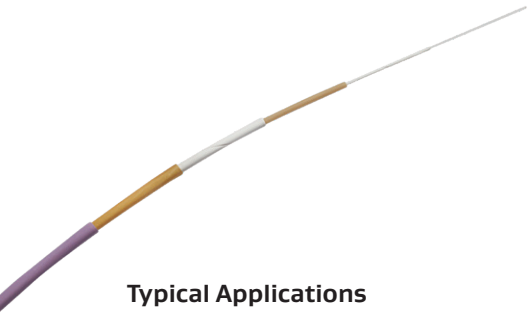
GORE® Fiber Optic Cables (1.8 mm Simplex)



Typical Applications

- Avionics/Vectronics digital networks
- Cabin/flight management systems
- Ethernet backbone
- In-flight entertainment (IFE) Systems
- HD streaming camera/video systems
- High bandwidth in-LRU data paths
- In-vehicle networking
- Intercom/radio/radar systems
- Sensor/processor connectivity
- Transceivers
- Weather radar systems

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ARINC 802-3; Performance Requirements (GSC-13-84639, GSC-13-84640, GSC-13-84943)
- BSS7239: Toxicity
- EN3745-513; JN1177: Test Methods for Crush Resistance
- STANAG 4754: NATO Generic Vehicle Architecture (NGVA) for Land System

Gore's most popular Simplex cables can easily accommodate higher bandwidth requirements in a robust package compared to standard alternatives (Table 1). This award-winning version offers a range of single-mode and multi-mode core types that reliably support current and next-generation data architectures up to 100+ Gb/s without interruption.

The innovative buffering system in their construction is proven to resist high-weight impact, crushing, kinking, abrasion, cut-through, high-intensity vibration, mechanical shock, wide temperatures, and more (Figure 1). This version is proven to exceed new stringent EN4641-301 and JN1177 aircraft industry standards intended initially for larger, more rugged fiber optic cable designs on 10+ Gb/s avionics networks.

The combination of Gore's unique cable materials also increases fiber movement under compression, improving termination with standard aerospace and defense connector systems.

With an exceptional balance of properties, Gore's 1.8 mm Simplex cables deliver improved durability, reliability, and longevity in extreme environments while meeting size, weight, and routing constraints.

Table 1: Cable Properties

Optical

Property	Value
Signal Transmission Speed Gb/s	Up to 100+
Maximum Optical Loss dB/km 850 nm 1300 nm 1310 nm	 4.0 / ≤ 5.0[a] ≤ 3.0[a] 3.0

Mechanical / Environmental

Property	Value
Jacket Material	PFA
Jacket Color	Violet or Yellow
Core Type	Single Mode or Multi-Mode, Graded Index
Coating Type	High-Temperature Acrylate
Buffering System	ePTFE / Crush-Resistant Layer OD: 900 microns (Nominal)
Temperature Range °C	-65 to +135

a. Based on Gore's part numbers GSC-13-84943-07 and GSC-13-84943-17.

