GORE® High Speed Data Cables
For Aerospace & Defense

TOTAL RELIABILITY IN AVIONICS & VECTRONICS

Together, improving life

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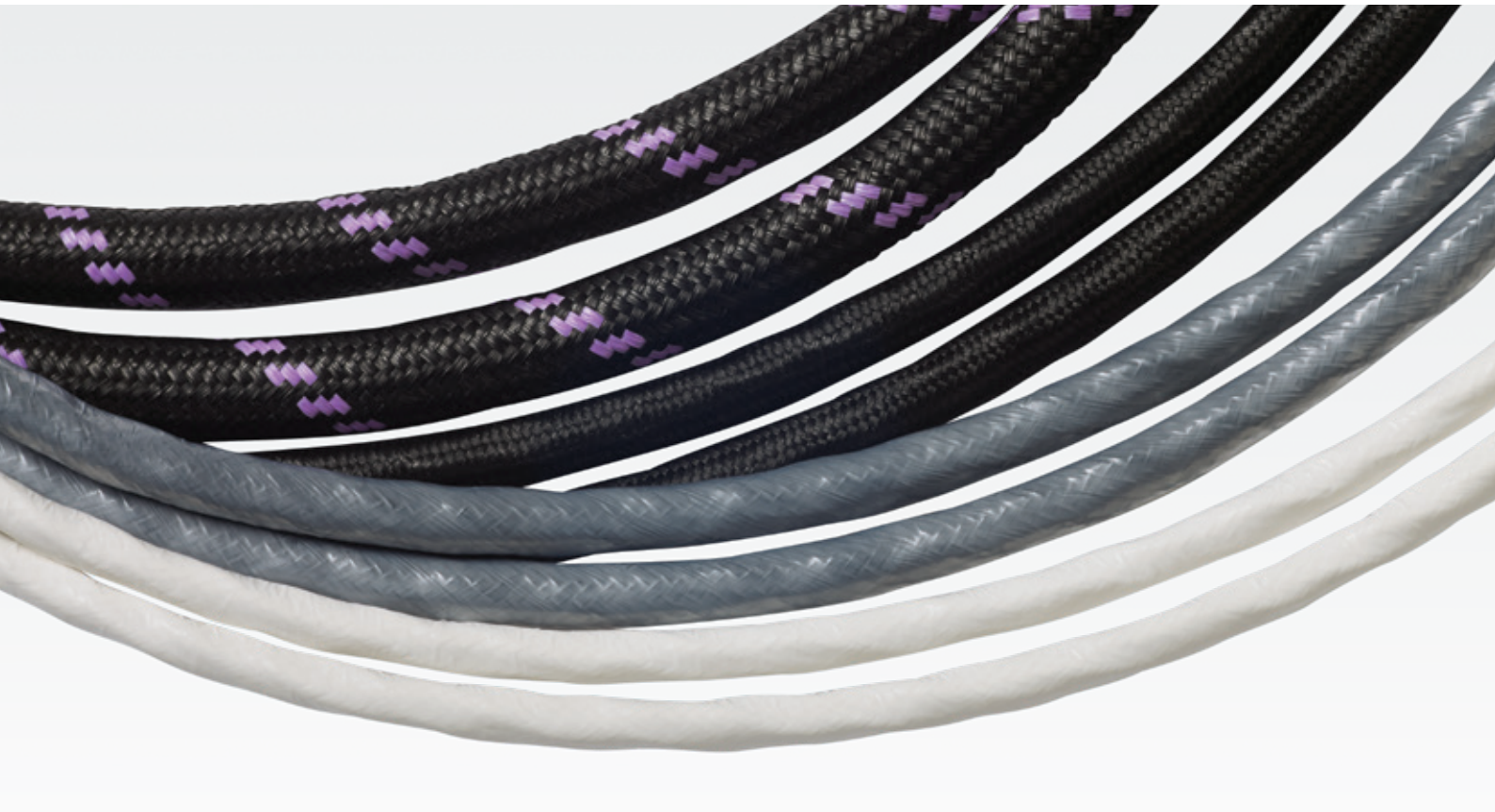


Benefits of GORE® High Speed Data Cables

- Excellent signal integrity with stable performance in extreme conditions
- High-speed data transmission minimizes the need for additional signal amplification
- Continuous high-voltage power and secure, high-bandwidth data transfer
- Increased durability due to materials that resist crushing, abrasion and cut-through
- Longer product life with chemically inert and temperature-resistant materials
- Fast routing due to smaller, lighter weight designs with more flexibility and tighter bend radius

Superior signal integrity for reliable data transmission in compact, robust designs

Engineered for demanding air and land conditions, GORE® High Speed Data Cables deliver superior signal integrity for reliable data transmission in durable, compact designs. They meet and even exceed stringent industry requirements for applications such as avionics and vectronics digital networks, mission and flight systems, signals intelligence, camera and video systems, and more.

Increased Durability

Gore's cables significantly reduce the challenges of installation and operation. The robust jacket and insulation materials in their construction resist wide temperature ranges, crushing, abrasion, and vibration. Using SAE AS4373™, Method 703, Gore's engineered fluoropolymer showed greater cut-through resistance at high temperatures compared to standard polytetrafluoroethylene (PTFE) and fluorinated ethylene propylene (FEP) (Figure 1). Our materials are also chemically inert, which reduces the reaction to harmful contaminants and fluids commonly found in harsh flight and mission environments..

Whatever type of high data rate cable your system architecture requires, Gore's solutions maintain stable communications on avionics and vectronics digital networks.

Significant Weight Savings

Gore's innovative cable technology can substantially reduce weight without sacrificing durability or signal quality. Built with a unique proprietary engineered fluoropolymer — expanded PTFE — jacket weight is reduced by as much as 37% when compared to ethylene tetrafluoroethylene (ETFE) and 50% when compared to FEP. Our cables' excellent performance can also reduce the need for additional signal amplification, further decreasing weight and power requirements.

Easier, Faster Routing

The lighter materials in GORE® High Speed Data Cables result in smaller gauge sizes in your system architecture where space is at a premium. Using SAE AS4373, Method 707, Gore's engineered fluoropolymer also proved to be much more flexible when compared to PTFE and FEP (Figure 2). Our cables' compact size, greater flexibility and tighter bending capability make initial routing easier and faster, particularly when retrofitting them in crowded areas.

Figure 1: Cut-Through Resistance at High Temperatures

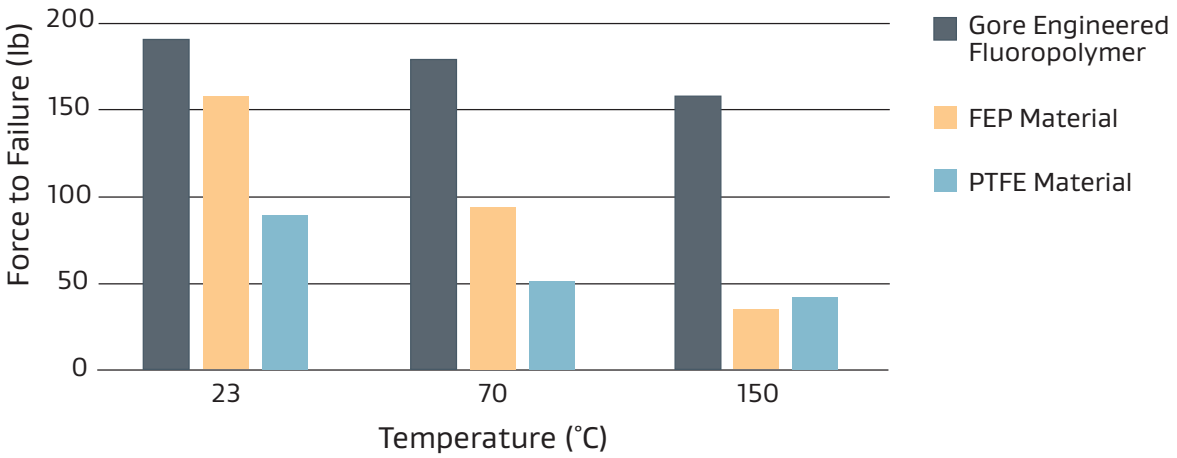
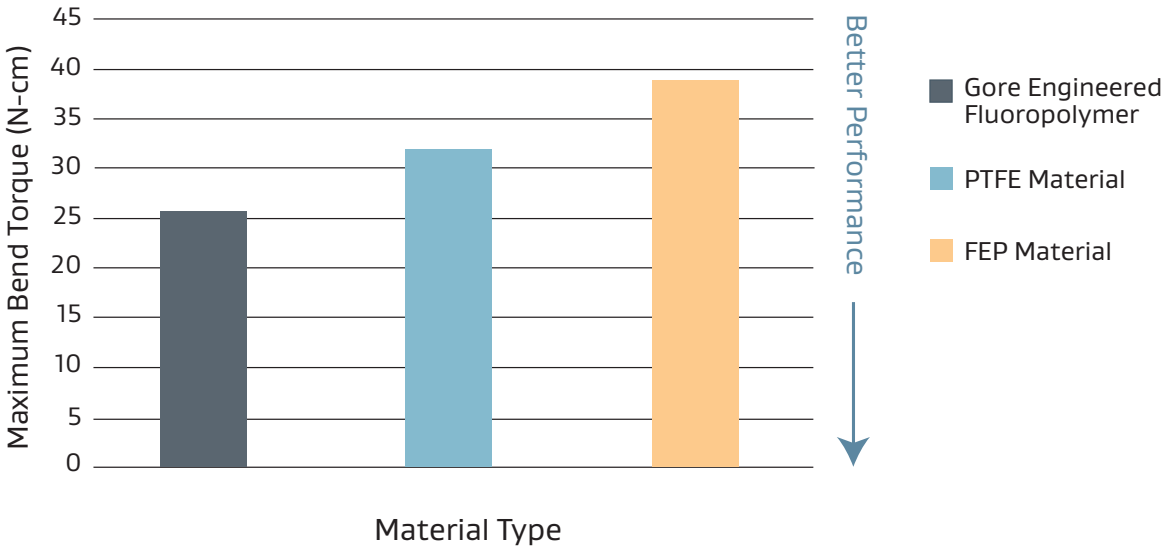


Figure 2: Flexure Comparison



Support standardized protocols

The aerospace and defense industries are moving away from proprietary networks to open-source architectures and standardized protocols in sophisticated avionics and vectronics. Therefore, Gore offers a selection of high-speed copper, fiber optic, and hybrid solutions that support standard protocols such as Ethernet, CAN Bus, FireWire®, USB, HDMI, Fibre Channel, and more.

For example, we offer several cable types that meet stringent Ethernet protocol and performance requirements to accommodate your system architecture now and in the future (Table 1).

Table 1: Gore's Cables Supporting Ethernet Protocols

Category	Typical Data Rate bit/sec	Cable Type	Construction	Page Number
8	40 Gb/s	Ethernet	4 Pairs	16
8	100+ Gb/s	Fiber Optics	1.8 mm Simplex	62
6A	10 Gb/s	Ethernet	4 Pairs	16
6A	10 Gb/s	Fiber Optics	1.8 mm Simplex	62
5e	10/100/1000 Mb/s	Ethernet	Quadrax	26
5e	10/100/1000 Mb/s	Ethernet	2 Pairs	30
5e	1 Gb/s	Ethernet	4 Pairs	16
5e	10/100 Mb/s	Shielded Twisted Pair	Single Pair	8
5e	1 Gb/s	Fiber Optics	1.8 mm Simplex	62

Gore manufactures solutions in various designs that support standardized high-speed protocols in avionics and vectronics.

Approved to VG standards for vectronics

Gore offers high data rate cables in several constructions and protocols approved to VG95218-31 standards (Tables 2-5). We manufacture them with a polyurethane (PU) halogen-free black jacket or engineered fluoropolymer white jacket specifically designed for cables installed in vectronics.

These military-grade cables can be extensively used in applications requiring maximum resistance to harsh land and vehicle conditions such as hot and cold weather, dirt, dust, vibration, fuels, and oils.

Table 2: GORE® Shielded Twisted Pair Cables

VG Part Number	Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Max. Insertion Loss dB/30 m (100 ft)				Jacket Material	Page Number
						100 MHz	200 MHz	500 MHz	1 GHz		
VG95218-T031V001	GSC-03-85203-VG	22 (19/34)	4.8 (0.19)	29.0 (1.14)	43.0 (28.9)	6.6	9.8	15.7	23.5	PU Halogen-Free	8

Table 3: GORE® CAN Bus Cables

VG Part Number	Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Max. Insertion Loss dB/30 m (100 ft)				Jacket Material	Page Number
						100 MHz	200 MHz	500 MHz	1 GHz		
VG95218-T031T001	GSC-03-84793-VG	24 (19/36)	4.2 (0.17)	17.2 (0.68)	23.0 (15.46)	6.5	10.0	16.0	22.0	Engineered Fluoropolymer	12

Table 4: GORE® Ethernet Cables (Cat6A)

VG Part Number	Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Max. Insertion Loss dB/30 m (100 ft)			Jacket Material	Page Number
						100 MHz	200 MHz	500 MHz		
VG95218-T031P001	GSC-01-85237-VG	24 (19/36)	9.0 (0.35)	45.0 (1.77)	94.0 (63.1)	5.6	8.1	14.1	PU Halogen-Free	16
VG95218-T031R001	GSC-01-85238-VG	24 (19/36)	9.0 (0.35)	45.0 (1.77)	67.0 (45.0)	5.6	8.1	14.1	Engineered Fluoropolymer	16
VG95218-T031U001	GSC-01-83134-VG	27 (07/34)	6.6 (0.26)	33.0 (1.29)	65.0 (43.7)	10.4	15.2	24.8	PU Halogen-Free	16

Table 5: GORE® USB Cables (3.0)

VG Part Number	Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Nom. Insertion Loss dB/1 m (3.28 ft)				Jacket Material	Page Number
						1250 MHz	2500 MHz	5000 MHz	7500 MHz		
VG95218-T031M001	GSC-01-85201-VG	Data Pair: 26 (19/38) Power Pair: 22 (19/34)	8.0 (0.31)	40.0 (1.58)	97.0 (65.1)	1.70	2.50	3.90	5.00	PU Halogen-Free	46

Image courtesy of Rheinmetall©

Gore’s rugged VG-approved cables can be reliably used in many current and future combat vehicles.

GORE® Shielded Twisted Pair Cables (100 Ohms)

Typical Applications

- Avionics/vetronics digital networks
- Cabin Management Systems
- Ethernet backbone
- HD streaming camera/video systems
- High-density connectors
- LVDS devices
- Sensor/processor Interconnects
- Serial buses

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability (DXN2600 through DXN2606)
- ABD0031 (AITM 3.0005); BSS7239: Toxicity (DXN2600 through DXN2606)
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density (DXN2600 through DXN2606)
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking (DXN2600 through DXN2606)
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)
- VG95218-31: Performance Requirements (GSC-03-85203-VG)

Well-suited for wire and cable harness applications, Gore's cables utilize low-voltage differential signals (LVDS). They deliver excellent signal integrity with controlled impedance for data transmission lines at speeds up to 1 GHz (Table 6).

The combination of durable materials in this construction enables a higher tolerance against typical aerospace and defense conditions such as rigorous routing and changing climates for extended service life (Figure 3).

Gore's low-profile configuration also has a direct impact on saving weight and space in aircraft and military vehicles. These cables are 30% smaller and 50% lighter when compared to standard oval cables (Figure 4). When compared to alternative round cables, Gore's unique design is drastically smaller in size (Figure 5). This smaller diameter allows for more flexibility and easier routing in hard-to-reach places of aircraft and vehicles for improved installation.

Table 6: Cable Properties

Electrical

Property	Value
Signal Transmission Speed GHz	Up to 1
Standard Impedance Ohms	100 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	42.6 (13.0)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 / 700[a] 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer or PU Halogen-Free[a]
Jacket Color	EF: White (Laser Markable) PU: Black[a]
Conductor	Silver-Plated Copper or SPC Alloy
Conductor Color-Coding	Blue/White
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200 -46 to +100[a]

a. Based on Gore's part number GSC-03-85203-VG for military vehicle systems.

Figure 3: Durable Package

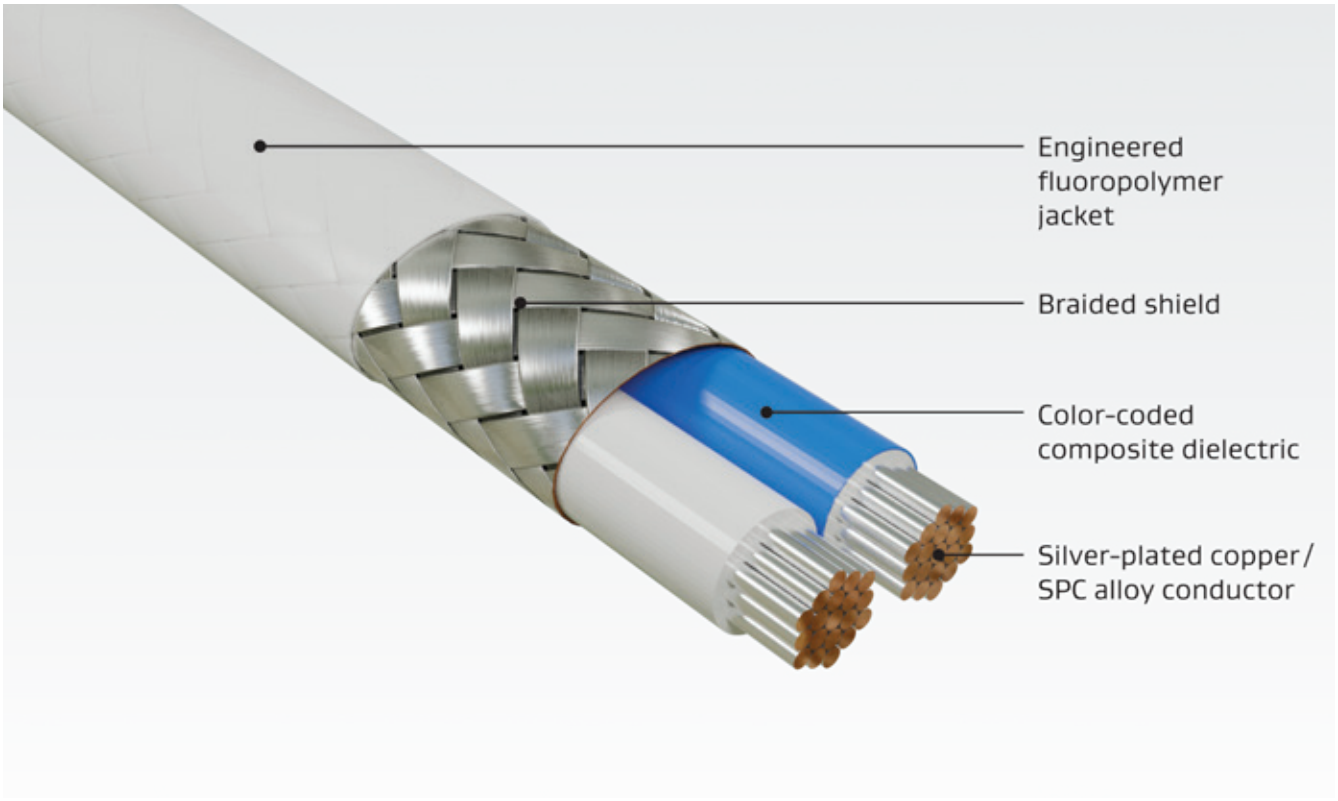


Figure 4: Low-Profile Configuration

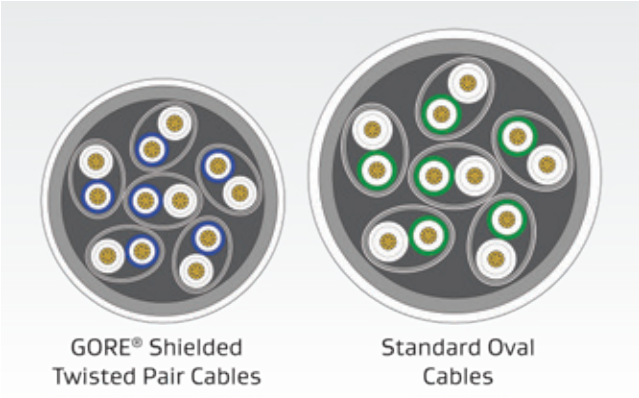
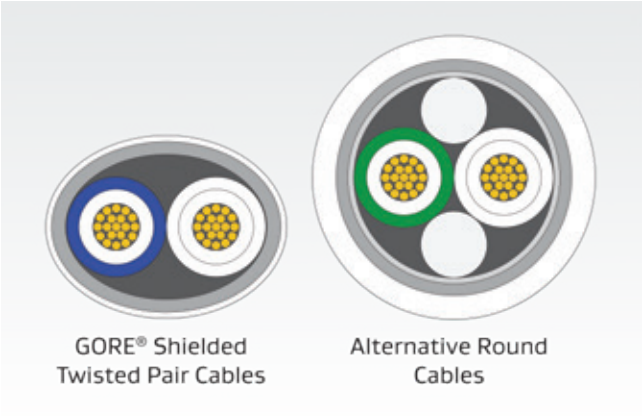


Figure 5: Smaller Diameter



GORE® Shielded Twisted Pair Cables (100 Ohms)

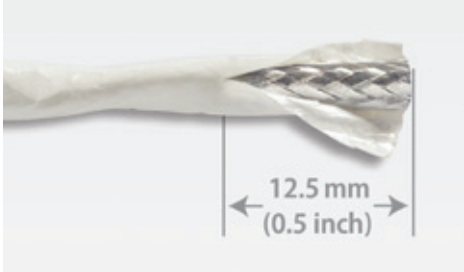
Table 7: Cable Characteristics

Gore Part Number	Gore Alternative Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Maximum Insertion Loss dB/30 m (100 ft)			
						100 MHz	200 MHz	500 MHz	1 GHz
DXN2600	GSC-03-84879-00	20 (19/32)	5.1 (0.20)	25.0 (0.98)	31.7 (21.3)	4.8	6.8	11.3	16.4
GSC-03-85203-VG	—	22 (19/34)	4.8 (0.19)	29.0 (1.14)	43.0 (28.9)	6.6	9.8	15.7	23.5
DXN2601	GSC-03-84880-00	22 (19/34)	3.8 (0.15)	19.1 (0.75)	23.2 (15.6)	6.6	9.8	15.7	23.5
DXN2602	GSC-03-84557-00	24 (19/36)	3.3 (0.13)	16.2 (0.64)	16.8 (11.3)	7.6	10.7	17.3	25.0
DXN2603	GSC-03-84823-00	26 (19/38)	2.5 (0.10)	12.6 (0.49)	12.8 (8.6)	9.4	13.8	21.5	31.2
DXN2604	GSC-03-84881-00	28 (19/40)	2.0 (0.08)	9.9 (0.39)	8.6 (5.8)	13.2	19.2	32.0	46.8
DXN2605	GSC-03-84710-00	30 (19/42)	1.8 (0.07)	8.9 (0.35)	7.1 (4.8)	20.9	23.6	38.3	56.9
DXN2606	—	32 (19/44)	1.7 (0.07)	8.6 (0.34)	5.0 (3.4)	27.0	39.0	60.0	—

Cable Preparation

Laser stripping is the ideal method to prep GORE® Shielded Twisted Pair Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 6). For more information regarding cable preparation, contact a Gore representative.

Figure 6: Peel-Back Method



Connector Systems & Backshells

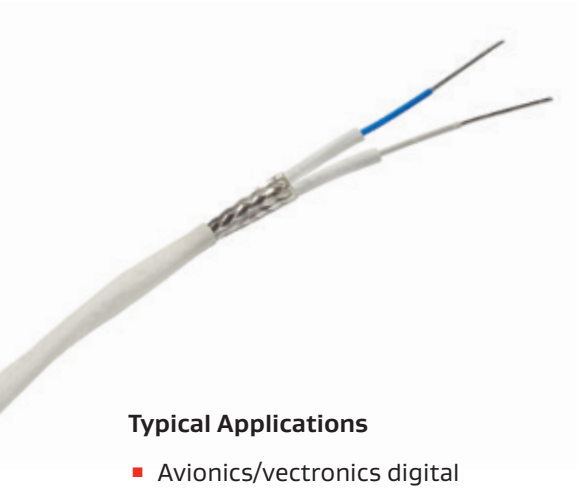
GORE® Shielded Twisted Pair Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with differential Twinax sizes 8 and 22D contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Samples & Ordering Information

GORE® Shielded Twisted Pair Cables are available in standard sizes (Table 7). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs – including other impedance options, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® CAN Bus Cables (120 Ohms)



Suitable for today's faster digital networks, Gore's controlled-impedance cables ensure high-quality signals for high data rate transmission up to 1 GHz. They provide versatile protection to shield sensitive wires from extreme mechanical and environmental impact (Table 8). These cables are built to perform accurately, reliably and securely over the application lifespan.

