SILIFLAM® THS

Very high safety cables for industrial applications

+ 400 °C to + 1400 °C (1)

General

SILIFLAM® THS cables are very high safety cables consisting of high-performance materials:

- Conducting metals such as nickel-plated copper, pure nickel, copper-nickel alloys, refractory metals, etc.
- Insulating materials such as mica, mineral and ceramic fibres, special glass, quartz, borosilicoaluminate, polyimide, polytetrafluorethylene, special organic polymers, resins and synthetic elastomers based on siloxanes, etc.

SILIFLAM® THS cables are totally asbestos-free.

They are available as standard versions or variants specially designed by our engineers and technicians for high-risk industrial applications and any installation continually or occasionally subject to very high temperatures.
SILIFLAM® THS products can withstand conditions and temperatures that no other standard cable on the market would ever be able to withstand.
They are particularly designed to power industrial installations and keep them running under the most severe operating conditions. They can also be used in zones where the ambient conditions are liable to vary under exceptional or accidental circumstances and attain abnormal levels. In this case, SILIFLAM® THS retain their electrical integrity for a period of time, in order to take the necessary measures to shut down the installation or evacuate personnel or appliances.

Operating temperatures and parameters (1)

Due to their specificity, and the nature of the installations powered, it is difficult to state specific and perfectly defined operating temperature ranges for SILIFLAM® THS.

However, it is possible to state recommended operating limits, essentially representing the temperature range withstood by the insulation without sustaining rapid noteworthy degradation of its dielectric properties, potentially leading to short circuits that can be harmful for the installation.

The values given below are therefore indicative.

SILIFLAM® THS 1000 Series: +400 °C to +800 °C.
SILIFLAM® THS 1200 Series: +500 °C to +1000 °C.
SILIFLAM® THS 1400 Series: +700 °C to +1200 °C.
SILIFLAM® THS 1500 Series: +900 °C to +1400 °C.

Correspond to varying exposure times and are dependent on various installation parameters:

- type of heat source: electrical resistor; molten metals or glass (spraying or dip-coating); infrared radiation; flames, furnace walls, etc.;
- proximity of this heat source;
- exposed cable length;
- frequency and duration of exposure;
- connection quality and type;
- installation conditions;
- ambient environment (moisture, steam, corrosive, oxidizing, reducing atmosphere, vacuum, etc.);
- heat exchange conditions (confinement, natural or forced convection, etc.);
- mechanical conditions (traction, compression, shearing, movements, shocks, vibrations, etc.);
- electrical conditions:
  - > permissible current in each conductor and permitted heating induced by Joule effect,
  - > installation operating voltage,
  - > required insulation resistance (this declines significantly with temperature. As such, the insulation can continue to withstand the operating voltage requested, but significant leakage currents may simultaneously appear and impede the operation of the installation).

To ensure a suitable installation capacity in thermal terms, it should be noted that the various influential factors tend to be cumulative, potentially causing the following phenomena in particular:

- thermal runaway (corrosion of conducting metal, most frequently at the connection, inducing an increase in resistivity and cable rupture at the connection);
- premature or even very rapid ageing of insulation;
- alteration of electrical properties of metals.

Variation of any one of the installation parameters or the combined action of a number of these parameters may be a significant influence on the temperature range that the cable is liable to withstand and tests under real-life conditions are strongly recommended.
Our technical departments are at your disposal to provide you with technical data or design a solution suited to your specifications.

We cannot be held liable in the event of damage sustained by the cable and/or its environment.

(1) All temperature stated in this document are indicative and tests under real-life conditions are required.

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LES CABLES DE L'EXTREME

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Standard products

Conducting cores (2%, 27% nickel-plated copper or pure nickel)
- Single-conductor: 0.22 mm² to 400 mm².
- Multi-conductor: > 0.22 mm² to 2.5 mm²: 2 to 37 conductors.
  > 4 to 6 mm²: 2 to 19 conductors.
  > 10 to 95 mm²: 2 to 5 conductors.

Multi-conductor cable conductor colour:
- **SILIFLAM® THS** 1000 and 1200 series: identification as per IEC 60445.
- **SILIFLAM® THS** 1400 and 1500 series: natural white or as per IEC 60445.

Outer colour:
- **SILIFLAM® THS** 1000 and 1200 series: brick red or grey.
- **SILIFLAM® THS** 1400 and 1500 series: natural white.

Note: The colour of the conductors is used for the purposes of identification during assembly.
In view of the extreme temperatures liable to be encountered by SILIFLAM® THS, some colours may partially disappear or be modified in the course of normal cable use, as most of the pigments used are not capable of withstanding the temperatures liable to be applied to these products.

SILIFLAM® THS are available not only in a standard version, but also as standard variants with PTFE (THS 1030 and 1230 series) or polyimide (THS 1050, 1250, 1450 and 1550 series) reinforced dielectric strength.

As an option, SILIFLAM® THS can include an electrical screen (–BCN series) or stainless steel armour (–BI series).

They can be customized for each specific application (see Options).

Applications

- Heavy industry: steel industry, foundry, steelworks, glassworks, etc.
- Chemical, nuclear, oil, mining industry, etc.
- Aeronautical and space industry.
- All installations subject to high temperatures or extreme conditions.

Approvals - standards

Due to their high degree of specificity **SILIFLAM® THS** products are not described in product standards and thus cannot receive approval certificates for specific standards.
Nevertheless, the type of insulation used provides them with exceptional properties allowing compliance with all or part of the requirements of the most stringent international standards, particularly in terms of fire behaviour: IEC 60331-11, IEC 60331-21, IEC 60332-1-1, IEC 60332-1-2, IEC 60332-3, ANSI/IEEE 383, NF C 32-070, VDE 0472-814, MIL W 25038, NBN C 30-004...
Please contact us to find out the parts of the standards applicable, with which each THS reference available is in compliance.

Options

- Other sheath or conductor colours: contact us.
- AWG cross-sections: contact us.
- Conducting cores made of other high-temperature metals (NiCr, FeCrAl, CuNi alloys, etc.) or refractory metals (tantalum, tungsten, titanium, molybdenum, etc.): contact us.
- Special hybrid or customized cables, designs on request to specifications: contact us.
- The **SILIFLAM® THS** range is also available as pyrometry cables (thermocouple, extension, compensation, platinum detector connection): contact us.
- Induction heating cables, protective outer sheathing of standard commercial cables: contact us.

Reference

The example below gives an indication of the process used to identify variants from the **SILIFLAM® THS range**.

Example: SILIFLAM® THS 1230 M - BCN - BI
SILIFLAM® THS xxxx x - xxx - xx

Type of insulation and sheathing (see specific technical data sheets):
Standard series: SILIFLAM® THS 1000 - 1030 - 1050 - 1200 - 1230 - 1250 - 1400 - 1450 - 1500 - 1550.
Or designed on request (examples: SILIFLAM® THS 1006, THS 1254, THS 1438, etc.).

U: unipolar (except THS 1000 series) / M: multi-conductor.

BCN (optional): nickel-plated copper electrical screen braid.

BI (optional): stainless steel outer shielding.

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