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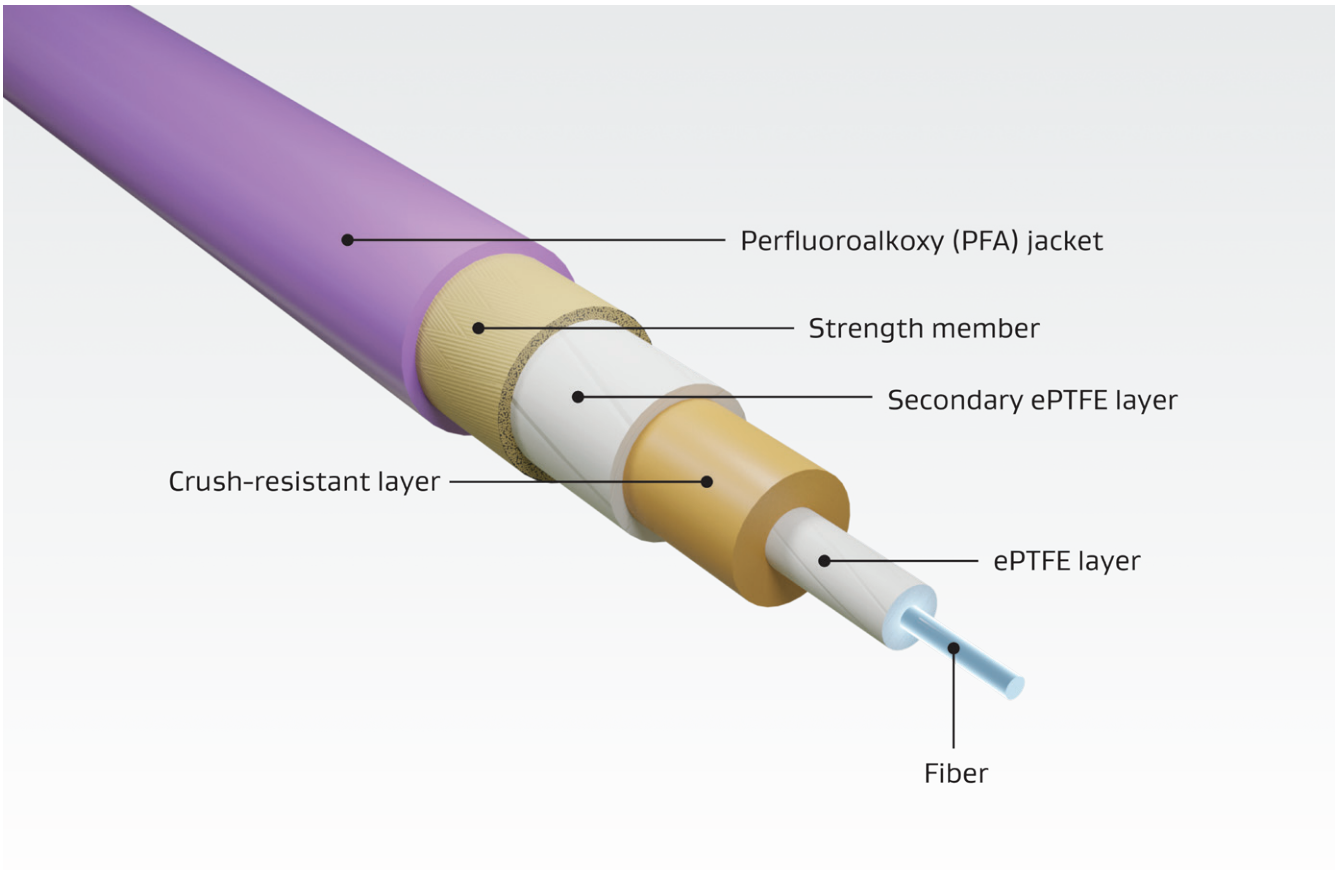
Figure 1: Crush-Resistant Layers



Connector Systems & Backshells

GORE® Fiber Optic Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC, MIL-STD-38999, and MIL-PRF-29504. Contact the specific manufacturer such as Amphenol®, COTSWORKS®, Glenair®, and Radiall for exact part numbers, tooling information, and termination instructions.

Enhanced Crush Protection

Gore evaluated the durability of GORE® Fiber Optic Cables, 1.8 mm Simplex compared to a leading alternative cable using EN3745, Method 513. Results showed that Gore's cable far exceeded the minimum weight impact requirements for enhanced crush protection (Figures 2 and 3). The unique construction of Gore's cables allows for lower force to move the fiber under compression while still maintaining excellent signal transmission. In contrast, the alternative cable showed significant optical loss under impact and failed to meet the industry specification.

