Stellar Unity
EST. 2019

Technical Information Sheet

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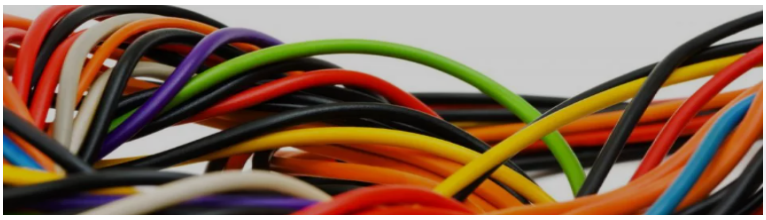
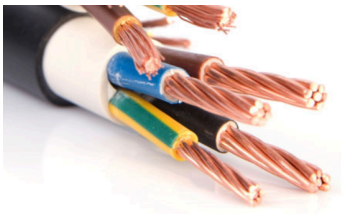


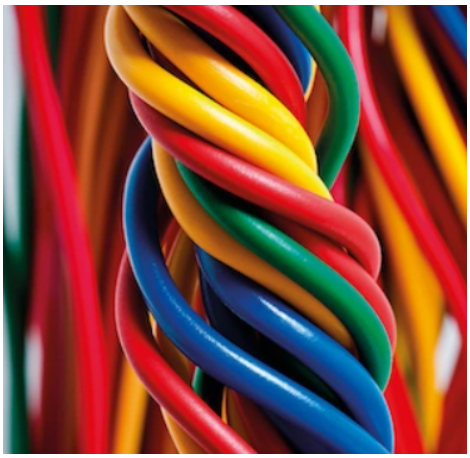



Silicone-based Flame Retardants for Wire and Cable

Revision version : 001	Date of revision : 24–Dec-2024	**Prepared by :** Adisakdi Ch.

Product Category	• Silicone-based Flame Retardants for Wire and Cable
Application	• Used in wire and cable application • Used in high-voltage wire • Used in other plastic processing for flame retardancy
Key Function(s)	• Slow down fire spread when igniting • Provide low smoke under firing environment • Prevent fire catching for rubber and plastic products

Flame retardants are chemicals used to slow down or prevent the ignition and spread of fire in various materials, including plastics, textiles, and other synthetic materials. They are classified based on their chemical composition and mode of action. There are many flame retardants available in the market. Brief technical information of each is highlighted as below.



Halogenated flame retardants
Commonly used. Contain halogens like chlorine or bromine, which release radicals that interfere with the chemical reactions that cause fire.

Phosphorus flame retardants
Can be organic or inorganic, and are often used in polyurethane foams for furniture, mattresses, and insulation.

Nitrogen flame retardants
Produce non-flammable gases during combustion, which can block gas phase combustion.

Inorganic flame retardants
Include metal hydroxides, phosphorus, nitrogen, silicon, and boron compounds. They are known for their thermal stability, non-volatility, and low price.

Organophosphorus flame retardants
React with free radicals during combustion, and act as radical scavengers that are activated by heat.

Nonetheless, Stellar Unity has collaborated with an advanced material manufacturer from China to provide silicone-based flame retardants which are not commonly or widely known, silicone-based flame retardants have such a unique property and high flame retardancy property. Silicone-based flame retardants are a class of flame retardant chemicals that use silicone as the primary component. These flame retardants are often used in various materials for specific products, including cable and wire, plastics, and rubber, to improve their resistance to fire. Silicone itself is known for its inherent heat resistance, flexibility, and stability, which makes it an effective base for flame-retardant formulations.

