

FAQs

LSZH Cable

What is LSZH?

LSZH stands for Low Smoke, Zero Halogens. A low-smoke, zero-halogen cable is one in which the jacket and insulation materials are made of special LSZH materials. When these cables come in contact with a flame very little smoke is produced making this product ideal for applications where many people are confined in a certain place (office buildings, train stations, airports, etc). While a fire may be very harmful in a building, the smoke can cause more damage to people trying to locate exits and inhalation of smoke or gases.

What are halogens?

Halogens are elements such as fluorine, chlorine, bromine, and iodine. Halogens are highly reactive and can be harmful to people and animals. Common cable insulation, such as PVC, contains high amounts of halogens. The *C* in PVC is *chloride*, which is an ion of chlorine. PVC contains about 29% chlorine by weight. Teflon® FEP and PTFE contains about up to 76% fluorine. Teflon, when burned, produces toxic acid.

Halogens, under normal circumstances, are very stable and present no danger. Problems arise when they burn.

A halogen-containing plastic can release hydrogen chloride, hydrogen fluoride, and other dangerous gases when burned. When hydrogen chloride comes in contact with water, it forms hydrochloric acid, which is also dangerous. Beyond beginning toxic to humans and animals, these gases are also highly corrosive to metal.

The concern, then, with common wire and cable insulating materials is that they will emit toxic gases and toxic smoke. These gases become even more harmful when mixed with water, like from a sprinkler system, creating toxic acids.

A LSZH material emits no dangerous gases or smokes when burned. In fact, they mainly contain miniscule trace amounts of halogens - well under 1% - but they essentially are halogen free.

Why is LSZH cable of interest?

Safety. LSZH cables are used in public spaces—train and subway cars and stations, airports, hospitals, boats, commercial buildings—where toxic fumes would present a danger in the event of a fire. Similarly, low-smoke properties also are helpful. More people in fires die from smoke

inhalation than any other cause. Reducing smoke in general and toxic smoke in particular saves lives.

Aren't wires and cables already fire resistant?

Many cables are tested to such flammability standards as UL 1581 vertical flame test (VW-1). VW-1 is a basic test of the flame resistance of a wire or cable. A flame is applied five times to a vertical-hanging wire for 15 seconds each. After each flame application, the wire must extinguish within 60 seconds. In addition, neither a flag near the top of the cable nor the cotton batten below the cable can be ignited during the test. Notice the test is to see if the cable self-extinguishes after the flame is removed.

But what if the flame isn't removed? Plastics burn and melt in a fire. LSZH cables will also burn. The important thing is that they don't emit heavy smoke or toxins.

Who defines LSZH wire and cable?

As of yet, there is no universal definition of what exactly constitutes a LSZH material. There are some variations depending on which definitions and test procedures you use. One widely used approach is to qualify your wire or cable to the following IEC requirements:

IEC 60332-1: Flammability
IEC 60754-1 and 60754-2: Acid Gas Generation
IEC 61034-2: Smoke Emission

These are the standards Alpha Wire uses defining our LSZH wire and cables.

Is the LSZH designation limited to wire and cable?

No. LSZH really refers to the plastic material. It can be used in other products, such as shrink and non-shrink tubing.

What are the tradeoffs of LSZH cable?

LSZH can be a direct replacement for "generic" PVC-based cables in most applications. The temperature range of LSZH material is a bit more restricted than for PVC: -20C to +75C for LSZH and -50C to +90C for PVC. Applications requiring extended temperature capabilities, wide resistance to chemicals, or other special needs may not be suited to LSZH cable.

LSZH cables are more expensive than PVC counterparts. The safety they offer means they offer more value that goes beyond acquisition costs. These cables can prevent harm to people and also prevent damage to hardware system in the event of a fire.

What LSZH products does Alpha Wire offer?

Alpha Wire offers LSZH-rated communication and control cables. LSZH cables are available in a range of conductor gauges and counts. They share common features:

- LSZH materials for low-smoke properties and reduced toxicity
- Tinned copper conductors resist corrosion
- Stranded conductors for installation flexibility
- Multiconductor and multipair configurations
- Unshielded versions for smallest diameter
- Foil shielded, overall or individual pairs, for EMI protection and improved signal integrity
- Color-coded conductor insulation for easy identification
- -20°C - +75°C temperature
- 150 / 300 voltage ratings
- UL Type CM and AWM 2494, 2464, 2509, 2576
- CSA Type CMG FT4
- UL VW-1 flame test

Look for LSZH shrink tubing by Alpha Wire. Coming soon!

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