Watch a video of Gore demonstrating the high impact resistance of the 1.8 mm Simplex at **youtube.com/watch?v=8e5fWJd2W6w&t=2s.**

Figure 2: Crush Resistance at 850 nm

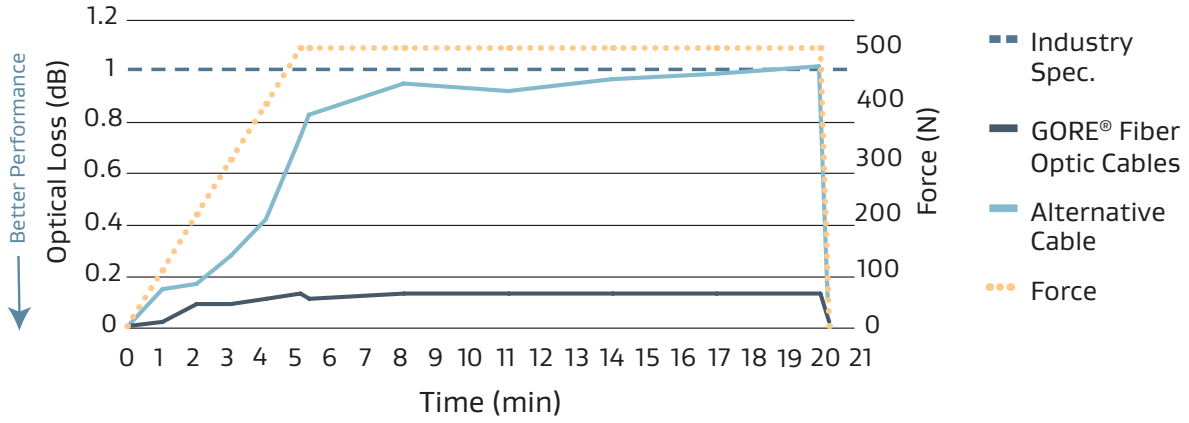
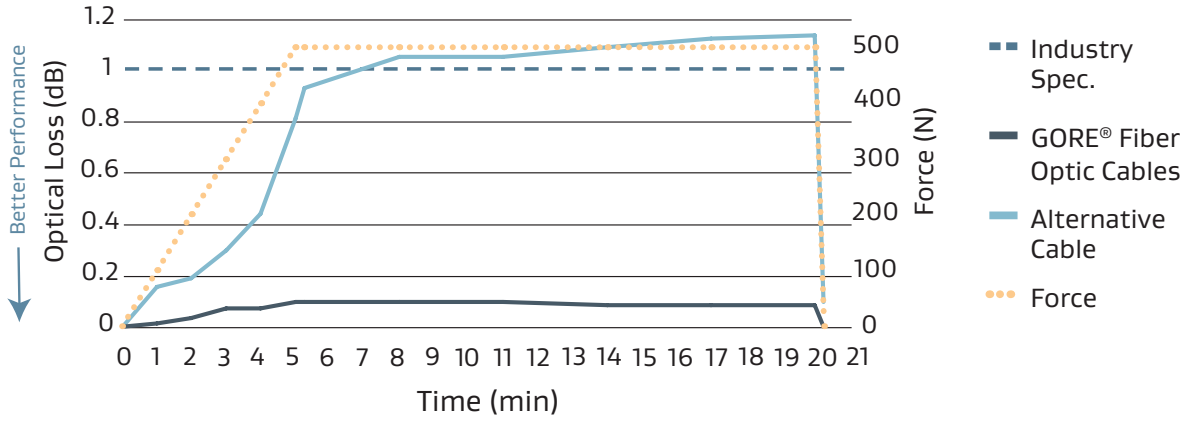


Figure 3: Crush Resistance at 1300 nm



GORE® Fiber Optic Cables (1.8 mm Simplex)

High Vibration & Mechanical Shock Endurance

Gore also evaluated the vibration and mechanical shock performance of its fiber optic cable after exposure to extreme temperatures. The samples were tested on multiple axes at a total energy of 15 g_{eff} for vibration and acceleration at 50 g (0.1 lb) for mechanical shock. Results showed that GORE® Fiber Optic Cables, 1.8 mm Simplex endured high-intensity vibration and mechanical shock without degradation or optical loss in a wide range of temperatures for extended service life (Figures 4–11).

