives, PTFE within the resin forms a network structure that works as supporting structure to prevent the melted resin from dripping.

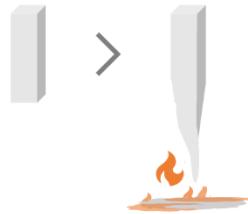
Fig. 2 Ignition combustion test with anti-dripping additive

Without an anti-dripping additive With an anti-dripping additive



Fig. 3 Anti-dripping mechanism (Illustration)

Without an anti-dripping additive



The flame drips and fire spread

With an anti-dripping additive



The network structure formed within the melted resin work as supporting structure

Daikin's anti-dripping additives

Two grades of anti-dripping additives are available.

Table 1 Daikin's anti-dripping additives

Items		FA-500H	FA-5601
Main component		PTFE	PTFE
Application		Anti-dripping additives Modifier to improve melt tension	Anti-dripping additives Modifier to improve melt tension and appearance
Appearance	-	White powder	White powder
Bulk density	g/ml	0.45	0.45
Average particle	μm	500	500
Combustion test	UL94	V-0	V-0
Micro-dispersibility	-	Standard	Good

Expected applications

Our anti-dripping additives can be applied in various fields requiring flame retardancy.

- Electronic appliance case
- OA case
- Construction materials
- Wire & Cables
- Data centers (containment areas), etc.

Feel free to contact us for questions or sample requests.

* The above properties are representative and not guaranteed.

For more information, visit our website.

DAIKIN INDUSTRIES, LTD.

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