With a compact footprint, Gore's CAN Bus cables are 40% smaller than alternative cable designs, which makes them fundamentally lighter. This reduced diameter enables better flexibility and a smaller bend radius for trouble-free installation in tight areas of aircraft and military vehicles (Figure 7).

Typical Applications

- Avionics/vectronics digital networks
- Cabin management systems
- Controller area networks
- Data links
- Electronic diagnostics
- HD streaming video systems
- Mission systems
- Serial buses

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)
- SAE J1128™: Low Voltage Primary Cable
- SAE J1939™: Serial Control and Communications Heavy Duty Vehicle Network
- VG95218-31: Performance Requirements (GSC-03-84793-VG)

Table 8: Cable Properties

Electrical

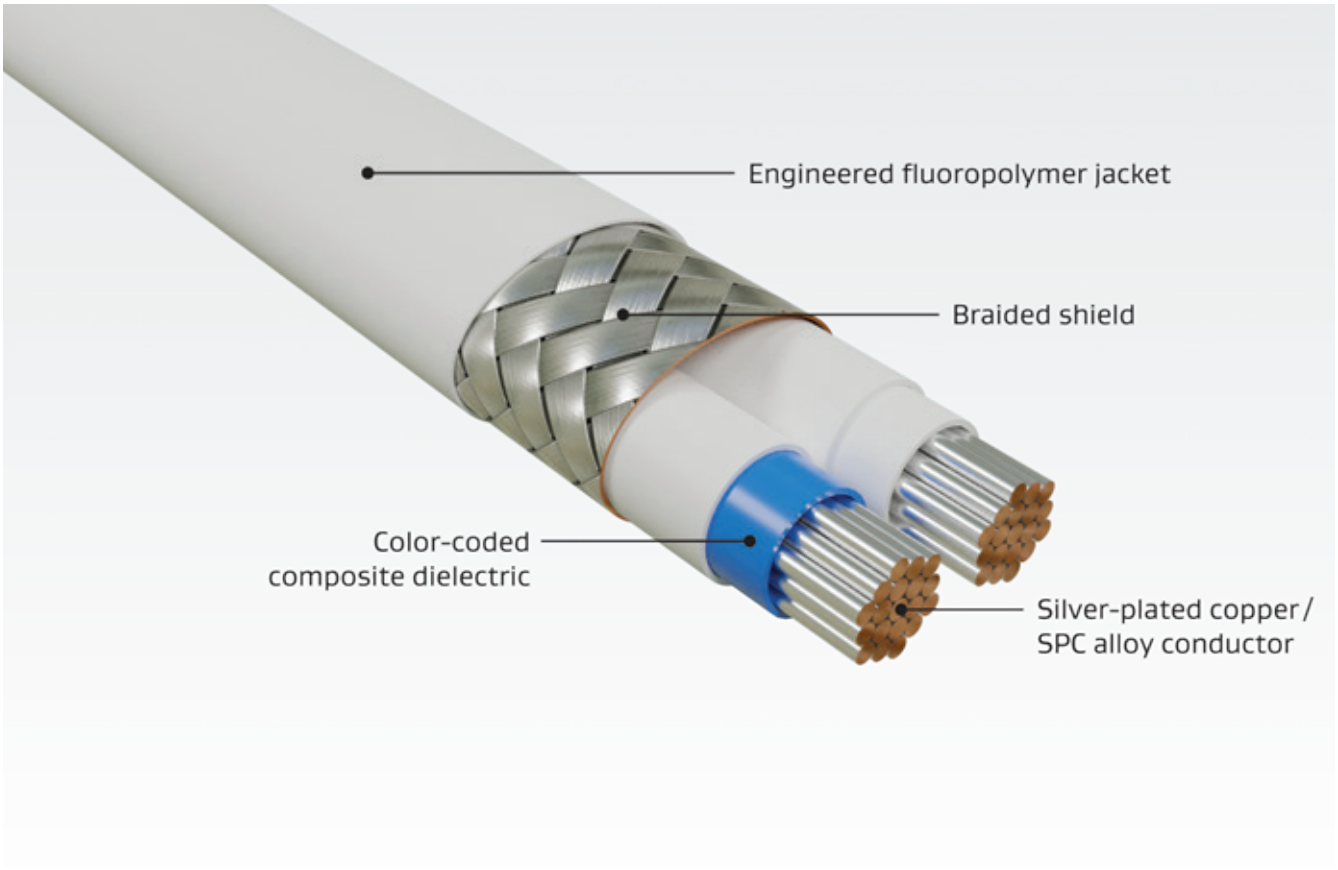
Property	Value
Signal Transmission Speed GHz	Up to 1
Standard Impedance Ohms	120 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	42.0 (12.8)
Dielectric Withstanding Voltage Vrms	
Conductor-to-Conductor	1500 / 700[a]
Conductor-to-Shield	1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper or SPC Alloy
Conductor Color-Coding	Blue/White
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

a. Based on Gore's part number GSC-03-84793-VG for military vehicle systems.

Figure 7: Compact Footprint



Cable Preparation

GORE® CAN Bus Cables include an inverted dielectric design that enables easier wire preparation and insertion in smaller connector systems.

Standard 120-ohm primary wires have a much larger diameter due to high impedance and typically will not fit into smaller holes unless wires are insulated with thin heat shrink. However, Gore's unique design eliminates the need to remove several inches of insulation from the end and apply heat shrink to fit wires into smaller holes.

The inverted dielectric layers can be stripped off using sharp mechanical strippers set at the next largest AWG size. Carefully cut the outer layers and use your fingertips to pull off gently. For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® CAN Bus Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 and 22D contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

GORE® CAN Bus Cables (120 Ohms)

Table 9: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)			
					100 MHz	200 MHz	500 MHz	1 GHz
GSC-03-85752-22D	22 (19/34)	5.1 (0.20)	25.5 (1.00)	28.0 (18.82)	5.6	8.5	13.5	19.0
GSC-03-84793-VG	24 (19/36)	4.2 (0.17)	17.2 (0.68)	23.0 (15.46)	6.5	10.0	16.0	22.0
GSC-03-85752-24D	24 (19/36)	4.2 (0.17)	21.0 (0.83)	23.0 (15.46)	6.5	10.0	16.0	22.0
GSC-03-85752-26D	26 (19/38)	3.5 (0.14)	17.5 (0.69)	15.4 (10.35)	8.0	12.0	18.0	24.0

Samples & Ordering Information

GORE® CAN Bus Cables are available in standard sizes (Table 9). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

With a compact footprint, Gore's CAN Bus cables enable better flexibility and a smaller bend radius for trouble-free installation in tight areas.

GORE® Ethernet Cables (Cat5e/6A/8)

For standard Ethernet Cat5e, Cat6A and Cat8 protocols, Gore's 4-pair cables are engineered for the increasing data and video demands of modern avionics and vectronics digital networks (Table 10). They meet, some versions even exceed, stringent electrical requirements for cables operating in extreme environments. Our cables have been selected for many airborne and defense program updates, including Future Vertical Lift (FVL) and Advanced Air Mobility (AAM). Examples include the UH-60, F-16, C-130, KC-135, and Abrams Main Battle Tank.

The Cat6A version delivers excellent signal integrity with sufficient margin for high-speed data and video transmission up to 10G BASE-T at lengths up to 80 m (262 ft). This award-winning version is also approved to SAE AS6070 and VG95218-31 standards and on the Qualified Products List (QPL).

We also offer a Cat8 version that meets faster speeds beyond 10G BASE-T to help you adapt now and be ready for the foreseeable future without having to transition to an entirely different cabling solution. This version reliably transfers data and video up to 40G BASE-T at lengths up to 22 m (72 ft) without compromising system robustness or adding weight.

Typical Applications

- Avionics/vectronics digital networks
- Cabin/flight management & mission systems
- Data storage
- Ethernet backbone
- HD streaming camera/video systems
- Radio/radar/communications systems
- Tactical links

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MILITARY VETRONICS ASSOCIATION

NGVA

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- ANSI/TIA 568.2-D: Balanced Twisted Pair Telecommunications Cabling and Components
- ARINC 664 P2-3: Aircraft Data Networks Ethernet Physical and Data Link Layer 10BASE-T, 100BASE-TX, and 100BASE-FX (RCN9235-24, RCN9241-24, RCN9235-26)
- IEEE 802.3: Ethernet 10G BASE-T (Cat5e/6A versions)
- IEEE 802.3bq: Ethernet 40G BASE-T (Cat8 version)
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)
- SAE AS6070™/5 & /6: 10G BASE-T (100 Ohms); QPL (RCN9034-24, RCN9047-26)
- STANAG 4754: NATO Generic Vehicle Architecture (NGVA) for Land Systems (GSC-01-85237-VG, GSC-01-85238-VG, GSC-01-83134-VG)
- VG95218-31: Performance Requirements (GSC-01-85237-VG, GSC-01-85238-VG, GSC-01-83134-VG)

Table 10: Cable Properties

Electrical

Property	Value	
	Cat5e/6A (10G BASE-T)	Cat8 (40G BASE-T)
Signal Transmission Speed Gb/s	Up to 10	Up to 40
Standard Impedance Ohms	100 ± 10	100 +10/-5
Typical Operating Voltage V	< 15	< 15
Nominal Velocity of Propagation %	80	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)	4.17 (1.27)
Capacitance pF/m (pF/ft)	42.6 (13.0)	41.0 (12.5)
Minimum Near-End Crosstalk (NEXT) dB		
10 MHz	59.2	—
100 MHz	52.3	45.3
500 MHz	42.2	34.8
1000 MHz	—	30.3
2000 MHz	—	25.8
Shielding Effectiveness dB	> 55	> 55
Dielectric Withstanding Voltage Vrms		
Conductor-to-Conductor	1500	1500
Conductor-to-Shield	1000	1000

Mechanical / Environmental

Property	Value	
	Cat5e/6A (10G BASE-T)	Cat8 (40G BASE-T)
Jacket Material	Engineered Fluoropolymer or PU Halogen-Free[a]	Engineered Fluoropolymer
Jacket Color	EF: White (Laser Markable) PU: Black[a]	White (Laser Markable)
Conductor	Silver-Plated Copper or SPC Alloy	
Conductor Color-Coding	Solid Blue & White/Blue Stripe, Solid Orange & White/Orange Stripe, Solid Green & White/Green Stripe, Solid Brown & White/Brown Stripe	
Dielectric Material	Expanded PTFE/PTFE	
Temperature Range °C	-65 to +200	

a. Based on Gore's part numbers, GSC-01-85237-VG, GSC-01-85238-VG, and GSC-01-83134-VG for military vehicle systems.

GORE® Ethernet Cables (Cat5e/6A/8)

Meet Size, Weight & Routing Constraints

GORE® Ethernet Cables with a 4-pair design feature a high-density construction with generally 24% smaller diameters, making them 25% lighter than alternative designs (Figures 8 and 9). We have proven that our unique design typically saves as much as 1.93 kg per 100 m (13 lb per 1000 ft) of weight in aircraft and combat vehicles compared to alternative cables.

To meet higher frequencies, replacing 4 leading alternative Cat6A cables with a single Gore Cat8 cable at 22 m (72 ft) could save installed weight up to 82 kg/km (180 lb/1000 ft). These reduced cable diameters also allow for greater flexibility and a tighter bend radius making routing easier and faster for maintainers.

Figure 8: High-Density Construction

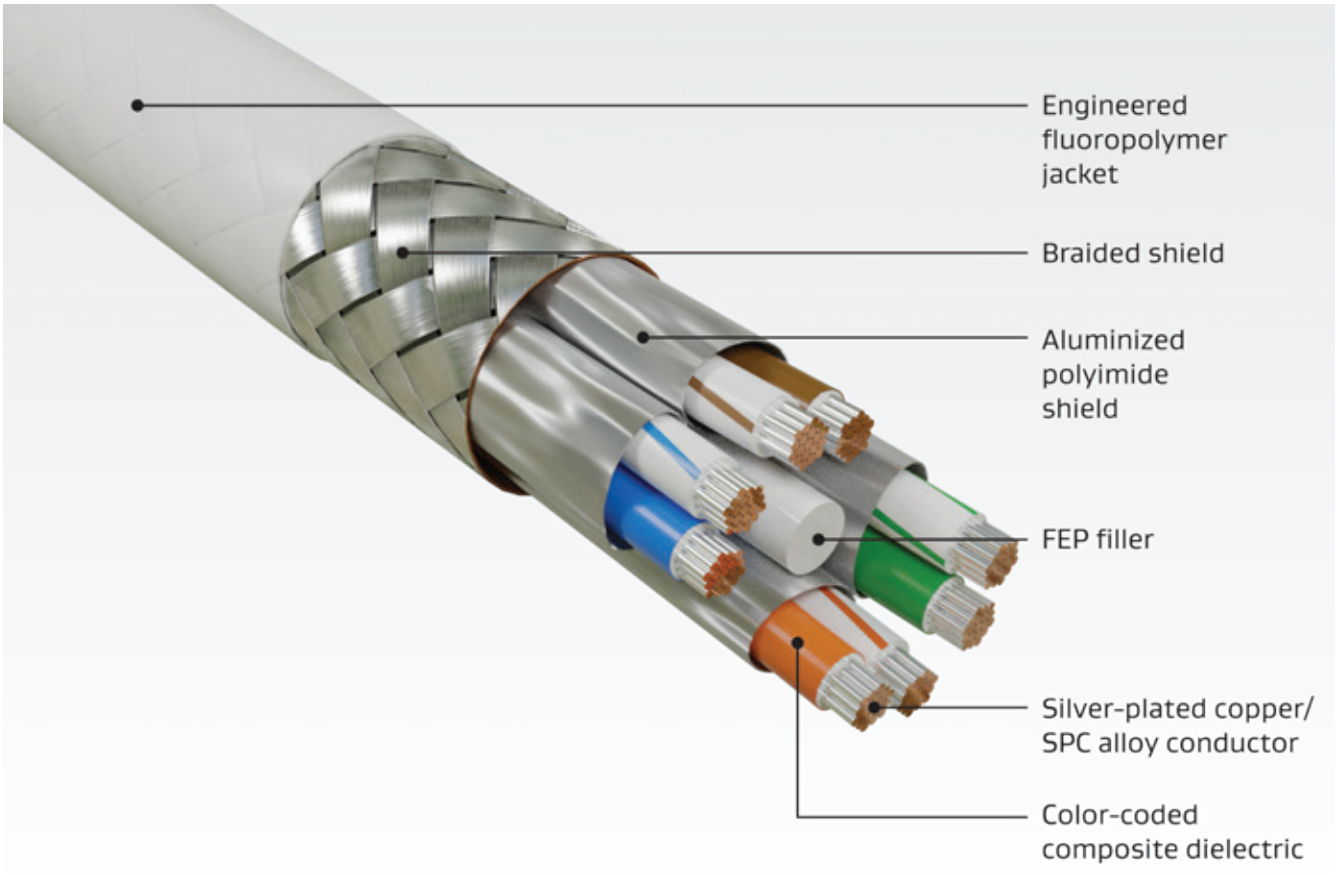
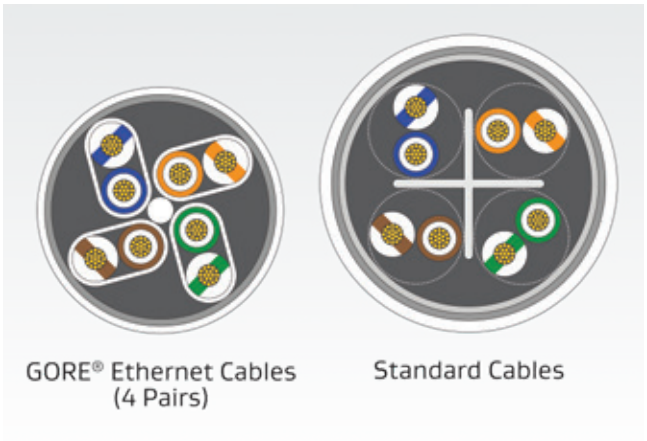


Figure 9: Reduced Diameter



Improved Electrical Performance

Gore compared its Cat6A version with leading alternative cables. The improved performance of GORE® Ethernet Cables directly translates to more reliable data transmission with a vastly better insertion loss-to-crosstalk ratio (Figure 10). Results indicated that this version provided additional margin to overcome installation issues and operational challenges. Similarly, results showed that our unique 4-pair design could reduce crosstalk right out of the box by more than 10 dB at 500 MHz compared to leading alternative cables (Figure 11).

Figure 10: Insertion Loss-to-Crosstalk Ratio Comparison

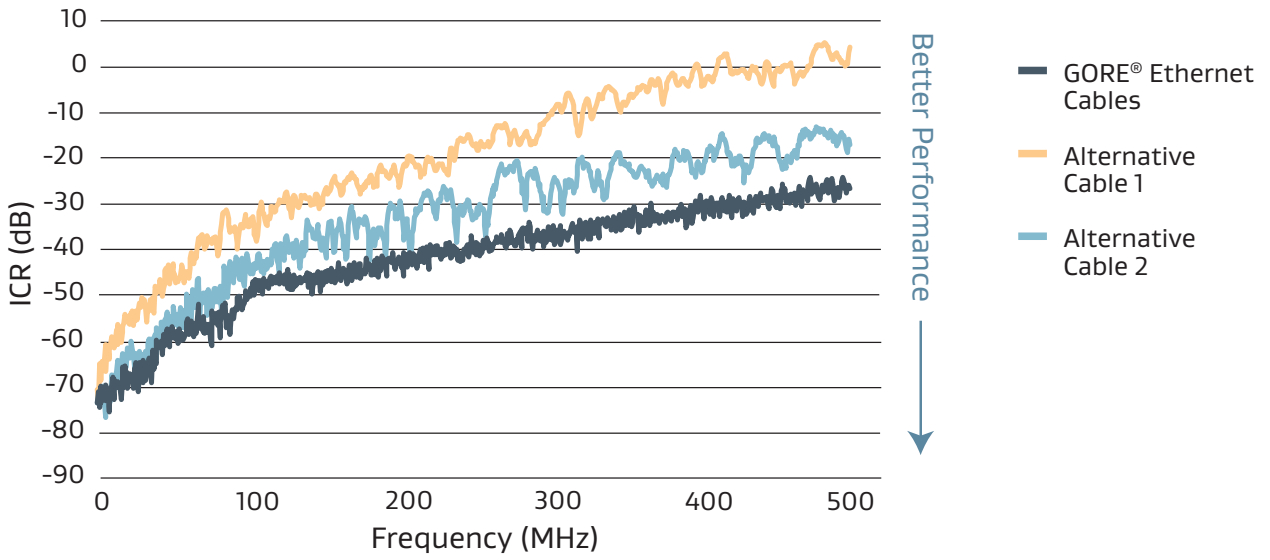
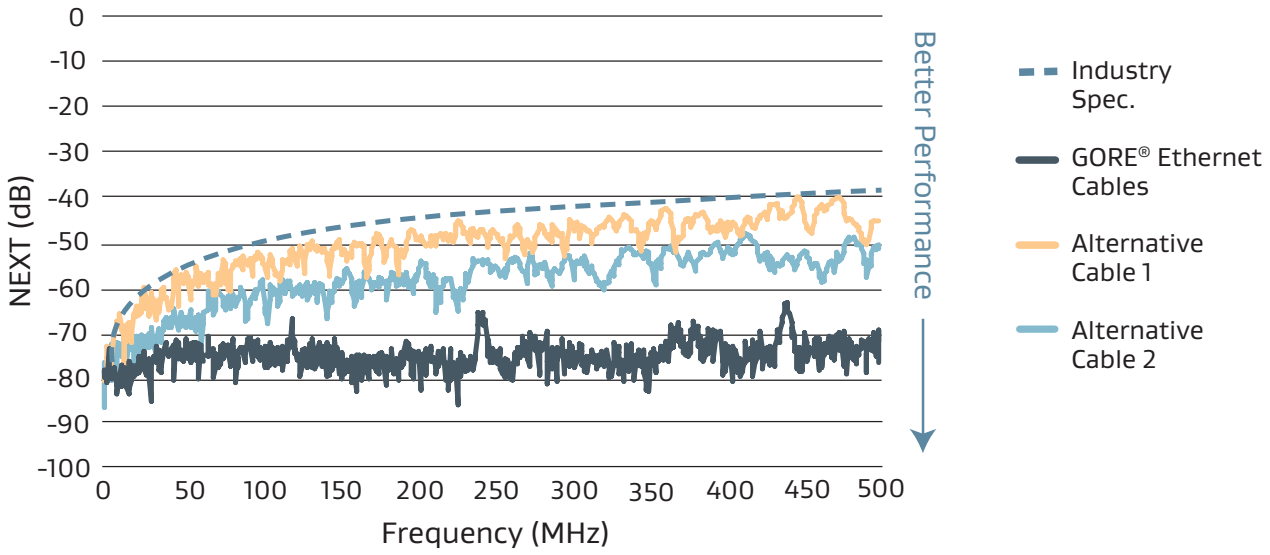


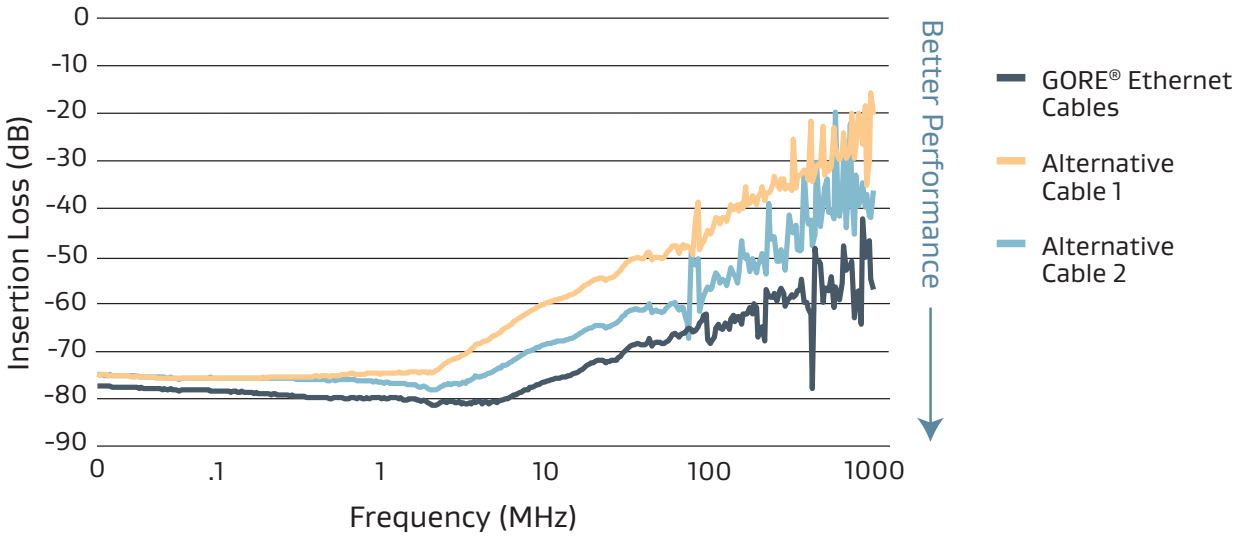
Figure 11: Crosstalk Comparison



GORE® Ethernet Cables (Cat5e/6A/8)

Results also showed that Gore's Cat6A cable improves signal integrity and reduces RF interference by as much as 20 dB at higher frequencies among multiple electronic systems (Figure 12). Proof that Gore's innovative 4-pair cable design provides better noise immunity and less EMI emissions compared to leading alternative cables.