Figure 4: Vibration Endurance at -40°C (850 nm)

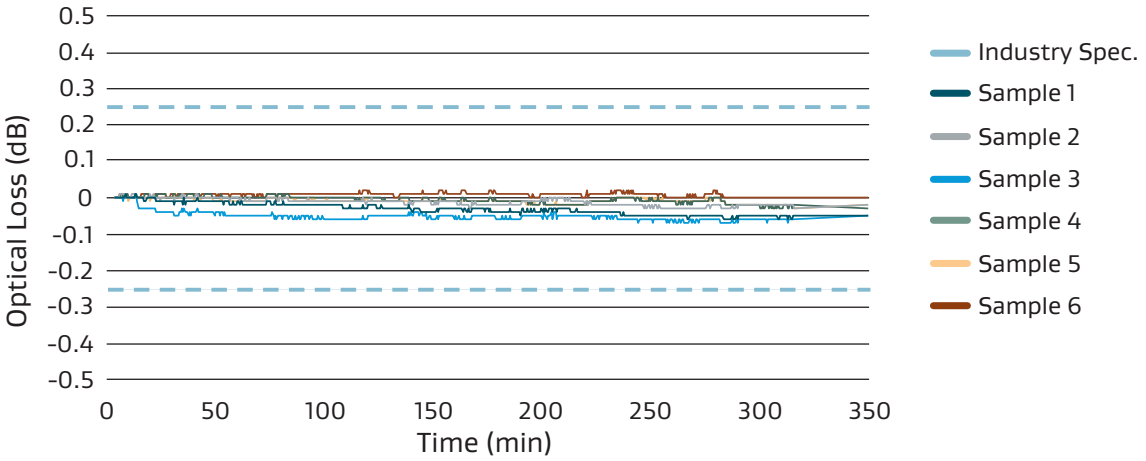


Figure 5: Vibration Endurance at -40°C (1300 nm)

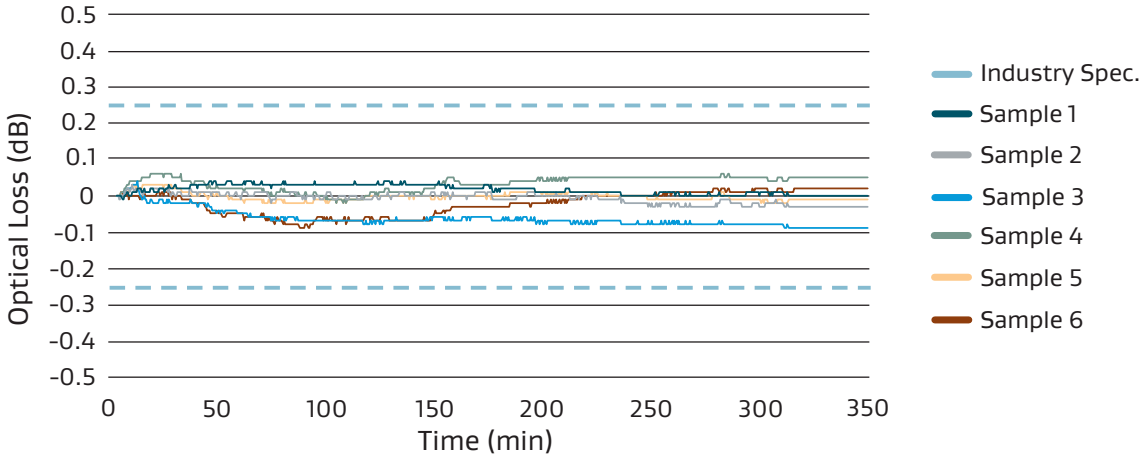


Figure 6: Vibration Endurance at +135°C (850 nm)

