

Clearfield®

Structured Strain Sensing Cable



Application

- Brillouin Distributed Strain Sensing (DSS)
- Structural Health Monitoring (SHM)
- Pipeline monitoring
- Soil movement, ground monitoring
- Precision measurement and alarm systems
- Direct burial in soil, concrete, composite structures
- Harsh environment, subsea, outdoors

Description

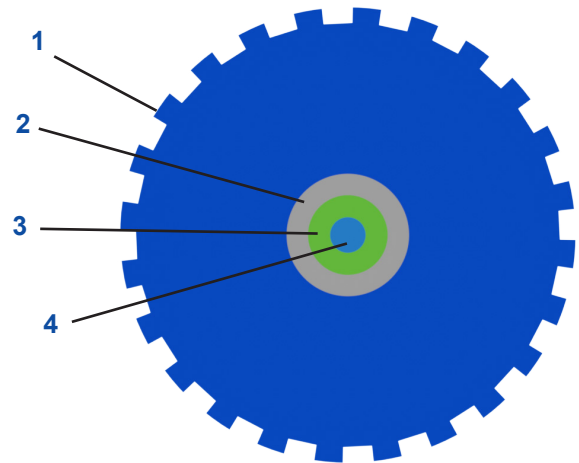
Distributed Fiber-Optic Strain Sensing (DFOSS) cable with a Fiber in Metal Tube (FIMT) encapsulated optical fiber, and a PA outer sheath, for strain sensing up to 1% (10000 μ strain)



Construction

1. PA outer sheath, with structured surface
2. Metal tube SS316L for protection and hermetic seal
3. Multi-layer buffer and strain transfer layer with interlocking system
4. Special strain sensing single mode fiber

- Central hermetically-sealed metal tube with one optical fiber
- High strain sensitivity
- Compact design, good flexibility, small bending radius
- Robust, abrasion resistant sheath, optimized strain transfer
- Longitudinally and laterally watertight
- Good rodent protection
- Halogen-free cable sheath



Customization Options and Services

- Accessories such as loops, fan-outs, connectors, mounting brackets, anchors etc. available
- Splicing kit for strain sensing cables
- Custom fiber types

Technical Specifications

Structured Strain Sensing Cable	
Standard Optical Fiber	Singlemode fiber
Standards	Cable tests complying with IEC 60794-1-2
Jacket color	Blue, similar to RAL 5005
Operating temperature	-30 °C ... +70 °C
Storage temperature	-30 °C ... +70 °C
Installation temperature	-5 °C ... +50 °C

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Technical Data at 20°C

Type	Cable ø mm	Weight kg/km	Max. tensile strength - Installation N	Typical load at 1% elongation N
1F	3.2	10.5	260	470

Type	Min. Bending Radius With Tensile	Min. Bending Radius Without Tensile	Max. Crush Res. N/cm
1F	20xD	15xD	250

Optical Fiber Data (Cabled) at 20°C

Fiber Type	Attenuation, dB/km 850 nm	Attenuation, dB/km 1300/1310 nm	Attenuation, dB/km 1550 nm
SMF	-	-	≤ 0.5

Typical Brillouin Parameters BOTDR or BOTDA at 1550nm

	Temperature sensitivity df_B / dT	Strain sensitivity $df_B / d\varepsilon$	Central Brillouin Frequency
SMF	~ 2 MHz/°C	~ 450 MHz/%	~ 10.7 GHz

Typical Rayleigh Parameters at 1550nm

	Temperature sensitivity df_B / dT	Strain sensitivity $df_B / d\varepsilon$
SMF	~ -4 GHz/°C	~ -0.13 GHz/ μ strain