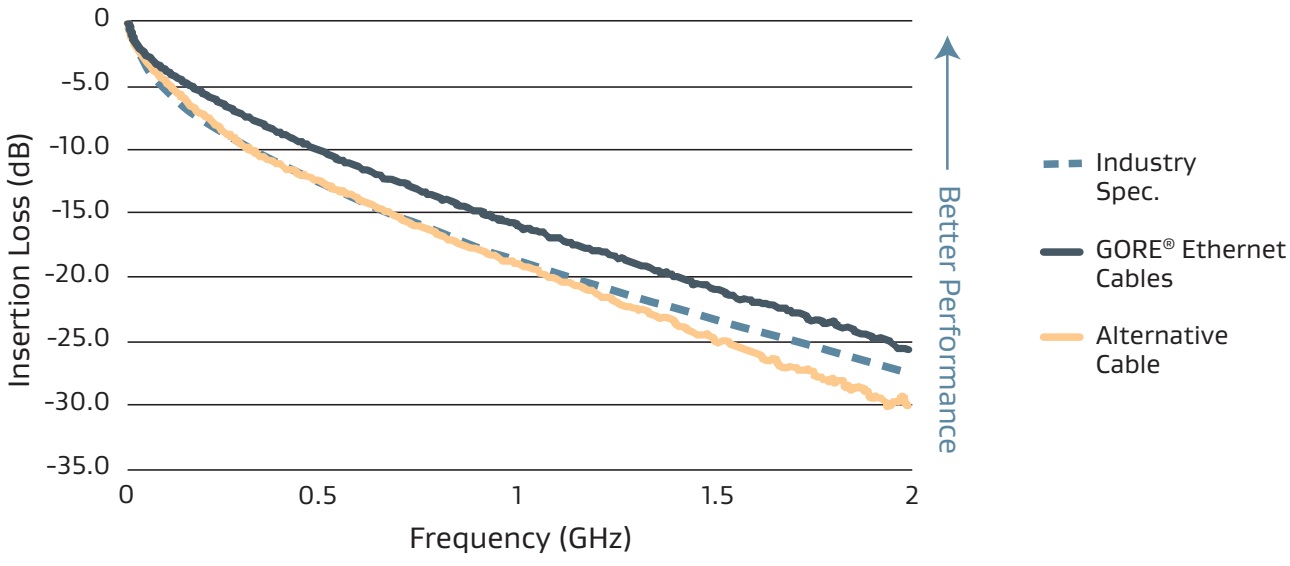
Figure 12: Shielding Effectiveness Comparison



Signal Integrity at Higher Frequencies

To meet Cat8 protocol, we compared our Ethernet 4-pair cable design with a leading alternative cable design. Results proved that our cable continued to deliver reliable signal integrity with lower insertion loss right out of the box up to 2000 MHz (Figure 13). In contrast, the leading alternative cable failed to meet the specification for Cat8 protocol at higher frequencies.

Figure 13: Insertion Loss Comparison



Cable Preparation

Laser stripping is the ideal method to prep GORE® Ethernet Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 14).

Figure 14: Peel-Back Method

Connector-Cable Compatibility

Gore also evaluated the electrical characteristics of its Cat6A cable terminated with leading high-speed aerospace and defense connector systems to assist designers in selecting the best option for a specific application (Table 11). Testing connector-cable compatibility during the initial design process ensures interconnects will perform reliably in specific applications.

Visit **gore.com/ethernet-cat6a-cable-connectors** to download Gore's best practices for terminating the Cat6A version of GORE® Ethernet Cables with leading connector systems and related performance data.

Gore's 4-pair Ethernet cables have been selected for many airborne and defense program updates such as the F-16.

GORE® Ethernet Cables (Cat5e/6A/8)

Table 11: Ethernet Cat6A Interconnect Options

Gore's part numbers RCN8966-24 and RCN8966-26 include a unique inverted dielectric for termination with selected high-speed aerospace and defense connector systems — including Amphenol®, Glenair®, Platinum Tools®, and Sentinel®. For other connector systems not listed in the table, contact a Gore representative.

	Gore Part Number					
Connector System	**GSC-01-85237-VG**	**RCN8966-24**	**RCN9034-24**	**RCN8966-26**	**RCN9047-26**	**RCN9034-28**
Amphenol® Octonet		●		●		
Amphenol® Oval Contact System (OCS13-53)	●	●	●	●	●	●
Amphenol® µ-Com	●	●	●	●	●	●
Amphenol® Socapex OctoMax 1G26				●	●	●
Bel Stewart SS-39200 Series		●		●		
Carlisle Octax® M38999 (Size 11)	●	●	●	●	●	●
Carlisle Octax®	●	●	●	●	●	●
Glenair® El Ochito®				●	●	●
Glenair® El Ochito® Type 1	●					
Glenair® Octobyte™ (Series ITH Connector)	●					
HARTING RJ Industrial® 10G RJ45 (Part Number 09451511560)	●	●	●	●	●	●
ITT Cannon OctoGig™		●	●	●	●	●
LEMO® 2B Series	●	●	●	●	●	●
ODU AMC® Break-Away (Part Numbers S12YAR-PD8XJG0-0000 / A12YAR-PD8XJG0-0000)		●	●	●	●	●
ODU AMC® High-Density (Part Numbers A10WAM-PD8XBE0-0000 / C10WAM-PD8XBE0-0000)		●	●	●	●	●
Omnetics Micro 360® Cat6a					●	
Platinum Tools® EZ-RJ45® 106193		●		●		
Sentinel® 111S08080095HA4		●				
Sentinel® 111S08080095LA4				●		
TE Connectivity® CeeLok FAS-T®		●		●		●
TE Connectivity® CeeLok FAS-X®	●	●	●	●	●	●

Proven Installed Performance

Gore designed a simulator to evaluate the effects of severe bending on high-speed data cables while being routed through an airframe (Figure 15). The simulator has various mandrels in fixed positions that replicate minimum bend radius conditions for repeatability. The simulator also includes two cable cleats to hold tension.

Testing characteristics such as return loss and crosstalk after routing through the simulator verifies whether a cable can withstand the complex challenges of installation that can degrade signal integrity. Gore routed a 2-m (6.5-ft) cable through the simulator for 4 cycles and measured the electrical performance of its Cat6A version and alternative cables.

Results showed that Gore's Cat6A cable maintained a sufficient margin below the specification limit for return loss compared to the alternative cables (Figure 16). Gore's cable provided consistent impedance control at higher frequencies after routing, indicating reliable high data rate transfer at 10 Gb/s. Similarly, Gore's Cat6A cable maintained a consistent margin of 20 dB, providing lower crosstalk after routing, while the alternative cables showed a slight change in the margin (Figure 17).

Gore's testing proved that GORE® Ethernet Cables deliver exceptional performance after installation, reduce maintenance and downtime, and lower total costs over time.

Watch videos of Gore engineers demonstrating the durability and routability of our Ethernet Cat6A cables and download related white papers at **gore.com/cable-routing-simulators.**

Figure 15: Cable Routing Simulator

GORE® Ethernet Cables (Cat5e/6A/8)

Figure 16: Return Loss Comparison after Routing

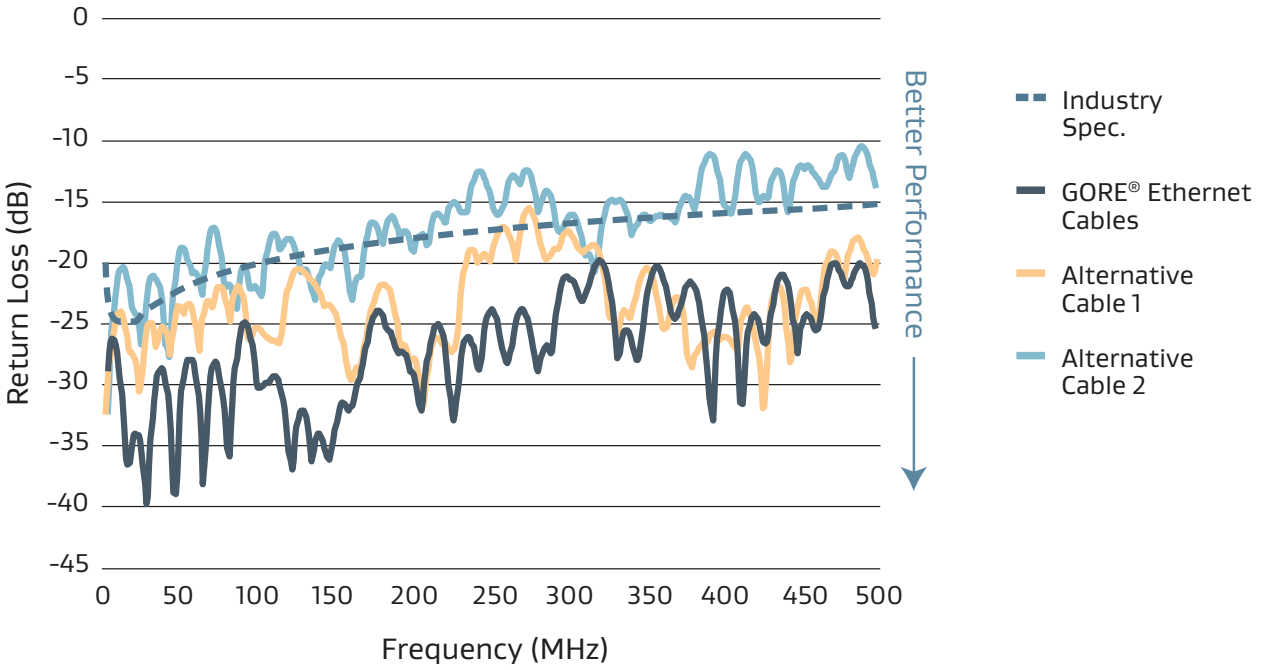
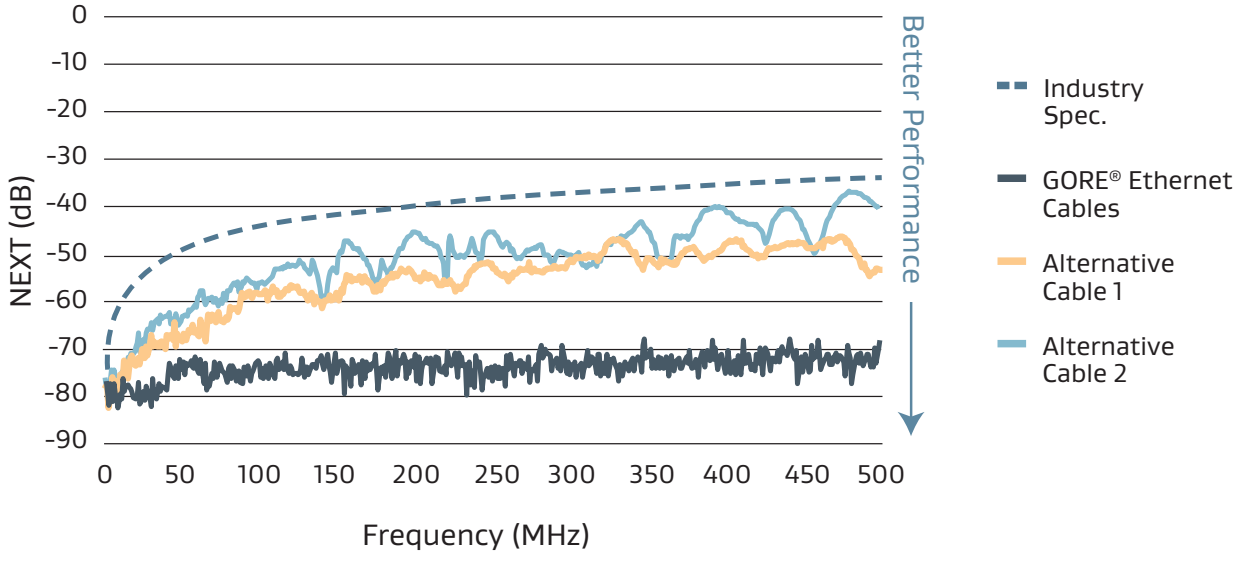


Figure 17: Crosstalk Comparison after Routing



Samples & Ordering Information

The 4-pair version of GORE® Ethernet Cables are available in standard sizes (Table 12). Insertion loss values are based on the maximum recommended use length. To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Table 12: Cable Characteristics

Insertion loss values are based on the maximum recommended use length. Also, Gore's Cat6A part numbers RCN9034-24 and RCN9047-26 are approved to SAE AS6070 standards supporting AS50881 EWIS (electrical wiring interconnection systems) specifications. They are also on the Qualified Products List (QPL).

Cat8

Gore Part Number	Conductor	AWG Size (Stranding)	Max Outer Diameter mm (in)	Min Bend Radius mm (in)	Nom Weight kg/km (lb/1000 ft)	Maximum Insertion Loss dB/22 m (72.2 ft)				
						250 MHz	500 MHz	1000 MHz	1500 MHz	2000 MHz
RCN9241	Silver-Plated Copper	24 (19/36)	6.6 (0.26)	13.2 (0.52)	59.5 (40.0)	8.9	12.8	18.6	23.2	27.2
						dB/20 m (65.5 ft)				
RCN9235-24	SPC Alloy	24 (19/36)	6.6 (0.26)	13.2 (0.52)	59.5 (40.0)	8.9	12.8	18.6	23.2	27.2
						dB/18 m (59 ft)				
RCN9235-26	SPC Alloy	26 (19/38)	5.6 (0.22)	11.2 (0.44)	44.65 (30.0)	8.9	12.8	18.6	23.2	27.2

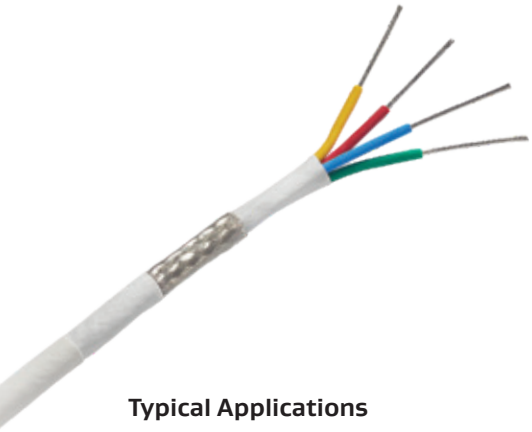
Cat6A

Gore Part Number	AWG Size (Stranding)	Maximum Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)		
					100 MHz	200 MHz	500 MHz
GSC-01-85237-VG	24 (19/36)	9.0 (0.35)	45.0 (1.77)	94.0 (63.1)	5.6	8.1	14.1
GSC-01-85238-VG	24 (19/36)	9.0 (0.35)	45.0 (1.77)	67.0 (45.0)	5.6	8.1	14.1
RCN8966-24	24 (19/36)	6.9 (0.27)	13.7 (0.54)	67.0 (45.0)	5.6	8.1	14.1
RCN9034-24	24 (19/36)	6.6 (0.26)	13.2 (0.52)	62.5 (42.0)	5.6	8.1	14.1
RCN8966-26	26 (19/38)	5.8 (0.23)	11.6 (0.46)	52.1 (35.0)	6.9	9.9	17.0
RCN9047-26	26 (19/38)	5.6 (0.22)	10.2 (0.44)	47.6 (32.0)	6.9	9.9	17.0
GSC-01-83134-VG	27 (07/34)	6.6 (0.26)	33.0 (1.29)	65.0 (43.7)	10.4	15.2	24.8
RCN9034-28	28 (19/40)	4.6 (0.18)	8.9 (0.35)	37.2 (25.0)	8.8	12.6	21.5

Cat5e

Gore Part Number	AWG Size (Stranding)	Maximum Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)	
					10 MHz	100 MHz
GSC-01-83471-00	24 (19/36)	6.3 (0.25)	30.0 (1.18)	56.0 (37.0)	2.3	8.1
GSC-01-83472-00	26 (19/38)	4.9 (0.19)	20.0 (0.79)	49.0 (32.9)	2.8	10.0

GORE® Ethernet Cables (Cat5e)



To meet Cat5e requirements in advanced avionics and vectronics, Gore offers an Ethernet quadrax version as a reliable substitute for dual twisted pairs (Table 13). These dual differential pairs transmit continuous bi-directional, high-speed signals up to 100 MHz at lengths up to 70 m (230 ft) using size 24 AWG and 50 m (164 ft) using size 26 AWG. Also, positioning two of these cables side by side can achieve Ethernet 1000BASE-T performance for more system design options.

Gore is the original inventor of this pioneering cable geometry that is approximately 40% smaller and up to 30% lighter than dual twisted pair constructions. (Figure 18). Our cable's lightweight build is also proven to save more than 5.0 kg (11 lb) on aircraft such as the fifth-generation F-35.

Typical Applications

- Avionics/vectronics digital networks
- Box-to-box systems
- Digital video interface (DVI)
- Ethernet backbone
- Flight/propulsion control
- HD streaming camera/video systems
- Mission systems
- Radio/radar/communications systems
- Tactical links
- Vehicle management systems

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- AFDX/ARINC 664, Part 7: Ethernet Networks
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- IEEE 802.3: Ethernet 100BASE-T / 1000BASE-T (2 cables)
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Table 13: Cable Properties

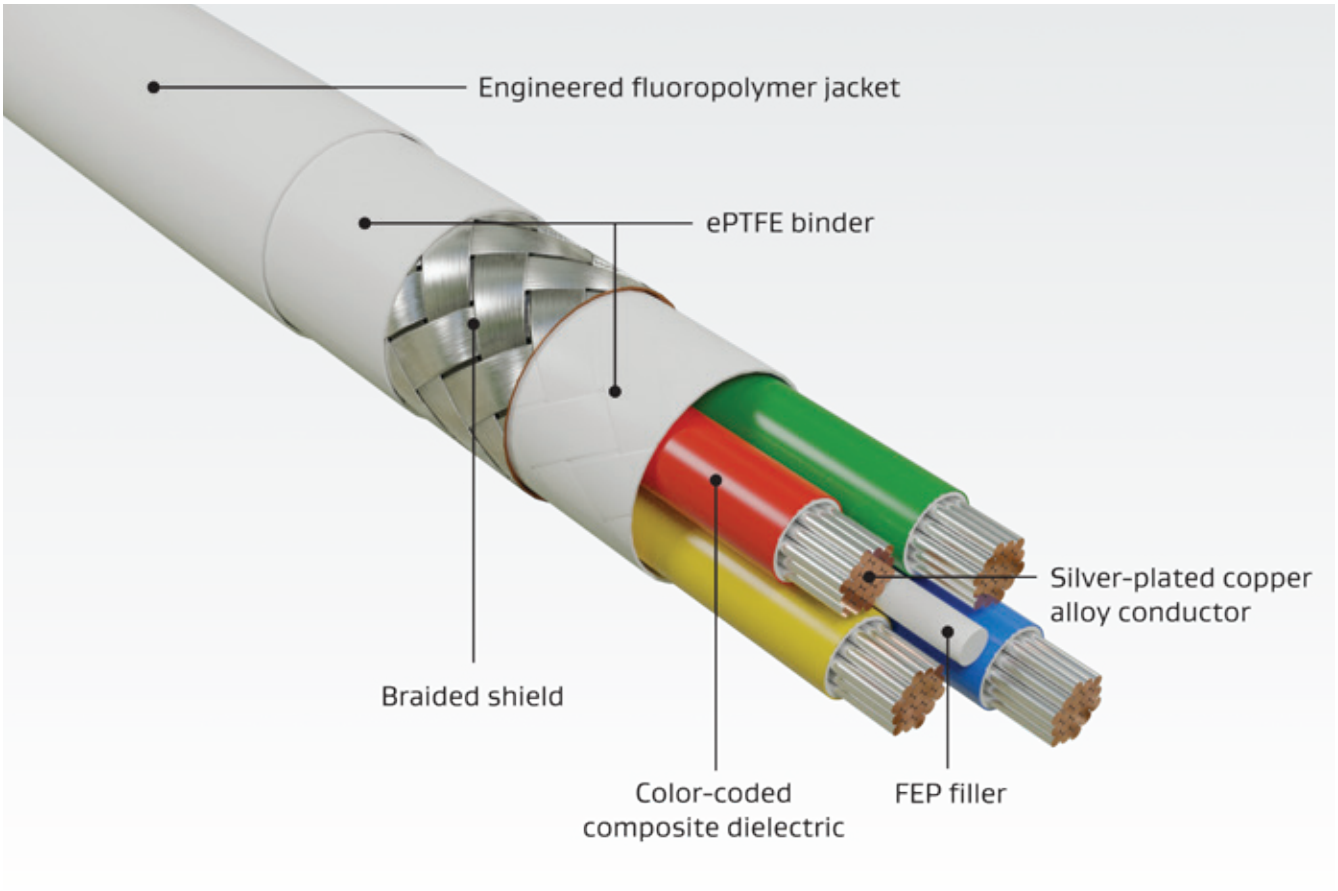
Electrical

Property	Value
Signal Transmission Speed MHz	Up to 100
Standard Impedance Ohms	100 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	45.0 (13.7)
Minimum Near-End Crosstalk (NEXT) dB	
10 MHz	50.0
100 MHz	35.0
Dielectric Withstanding Voltage Vrms	
Conductor-to-Conductor	1500
Conductor-to-Shield	1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper Alloy
Conductor Color-Coding	Blue/Red, Green/Yellow
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

Figure 18: Lightweight Build



Cable Preparation

Laser stripping is the ideal method to prep GORE® Ethernet Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 19). For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® Ethernet Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Figure 19: Peel-Back Method

GORE® Ethernet Cables (Cat5e)

Table 14: Cable Characteristics

Typical insertion loss values are based on the maximum recommended Cat5e use lengths.

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Maximum Insertion Loss dB/30 m (100 ft)	
					10 MHz	100 MHz
GSC-03-84608-00	24 (19/36)	4.1 (0.16)	20.0 (0.79)	33.0 (22.0)	2.8	9.4
GSC-03-84820-00	26 (19/38)	3.3 (0.13)	15.0 (0.59)	23.0 (15.0)	3.9	13.2

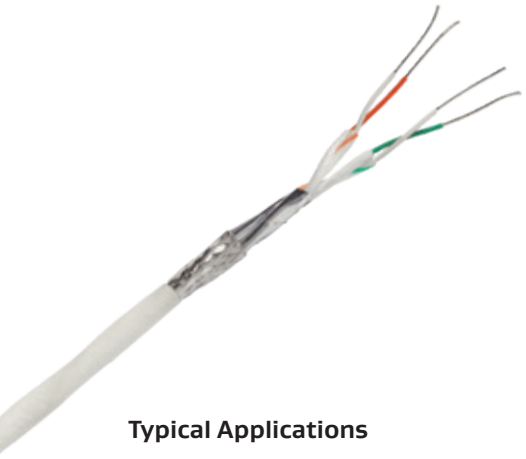
Samples & Ordering Information

The quadrax version of GORE® Ethernet Cables is available in standard sizes (Table 14). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.** Also, **see page 34** regarding GORE® Quad Cables with tighter skew requirements for high-speed serial data and video protocols.

The quadrax version of Gore's Ethernet cables is proven to save more than 5.0 kg (11 lb) on aircraft such as the fifth-generation F-35.

GORE® Ethernet Cables (Cat5e)



For Ethernet Cat5e protocol, Gore's 2-pair cable preserves signal integrity, significantly exceeds crosstalk requirements, and reliably carries high-speed data up to 1 GHz (Table 15). For Ethernet 1000BASE-T performance, positioning two of these cables side by side gives engineers more options when designing avionics or vectronics systems.

Gore's mechanically strong cable can easily tolerate difficult conditions such as extreme temperatures and constant vibration during flights and missions. It also has a smaller form factor that is highly flexible with tighter bending capability, which means simpler routing and quicker installation in crowded areas with less space (Figure 20).