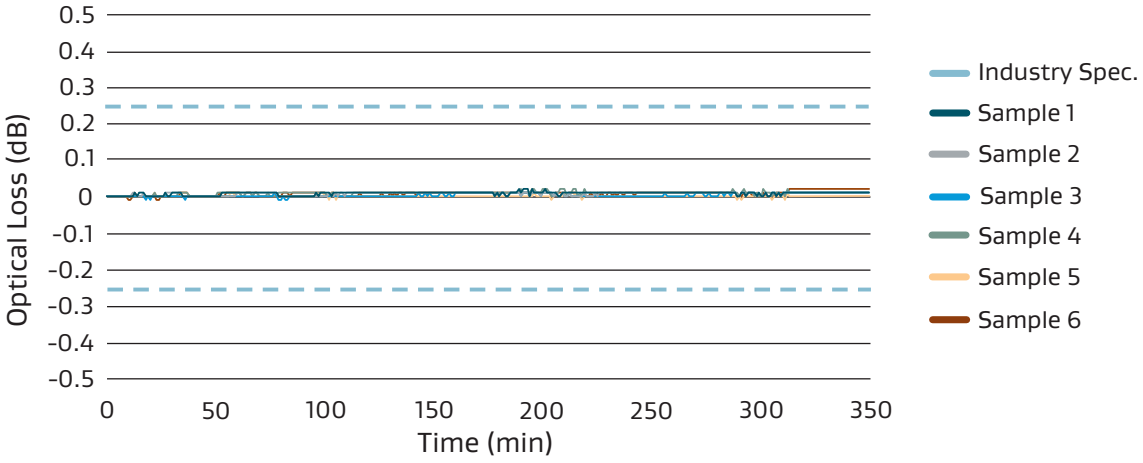


Figure 7: Vibration Endurance at +135°C (1300 nm)

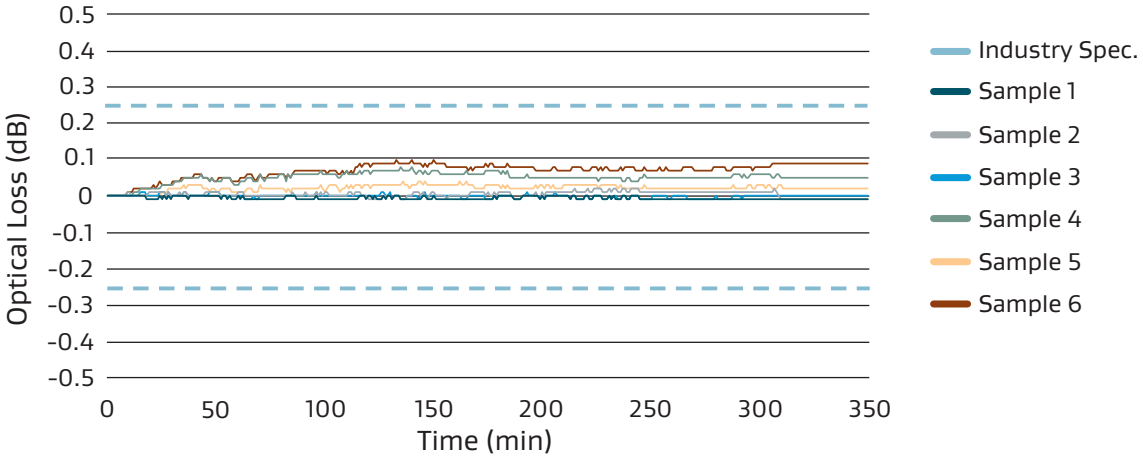


Figure 8: Mechanical Shock Endurance at -40°C (850 nm)

