

# SELECT THE RIGHT FIBER OPTIC CABLE FOR HARSH ENVIRONMENTS

White paper 2023/09  
Select the right fiber optic cable

For tactical operations in harsh conditions choosing the right fiber optic cable is of great importance. Your cables must be able to withstand the elements, from freezing winter conditions to hot summer days yet still be able to perform. Except for the elements the cables must be durable enough to cope with high tensile loads and even being run over by a truck.

Another issue that cannot be ignored for cables left in nature is the risk from animals chewing or walking on the cable. This first problem is mainly related to rodents, but wild boars and coyotes are also known to create problems. Rodent damage to communications cables is more than just a small issue, as it can result in costly repairs and service interruptions. For example, in 1987, a squirrel took out the power to a NASDAQ computer center for nearly an hour and a half, stopping an estimated 20 million shares from being traded.

## Facts about Micropol:

- Micropol is a Swedish company, established in 1988
- Technology leaders in passive fiber optics
- Business areas: Defence & Security and Networks
- 2100 m<sup>2</sup> production facility, including clean room production
- Certified according to ISO 9001:2015

The choice of fiber optic cables often stands between metal braided cables and heavy-duty cables.

When deploying long lengths of metal braided cables clamps are often needed to pin the cable to the ground. The lack of flexibility in the metal braided cable can also create



*Heavy-duty cable in harsh environments*

interior damage to the fibers during strong bending forces e.g. when an animal is chewing or standing on the cable. Damage due to animals walking on the cable, as the metal works like an internal "knife", is mainly an issue for larger animals with hooves.

Since the metal braided cable is galvanic there is also a need to install lightning protection to avoid damage to the equipment. The heavy-duty cable is non-galvanic and more flexible without cable memory which allows for easier deployment without clamps.

The heavy-duty cable's flexibility together with its non-galvanic attributes makes it a good choice for tactical communications. The heavy-duty cable is impossible to detect with thermal cameras or metal detectors, giving it a big advantage in tactical operations where discretion is key.

Even if Micropol is brand independent, the majority of our deliveries are based on the heavy-duty cable that is a popular choice among our customers operating in harsh environments. All our communication systems are produced in Sweden.

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## Summary metal braided cable vs heavy-duty cable

### Advantages of metal cable

- Better resistant against rodent
- High crush resistance

### Advantages of heavy-duty cable (non-metal)

- No need for lightning protection
- No cable memory, no or less need for clamp during deployment
- More flexible (can be bend sharper without fiber breaking)
- Cannot be detected with metal detector or thermal camera

Properties	Metal braided cable VG95218-30 type L	Heavy-duty opto cable
Bending radius (mm)	57	30
Bending radius without tensile stress (mm)	39	28
Weight per km (kg)	25	29
Operating temperature (°C)	-46 to 85	-57 to 85
Storage temperature (°C)	-45 to 55	-70 to 85
Tensile load, 4 Ch (N)	2000	2000
Impact resistance (#)	25	200
Wall thickness of sheat (mm)	0,8	0,75
Crush resistance (N)	2000	2000
Need of lightning protection	YES	NO
Galvanic (detectable)	YES	NO
Cable clamps needed	YES	NO