Typical Applications

- Avionics/vectronics digital networks
- Cabin/vehicle management systems
- Ethernet backbone
- HD streaming video systems
- Mission systems
- Radar/radio/communications systems
- Serial buses

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- ANSI/TIA 568-C.2: Performance Requirements
- IEEE 802.3: Ethernet 100BASE-T / 1000BASE-T (2 cables)
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Table 15: Cable Properties

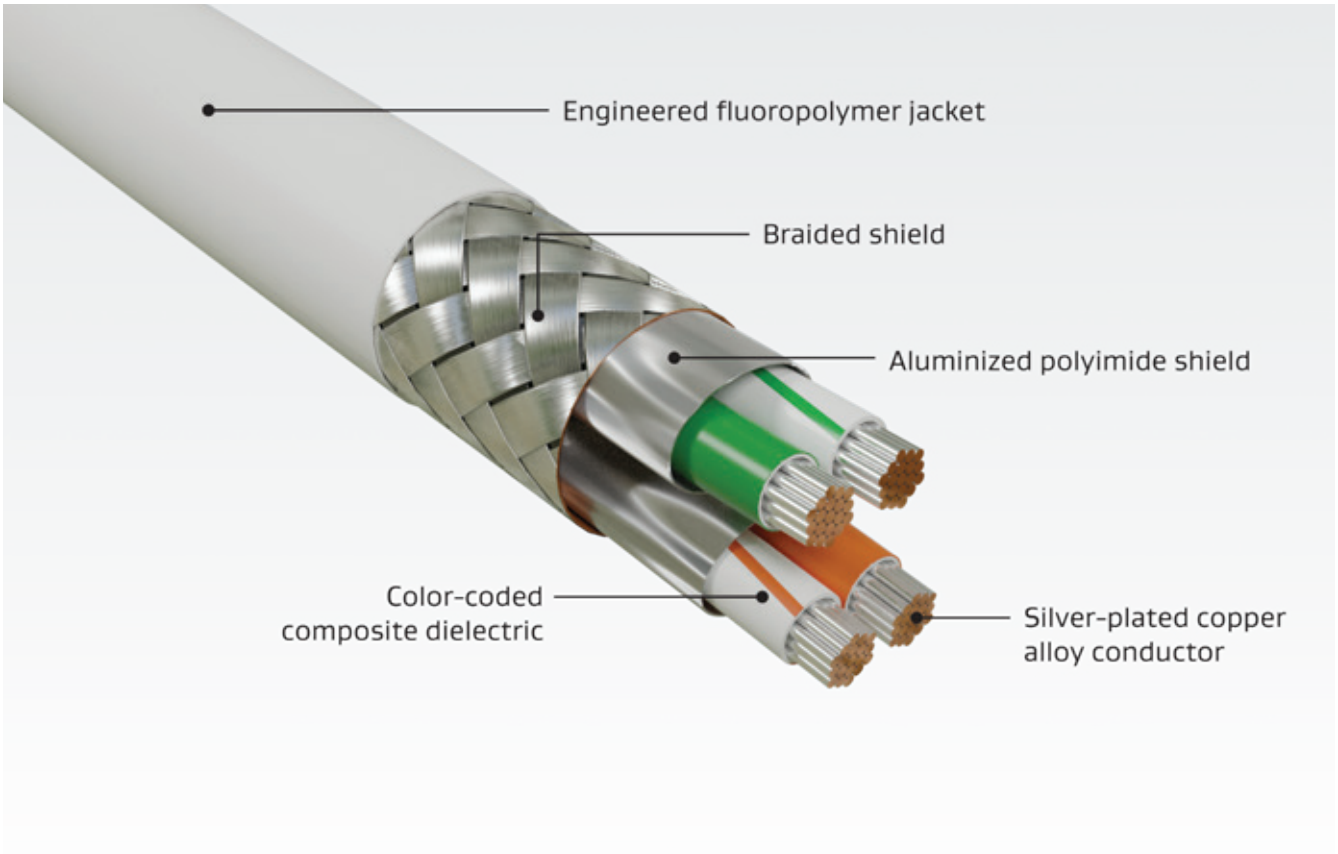
Electrical

Property	Value
Signal Transmission Speed GHz	Up to 1
Standard Impedance Ohms	100 + 10/-5
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	41.0 (12.5)
Minimum Near-End Crosstalk (NEXT) dB	
10 MHz	59.2
100 MHz	52.3
Dielectric Withstanding Voltage Vrms	
Conductor-to-Conductor	1500
Conductor-to-Shield	1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper Alloy
Conductor Color-Coding	Solid Green & White/Green Stripe, Solid Orange & White/Orange Stripe
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

Figure 20: Smaller Form Factor



Cable Preparation

Laser stripping is the ideal method to prep GORE® Ethernet Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 21). For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® Ethernet Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Figure 21: Peel-Back Method

GORE® Ethernet Cables (Cat5e)

Table 16: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)			
					100 MHz	200 MHz	500 MHz	1 GHz
RCN9133-24	24 (19/36)	5.1 (0.20)	25.4 (1.00)	35.7 (24.1)	5.6	8.1	14.1	—
RCN9133-26	26 (19/38)	4.5 (0.17)	22.5 (0.87)	31.2 (21.0)	8.9	12.9	21.0	29.3

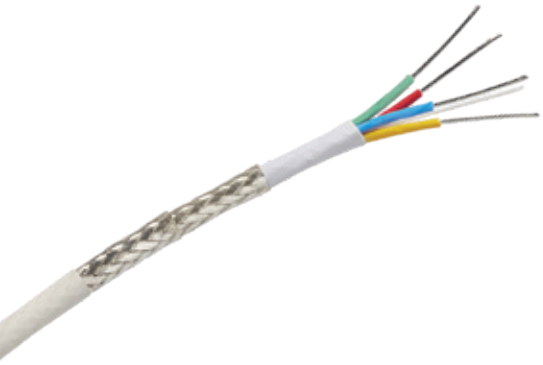
Samples & Ordering Information

The 2-pair version of GORE® Ethernet Cables is available in standard sizes (Table 16). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

For Ethernet Cat5e protocol, Gore's 2-pair cable is an ideal solution in place of a 4-pair or quadrax design in your system architecture.

GORE® Quad Cables (100 Ohms)



Gore offers quad cables with tighter skew requirements that are perfectly aligned with today's high-speed serial data and video protocols in advanced systems (Table 17). These dual differential pairs routinely transfer bi-directional signals for data and video at speeds up to 1 GHz at lengths up to 30 m (100 ft).

These cables are constructed with remarkably strong materials and perform without failure in the most difficult airborne and land conditions such as rigorous routing and extreme temperature and weather changes (Figure 22).

As the original architect of this innovative quad design, Gore's cables are significantly smaller — by approximately 40% — when compared to dual twisted pair constructions (Figure 23). These smaller cable diameters are also up to 30% lighter for considerable weight savings in aircraft and armored vehicles.

Table 17: Cable Properties

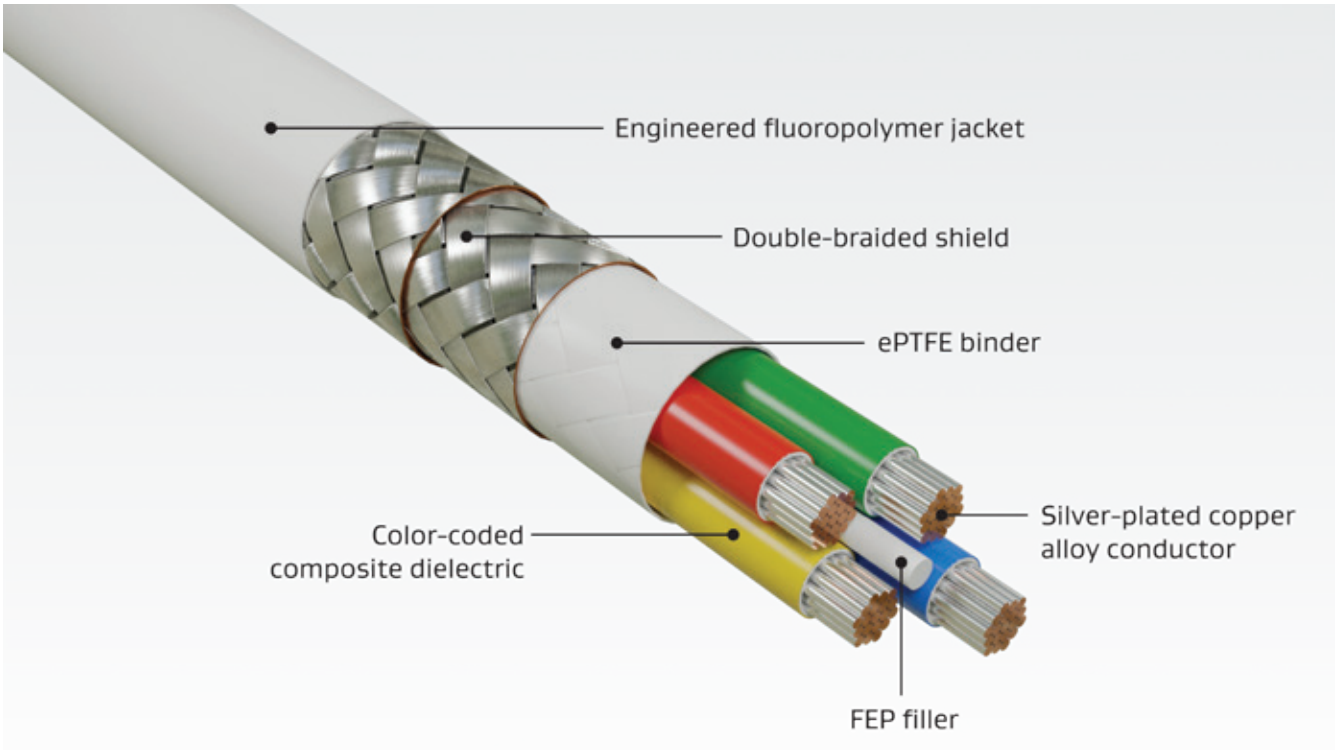
Electrical

Property	Value		
	RCN8752 (24 AWG)	**RCN8982 (26 AWG)**	**RCN8973 (28 AWG)**
Signal Transmission Speed GHz	Up to 1	Up to 1	Up to 1
Standard Impedance Ohms	100 ± 5	100 ± 10	100 ± 10
Typical Operating Voltage V	< 15	< 15	< 15
Nominal Velocity of Propagation %	> 80	> 80	> 80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)	4.23 (1.29)	4.10 (1.25)
Capacitance pF/m (pF/ft)	50.0 (15.2)	39.4 (12.0)	42.7 (13.0)
Minimum Near-End Crosstalk (NEXT) dB 10 MHz 100 MHz	 50.0 35.0	—	—
Maximum Skew Within Pair ps/m (ps/ft)	13.12 (4.0)	13.12 (4.0)	13.12 (4.0)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	1500	1500	1500

Mechanical / Environmental

Property	Value		
Jacket Material	Engineered Fluoropolymer		
Jacket Color	White (Laser Markable)		
Conductor	Silver-Plated Copper Alloy		
Conductor Color-Coding	Blue/Red, Green/Yellow	Blue/Orange, Green/Red	Black/Blue, Green/White
Dielectric Material	Expanded PTFE/PTFE		
Temperature Range °C	-55 to +200	-55 to +200	-55 to +200

Figure 22: Remarkably Strong Cable Materials



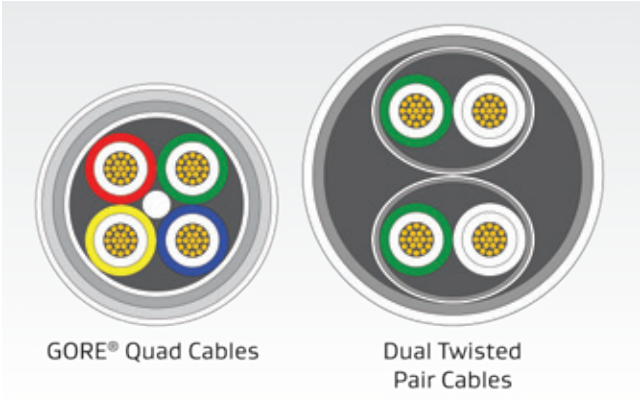
Typical Applications

- Avionics/vectronics digital networks
- Box-to-box systems
- Digital video interface (DVI)
- EO/IR (electro-optical infrared) sensors
- Ethernet backbone
- Flight/propulsion control
- HD streaming camera/video systems
- Mission systems

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- AFDX/ARINC 664, Part 7: Ethernet Networks
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- IEEE 802.3: Ethernet 1000BASE-T
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Figure 23: Reduced Cable Design



GORE® Quad Cables (100 Ohms)

Table 18: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Typical Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)			
					100 MHz	250 MHz	500 MHz	1 GHz
RCN8752	24 (19/36)	3.8 (0.15)	19.0 (0.75)	32.4 (21.7)	6.3	10.4	15.3	22.7
RCN8982	26 (19/38)	3.4 (0.14)	17.0 (0.67)	23.6 (15.8)	10.0	15.0	21.0	30.0
RCN8973	28 (19/40)	2.8 (0.11)	14.0 (0.55)	20.6 (13.8)	8.9	20.5	28.9	39.8

Cable Preparation

Laser stripping is the ideal method to prep GORE® Quad Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 24). For more information regarding cable preparation, contact a Gore representative.

Figure 24: Peel-Back Method

Connector Systems & Backshells

GORE® Quad Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Samples & Ordering Information

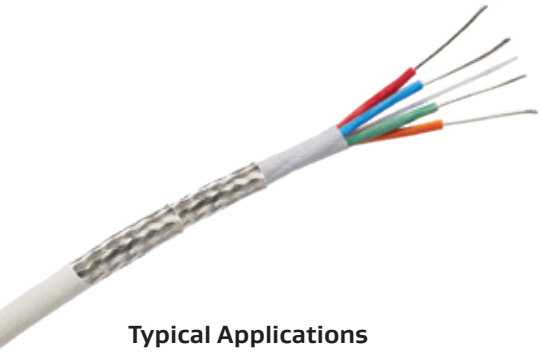
GORE® Quad Cables are available in standard sizes (Table 18). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.** Also, **see page 26** regarding the quadrax version of GORE® Ethernet Cables for Cat5e protocol.

Image courtesy of Rheinmetall©

Gore’s quad cables are perfect for optronics systems in unmanned aircraft and military vehicles that use high-speed serial data and video protocols.

GORE® FireWire® Cables (110 Ohms)



Typical Applications

- Avionics digital networks
- Flight control
- HD streaming camera/video systems
- Mission systems

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)
- SAE AS5643™: IEEE-1394b Interface Requirements for Military and Aerospace Vehicle Applications
- SAE AS5643™/2: S200 Copper Media Interface Characteristics Over Extended Distances
- SAE AS5643™/3: IEEE-1394 Beta PHY Enhancements
- SAE AS5657A™: Test Plan/ Procedure for AS5643 IEEE-1394b Interface Requirements for Military and Aerospace Vehicle Applications (Contact Gore for available data)

For defense and commercial aircraft, this version of Gore's quadrax cables is the premier solution for copper-based IEEE 1394b FireWire® data links. They transmit uninterrupted high-fidelity signals with flexure for interconnect solutions up to 30 m (100 ft) at S400 data transfer rates (Table 19).

Built with durable materials that are highly flexible, Gore's cables provide a protective barrier against tough aircraft environments for long-term product life (Figure 25).

Also, Gore's quadrax design is approximately 40% smaller than dual twisted pair constructions (Figure 26). These cables are also proven to save as much as 5.2 kg (11.5 lb) per aircraft.

Table 19: Cable Properties

Electrical

Property	Value
Signal Transmission Speed Mb/s	Up to 400
Standard Impedance Ohms	110 +6/-4
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	36.1 (11.0)
Typical Skew Within Pair ps/m (ps/ft)	3.5 (1.1)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper or SPC Alloy
Conductor Color-Coding	Blue/Orange, Green/Red
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-55 to +200

Figure 25: Highly Flexible Cable Technology

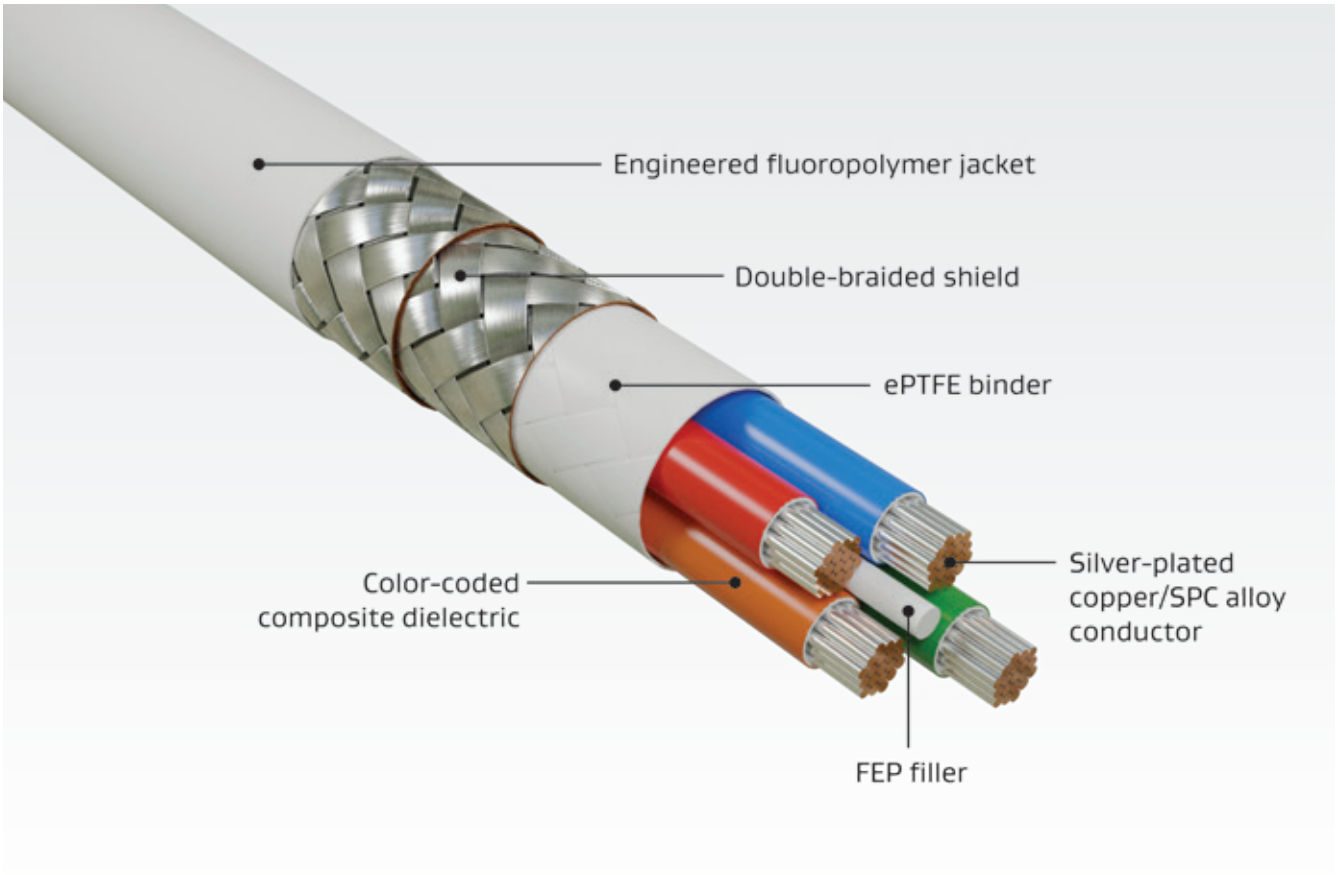
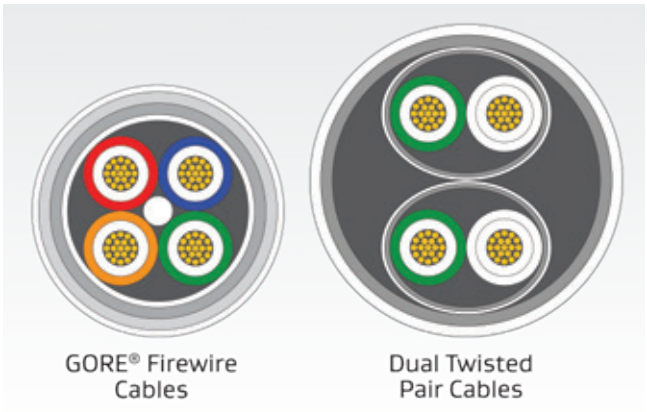


Figure 26: Smaller-Scale Dimensions



GORE® FireWire® Cables (110 Ohms)

Signal Integrity with Flexure

To ensure signal integrity with flexure of GORE® FireWire® Cables, the eye pattern of a 15-m (50-ft) cable transmitting 500 Mb of data was evaluated before and during flexure. The diamond-shaped eye mask indicates the minimum receiver sensitivity as specified by IEEE 1394b (Figure 27).

Results indicated that Gore's cable passed the eye mask test with margin, indicating greater transmission length is possible. The eye pattern test was repeated with the cable wrapped 20 times around a 12.7-mm (0.5-in) radius mandrel. No substantial degradation in signal quality was observed with flexure (Figure 28).

Figure 27: Eye Pattern before Flexure

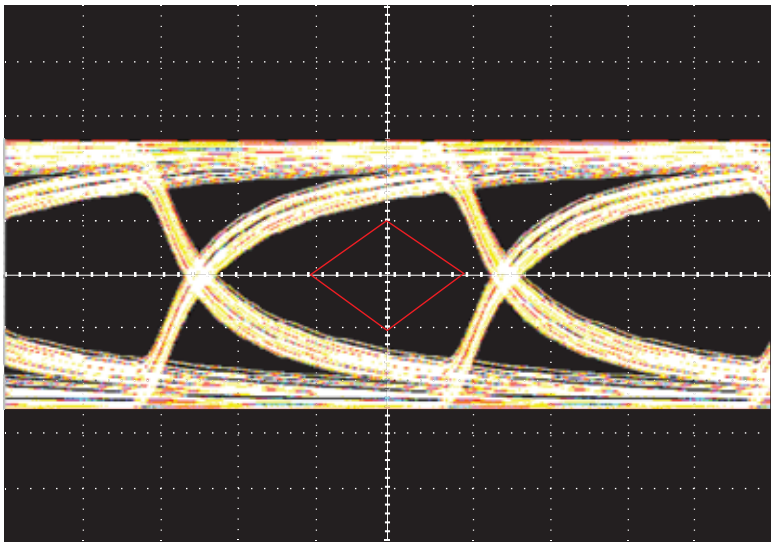


Figure 28: Eye Pattern with Flexure

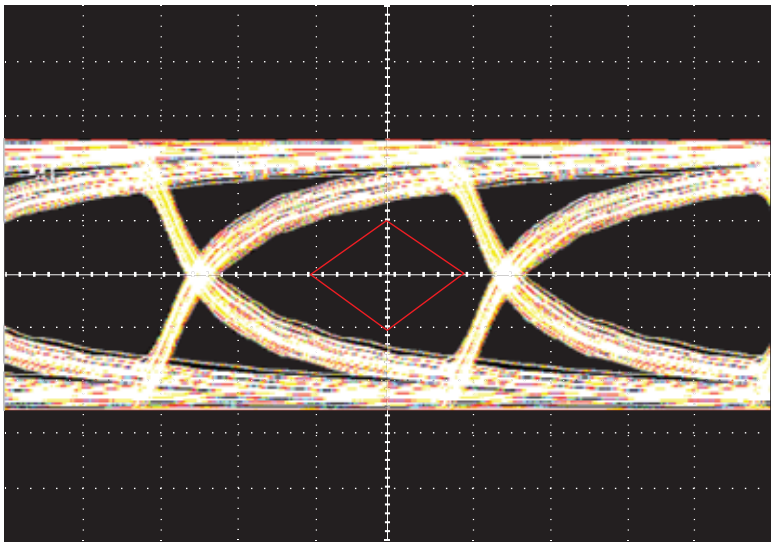


Table 20: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)			
					100 MHz	250 MHz	500 MHz	1 GHz
RCN8645	22 (19/34)	5.3 (0.21)	26.5 (1.5)	61.0 (41.0)	5.5	8.8	12.8	18.2
RCN9206[a]	22 (19/34)	5.3 (0.21)	26.5 (1.5)	61.0 (41.0)	5.5	8.8	12.8	18.2
RCN8647	24 (19/36)	4.8 (0.19)	24.0 (0.95)	46.1 (31.0)	6.8	10.9	15.5	22.5
RCN9205[a]	24 (19/36)	4.8 (0.19)	24.0 (0.95)	46.1 (31.0)	6.8	10.9	15.5	22.5
RCN8652	26 (19/38)	3.8 (0.15)	19.0 (0.75)	33.0 (22.2)	9.0	14.2	20.2	29.5
RCN9204[a]	26 (19/38)	3.8 (0.15)	19.0 (0.75)	33.0 (22.2)	9.0	14.2	20.2	29.5

a. Fully compliant to JSFY18 requirements.

Cable Preparation

Laser stripping is the ideal method to prep GORE® FireWire® Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 29). For more information regarding cable preparation, contact a Gore representative.

Figure 29: Peel-Back Method

Connector Systems & Backshells

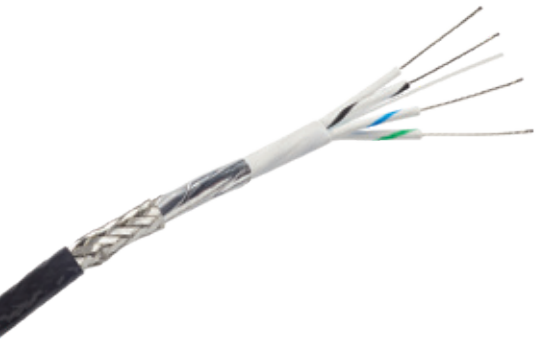
GORE® FireWire® Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 and 22D contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Samples & Ordering Information

GORE® FireWire® Cables are available in standard sizes (Table 20). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Fibre Channel Cables (150 Ohms)



In hazardous aircraft environments, this cable enhances noise immunity and EMI suppression while maintaining consistent signal integrity at data rates up to 1 GHz (Table 21). Using the field-cancellation properties of a balanced cable design, it can transmit two differential signals within the same shield without interfering with each other.