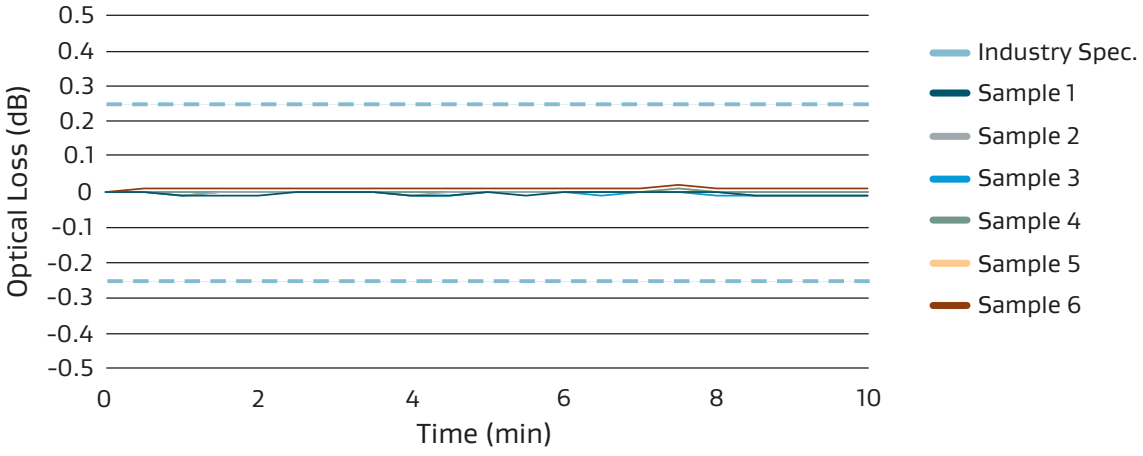


Figure 9: Mechanical Shock Endurance at –40°C (1300 nm)

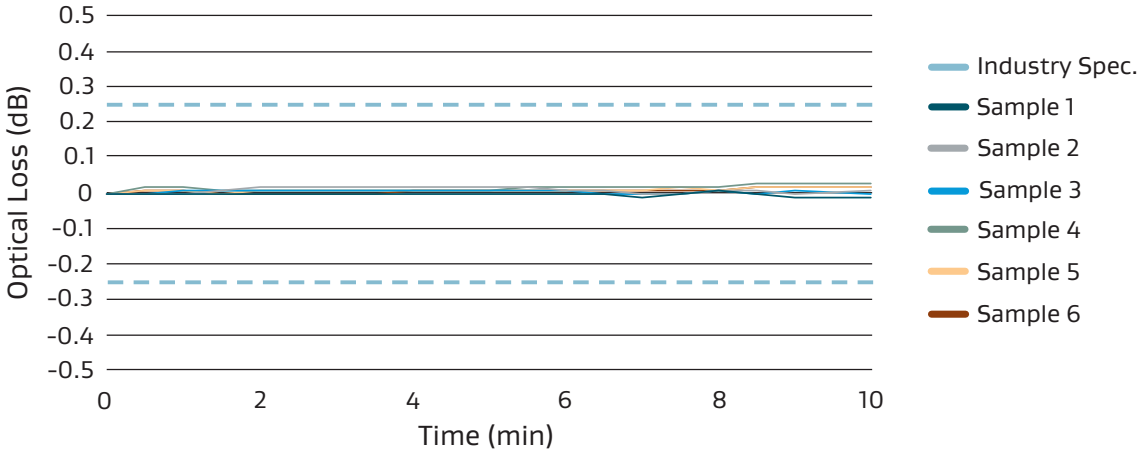


Figure 10: Mechanical Shock Endurance at +135°C (850 nm)

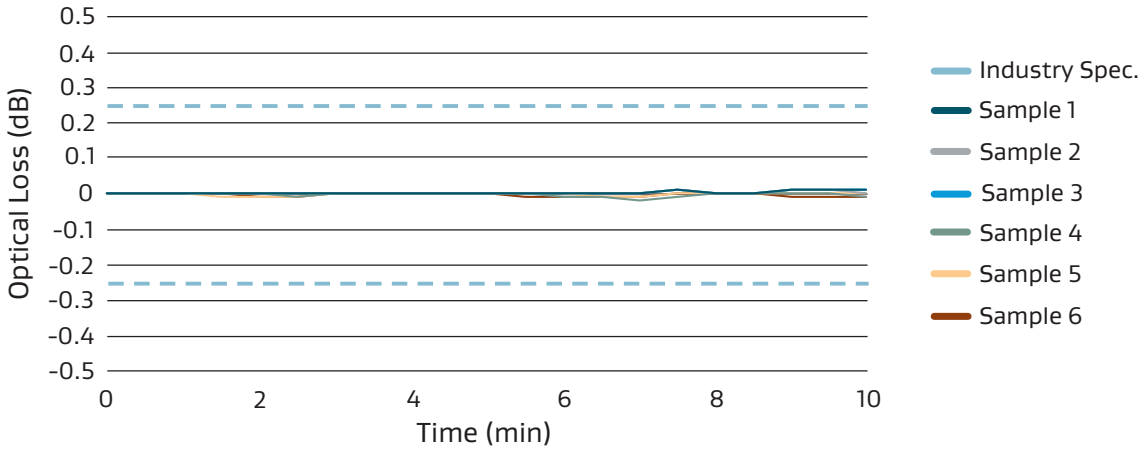


Figure 11: Mechanical Shock Endurance at +135°C (1300 nm)

