FAQs

What are Halogen-Free Cables?

What are halogens, and what are the concerns about their usage?

Halogens are a group of elements that include fluorine, chlorine, iodine, and bromine. They're all volatile materials that are highly reactive to other substances. For years, halogens have been used in cables for various reasons, including low cost and high heat resistance.

However, the volatility of these materials can cause serious problems. Specifically, when halogens are burned, they generate significant amounts of toxic smoke. During a fire, corrosive gases that include hydrochloric and hydrofluoric acid can occur. The combination of dark smoke and toxic chemicals have caused a number of deaths when fires hit subway tunnels and other areas with limited airflow, such as aircraft cabins. Many users are now shifting to halogen-free cables to avoid these problems.

What industries are adopting halogen-free cables?

Any markets where smoke caused by burning halogens is an issue. Transportation, military systems and public buildings are among the main fields that are adopting halogen-free cables. Any area where people are in confined spaces, for example in submarines or train cars, is a prime candidate for using halogen-free cables. As more buyers and engineers understand the benefits of these cables, the applications are likely to rise in any areas where large numbers of people gather. First responders are increasingly encouraging companies to use low-smoke products.

Are there alternatives that also offer low-smoke performance?

There are a few different options for those looking for low-smoke cables. They're often divided into three categories: Low Smoke, Zero Halogen (LSZH); Low Smoke and Fume (LSF); and Flame Retardant and Noncorrosive (FRNC).

LSZH cables don't generate toxic gases and they burn with only a small amount of clear smoke, which is preferable to the dark smoke of halogens. Their downside is that they're not flame retardant.

LSF materials emit some black smoke and toxins, but the levels for each are well below those of standard wires and cables. They are not 100% halogen free, nor are they flame-retardant.

FRNC cables provide the highest level of protection, with very little smoke production and tiny amounts of toxic gases. They are self-extinguishing, so they help prevent the spread of flames. The downside is that they have higher costs than the alternatives.

Are there industry standards for this type of cable?

Underwriters Laboratory offers certification for halogen-free and low-smoke cables. UL also requires specific markings for halogen-free and low-smoke halogen-free cables so it's easy to identify them. The UL certification is based on the IEC 6281 standard, which sets all of the requirements for halogen-free, low-smoke thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 volts.

The European Standard DIN EN 45545-2 now sets the requirements regarding fire protection in rail vehicles. It mandates that all cables must be halogen-free, flame-retardant, and self-extinguishing, and will not contribute to fire propagation.

Can halogen-free cables meet other environmental requirements such as temperature and flexibility?

Safety in fires is the first parameter examined by those who adopt halogen-free cables, but it's far from the last. These cables can meet the strict demands of aircraft, military, and industrial environments. Halogen-free materials are rugged enough to meet nautical requirements for reeling applications, which test resistance to corrosive salts, temperature changes and constant mechanical stresses.

Many versions are heat resistant up to +90°C, with options as high as 180°C. They can also withstand temperatures down to −40°C (−40 F).

There are halogen-free and low-smoke cables that can provide enhanced flexibility. They can withstand the constant movement on rugged machines like portable cranes or in train doorway systems that open and close several times per hour. Electromagnetic interference (EMI) performance can also be met while maintaining low-smoke and halogen-free characteristics.

Can halogen-free cables handle a range of wiring functions?

Absolutely. Twisted pair cables are available for CAT 5e, CAT 6, CAT 6A, and CAT 7A applications, handling the speed requirements and tough environmental standards set for European trains.

Halogen-free cables also perform well in control and connection applications like assembly lines and control panels for tool-working machines. Data cables can handle a broad range of signal transmission technologies as well as handling measurement and control signals, to name a few. Cables can also meet the power requirements of many industries. Their versatility is further highlighted by the availability of cables with colored cores. Basically, there aren't many cabling requirements that can't be met by low-smoke halogen-free products.