Gore is the original inventor of this low-dielectric quadrax cable geometry that saves more weight than other cable designs. Our cable diameter is 40% smaller than dual-twisted pair cables, which makes it inherently lighter weight without jeopardizing toughness (Figures 30 and 31). The excellent flexibility and tight bend radius of this cable also make initial wring simpler and faster for aircraft maintainers.

Our high-speed fibre channel interconnect has been proven on many military, commercial, and business aircraft — such as the F-16, F-18, AV-8B, and Falcon 7X.

Typical Applications

- Active electronically scanned arrays (AESA)
- Cabin/flight management systems
- Mission systems
- Tactical aircraft moving maps

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- ANSI X3.303: Fibre Channel Physical and Signaling Interface-3 (FC-PH-3)
- EN3475-503: Test Methods for Scrape Abrasion
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Table 21: Cable Properties

Electrical

Property	Value
Signal Transmission Speed GHz	Up to 1
Standard Impedance Ohms	150 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	87
Nominal Time Delay ns/m (ns/ft)	4.0 (1.22)
Capacitance pF/m (pF/ft)	28.2 (8.6)
Typical Skew Within Pair ps/m (ps/ft)	3.0 (0.9)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	FEP
Jacket Color	Black
Conductor	Silver-Plated Copper Alloy
Conductor Color-Coding	Black/White Stripe, Blue/White Stripe, Green/White Stripe, Solid White
Dielectric Material	Expanded PTFE
Temperature Range °C	-65 to +200

Figure 30: Tough Quadrax Construction

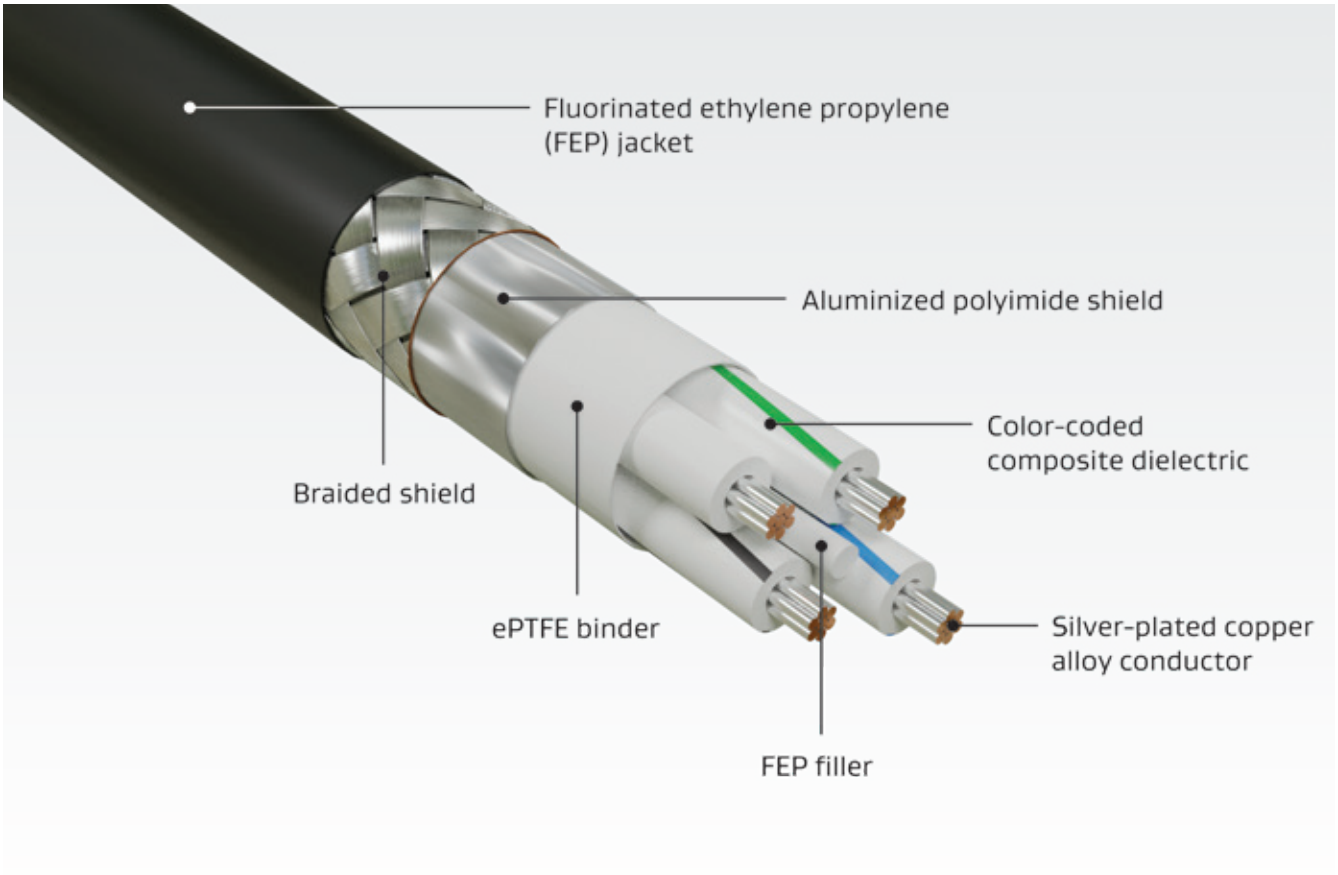
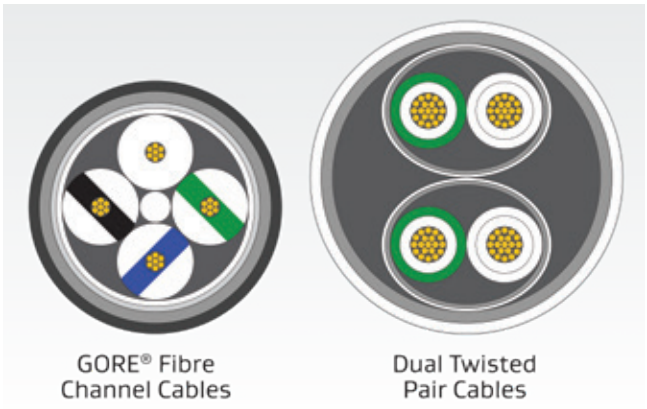


Figure 31: Low-Dielectric Cable Geometry



GORE® Fibre Channel Cables (150 Ohms)

Table 22: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)
					500 MHz
RCN8328	26 (7/34)	4.8 (0.19)	25.0 (1.00)	34.0 (22.9)	10.0

Connector Systems & Backshells

GORE® Fibre Channel Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Our cables can also be terminated with commercially available connectors to create assemblies and optimize performance in the smallest possible package. For between-the-box applications, connector options include MIL-C-38999 with size 11 contacts and DB-9 plug and receptacles. For inside-the-box applications, connector options include SMP, SMA, SSMC, and MCX.

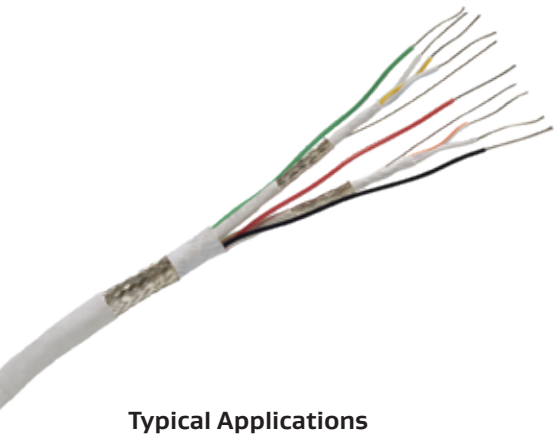
Samples & Ordering Information

GORE® Fibre Channel Cables are available in a standard size (Table 22). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Gore's high-speed fibre channel interconnect has been proven on many defense, commercial, and business aircraft such as the Falcon 7X.

GORE® USB Cables (2.0 / 3.0 / 3.1)



Each version of these cable bundles equally deliver non-stop signal transmission up to 10 Gb/s ensuring high volumes of data and video are uploaded and downloaded instantly (Table 23). They also support the latest power management systems allowing soldiers, passengers, and aircrews to charge carry-on devices quickly and easily without delays.

In addition, these sturdy cable bundles provide added protection that withstands extreme air and land environments for lifetime service (Figure 32). Gore's USB cables have been proven to meet complex design requirements and stringent industry standards for soldier systems and small at-seat modules in commercial aircraft.

Typical Applications

- Content loading
- Data transfer
- Electronic flight Bag (EFB)
- HD streaming video systems
- Peripheral/sensor networking
- Portable electronic devices
- Power remote devices
- Soldier systems
- Vehicle/dismount connectivity

Standards Compliance

- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- CS/FAR Part 25, Section 25.853, Appendix F, Part I (b)(7): Flammability
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)
- VG95218-31: Performance Requirements (GSC-01-85201-VG)

Table 23: Cable Properties

Electrical

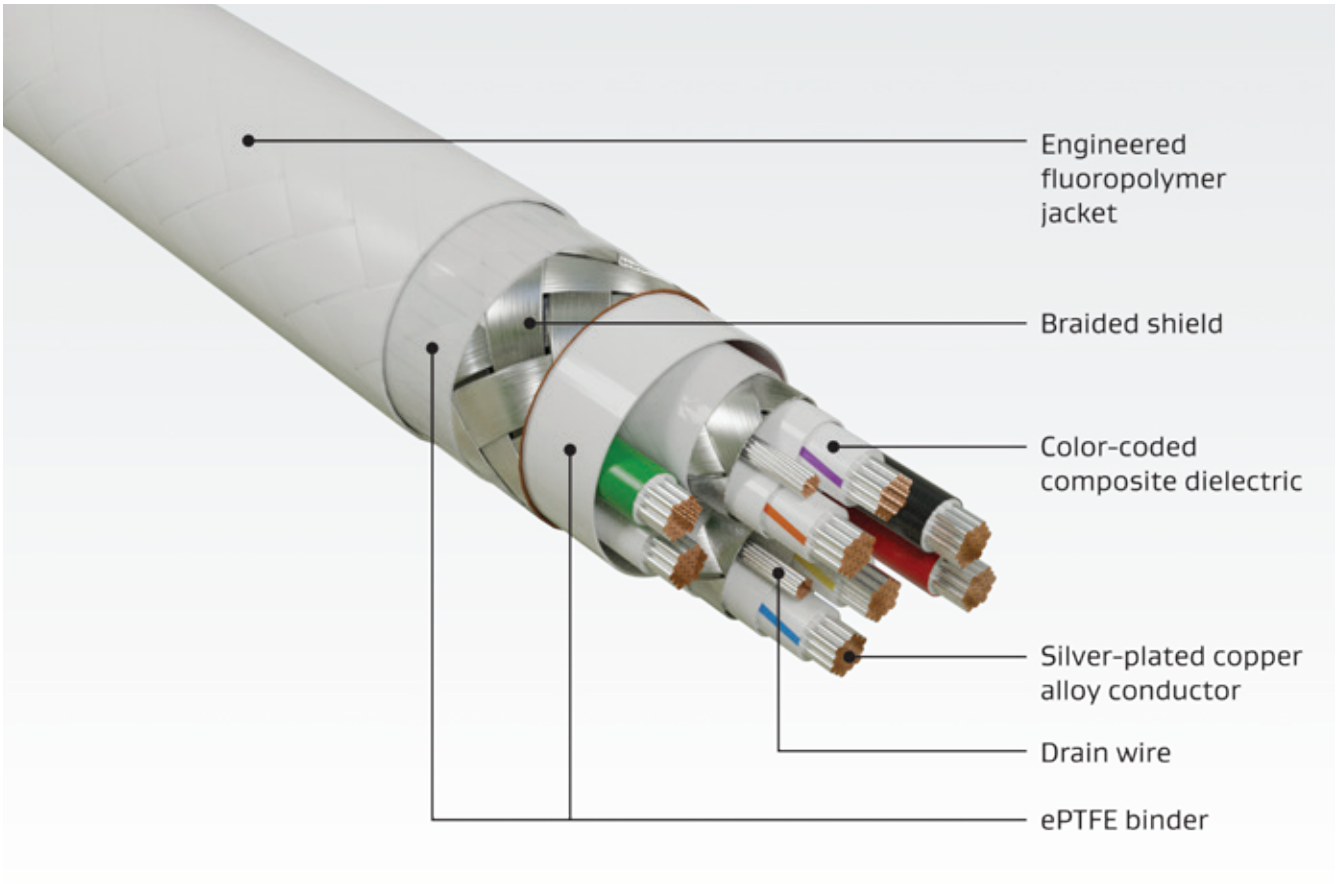
Property	Value
Signal Transmission Speed Gb/s	Up to 10
Standard Impedance Ohms High-Speed Pairs Low-Speed Pair	 90 ± 5 90 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.07 (1.24)
Capacitance pF/m (pF/ft)	50.0 (15.2)
Maximum Skew Within Pair[a] ps/m (ps/ft)	15.0 (4.6)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer or PU Halogen-Free[b]
Jacket Color	EF: White (Laser Markable) PU: Black[b]
Conductor	Silver-Plated Copper Alloy
Conductor Color-Coding	High-Speed Pairs: Blue/White, Yellow/White, Orange/White, Violet/White Low-Speed Pair: Green/White Power Pair: Black/Red
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

a. Shielded twisted pairs only.
b. Based on Gore's part number GSC-01-85201-VG for military vehicle systems.

Figure 32: Sturdy Cable Bundle



Cable Preparation

Laser stripping is the ideal method to prep GORE® USB Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 33). For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® USB Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Figure 33: Peel-Back Method

GORE® USB Cables (2.0/3.0/3.1)

Table 24: Cable Characteristics

2.0 Version

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Nominal Insertion Loss dB/1 m (3.28 ft)		
					96 MHz	200 MHz	400 MHz
RCN8800-22D-22P-H	Data Pair: 22 (19/34) Power Pair: 22 (19/34)	5.1 (0.20)	15.0 (0.60)	52.0 (35.0)	0.33[a]	0.55[a]	1.00[a]
RCN8800-24D-22P-H	Data Pair: 24 (19/36) Power Pair: 22 (19/34)	4.8 (0.19)	13.0 (0.50)	48.0 (32.0)	0.33[a]	0.55[a]	1.00[a]
RCN8800-26D-24P-H	Data Pair: 26 (19/38) Power Pair: 24 (19/36)	4.3 (0.17)	10.0 (0.39)	46.1 (31.0)	0.42	0.71	1.29

3.0 Version

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Nominal Insertion Loss dB/1 m (3.28 ft)			
					1250 MHz	2500 MHz	5000 MHz	7500 MHz
GSC-01-85201-VG	Data Pair: 26 (19/38) Power Pair: 22 (19/34)	8.0 (0.31)	40.0 (1.58)	97.0 (65.1)	1.70	2.50	3.90	5.00

3.1 Version

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Nominal Insertion Loss dB/1 m (3.28 ft)			
					1250 MHz	2500 MHz	5000 MHz	7500 MHz
GSC-03-84761-24D	Data Pair: 26 (19/38) Power Pair: 24 (19/36)	5.8 (0.23)	Static (< 20 bends): 15.0 (0.59) Dynamic: 60.0 (2.36)	65.0 (43.7)	1.70	2.50	3.90	5.00

a. Values are limited in length due to timing of protocol.

Samples & Ordering Information

GORE® USB Cables are available in standard sizes (Table 24). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Image courtesy of Rheinmetall©

Proven to meet complex system design requirements, Gore's lightweight USB cables allow soldiers to connect devices quickly and easily while increasing comfort.

GORE® HDMI Cables (1.4 Cat2 / 2.0)

Gore's cable bundles support standard protocols at 4K (2160p) video resolution for a richer viewing experience on aircraft and combat vehicle displays. They provide outstanding signals for high-speed data and video transmission up to 18 Gb/s over the application lifetime (Table 25). Military operators and commercial flight crews can view critical information and passengers can watch in-flight entertainment on crystal clear, high-definition displays.

Also, Gore's low-weight construction enables a smaller cable diameter that increases flexibility with a tighter bend radius for less complicated routing in tiny spaces of aircraft and vehicles (Figure 34).

Typical Applications

- Consoles
- Electronic flight bag (EFB)
- Flight management systems
- Glass displays
- HD streaming video systems
- In-flight entertainment (IFE) systems
- Mission systems
- Portable electronic devices
- Sensor/processor connectivity
- Weather mapping

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Table 25: Cable Properties

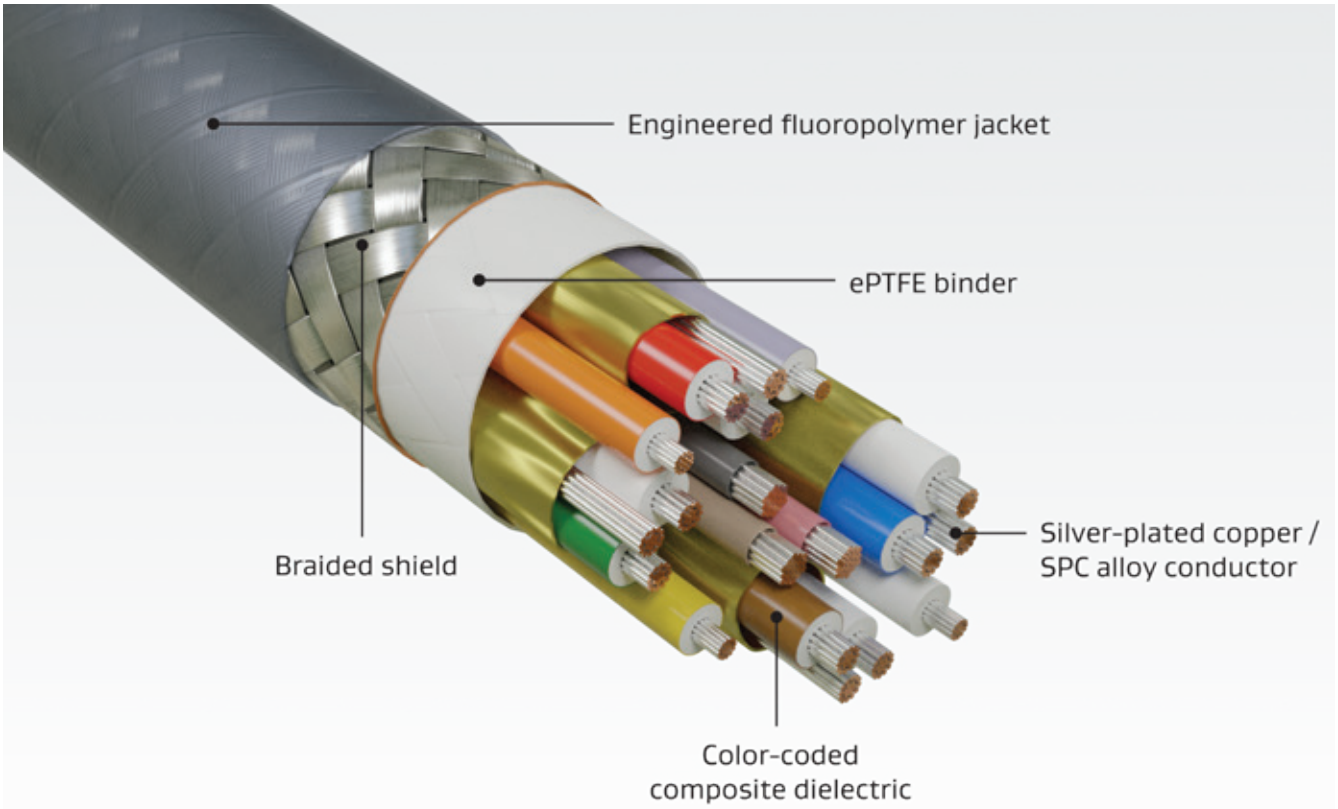
Electrical

Property	Value
Signal Transmission Speed Gb/s	Up to 18
Standard Impedance Ohms	100 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	230.0 (70.0)
Maximum Skew Within Pair ps/m (ps/ft)	15.0 (4.6)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	Gray
Conductor	Silver-Plated Copper or SPC Alloy
Conductor Color-Coding	High-Speed Pairs: Blue/White, Brown/White, Green/White, Red/White Singles: Orange, Violet, White, Yellow Triad: Gray, Pink, Tan
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

Figure 34: Low-Weight Cable Bundle



Cable Preparation

Laser stripping is the ideal method to prep GORE® HDMI Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 35). For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® HDMI Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Figure 35: Peel-Back Method

GORE® HDMI Cables (1.4 Cat2 / 2.0)

Table 26: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/5 m (16.4 ft)		
					1 GHz	2 GHz	3 GHz
RCN9121	Data/Drains/Discrete Pairs: 26 (19/38) Capacitance-Controlled Singles: 28 (19/40)	6.6 (0.26)	13.0 (0.51)	77.5 (52.0)	4.9	8.5	12.0

Samples & Ordering Information

GORE® HDMI Cables are available in a standard size (Table 26). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.** Also, **see page 78** regarding Gore's HDMI cable packaged with GORE® Abrasion Resistant Cable Jacket.

Image courtesy of Rheinmetall©

Aviators, aircrew, and military operators can view critical information and passengers can watch IFE on crystal-clear, high-definition displays using Gore's HDMI cables.

GORE® DVI Cables (Digital Only)

Gore's single-link cables are built specifically for the digital component of DVI (digital video interface) systems. They deliver exceptional signal quality supporting the highest video resolution for optimal viewing on modern displays (Table 27). These cables meet stringent requirements for impedance control, insertion loss, skew, and EMI shielding necessary for reliable cable performance in DVI systems operating in demanding EMI environments.

Additionally, Gore's cable technology is smaller, lighter weight and more flexible without sacrificing robustness. These versatile cables also enable responsible termination with leading aerospace and defense connector systems.

Gore's cables are ideally suited for standard DVI harness configurations installed in aircraft and military vehicles (Figure 36). Design engineers no longer have to worry about designing harnesses with digital components that are ultimately inadequate for harsh environments.

Typical Applications

- Cockpit/vehicle displays
- Crew workstation displays
- Flight management systems
- In-flight entertainment (IFE) systems
- Mission systems
- Weather mapping

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ANSI/NEMA WC 27500: Environmental Testing, Jacket and Marking
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data

Table 27: Cable Properties

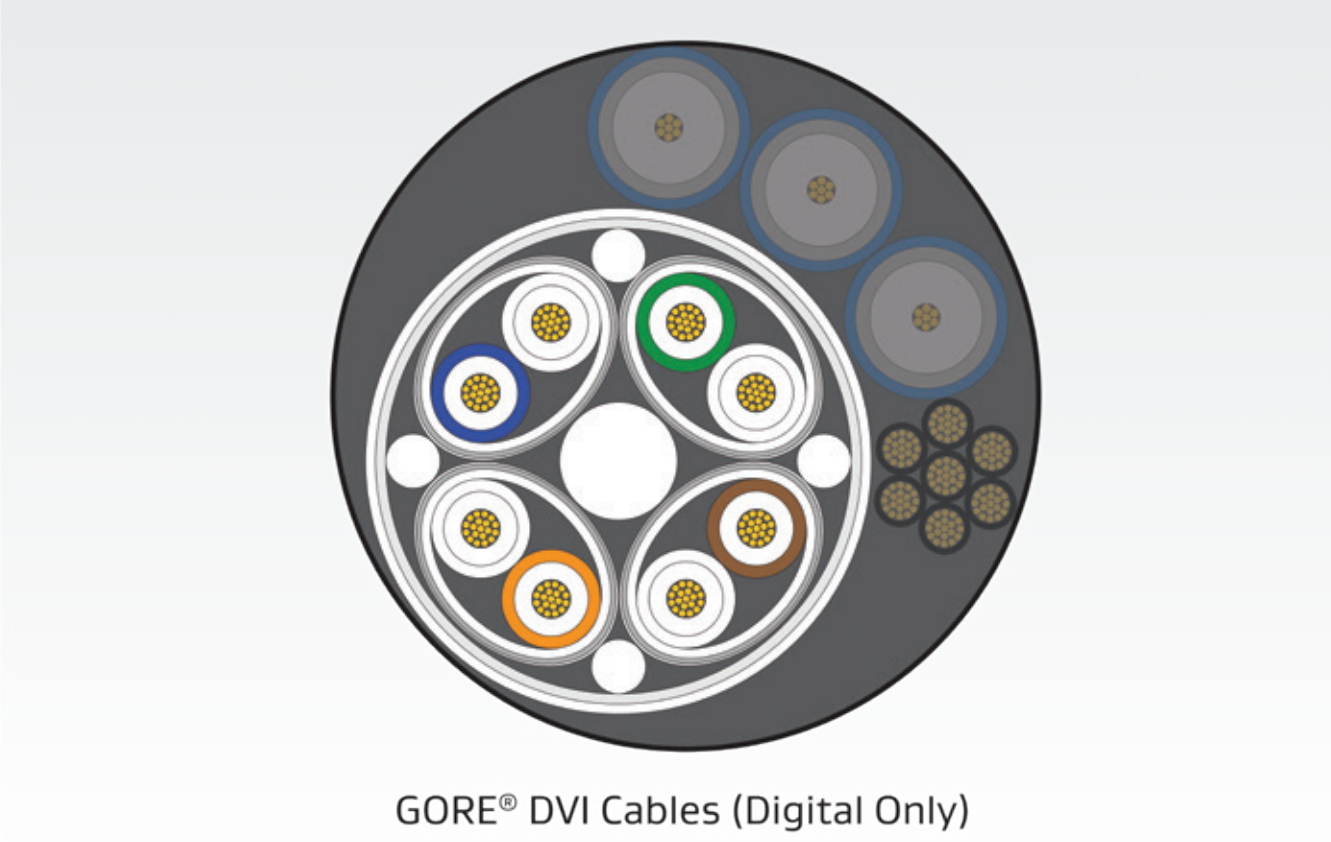
Electrical

Property	Value
Standard Impedance Ohms	100 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.07 (1.24)
Capacitance pF/m (pF/ft)	40.0 (12.0)
Maximum Skew ps/m (ps/ft) Pair-to-Pair Within Pair	 52.50 (16.0) 13.12 (4.0)
Dielectric Withstanding Voltage Vrms Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper Alloy
Conductor Color-Coding	Blue/White, Brown/White, Green/White, Orange/White
Dielectric Material	Expanded PTFE/PTFE
Temperature Range °C	-65 to +200

Figure 36: Standard DVI Harness Cross-Section



Cable Preparation

Laser stripping is the ideal method to prep GORE® DVI Cables. Alternatively, Gore recommends using thermal or sharp mechanical strippers. Also, a unique method is to make a short, horizontal slit in the jacket material, peel it back to allow for contact termination and return the jacket to its original position for a neat closure (Figure 37). For more information regarding cable preparation, contact a Gore representative.