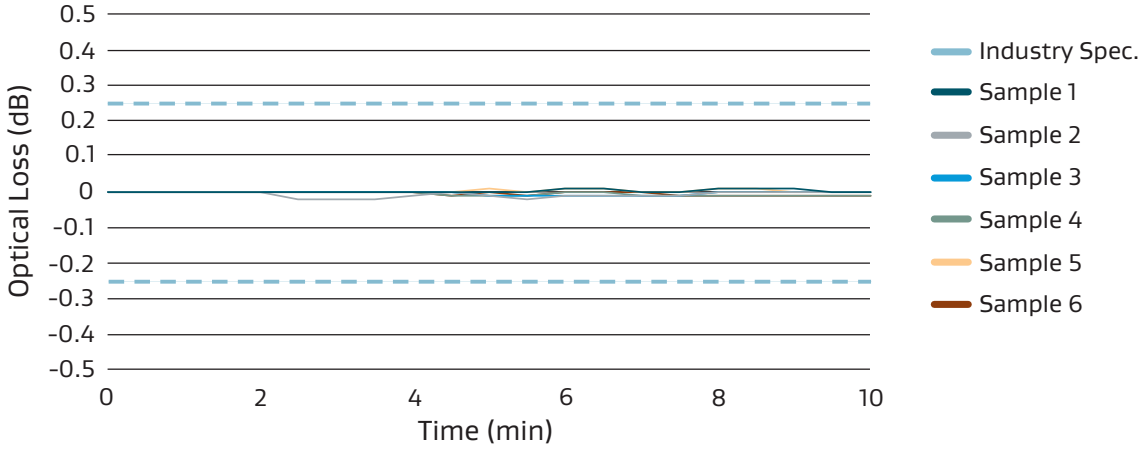


Table 2: Cable Characteristics

Gore Part Number	Core Type	Core/ Cladding/ Coating	Jacket Color	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight g/m	Maximum Tensile Strength N
GSC-13-84689-04	SM (Single Mode)	9/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	150
GSC-13-84689-07	SM (Single Mode)	9/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	150
GSC-13-84640-04	OM1 (Multi-Mode, Graded Index)	62.5/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84640-07	OM1 (Multi-Mode, Graded Index)	62.5/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84639-04	OM2 (Multi-Mode, Graded Index)	50/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84639-07	OM2 (Multi-Mode, Graded Index)	50/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84943-04	OM3 (Multi-Mode, Graded Index)	50/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84943-07	OM3 (Multi-Mode, Graded Index)	50/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-84943-17[a]	OM3 (Multi-Mode, Graded Index)	50/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-85423-04	OM4 (Multi-Mode, Graded Index)	50/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-85423-07	OM4 (Multi-Mode, Graded Index)	50/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-85868-04	OM5 (Multi-Mode, Graded Index)	50/125/245	Yellow	1.8 (0.07)	18.0 (0.71)	4.0	200
GSC-13-85868-07	OM5 (Multi-Mode, Graded Index)	50/125/245	Violet	1.8 (0.07)	18.0 (0.71)	4.0	200

a. Includes a JN1177 marking on the jacket material.

Samples & Ordering Information

The 1.8 mm Simplex version of GORE® Fiber Optic Cables is available in standard sizes (Table 2). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** To view our full inventory and order complimentary samples of selected products for prototyping and evaluation in your application, visit **gore.com/hsdc-sample-inventory-air-defense.**

For more information or to discuss specific characteristic limits and application needs — including a bend-sensitive fiber option or particular fiberglass type, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

W. L. Gore & Associates
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