

The Safety and Benefits of Flame Retardants in Electronics

FLAME RETARDANTS ARE CRITICAL SAFETY TOOLS

INTRODUCTION

For decades, flame retardants have provided an important layer of fire protection that helps save lives and property by preventing accidental ignition of electronic devices and slowing combustion if ignition does occur. Since the introduction of strict fire safety standards in the U.S. — including those standards where flame retardants are a useful tool — fires have been reduced by over 50 percent, from 734,000 in 1980 to 352,000 in 2016¹.

Fire prevention remains a serious public health issue. Between 2010 and 2014, U.S. fire departments responded to an estimated annual average of 45,210 reported U.S. home structure fires involving electrical failure or malfunction². These fires caused annual averages of 420 civilian deaths, 1,370 civilian injuries, and \$1.4 billion in direct property damage³.

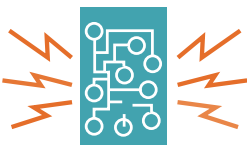
FIRES
REDUCED 50%



“...the fact that fires originating from consumer electronic equipment represents less than one percent of all residential fires in the United States is largely credited to the use of flame retardants.”

NATIONAL INSTITUTES OF STANDARD AND TECHNOLOGY

IMPORTANT FOR COUNTLESS EVERYDAY ITEMS, ESSENTIAL FOR ELECTRONICS



Electronic products are unique because they have a potential ignition source generated by the essential components of the product — circuit boards, batteries and other electrified components. Batteries can overheat, and circuit boards and other device components carry electric currents; therefore, electronic products present a higher risk of flammability than non-electronic products. One of the most important benefits of flame retardants in product design is they can stop small ignition events from turning into larger fires. In other words, flame retardants help reduce the risk of fire and are essential for ensuring manufacturers meet fire safety standards.



In many cases, flame retardants also enhance product performance and address key technical challenges like moisture uptake, mechanical performance, and resistance to aging.

Within electronics, each product category (e.g., TVs, phones, computers, appliances) has unique design, performance, and safety requirements. Electronics manufacturers need a broad array of material choices, including various plastics and flame retardants, to help meet these requirements. Material selection has a direct impact on utility, functionality, safety, cost, and weight of the product. Replacing plastics with materials like metals would not only increase weight, it would increase the risk of shock and heat transfer. Plastics, and specifically flame retarded plastics, are often the best choice for manufacturers seeking the best performance for their products.

¹ Hylton J.G. Haynes, 'Fire Loss in the United States 2016,' National Fire Protection, 06/2018.

² Richard Campbell, 'Electrical Fires,' National Fire Protection, 03/2017. ³ Ibid.

³ TJ McCue, '24 Electronic Products Per Household -- Got Recycling?,' [Forbes](#), 13/01/2013.

SAFELY INCORPORATED INTO THE DESIGN AND PRODUCTION OF ELECTRONICS

The electronics industry works with governments, standards-setting bodies, and other stakeholders to continuously evaluate the materials it uses in its products to ensure products meet safety standards and environmental stewardship requirements. Regulatory bodies such as the U.S. EPA and CPSC, and standard-setting organizations such as NFPA, ICC, and UL have an important role in testing, approving or overseeing the safe use of flame retardants and the products in which they are used. While there is no mandate that requires manufacturers to include specific flame retardants in their products, manufacturers often use flame retardants as they provide the most effective way to ensure their products meet performance and safety standards.

Have you ever noticed a spark, overheating, melting, or smoke from an electrical device? Flame retardants are one of the key reasons these failures do not escalate into something more serious like a home or office fire.

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