Connector Systems & Backshells

GORE® DVI Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC and MIL-STD-38999 with size 8 contacts. Contact the specific manufacturer such as Amphenol® and Glenair® for exact part numbers, tooling information, and termination instructions.

Figure 37: Peel-Back Method

GORE® DVI Cables (Digital Only)

Exceptional Signal Quality

Gore evaluated the eye pattern of their 5-m (16-ft) DVI digital only cable to ensure the consistency of signal quality and transmission. The diamond-shaped eye mask shown in Figure 38 indicates the minimum receiver sensitivity specified by DVI Revision 1.0. Results showed that GORE® DVI Cables passed the eye mask test.

Figure 38: Eye Pattern of Gore's DVI Cable

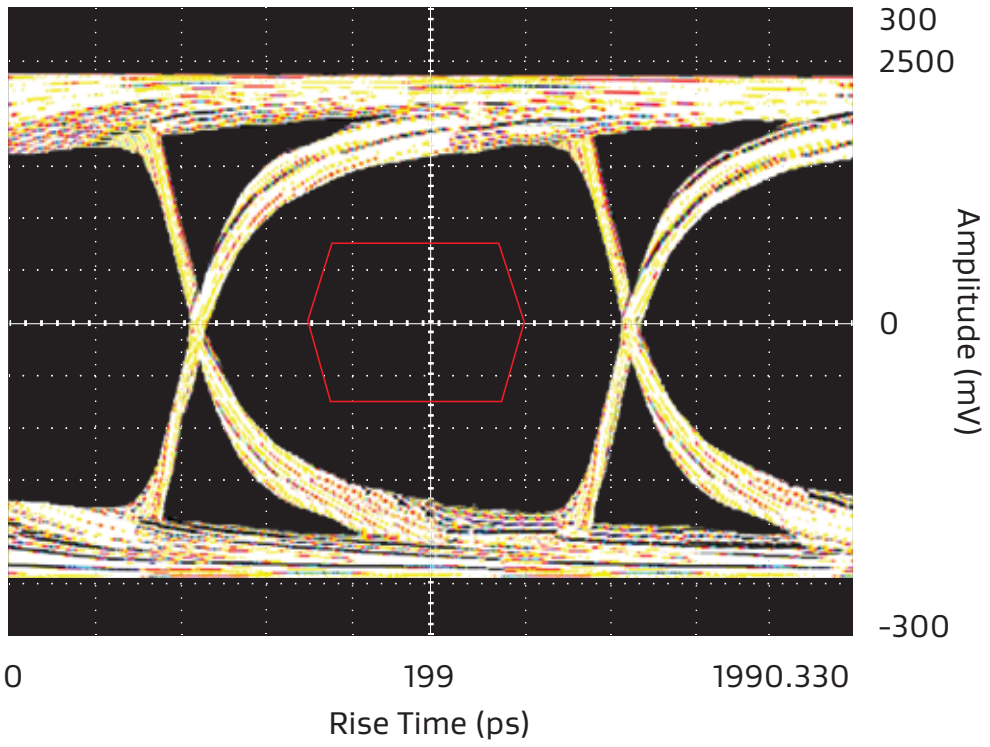


Table 28: Cable Characteristics

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/100 m (328 ft)			
					100 MHz	200 MHz	500 MHz	1 GHz
GSC-01-85249-24S	24 (19/36)	8.3 (0.33)	42.0 (1.65)	121.0 (81.31)	19.4	28.2	46.0	68.2

Samples & Ordering Information

GORE® DVI Cables are available in a standard size (Table 28). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Gore's single-link DVI cables support the highest video resolution for optimal viewing on modern displays in aircraft, drones, and military vehicles.

GORE® Coaxial Cables (75 Ohms)

Our cables are designed specifically for 4K video interface systems operating at 75 ohms (Table 29). They optimize signals and video transmission with ultra-low loss up to 6 GHz while maintaining controlled impedance. They are also proven to provide outstanding shielding effectiveness for less RF interference among electronics. They meet and even exceed stringent industry requirements while also meeting standards set forth by the Society of Motion Picture and Television Engineers (SMPTE).

These coaxial cables significantly reduce size and weight without jeopardizing mechanical strength and electrical reliability than standard legacy RG coaxial cables (Figure 39). They are also easier to install in aircraft and defense vehicles with overcrowded areas because of the smaller diameter that increases flexibility with a tighter bend radius.

With complete mechanical and electrical reliability, our coaxial cables save weight and reduce operating costs — making them an ideal replacement for legacy RG coaxial cables.

Typical Applications

- Avionics/vectronics displays
- HD streaming camera/video systems
- Remote-controlled turret cameras

Standards Compliance

- FAR Part 25, Appendix F, Part I: Flammability
- MIL-C-17G: Cables, Radio Frequency, Flexible and Semi-Rigid
- SMPTE 292M: Bit-Serial Digital Interface for High Definition Television (HDTV)
- SMPTE 424M: 3 Gb/s Signal/Data Serial Interface for HDTV
- SMPTE 2081-1: 6 Gb/s Signal/Data Serial Interface for HDTV
- SMPTE 2082-1: 12 Gb/s Signal/Data Serial Interface for HDTV

Table 29: Cable Properties

Electrical

Property	Value
Signal Transmission Speed GHz	Up to 6
Standard Impedance Ohms	75 ± 2
Typical Operating Voltage V	< 420
Nominal Velocity of Propagation %	83
Nominal Time Delay ns/m (ns/ft)	4.0 (1.26)
Capacitance pF/m (pF/ft)	53.2 (16.2)
Shielding Effectiveness dB through 2 MHz	> 100
Nominal Dielectric Constant	1.4

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper
Dielectric Material	Expanded PTFE
Temperature Range °C	-55 to +200

Figure 39: Small, Lightweight Construction

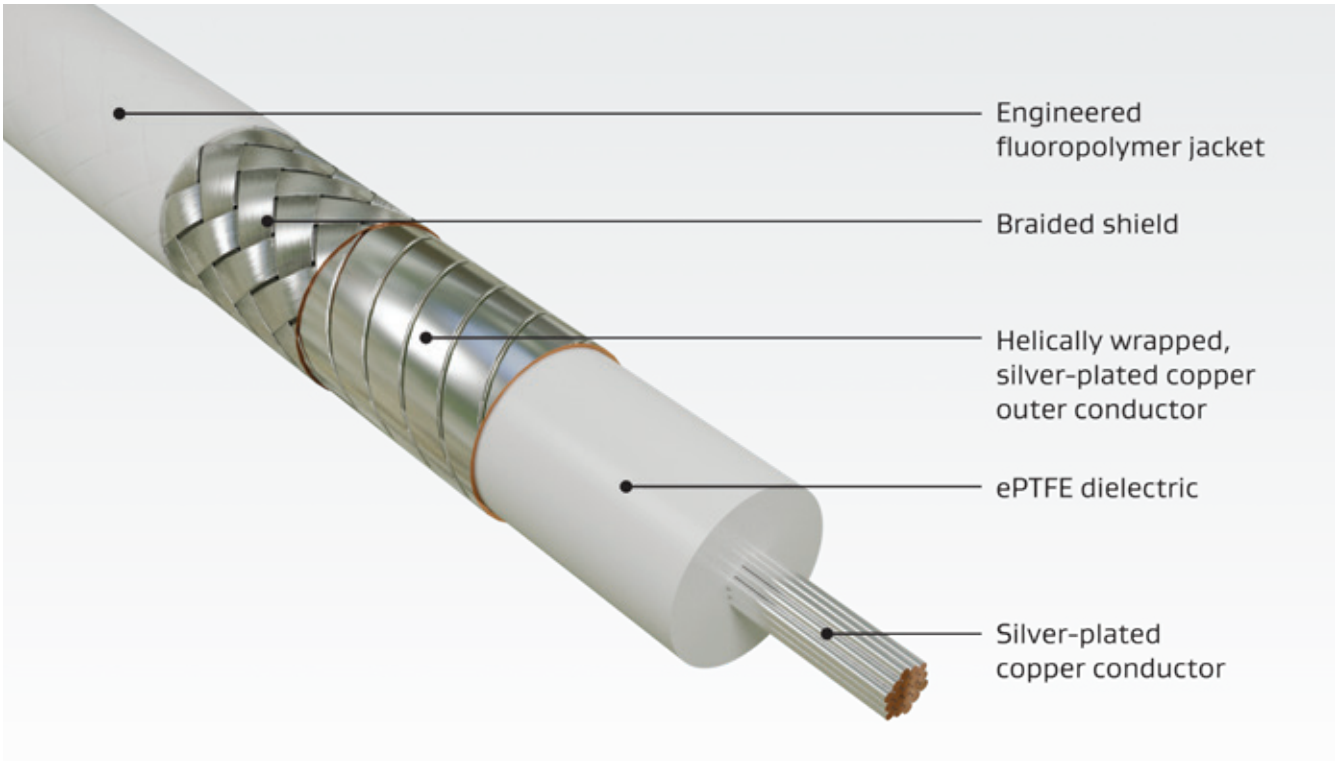


Table 30: Cable Characteristics

Insertion loss values are based on the maximum recommended use length.

Gore Part Number	AWG Size (Stranding)	Maximum Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)		Legacy RG Coaxial Cable Replacement
					3 GHz	6 GHz	
CXN3671	22 (19/34)	4.85 (0.19)	30.5 (1.2)	42.1 (28.3)	17.6	31.4	6, 59, 302

Gore Part Number	AWG Size (Stranding)	Maximum Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/15 m (50 ft)		Legacy RG Coaxial Cable Replacement
					3 GHz	6 GHz	
CXN3680	26 (19/38)	2.54 (0.10)	16.0 (0.63)	17.0 (11.4)	17.06	24.76	174

Ordering Information

The 75-ohm version of GORE® Coaxial Cables is available in standard sizes (Table 30). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Coaxial Cables (50 Ohms)

For commercial and military aircraft systems requiring controlled impedance at 50 ohms, Gore offers a direct replacement for standard RG400 cables. Our aviation coaxial cables are proven to optimize signal transmission at speeds up to 3 GHz with 10% lower loss than RG400 cables (Table 31).

These low-loss cables yield substantial size and weight savings without losing mechanical robustness or electrical stability. Our downsized cable design is 30% smaller and 60% lighter than RG400 cables.

By replacing the RG400 version with Gore's lightweight cables in an IFE system on an Airbus 330/340 passenger airliner, the weight savings is 22 kg (48 lb). If all of the RG400 cables were replaced with our cables in a typical large cabin business jet, the expected weight savings would be approximately 19 kg (42 lb).

Typical Applications

- Box-to-antennas
- Communications systems
- In-flight entertainment (IFE) systems
- Navigation systems

Standards Compliance

- EN4604-003: Cable Characteristics for Signal Transmission
- FAR Part 25, Appendix F, Part I: Flammability
- MIL-C-17/128: Electrical Performance Requirements for Radio Frequency, Flexible RG400 Coaxial Cable, 50 Ohms

Table 31: Cable Properties

Electrical

Property	Value
Signal Transmission Speed GHz	Up to 3
Standard Impedance Ohms	50 ± 2
Maximum Transfer Impedance mOhm/m from 1 to 3 GHz	30
Test Voltage V AC Jacket Material Dielectric Material	 2000 4000
Typical Operating Voltage Vrms	250
Nominal Velocity of Propagation %	> 80
Nominal Time Delay ns/m (ns/ft)	4.0 (1.26)
Capacitance pF/m (pF/ft)	80.0 (24.4)

Mechanical / Environmental

Property	Value
Jacket Material	Extruded FEP
Jacket Color	White (Laser Markable)
Conductor	Silver-Plated Copper
Dielectric Material	FEP over Expanded PTFE
Temperature Range °C	-65 to +200

Table 32: Cable Characteristics

Insertion loss values are based on the maximum recommended use length.

Gore Part Number	AWG Size (Stranding)	Maximum Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)		
					200 MHz	400 MHz	3 GHz
GSC-03-81748-00	19 (01)	3.60 (0.14)	35.0 (1.38)	2.60 (1.75)	5.1	7.5	24.0

Ordering Information

The 50-ohm version of GORE® Coaxial Cables is available in a standard size (Table 32). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Gore's 50-ohm coaxial cables for IFE systems are proven to save 22 kg (48 lb) on commercial aircraft.

GORE® Fiber Optic Cables (1.8 mm Simplex)

Typical Applications

- Avionics/Vectronics digital networks
- Cabin/flight management systems
- Ethernet backbone
- HD streaming camera/video systems
- High bandwidth in-LRU data paths
- In-flight entertainment (IFE) systems
- 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 33). 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 40). 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 33: Cable Properties

Optical

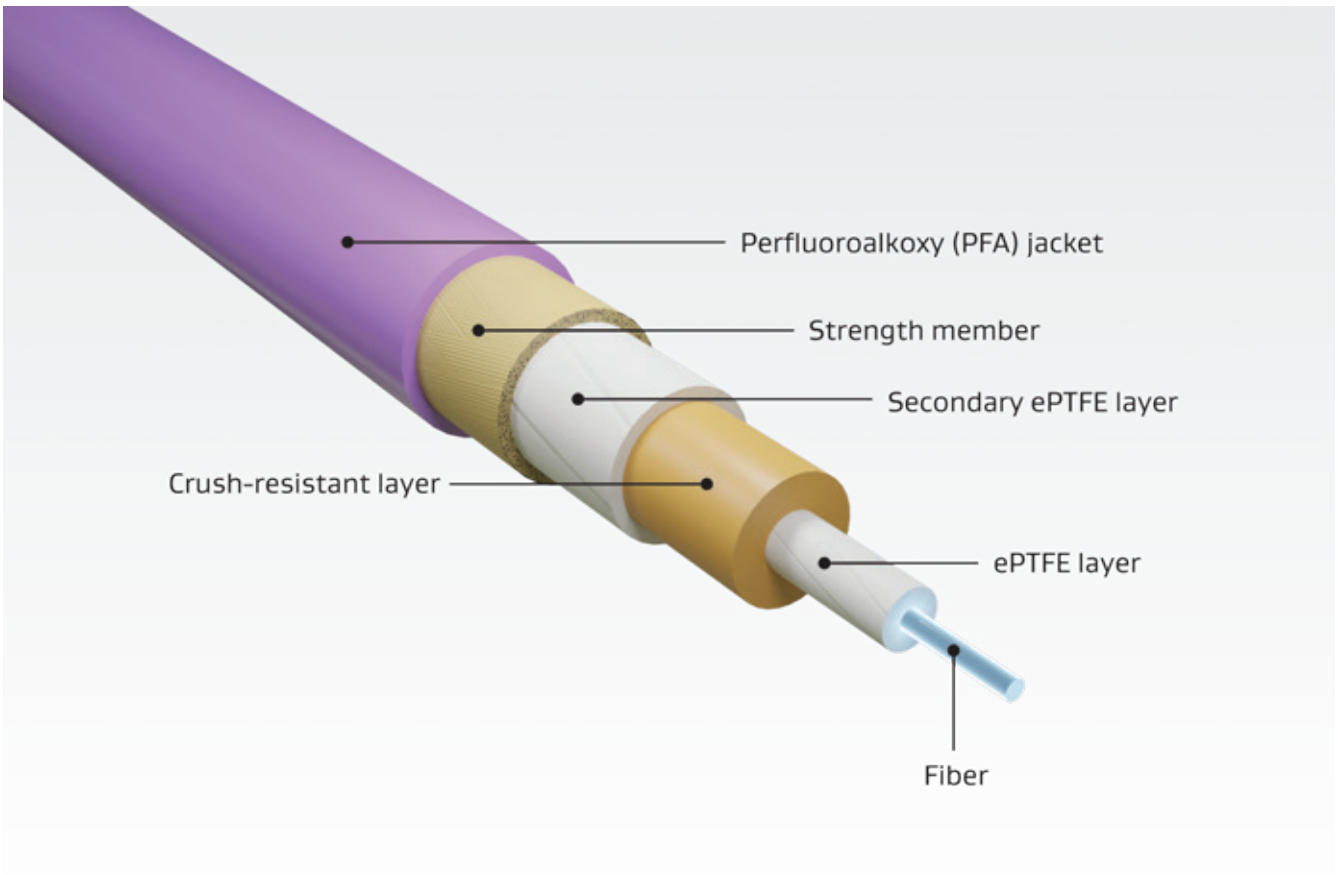
Property	Value
Signal Transmission Speed Gb/s	Up to 100+
Maximum Optical Loss dB/km 850 nm 1300 nm 1310 nm	 4.0 / ≤ 5.0[a] ≤ 3.0[a] 3.0

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.

Figure 40: 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.

GORE® Fiber Optic Cables (1.8 mm Simplex)

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 41 and 42). 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 41: Crush Resistance at 850 nm

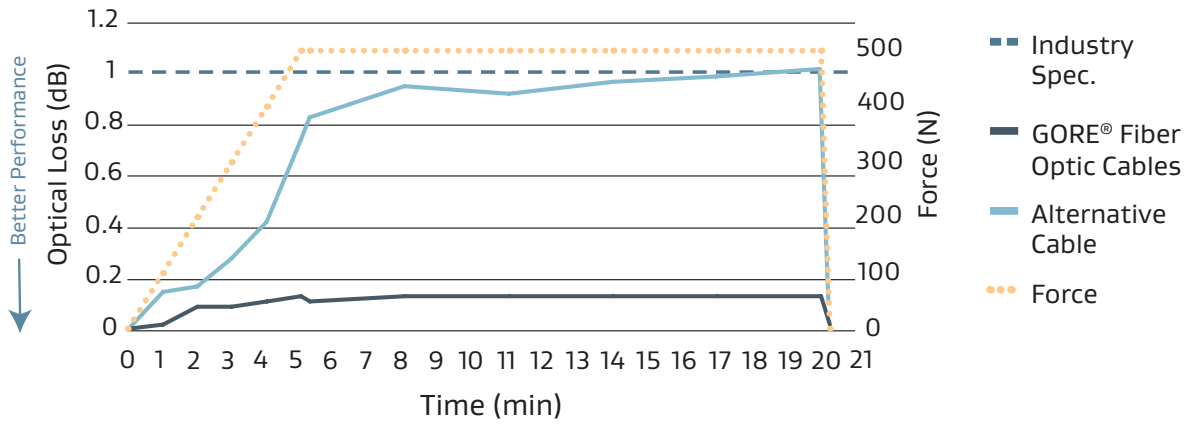
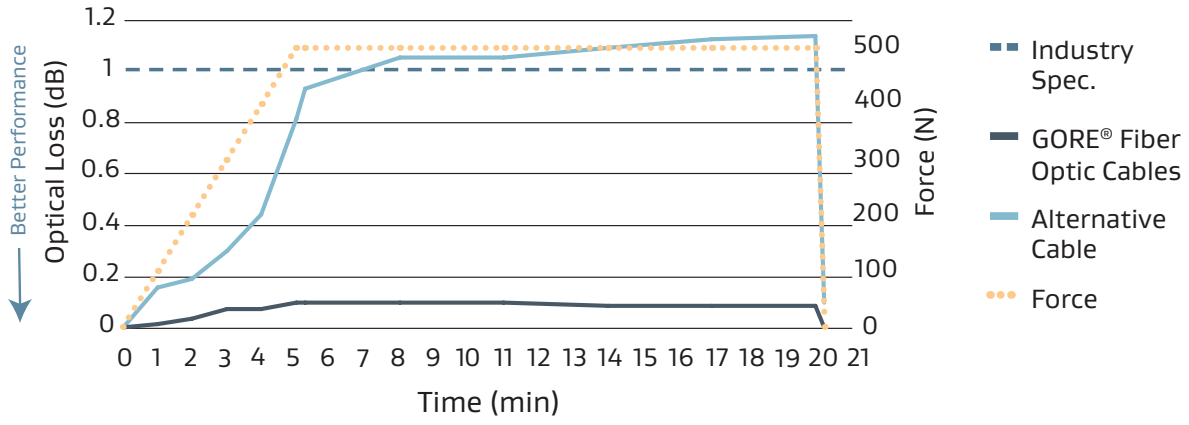


Figure 42: Crush Resistance at 1300 nm



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 43–50).