For more information of product

Website : www.s-unity.com

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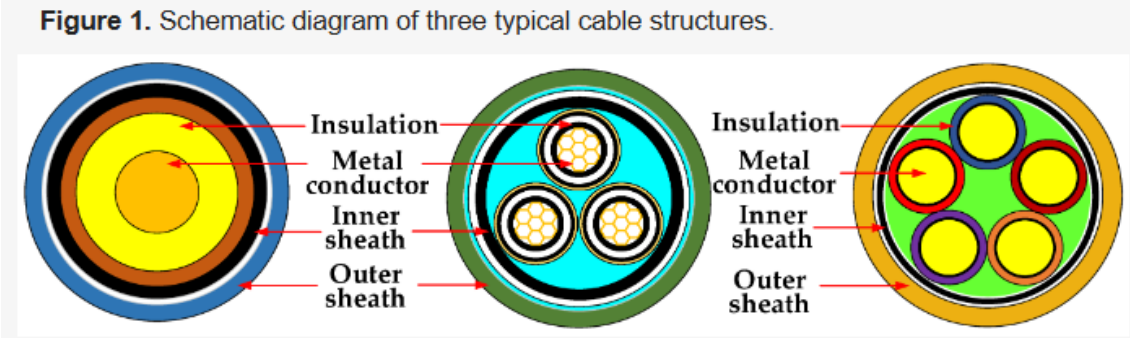
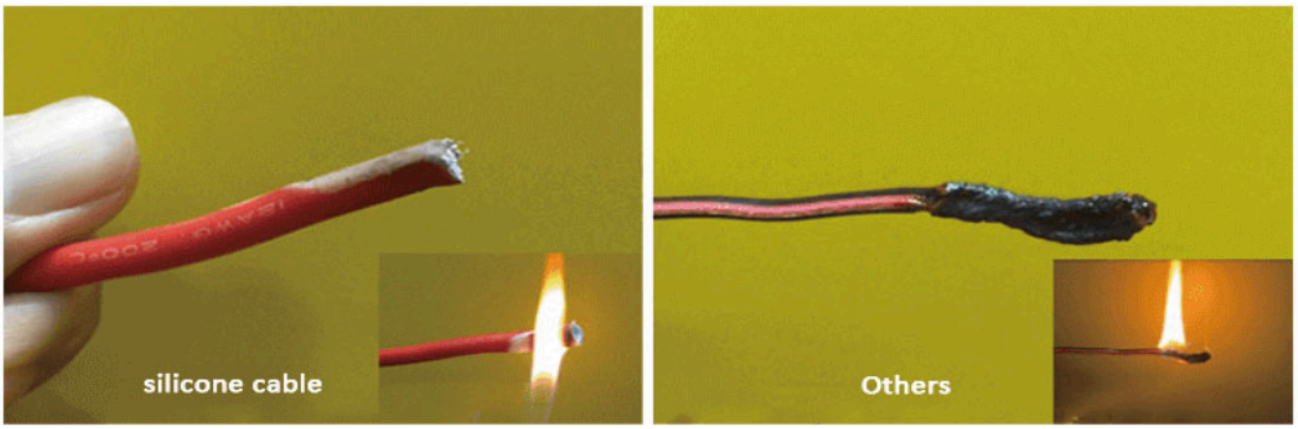


Key Characteristics of Silicone-Based Flame Retardants:

Silicone-based flame retardants typically use silicone polymers (siloxanes) as their base. These polymers contain silicon-oxygen bonds, which provide excellent thermal stability and resistance to fire. The silicone backbone does not burn easily, and when exposed to high temperatures, it tends to form a protective, insulating char layer that prevents further combustion.



Silicone-based flame retardants work in several ways:

Thermal Stability: Silicone materials are inherently heat-resistant, which helps to delay the onset of combustion in the materials containing these flame retardants.

Char Formation: When exposed to heat, silicone-based flame retardants can form a protective char layer, which insulates the material from heat and limits the spread of flames.

Smoke Suppression: Some silicone-based flame retardants also reduce smoke generation during combustion, which is an important factor for fire safety, particularly in enclosed spaces like buildings, airplanes, or ships.

Applications:

Silicone-based flame retardants are used in a variety of industries and materials:

Cables and Wires: Our Chinese silicone-based flame retardant manufacturer has supplied the largest 5 cable and wire makers in China. Silicone-based flame retardants are commonly used in wire and cable coatings, especially in environments requiring high heat resistance (e.g., automotive, aerospace, and industrial settings).

Rubber and Elastomers: Silicone-based flame retardants are used to improve the fire resistance of rubber, which is used in seals, gaskets, and other components in high-temperature applications.

Building Materials: Silicone-based flame retardants are used in coatings and insulation materials to improve fire safety in construction.

At Stellar Unity, our silicone-based flame retardant manufacturer could provide guideline formulation and samples for customers to have an internal evaluation. Our supplier has been rewarded as one of the Innovative Organization by Chinese authority.