

## Halogen-Free Standards

Our halogen-free cables meet the most important international standards. Moreover Belden selected halogen-free jacketing materials are suitable for outdoor use like direct burial.

In comparison to products containing halogens (like PVC), these halogen-free materials offers considerable advantages in case of a fire:

- Less impairment to vision
- Minimal toxic gases
- No release of highly caustic acids
- More safety for man, nature and materials.

Belden's halogen-free cables are both FRNC (= Flame-Retardant, Non-Corrosive ) and LSNH (= Low-Smoke, Non-Halogen).

In the event of a fire, low halogen cables can burn extremely fiercely. In addition, a forced air flow intended to cool equipment can provide a continuous supply of oxygen, thus "feeding" the fire. Where this air flow has a HVAC function, fire and toxic smoke may be distributed to other parts of the building.

### Beyond Zero Halogen

Where there is a risk of fire and/or smoke being propagated and spread throughout a building, there is an additional risk of corrosive and toxic damage. Recent research has demonstrated that several cables in common use may in fact propagate fire and smoke extremely rapidly. These include cables with a fire rating, including low smoke and low halogen. In a number of actual fires, severe structural damage has occurred.

### Products Tested for Public Safety

It goes without saying that where public safety is concerned, there can be no shortcuts. Safety standards are high to ensure minimum damage to life, property and the environment. When it comes to cables, make sure you specify the best products for safety. So you can be confident of performance and quality – even in the event of a calamity.

Belden cables offer the quality and reliability consistent with your long-term needs. And to ensure top performance. Belden cables are available with extended fire ratings. Belden has developed these cables in response to the industry's growing demand for halogen free cables with acid free, non toxic and low smoke density which are also flame and fire retardant.

The test designation (and its meaning) would be one of the following:

#### IEC 60754-1

The cable must be designed with halogen-free plastics. This has an additional advantage: no formation of toxic gases.

#### IEC 60754-2

This test determines the level of corrosion by combustion of insulation-bedding and sheathing compounds. A minimum of 1000 mg (±5 mg) of insulating or sheathing compound should be heated in a furnace, 500 - 600 mm long, to a temperature of 935°C.

#### IEC 60332-3C (Test on Fire Behavior on Cable Bundles)

The cables should be flamed/torched from a distance of 75 mm by a propane gas burner. The test duration is 20 min. The test is passed if the flames extinguish by themselves and when no part of the samples is affected above a 2.5 m height from the burner.

#### IEC 60332-1

A sample of 600 mm is burnt with a flame of a propane gas burner. The test is passed, if the sample has not burnt or when the flames extinguish by themselves and the affected part of the sample which is located the farrest from the bottom edge of the burner has not reached the opposite edge of the sample.

#### IEC 61034-1

The measurement system (27 m<sup>3</sup> chamber) consists of a light source (a standardized 100 W halogen lamp) and a selenium or silicon photo-electric cell, both installed at a height of 2.15 m. A rectangular tray filled with 1 litre of alcohol provides the fire source. A ventilator ensures an even distribution of smoke. The number of test samples depends on the outer diameter. The light intensity is recorded by a plotter. The test is passed if the level of light transmission is not lower than 60%.

Specification	International IEC	Europe CENELEC	Germany VDE	Switzerland SEV	Spain UNE	Italy CEI	France NF	United Kingdom BS	Others
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### Material Properties

Quantity of halogen (halogen-free)	IEC 60754-1	EN 50267-2-1	VDE 0482, Teil 267	TP 20B/3C 3.4.5	UNE EN 50267-2-1	CEI 20-37-2	NFC 20-454	-/-	-/-
Toxicity index (no toxic gases)	IEC 60754-1	EN 50305	-/-	-/-	UNE EN 50267-2-1	CEI 20-37-7	NFC 20-454	-/-	NES 713
Degree of Acidity (no corrosive gases)	IEC 60754-2	EN 50267-2-2	VDE 0482, Teil 267	TP 20B/3C 3.4.4/3.4.5	UNE EN 50267-2-3	-/-	NFC 20-454	BS 6425 Part 2	-/-

### Fire Performance

Fire retardant (no flame propagation)	IEC 60332-3C IEC 60333-3	EN 50265-2-1 (HD405.3)	VDE 0482, Teil 266-2-4	TP 20B/3C 3.4.1.3	UNE 20423-3 UNE 20427	CEI 20-22-3	NFC 32070-C1	BS 4066 Part 3	-/-
Flame retardant	IEC 60332-1	EN 50265-2-1 (HD405.1/2)	VDE 0482, Teil 265-2-1	TP 20B/3C 3.4.1.1	UNE EN 50265-2-1	-/-	-/-	BS 4066 Part 1	-/-
Low smoke density	IEC 61034-1	EN 50268-2-1	VDE 0482, Teil 268	TP 20B/3C 3.4.3	UNE EN 50268	CEI 20-37-5	-/-	BS 7622 Part 1	-/-