Figure 43: Vibration Endurance at –40°C (850 nm)

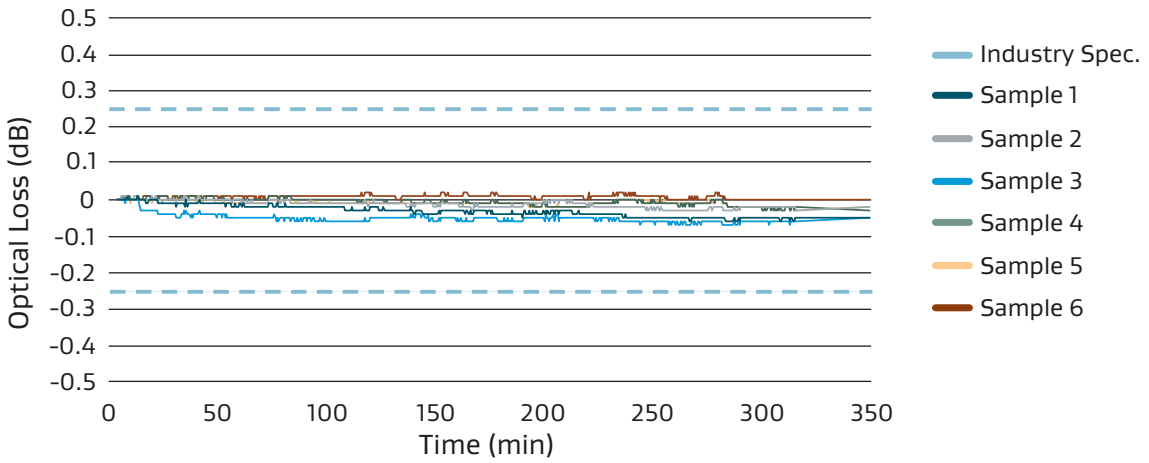
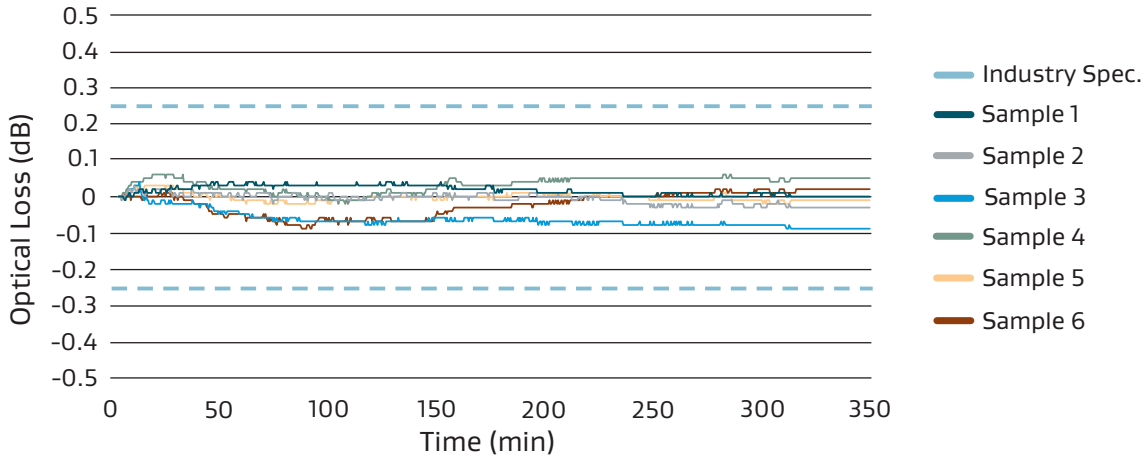


Figure 44: Vibration Endurance at –40°C (1300 nm)



GORE® Fiber Optic Cables (1.8 mm Simplex)

Figure 45: Vibration Endurance at +135°C (850 nm)

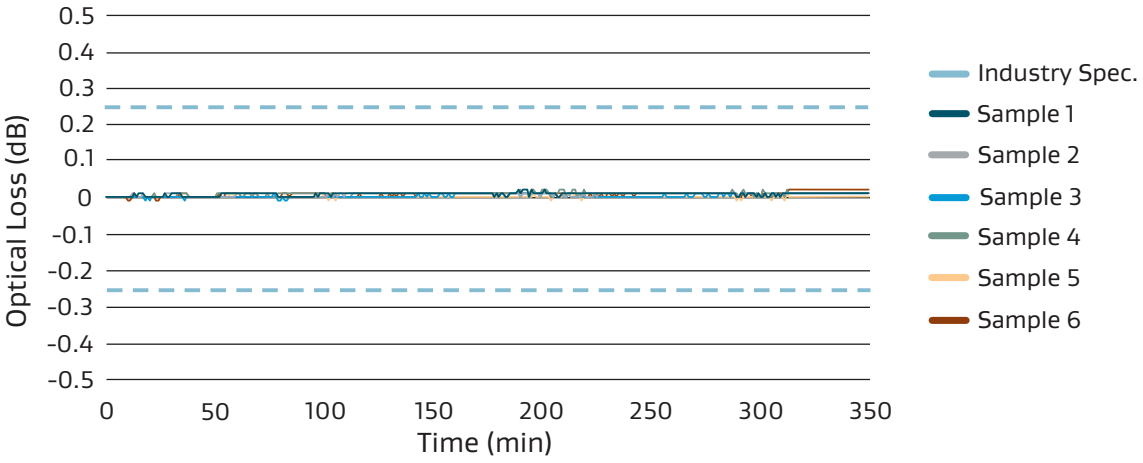


Figure 46: Vibration Endurance at +135°C (1300 nm)

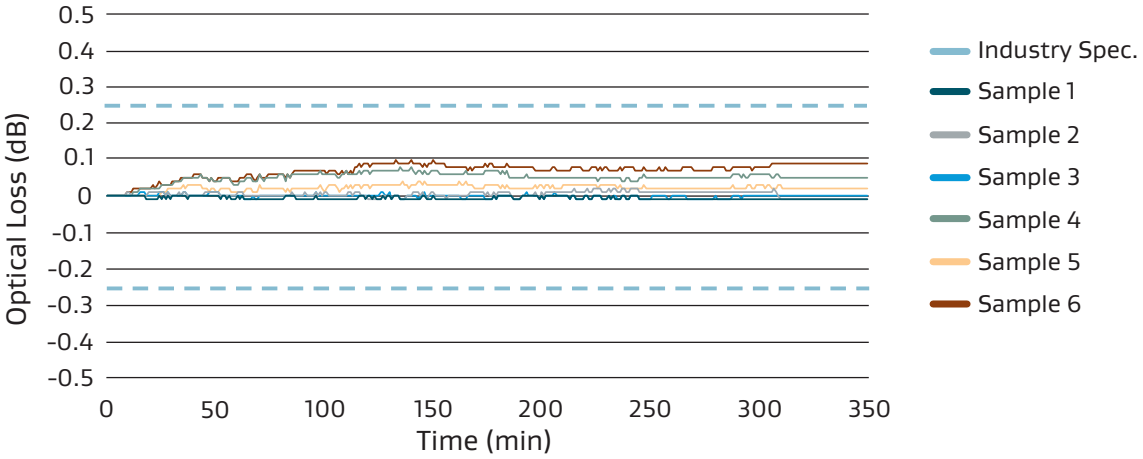


Figure 47: Mechanical Shock Endurance at –40°C (850 nm)

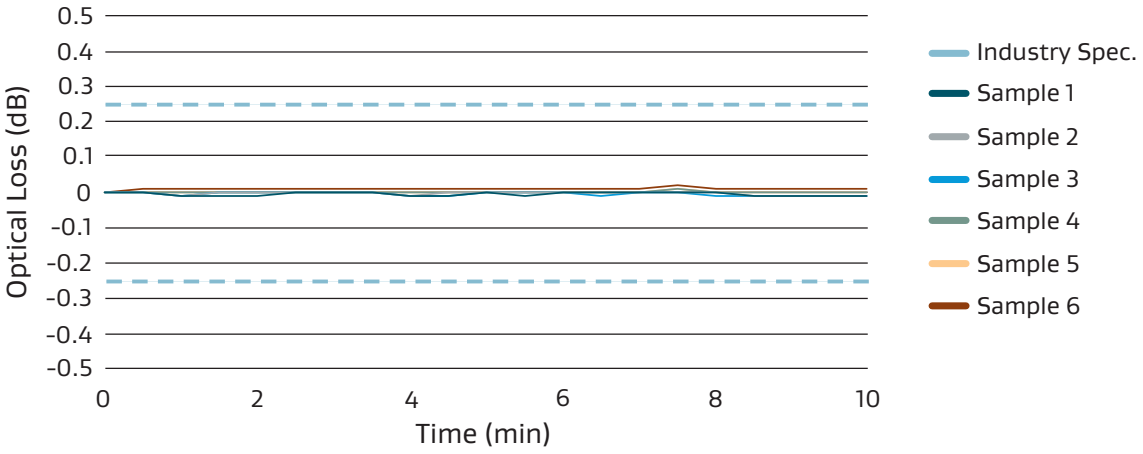
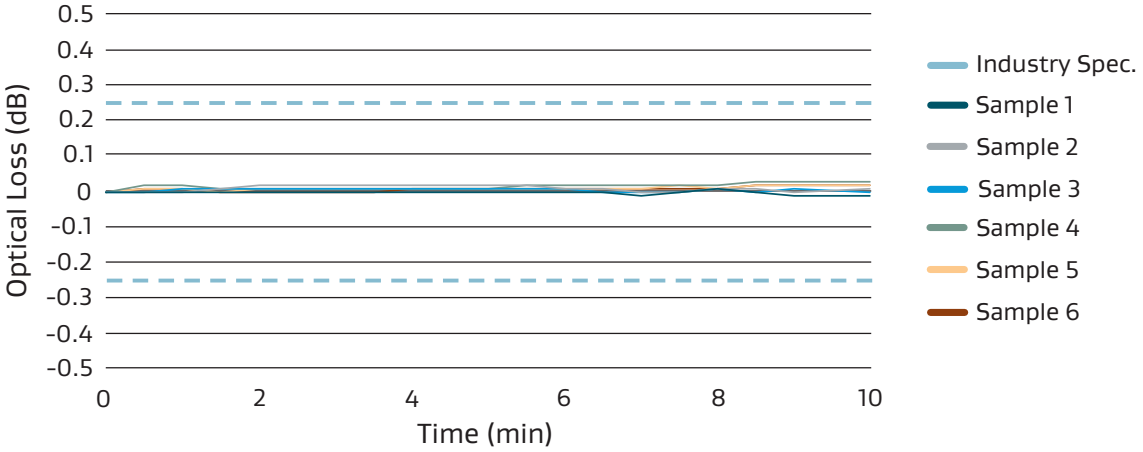


Figure 48: Mechanical Shock Endurance at –40°C (1300 nm)



GORE® Fiber Optic Cables (1.8 mm Simplex)

Figure 49: Mechanical Shock Endurance at +135°C (850 nm)

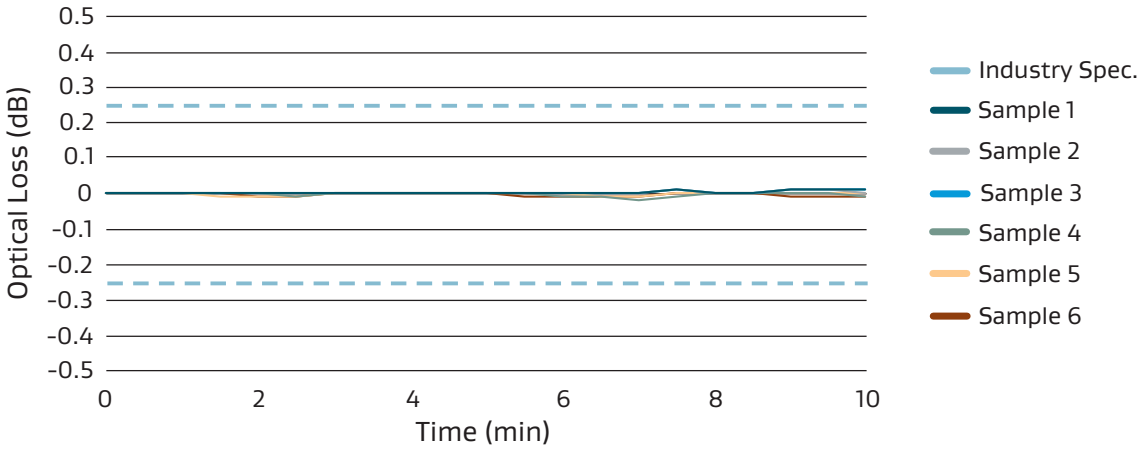
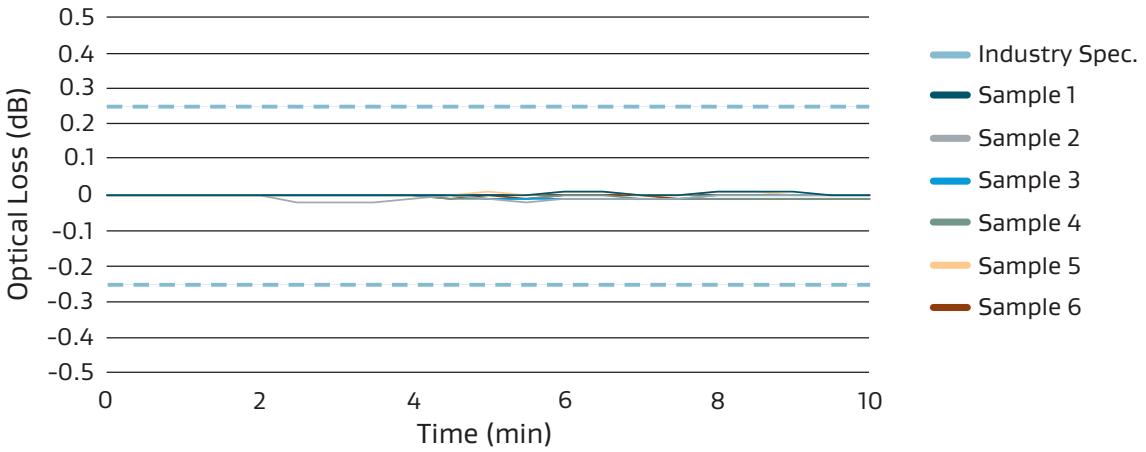


Figure 50: Mechanical Shock Endurance at +135°C (1300 nm)



Gore's 1.8 mm Simplex cable accommodates bandwidth-intensive connectivity requirements up to 100+ Gb/s in a robust package without sacrificing size or weight.

Table 34: 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 34). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

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.**

GORE® Fiber Optic Cables (1.2 mm Simplex)

The standard version of Gore's Simplex cables delivers stable optical performance with low loss for transferring high-bandwidth data and video on aerospace and defense digital networks (Table 35). Constructed with a rugged buffering system, these cables tolerate vibration, shock, and tension that can severely impact overall system performance in aircraft and armored vehicles.

Gore's 1.2 mm Simplex cables in single-mode and multi-mode core types are also smaller and lighter without losing mechanical strength. They minimize routing and installation complexities in condensed areas of a fiber optic communications system.

Typical Applications

- Avionics/vectronics digital networks
- Ethernet backbone
- Flight management systems
- HD streaming video systems
- Inside-the-box devices
- Intercom/radio systems
- Laser pigtails
- Strain-gauge systems
- Transceivers

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230-F6; BSS7324-7.25; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- MIL-STD-202, Method 103: Humidity
- MIL-STD-810, Method 509: Salt Fog
- MIL-STD-810, Method 510: Sand and Dust

Table 35: Cable Properties

Optical

	Value				
Property	**FON1002**	**FON1003**	**FON1253**	**FON1307**	**FON1371**
Signal Transmission Speed Gb/s	Up to 10				
Maximum Optical Loss at 1300 nm dB/km	—	—	—	≤ 1.5	≤ 0.7
Maximum Optical Loss at 1310 nm dB/km	≤ 0.7	≤ 1.5	≤ 0.4	—	—

Mechanical / Environmental

Property	**Value**				
Jacket Material	Extruded FEP				
Jacket Color	Blue				
Core Type	Single Mode or Multi-Mode, Graded Index				
Coating Type	Polyimide	Polyimide	High-Temperature Acrylate		
Buffering System	PTFE				
Temperature Range °C	-65 to +200	-65 to +200	-55 to +125	-55 to +125	-55 to +125

Table 36: Cable Characteristics

Gore Part Number	Core Type	Core/ Cladding/ Coating	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight g/m	Maximum Tensile Strength N
FON1002	SM (Single Mode)	9/125/155	1.2 (0.04)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)	2.5	350
FON1003	OM1 (Multi-Mode, Graded Index)	62.5/125/155	1.2 (0.04)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)	2.5	350
FON1253	SM (Single Mode)	9/125/250	1.2 (0.04)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)	2.5	350
FON1307	OM2 (Multi-Mode, Graded Index)	50/125/250	1.2 (0.04)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)	2.5	350
FON1371	OM1 (Multi-Mode, Graded Index)	62.5/125/250	1.2 (0.04)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)	2.5	350

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.

Samples & Ordering Information

The 1.2 Simplex version of GORE® Fiber Optic Cables is available in standard sizes (Table 36). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Fiber Optic Cables (900 micron)

This version of Gore's fiber optic cables provides a high level of crush protection similar to the Simplex versions while drastically reducing shrink back and the time required to terminate samples. These single-mode and multi-mode cables deliver unfailing signal transmission with low optical loss in rigorous maintenance, flight and military operational conditions, ensuring lifetime performance and lower total costs (Table 37).

Gore's 900-micron optical fiber cables incorporate smaller, lighter, and highly flexible materials that are easy to route — making them an excellent choice for inside-the-box applications. They can also be packaged with GORE® Cable Protection Systems for outside-the-box systems.

Typical Applications

- Inside-the-box devices
- Outside-the-box systems
- Transceivers

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
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ARINC 802-3: Performance Requirements (GSC-13-85067-00)

Table 37: Cable Properties

Optical

Property	Value
Signal Transmission Speed Gb/s	Up to 100
Maximum Optical Loss at 850 nm dB/km	3.0
Maximum Optical Loss at 1310 nm dB/km	1.0

Mechanical / Environmental

Property	Value
Jacket Material	PEEK
Jacket Color	Tan
Core Type	Single Mode or Multi-Mode
Coating Type	High-Temperature Acrylate
Buffering System	Expanded PTFE
Temperature Range °C	-60 to +135

Table 38: Cable Characteristics

Gore Part Number	Core Type	Core/ Cladding/ Coating	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight g/m	Maximum Tensile Strength N
GSC-13-85067-00	OM1 (Multi-Mode)	62.5/125/245	0.9 (0.35)	18.0 (0.71)	0.85	50
GSC-13-85424-00	OM4 (Multi-Mode)	50/125/245	0.9 (0.35)	18.0 (0.71)	0.85	50
GSC-13-85375-00	SM (Single Mode)	9/125/245	0.9 (0.35)	18.0 (0.71)	0.85	50
GSC-13-85869-00	OM5 (Multi-Mode)	50/125/245	0.9 (0.35)	18.0 (0.07)	0.85	50

Connector Systems & Backshells

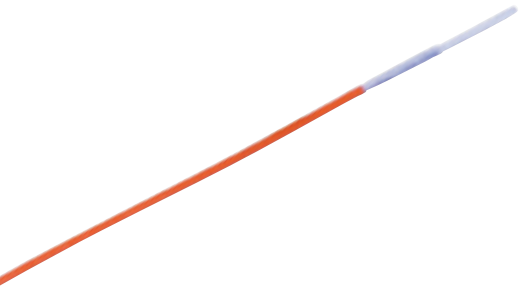
GORE® Fiber Optic Cables are designed to fit a variety of high-speed aerospace and defense connector systems and backshells such as ARINC, MIL-STD-38999, and MIL-PRF-29504. Contact the specific manufacturer such as Amphenol®, COTSWORKS®, Glenair®, and Radiall for exact part numbers, tooling information,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

Samples & Ordering Information

The 900 micron version of GORE® Fiber Optic Cables is available in standard sizes (Table 38). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

For more information or to discuss specific characteristic limits and application needs — including fiber options packaged with GORE® Cable Protection Systems for outside-the-box systems, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Fiber Optic Ribbon Cables



With a unique buffering system, Gore's rugged cables provide reliable protection under challenging conditions while maintaining high-bandwidth communications up to 12 channels on advanced digital networks (Figure 51). They bring consistent signal integrity with low optical loss for uninterrupted data and video transmission after installation and long after alternative cables have succumbed to their environment (Table 39).

Also, the compact design of our multi-channel ribbon cables increases flexibility with a small bend radius, which simplifies and speeds up the installation process in cramped areas. They are proven to optimize performance in applications ranging from inside-the-box devices to outside-the-box systems in aircraft and military vehicles.

Typical Applications

- Avionics/vetronics digital networks
- Ethernet backbone
- Flight management systems
- HD streaming video systems
- 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
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- MIL-STD-202, Method 103: Humidity
- MIL-STD-810, Method 509: Salt Fog
- MIL-STD-810, Method 510: Sand and Dust

Table 39: Cable Properties

Optical / Mechanical / Environmental

	Value			
Property	**FON1214**	**FON1256**	**FON1551**	**FOA8100**
Typical Application	Inside-the-Box Devices		Outside-the-Box Systems	
Signal Transmission Speed Gb/s	Up to 100		Up to 100	
Maximum Optical Loss[a] at 850 nm dB/km	≤ 4.0	≤ 2.3	≤ 3.5	≤ 2.3
Jacket Material	Engineered Fluoropolymer		Extruded PVDF	Extruded PVDF with Strength Member
Jacket Color	White		Orange	
Core Type	Single Mode, Multi-Mode or Multi-Mode, Graded Index		Multi-Mode or Multi-Mode, Graded Index	
Coating Type	Acrylate	High-Temperature Acrylate	High-Temperature Acrylate	
Buffering System	PTFE		PTFE	
Nominal Weight g/m	2.0		2.0	
Tensile Strength N	350		350	
Temperature Range °C	-55 to +125	-60 to +85	-55 to +125	-60 to +125

a. Optical values are typical.

Figure 51: Unique Buffering System

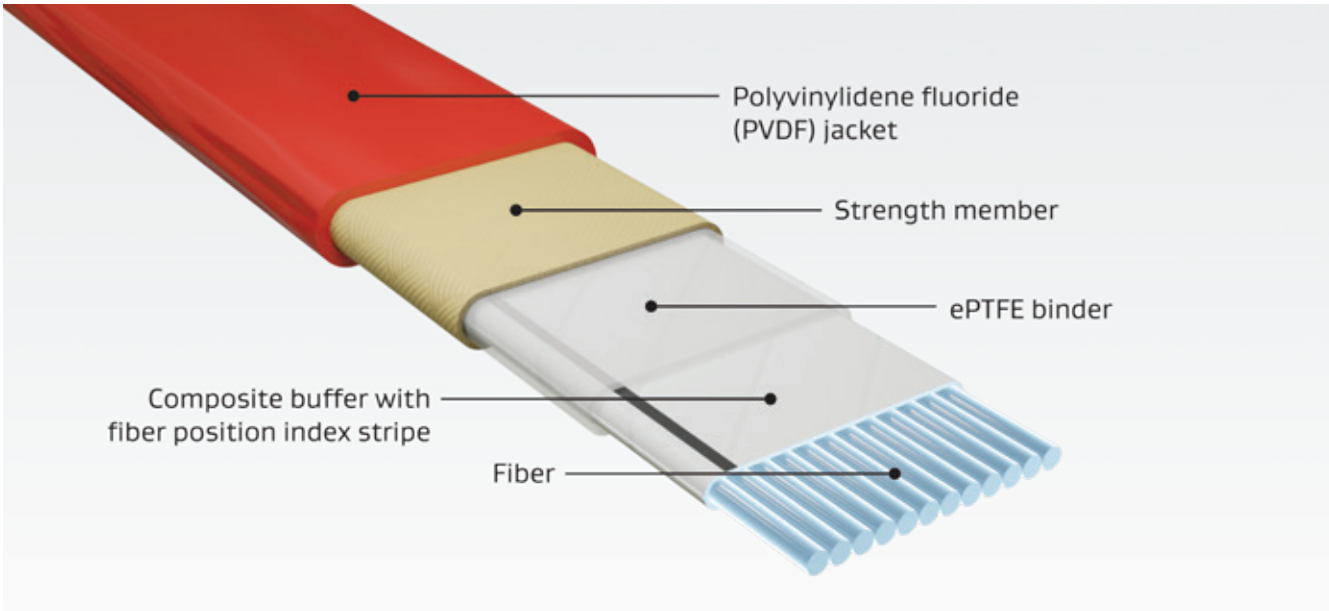


Table 40: Cable Characteristics

Gore Part Number	Core Type	Core/Cladding/ Coating	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)
FON1214/1/*	OM1 (Multi-Mode, Graded Index)	62.5/125/245	3.6 (0.14)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)
FON1214/2/*	SM (Single Mode)	9.5/125/245	3.6 (0.14)	Short-Term: ≥ 6.0 (0.24) Long-Term: ≥ 13.0 (0.51)
FON1214/4/*	OM2 (Multi-Mode, Graded Index	50/125/245	3.6 (0.14)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)
FON1214/5/*	OM3 (Multi-Mode)	50/125/245	3.6 (0.14)	Refer to Manufacturer Data Sheet
FON1214/6/*	OM4 (Multi-Mode)	50/125/245	3.6 (0.14)	Refer to Manufacturer Data Sheet
FON1256/*/*	OM1-OM3 (Multi-Mode)	50/125/245, 62/125/245	3.6 (0.14)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)
FON1551	OM2 (Multi-Mode, Graded Index)	50/125/245	3.8 (0.15)	Short-Term: ≥ 6.0 (0.24) Long-Term: ≥ 13.0 (0.51)
FOA8100/*/*	OM3 (Multi-Mode)	50/125/245	5.1 (0.20)	Short-Term: ≥ 12.0 (0.47) Long-Term: ≥ 25.0 (0.98)

Connector Systems & Backshells

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

Samples & Ordering Information

GORE® Fiber Optic Ribbon Cables are identified by an asterisk designating the core type followed by an asterisk designating the number of fibers (i.e., 4, 8, or 12) (Table 40). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times. For more information or to discuss specific characteristic limits, application needs, and exact part number values, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Cable Protection Systems

Built with crush- and abrasion-resistant materials, Gore's durable jacket systems provide some of the highest levels of protection available in the industry today (Table 41). They meet the demands of OEMs and system suppliers requiring more protection for packaging copper wires and fiber optics in thin, lightweight and routable designs. These cable protection systems routinely tolerate complicated routing and defend against harsh aerospace and defense conditions such as fluctuating temperatures and severe vibration.

