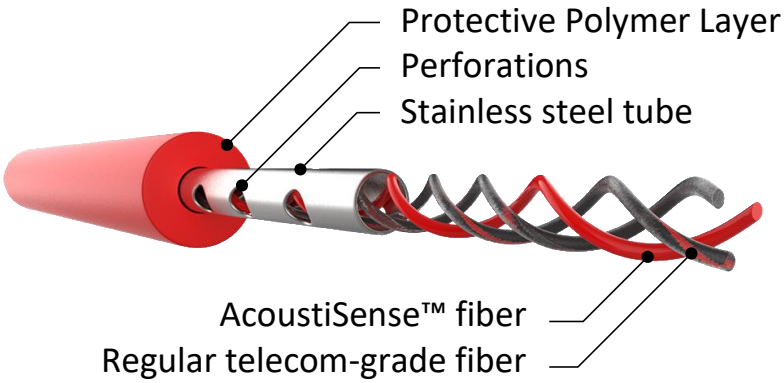
Technical Datasheet

SONOSENS™

Ref. No.: ACC 40085-E 230020-802



Description

The SonoSens cable is designed to enhance the acoustic transmission for professional DAS (Distributed Acoustic Sensing) Applications. It is protected with a metallic layer, which provides a robust cable design for the maximum lifetime of the final application. The SonoSens cable transmits up to 40% more detectable signal than comparable products. This makes SonoSens a practical product for a wide range of acoustic sensing projects and combines mechanical protection and acoustic sensing performance all in one.

General characteristics

Total cable weight	23 kg/km	15.46 lbs/kft
Outer diameter	4.00 mm	0.157"
Number of fibers	3	
Rayleigh enhanced fiber type (G657A1)	1x AcoustiSens™ by OFS	
Telecom fiber type (G652D)	NBG OneLight G652D(250µm) or equiv.	
Storage temp. range	-50°C … +80°C	-58°F…+176°F
Operational temp. range	-40°C … +80°C	-40°F…+176°F

Tube Characteristics

Outer diameter	1.80 mm	0.071"
Inner diameter	1.40 mm	0.055"
Material	2.4858	825
Hole dimensions	0.90 x 1.40 mm	0.035 x 0.055 "
Ohmic resistance	~ 0.83 Ohm/m	0.25 Ohm/ft

Polymer Sheath Characteristics

Outer diameter	4.00 mm	0.157"
Inner Diameter	2.30 mm	0.091"
Material	PVC / RAL3000 (red)	

Mechanical characteristics

Ultimate tensile strength*	> 8 669 N	> 1 949 lbs
Max. operational tensile force* (ends fixed)	3 468 N	780 lbs
Crush resistance*	>8kN/100mm	>1800lbs/3.93"
Min. bending radius (before kink; without load)	> 160 mm	> 6.3"
Max. hydrostatic pressure*	> 80 bar	> 39.0 kPSI
Temperature coefficient (inner tube)	$14.1*10^{-6}$ K^{-1}	$14.1*10^{-6}$ K^{-1}
E-Module* (inner tube)	195 kN/mm²	195 GPa

Acoustic performance (using AcoustiSens fiber)

Operating Range	1536 – 1556 nm
Target measuring window	100 Hz to 1 kHz
Enhancement[1)]	10-15 dB

*) at 20°C
1) compared to naturally occurring Rayleigh backscatter in G657A1 fiber

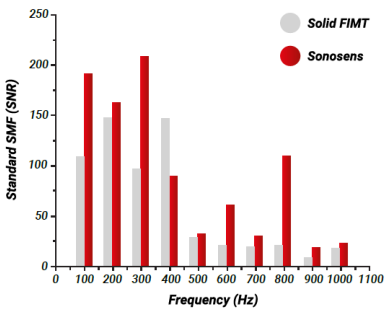


Figure A

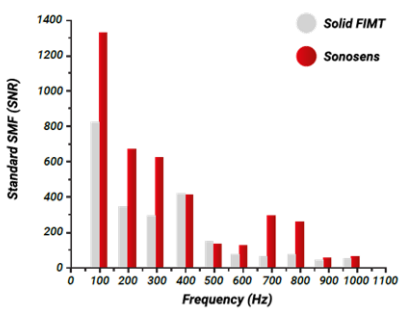


Figure B

Telecom-grade fiber sensing: After applying a standardized SNR scale (Y-axis), when utilizing telecom-grade single-mode fibers for sensing, the SonoSens showed measurable SNR Improvement at all studied frequencies except for 400 Hz. This observation suggests a resonant frequency for the FIMT near 400 Hz. (Figure A)

AcoustiSens fiber sensing: Again, using the same standardized SNR scale (Y-axis), when utilizing AcoustiSens enhanced Rayleigh backscatter fibers for sensing, in all measurements, the AcoustiSens shows significant SNR improvement. When combined with SonoSens, the SNR improvements exhibit additional SNR improvement at most tested frequencies. Notably, the response at 400 Hz favors typical solid FIMT construction. (Figure B)

Datasheet created by Patrick Breinessl, approved by Patrick Weissinger - 01.08.2022