

Anti-rodent cables in corrugated steel tape armours.

Cables, including fiber optic cables are often susceptible to rodents. This is particularly a problem for cables placed directly in the sewage system, where cables are exposed to direct contact with rats. This problem also applies to fiber optic cables, that are placed in standard ducts, where some place remains in secondary pipes for the movement of rodents. Thus, when rodents encounter an obstacle on its way, preventing from further movement, they try to force their way through using sharp teeth. When installing cables in secondary sewage it is not possible to arrange all the cables in a parallel way to each other so as they form a single package. Cables are often twisted and mixed with each other so paths of free movement of rodents in pipes are blocked. The only solution in this situation is a choice of a cable that is properly protected against the possible damage by rodents. From the above, we can clearly see that the exposure of the cables to the attack of rodents depends on the situation such as space-environment cable placing, configuration of telecommunication ducts, ways of cable placement and others.

There are a lot of ways to protect cables from rodents and their effectiveness depends on the applied measure, which also determines the price of the cable. There are solutions using glass fiber materials in a standard cable construction, sometimes with the use of double coating where the glass fiber material is disposed between the inner and outer coating. The glass fiber material can be coated with a special rodent deterrent anti-attractant finishing. Also, the anti-attractant measure may be separately added to the cable sheath during extrusion coating process. Sometimes the use of polyamide from the group of PA 12 as a coating material improves the mechanical properties of cable, and then the cable is difficult to be broken through by rodents. The combination of this effect with the diameter size of the cable and the use of double polyethylene polyamide PA / HDPE layer coating in which the polyamide layer may be internal or external, may increase the level of protection. However, none of the above technical solutions provides an effective 100% protection cable from rodents. The only protection of cables against rodents that we can be sure of is guaranteed by metal armour made of wires or steel tapes. In the case of soft fiber optic cables that can be characterized by a range of diameters typically 5mm- 20mm, best suited armour is made in the form of corrugated steel tape (wavy with a small wave amplitude), which in addition to the added value in the form of the desired anti-rodent properties characterized by adequate flexibility to support the process of installing/placing cables.

In 2016 FIBRAIN started a serial production of corrugated steel tape armouring cables. These cables are manufactured using specialized equipment from the RosendahlAustria company and have been integrated into the existing extrusion coating production line. Equipping the line where special corrugated armour is placed on cables with the automatic laser welder for steel tape and integration with the extrusion coating line enabled the continuous production of corrugated steel tape armouring cables, even though the recommended length is 2k and 4km. The innovation, as for the product portfolio of FIBRAIN corrugated steel tape armouring cables, is the fact that constructions from 7.5mm diameter that is central tube with max. 24 fibers are easily available, which is not very common because they can be rarely found on the market.

There is a whole family of multi-tube and twisted cables, typically up to 288 fibers that can be characterized with standard geometrical, mechanical and environmental parameters. However, there is always the possibility of designing these cables for the needs of a specific project by changing their strength parameters, colour, coating material, number of layers, fiber type, adding a specially prepared and tailor-made printing or using additional copper cores for the power active devices (hybrid cable). Corrugated steel tape armouring cables, as well as other fiber optic cables, have in their structure colorful, easily distinguishable yarns to tear the sheath, which facilitate and prepare

the end of the cable for the assembly. Due to the fact that these yarns are placed directly under the armour, they enable to tear the armour and coating at the same time. In the attachment, DSH technical worksheets of two cable families with their geometric dimensions and mechanical as well as environmental properties are attached.