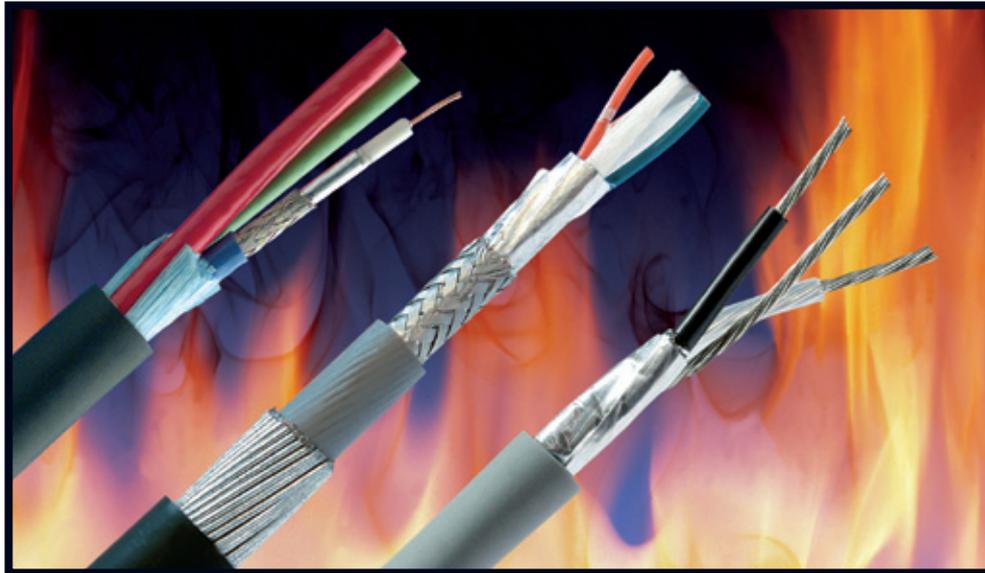


CB 004E

### Low Smoke Non Halogen Cables

Belden®'s IEC compliant cables provide maximum safety and assurance.



### Low Smoke Non Halogen Cables – The Responsible Choice.

- Belden Low Smoke Non Halogen (LSNH) cables are fully compliant with relevant IEC standards for maximum safety and durability
- They feature superior flame retardancy to reduce the spread of fire

Awareness of the impact of smoke and harmful gases emitted during a fire has led to a growing demand for an alternative to the more traditional plastic halogenated cable constructions.

PVC has long been used as an appropriate cable insulation and jacketing material with a high degree of flame-retardancy. However, in the event of a fire this will generate dense black smoke, with toxic and corrosive gases that can cause fatality and destruction.

#### Why are Halogens Harmful?

This fatality and destruction is attributable to the significant amounts of halogens, namely chlorine, found in PVC based compounds. On combustion, lethal gas is released, which on contact with moisture produces copious amounts of hydrochloric acid.

Particularly hazardous in areas of minimal ventilation and restricted escape, the dense black smoke impairs visibility and means of escape, equipment will be damaged by the corrosive gases whilst the effects of inhalation of toxic gases can be fatal.

Flame retardancy is important but so is the choice of a cable that emits smoke in very low levels and more importantly – without harmful corrosive and toxic gases.

Despite stricter legislation and a more responsible attitude, lives and equipment are still put at risk due to the use of halogenated cables or cables that scarcely meet recommended industry standards.

#### Be Certain with Belden

Belden LSNH cables assure maximum safety thanks to their non-halogenated structure and reduce the spread of fire with their superior flame-retardant features. With wider operating temperatures for a variety of applications and improved tensile strength for durability, Belden LSNH cables stand for ultimate quality and reliability.

**Be certain.  
Belden.**

## What is a Low Smoke Non Halogen Cable?



The use of non halogenated materials in both the cable insulation and the cable jacket is essential.

To create a true Low Smoke Non Halogen cable, manufacturers must ensure that their cable designs incorporate non halogenated materials for both the cable insulation and the cable jacket.

The International Electrotechnical Commission (IEC) has developed International Standards which clearly state what constitutes a Low Smoke and Non Halogen cable.

The standards developed and referenced by the IEC include:

- **IEC 61034-2 Measurement of smoke density of cables burning under defined conditions**  
A minimum light transmission value, expressed as a percentage light transmittance, is recorded during a fire in a 3 metre cube area.  
The recommended minimum light transmission value is greater than 60%.
- **IEC 60754 Tests On Gases Evolved During Combustion Of Materials From Cables**  
Part 1: Determination of amount of halogen acid gas  
– Halogen acid evolved after 60 minutes burn time is captured, absorbed into a test solution and expressed as an amount of hydrochloric acid.  
The level of hydrochloric acid measured in the test solution must be less than 5 mg/g.  
Part 2: Determination of degree of acidity of gases for materials by measuring pH and conductivity  
– Gases produced after 30 minutes burn time are captured, absorbed into a test solution and analysed for pH and conductivity.  
The pH value of the test solution should not be less than 4.3.  
The conductivity value of the test solution should not exceed 10 µS/mm.

