

GENERAL INFORMATION

Insulation material:

The following designations are used for insulation materials in this catalog. All materials are halogen-free.

XLPE stands for cross-linked polyethylene compound. It has excellent mechanical and electrical characteristics.

Sheathing material:

The designation SHF1 stands for thermoplastic compound. This material is halogen-free, highly flame-retardant and has low smoke emission.

Definition of terms:

Flame-retardant

To be flame-retardant, the cables must withstand the test specified in IEC standard 60332-3 or IEC 60332-1. Flame-retardant cables do not propagate fire, and are self-extinguishing.

IEC 60332-3 is the test for bunched wires and cables and has three categories A, B and C, defined by different limits for flammable material and burning times. Burning time describes how long the burner is directed towards the bunch of cables. The requirement for passing the test is that after the burner has been removed the cables must extinguish themselves. Burning may not occur more than 2.5 m from the burner as shown in the figure.

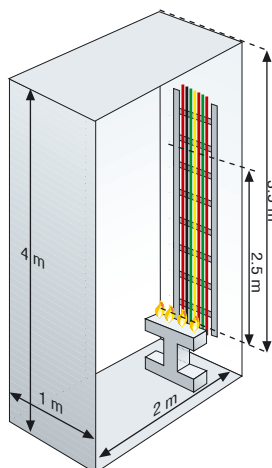
| Category | Amount of burning material | Burning time |
|----------|----------------------------|--------------|
| A | 7 litres/m | 40 min |
| B | 3,5 litres/m | 40 min |
| C | 1,5 litres/m | 20 min |

All Helkama cables comply with the most severe requirements of category A.

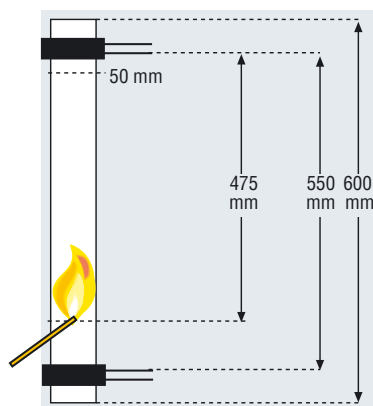
Test on bunched cables

IEC 60332-3

Burning is allowed up to max. 2.5 meters from the burner within specified time.



IEC 60332-1 is the test for single insulated wire and cable. Test procedure and requirements according to the picture, below.



Min. 50 mm of the cable, measured from the upper support, must remain unburned after the specified time.

Halogen-free

Halogen-free refers to the absence of halogens, such as chlorine and fluorine, and is determined on the basis of halogen content and the acidity of gases of a cable.

IEC 60754-1 determines the halogen content of the material. To meet the requirements as halogen-free the halogen content of the material may not exceed 0,5 % or 5 mg/g.

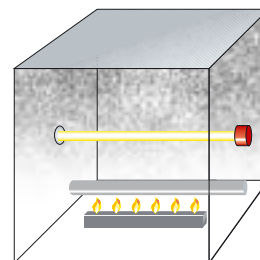
IEC 60754-2 determines the degree of acidity of gases evolved during combustion. The limit values are 4,3 for pH and 10 mikroS for conductivity.

Smoke emission

Smoke emission refers to visibility in a fire. The greater the light transmittance, the better the visibility. When tested in accordance with **IEC 61034-1** (test method) and **IEC 61034-2** (test requirements) the smoke emission of a cable during fire must not exceed the following values.

27m³ cube smoke chamber

Requirements:
60 % light transmittance



Fire-resistant

To be classified as fire-resistant the cables must withstand the test specified in standard **IEC 60331-21**. The cables must operate for a minimum of 90 minutes while the burner is directed towards the cable as shown below. Helkama fire-resistant cables are also flame-retardant.

