



## Materials for specific requirements

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### **Rodent protection**

Amongst the problems encountered during the network life, mechanical damages, in particular civil works and rodent attacks, are considered as the major contributor to the maintenance cost.

We therefore recommend that during the design stage special attention should be paid to the routing of the cables and the use of cables specially designed to withstand the environmental conditions, to prevent damage during the installation phase.

With regards to protection of the cables from rodents, various experiments were carried out in international institutes to find the most effective means of cable protection. Different metallic and non-metallic variants, exhibiting different levels of protection against rodents, were developed and tested.

Resulting from tests carried out and based on it's manufacturing experience, Kabelwerk Eupen AG proposes two different means of rodent protection:

#### **Non-metallic rodent protection:**

A thick layer of glass yarns placed under the outer sheath repels rodents as they start biting it.

An alternative is to utilise a strong and sleek material, like Polyamide, for the outer sheath of the cable.

The non-metallic elements should only be seen as a protection against rodents by limiting how deep into the cable a rodent will bite.

#### **Metallic rodent protection:**

- corrugated steel tape: a 0.15 mm thick steel tape corrugated and longitudinally applied before outer sheath extrusion during the manufacturing process.
- steel tape: two 0.1 mm thick overlaying steel tapes are helically wound around the cable before outer sheath extrusion during the manufacturing process.

The metallic rodent protection is the most effective protection available.

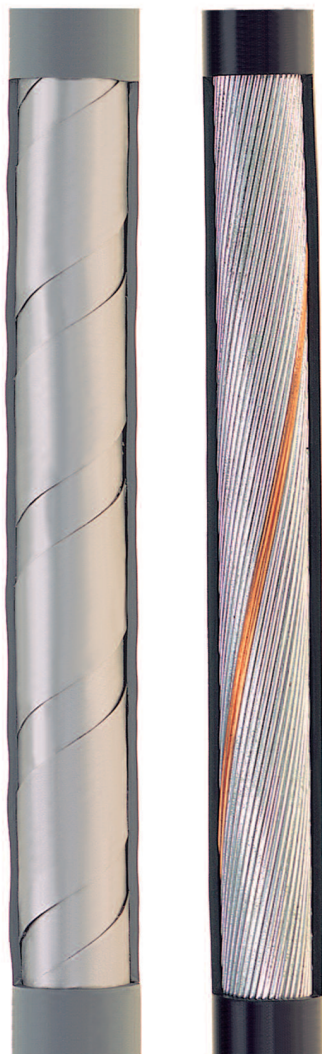
### **Termite protection**

Termite protection can be provided by an outer polyamide sheath, usually extruded over the standard outer sheath.

### **Special armour**

The following armour can be provided for fibre optic cables that require extra protection against mechanical impacts during installation and operation:

- Double steel tape armour. Two layers of galvanized steel tape completely cover the cable core.
- Galvanized steel wire armour in a stranded concentric layer of round wires.



### **Protection against chemicals**

When optical fibres cables are installed in harsh environments like petrochemical environments, in grounds that may be subject to oil or acid pollution, in pipes that may accidentally contain oil or chemicals, then the cables should be appropriately protected.

Kabelwerk Eupen AG provides for these severe environments special cables, protected either by a copolymer aluminium clad foil or by a lead sheath, with PE outer sheath.

### **Outer sheath materials**

- polyethylene (PE)
- copolymer aluminium clad foil
- polyvinylchlorid (PVC)
- polyamide (PA)
- halogen-free, flame-retardant compounds (LSOH)

LSOH: materials which are flame-retardant and halogen-free.

Kabelwerk Eupen AG developed its own proprietary compound in order to meet fire-tests performances required by different international standards (IEC, BS, VDE ...).

The Kabelwerk Eupen compounds have a low water absorption and therefore are suitable also for cables used in outdoor applications.

Additional information on the proprietary halogen-free, flame-retardant compounds and tests methods can be found in our EUCASAFE catalogue.