IEC 60754 Part 1 determines the level of halogen emission of the materials used in the cable and IEC 60754 Part 2 determines the level of its' corrosive gases.

For a cable to be classified as non halogen, it must pass both parts of IEC 60754.

### Low Smoke Non Halogen – The Importance of Compliance

Compliance to the IEC applicable standards will always be important, but never more so than when there is a risk of loss of life. The consequences of fire go beyond ignition and flame, the presence of toxic fumes in low ventilated or confined spaces where means of escape is restricted could be the difference between life and death.

Confirming a cable's compliance as a Low Smoke Non Halogen cable can be done simply by using the following checklist:

IEC Standard Reference	IEC Standard Measurement	Is your cable choice compliant?
IEC 60754-1*	Amount of halogen acid gas	?
IEC 60754-2*	Degree of acidity of gases	?
IEC 61034-2	Smoke density	?

\* Cables which do not conform to all parts of these IEC standards are not compliant and cannot be deemed to be Low Smoke Non Halogen.

IEC Compliance for  
Maximum Safety and  
Assurance.



## Low Smoke Non Halogen or Low Smoke and Halogen – There is a Difference!

It is true to state that a cable can have low smoke characteristics so that in the event of a fire, it will not release the dense smoke plumes seen with a traditional PVC cable.

However, a cable can be low smoke and fume and yet still release toxic and corrosive gases when ignited. Despite its low smoke generation, this classification of cable, commonly known as LSF (Low Smoke and Fume) still typically contains PVC based compounds, making it exempt from halogen free compliance.

Check the cable specification; cables which have PVC in their insulation or cable jacket are not compliant and cannot be deemed to be Low Smoke Non Halogen. If they contain PVC, they are not halogen-free.

Stringent fire requirements, environmental concerns and new legislation have resulted in an increased demand for both Low Smoke and Low Smoke Non Halogen cables. This increase in demand has also led to a growth in the number of cable manufacturers and cable suppliers in the market.

With a multitude of cables available and the industry abbreviations used to describe a cable's characteristics, it is often confusing to determine the difference between a Low Smoke cable and a Low Smoke Non Halogen cable.

Whilst a Low Smoke cable is acceptable in some industries and applications, for maximum safety, a fully compliant Low Smoke Non Halogen cable from a reputable cable manufacturer is recommended.

### Flame Retardant Low Smoke Non Halogen – The Importance of Quality

A high performance Low Smoke Non Halogen cable can bring benefits in addition to compliance, particularly in the case of flame retardancy which is vital to help prevent the spread of fire.

Conformity to the IEC standard 60332-1-2 is a fundamental requirement for flame retardancy for communications cables whether halogenated or not; however, superior quality Low Smoke Non Halogen cables can achieve a higher rating to the IEC standard 60332-3-24.

Superior flame retardancy to reduce the spread of fire, wider operating temperatures for confident use in varying temperature applications and improved tensile strength for durability can all be achieved from a premium quality cable designed for total reliability and safety.

Reputable cable manufacturers will build these additional benefits into their cable design and manufacturing processes. Process capability does not necessarily bring process stability, consistent manufacturing quality is vital for assured performance and Flame Retardant Low Smoke Non Halogen compliance.



IEC standard 60332-1-2 Single Wire Flame Test

Superior quality cables can achieve a higher rating to the IEC standard 60332-3-24.

## The Importance of Quality and Compliance Backed by Belden

### Belden Cables are Genuinely LSNH – Low Smoke AND Non Halogen

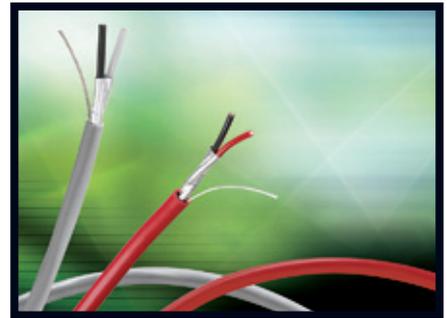
As one of the world's leading producers of cable products and solutions, Belden has an outstanding reputation for quality and reliability. All Belden low smoke non halogen materials are fully compliant with all relevant IEC standards, have excellent flame retardancy and deliver an outstanding performance.

So you can be assured that your application is fully compliant for maximum safety and assurance.

Be certain. Check the cable specification to ensure the insulation and jacketing materials are Flame Retardant, Low Smoke and Non Halogen.



Belden Multi-Conductor Cables



Belden Paired Cables