Quick & Easy Installation

Within GORE® Cable Protection Systems, copper and fiber can float freely without getting damaged during installation in cable runs and sharp edges in airframes and vehicles. Gore's highly flexible designs offer tighter bending capability that allows copper and fiber to be routed without exceeding the minimum bend radius eliminating over bending. Installers will find it quicker and easier to route copper and fiber packaged with Gore's cable protection systems in less space without having to worry about breakage or failure.

Standards Compliance

- ABD0031 (AITM 2.0005); BSS7230; FAR Part 25, Appendix F, Part I: Flammability
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ABD0031 (AITM 3.0008B); BSS7238; FAR Part 25, Appendix F, Part V: Smoke Density
- SAE AS81914™/1-6: Plastic Convoluted Tubing Requirements

Table 41: Cable System Properties

Mechanical / Environmental

Property	Value
Jacket Material	Expanded PTFE/PTFE
Jacket Color	Black with Violet Stripes
Temperature Range °C	-65 to +260

GORE® Cable Protection Systems are designed to fit a selection of high-speed aerospace and defense connector system backshells (Table 42). Contact a Gore representative for additional connector system backshells not listed in the table.

Visit **gore.com/cps-termination-instructions** to download Gore's best practices for terminating GORE® Cable Protection Systems with M85049/88 connector backshells, adapters, and backshells with a similar banding platform.

Table 42: Recommended Connector Backshells

	Gore Part Number				
Connector Backshell	**FON1594**	**FON1580**	**FON1611**	**FON1612**	**FON1599**
Mil-Spec M85049/88	●	●	●	●	●
Glenair® HatTrick™ System, Series 713-355		●	●	●	●

Table 43: Cable System Characteristics

Gore Part Number	Overall Size mm (in)	Minimum Convoluted Tubing ID mm (in)	Maximum Convoluted Tubing OD mm (in)	Minimum Bend Radius mm (in)	Nominal Weight Kg/km (lb/1000 ft)
FON1594	7.2 (0.29)	3.2 (0.13)	3.9 (0.15)	9.5 (0.38)	30.0 (20.0)
FON1580	9.4 (0.37)	4.6 (0.18)	8.1 (0.32)	8.0 (0.31)	74.4 (50.0)
FON1611	13.5 (0.53)	7.8 (0.31)	11.4 (0.45)	11.1 (0.44)	116.0 (78.0)
FON1612	17.1 (0.68)	10.8 (0.43)	15.0 (0.59)	12.7 (0.50)	149.0 (100.0)
FON1599	17.9 (0.71)	12.4 (0.49)	16.8 (0.66)	19.1 (0.75)	164.0 (110.0)

Ordering Information

GORE® Cable Protection Systems are available in standard sizes (Table 43). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**.

For more information or to discuss specific characteristic limits and application needs regarding Gore's full portfolio of high-speed data cables packaged with GORE® Cable Protection Systems, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Abrasion Resistant Cable Jacket

Engineered with a revolutionary fluoropolymer fiber material, Gore's cable jacket is proven to meet new stringent industry standards for durability without sacrificing size, weight or electrical performance (Table 44).

This rugged cable jacket is extremely abrasion resistant and meets EN3475-503 requirements. It eliminates the need for additional protective sleeving now required for copper cables installed in seats. Our state-of-the-art cable technology is thinner, lighter and more flexible with tighter bendability for straightforward routing and expedited installation in narrow seat configurations.

GORE® Abrasion Resistant Cable Jacket ensures all-around, lifetime mechanical protection and is ideal for packaging copper cables that support the latest standardized high data rate protocols such as HDMI and more.

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
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- EN3475-503: Test Methods for Scrape Abrasion
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Proven Superior Cut-Through Resistance

Using SAE AS4373, Method 703, Gore compared 100-ohm quadrax cables packaged with 4 different jacket types. Results indicated that GORE® Abrasion Resistant Cable Jacket drastically outperformed PFA and FEP materials for superior cut-through resistance at high temperatures (Figure 52).

Testing proved that our pioneering cable jacket can tolerate extreme operational conditions and complex routing without cracking or splitting. They ensure copper wires transmit data and video reliably in the intended application.

Figure 52: Cut-Through Resistance at High Temperatures

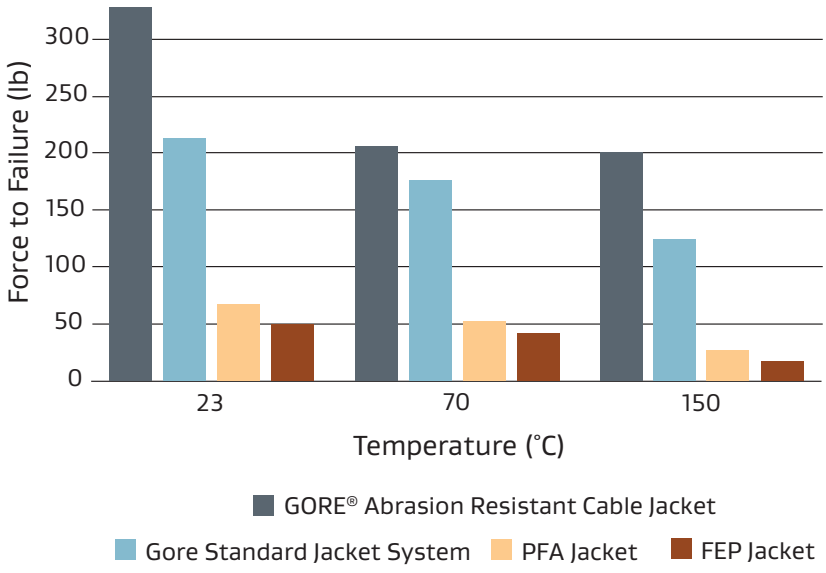


Table 44: Cable Properties

Typical values are based on the 2.0 version of GORE® HDMI Cables packaged with GORE® Abrasion Resistant Cable Jacket.

Electrical

Property	Value
Signal Transmission Speed Gb/s	Up to 18
Standard Impedance Ohms	100 ± 10
Typical Operating Voltage V	< 15
Nominal Velocity of Propagation %	80
Nominal Time Delay ns/m (ns/ft)	4.10 (1.25)
Capacitance pF/m (pF/ft)	230.0 (70.0)
Maximum Skew Within Pair ps/m (ps/ft)	15.0 (4.6)
Dielectric Withstanding Voltage Vrms) Conductor-to-Conductor Conductor-to-Shield	 1500 1000

Mechanical / Environmental

Property	Value
Jacket Material	Engineered Fluoropolymer Fiber Braid
Jacket Color	Black
Conductor	Silver-Plated Copper or SPC Alloy
Conductor Color-Coding	High-Speed Pairs: Blue/White, Brown/White, Green/White, Red/White Singles: Orange, Violet, White, Yellow Triad: Gray, Pink, Tan
Dielectric Material	Expanded PTFE/PTFE
Cut-Through Resistance kg (lb) (SAE AS4373-703) 23°C 70°C 150°C	 122 (270) 73 (160) 59 (130)
Scrape Abrasion Resistance Cycles (EN3475-503) 30°C & 55°C / F = 1.2 daN	> 8,000
Temperature Range °C	-65 to +200

GORE® Abrasion Resistant Cable Jacket

Table 45: Cable Characteristics

HDMI 2.0 Version

Gore Part Number	AWG Size (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lb/1000 ft)	Typical Insertion Loss dB/30 m (100 ft)			
					825 MHz	2475 MHz	4125 MHz	5100 MHz
RCN9195	Data/Drains/Discrete Pairs: 26 (19/38) Capacitance-Controlled Singles: 28 (19/40)	6.6 (0.26)	13.0 (0.51)	77.5 (52.0)	5.0	12.0	20.0	25.0

Ordering Information

The 2.0 version of GORE® HDMI Cables packaged with GORE® Abrasion Resistant Cable Jacket is available in a standard size (Table 45). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors**. Also, **see page 80** regarding GORE® Tethered Drone Cables packaged with this rugged fiber braid cable jacket.

For more information or to discuss specific characteristic limits and application needs regarding Gore's full portfolio of high-speed data cables packaged with GORE® Abrasion Resistant Cable Jacket, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

Proven to meet new stringent requirements, Gore's cable jacket with abrasion resistance eliminates the need for protective sleeving now required for copper cables installed in seats.

GORE® Tethered Drone Cables

Gore strikes a balance by combining power and fiber optic lines with our unique materials in a hybrid solution. Our cables with a patented design deliver continuous high-voltage power, secure signals, and unfailing data transmission in difficult environments (Table 46). They are 20% smaller and lower weight than standard nylon cables, which takes up less space inside the Tether Management System (TMS) for more design options and payload.

We engineer these cables with proven high-strength and weather-proof materials that withstand the most demanding conditions, such as extreme temperature changes (Figure 53). They even provide durable protection with greater weight stability in harsh contaminants and fluids such as fuels, oils, and salt water. Our materials are also low friction, making them much easier to handle than standard cables.

Ultimately, GORE® Tethered Drone Cables maximize TMS availability, increase design options and payload, enable drones to fly higher, expand the line of sight or coverage, and operate over the drone's lifetime.

Typical Applications

- Electro-optical infrared (EO/IR) sensors
- HD streaming camera/video systems
- Intelligence, surveillance, and reconnaissance (ISR)
- Search and rescue
- Telecommunications

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
- ABD0031 (AITM 3.0005); BSS7239: Toxicity
- ARINC 802-3: Performance Requirements
- SAE AS4373™: Test Methods for Insulated Electric Wire (Contact Gore for available data)

Proven High Strength

We package our cables with GORE® Abrasion Resistant Cable Jacket for added ruggedness. They are specifically designed to withstand crushing, abrasion, repeated reeling, fluctuating temperatures, humidity, rain, snow, and rough terrain (Figure 54). The single-mode fiber optic cable meets ARINC 802-3 requirements and is proven to provide a high level of crush resistance with low insertion loss — ensuring a secure data link from the drone to the ground support equipment (GSE). The fiber can serve as a low-loss coaxial cable for applications that transmit and receive data such as temporary cell towers, rural network connectivity, mesh drone networks, and line-of-sight communications. The fiber can even be used in video systems as a downlink for continuous streaming to provide situational awareness and coverage for emergency response, search and rescue, news and events, aerial photography, and border patrol.

Higher Level of Weight Stability

Using SAE AS4373, Method 601, Gore compared its cable engineered with a unique fluoropolymer fiber braid to a standard cable constructed with a nylon braid. Results showed that the initial weight of the standard nylon cable increased significantly by 13% after exposure to hydraulic fluid and more than 7.5% in salt water (Figure 55). However, Gore's fiber braid cable provided a higher level of weight stability. Results showed a significant reduction in weight pick-up, less than 2.5% in these harsh fluids. In particular, they held less than 1% in salt water, which translates to 90% less weight pick-up than standard nylon cables.

Figure 53: High-Strength, Weather-Proof Materials

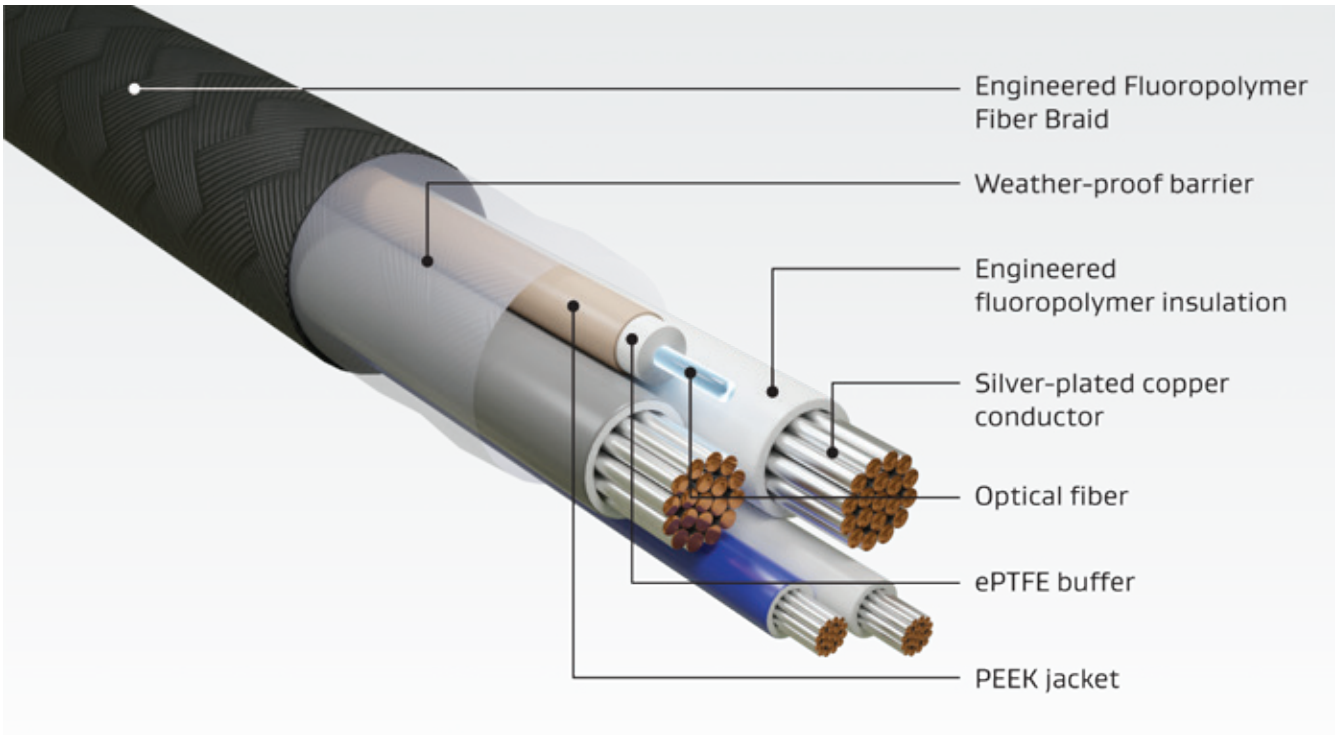


Figure 54: Tensile Strength of GORE® Tethered Drone Cables

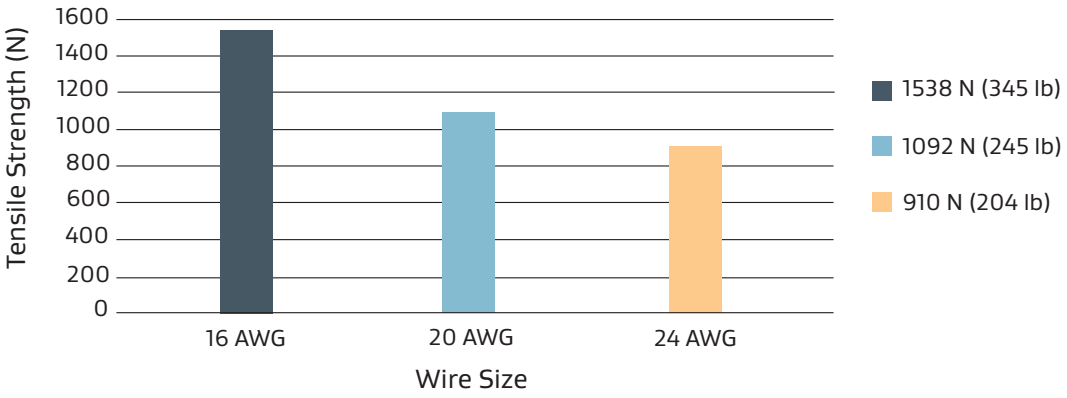
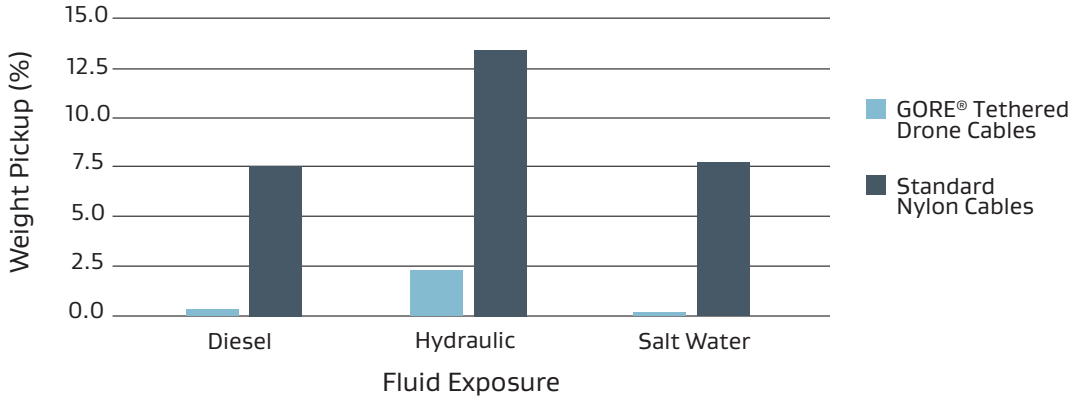


Figure 55: Comparison of Weight Stability After Fluid Immersion



GORE® Tethered Drone Cables

Table 46: Cable Properties

Electrical

	Value		
Property	**Data Pair**	**Power Pair**	**Fiber Optic**
Operating Voltage[a] Vrms	250	600	—
Testing Voltage Vrms	1500	1500	—
Maximum Optical Loss at 1310 nm dB/km	—	—	0.35
Maximum Optical Loss at 1550 nm dB/km	—	—	0.20

Mechanical / Environmental

	Value		
Property	**Data Pair**	**Power Pair**	**Fiber Optic**
Jacket Material	Engineered Fluoropolymer Fiber Braid		
Jacket Color	Black		
Insulation Color	Blue/White	Gray/White	Brown
Insulation Wall Thickness mm (in)	0.14 (0.006)	0.14 (0.006)	—
Conductor	Silver-Plated Copper	Silver-Plated Copper	—
Mode Type µm	—	—	Single, 900
Core/Cladding/Coating	—	—	8/125/245
Coating Type	—	—	High-Temperature Acrylate
Buffer	—	—	Expanded PTFE
Dielectric Material	Expanded PTFE/PTFE		
Crush/Impact Resistance[b] kgf/cm (lb/in) (ARINC 802-3)	—	—	Pass
Tensile Strength[b] N (lb) 16 AWG 20 AWG 24 AWG	 1538 (345) 1092 (245) 910 (204)		
Scrape Abrasion[b] Cycles, 500 g (1.1 lb) (SAE AS4373)	> 36,000		
Fluid Immersion/Weight Stability[b] % Absorption (SAE AS4373)	Pass > 1 (Salt Water, Diesel), > 2.5 (Hydraulic)		
Cold Bend Resistance[b] (SAE AS4373)	Pass		
Temperature Range °C	-60 to +200	-60 to +200	-60 to +85[c]

a. Based on NEMA HP3 wire.

b. Testing based on size 22 AWG.

c. Attenuation may increase above 85°C.

Table 47: Cable Characteristics

Gore Part Number	Construction	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight Kg/km (lb/100 ft)	Max Conductor DC Resistance (Ohms/1000 ft)
RCN9164	Power Pair: 16 AWG (19/29) Fiber: 1 Single Mode, 900 micron	3.8 (.148)	38 (1.48)	33.32 (2.23)	4.5
RCN9166	Power Pair: 20 AWG (19/32) Fiber: 1 Single Mode, 900 micron	2.9 (.117)	29 (1.17)	17.89 (1.20)	9.1
RCN9168	Power Pair: 24 AWG (19/36) Fiber: 1 Single Mode, 900 micron	2.3 (.092)	23 (0.92)	10.29 (0.69)	23.6
RCN9188	Power Pair: 20 AWG (19/32)	2.9 (.117)	29 (1.17)	16.7 (1.12)	9.1
RCN9190	Power Pair: 24 AWG (19/36)	2.2 (.087)	22 (0.87)	8.9 (0.60)	23.6
RCN9217	Power Pair: 16 AWG (19/29) Data Pair: 28 AWG (19/40) Fiber: 1 Single Mode, 900 micron	3.8 (.148)	38 (1.48)	35.7 (2.40)	4.5
RCN9218	Power Pair: 20 AWG (19/32) Data Pair: 28 AWG (19/40) Fiber: 1 Single Mode, 900 micron	3.2 (.127)	32 (1.27)	20.8 (1.40)	9.1

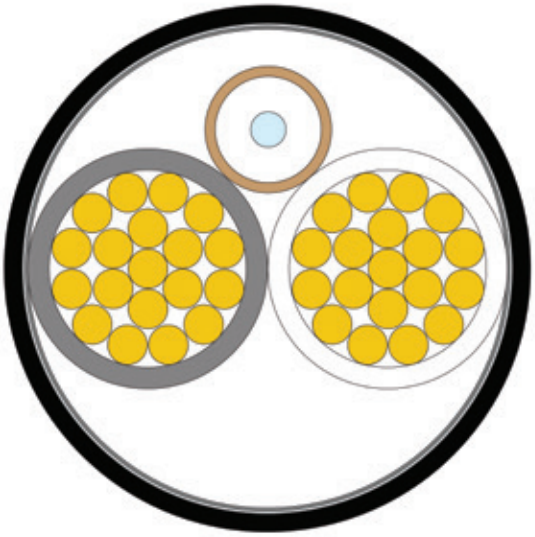
Samples & Ordering Information

GORE® Tethered Drone Cables are available in various designs and standard sizes (Table 47 and Figure 56). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** In addition, **see page 88** regarding Gore's full inventory of complimentary sample products and lead times.

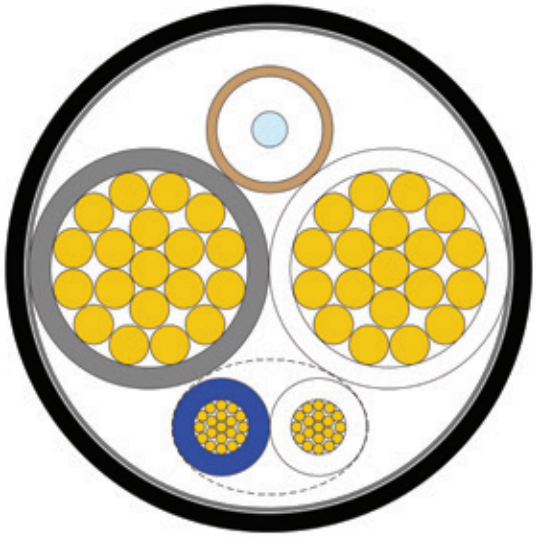
For more information or to discuss specific characteristic limits and application needs, contact a Gore representative today at **gore.com/aerospace-defense-contact.**

GORE® Tethered Drone Cables

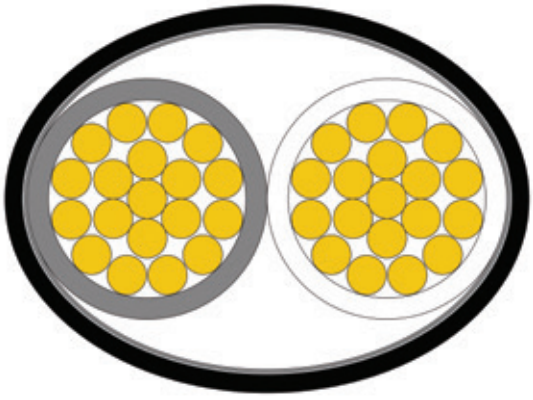
Figure 56: Cable Designs



RCN9164 through RCN9168



RCN9217 & RCN9128



RCN9188 & RCN9190

Photo courtesy of Lance Cpl. Rhita Daniel

Gore's game-changing cables give you more payload options, allow drones to fly higher, and expand your line of sight or coverage.

Sample Product Inventory

Complimentary samples of Gore's pre-qualified solutions for prototyping and evaluation are available with short lead times based on in-stock availability (Tables 48–51). As a result, aircraft and military vehicle OEMs can validate and support low-rate production using Gore's standard products in their specific application with lower technical and business risks to their programs.

Visit **gore.com/hsdc-sample-form-air-defense** to fill out the short online form and receive your complimentary samples. Alternatively, contact a Gore representative today at **gore.com/aerospace-defense-contact** regarding available materials for your sample, prototype, and small production requirements.

Table 48: Inventory of Gore's Standard Copper Cables

Cable Type/Protocol	Construction	Standard Impedance Ohms	Gore Part Number
Shielded Twisted Pair	Single Pair (20 AWG)	100	DXN2600
	Single Pair (22 AWG)	100	GSC-03-85203-VG
	Single Pair (22 AWG)	100	DXN2601
	Single Pair (24 AWG)	100	DXN2602
	Single Pair (26 AWG)	100	DXN2603
	Single Pair (28 AWG)	100	DXN2604
	Single Pair (30 AWG)	100	DXN2605
	Single Pair (32 AWG)	100	DXN2606
CAN Bus	Single Pair (24 AWG)	120	GSC-03-84793-VG
	Single Pair (24 AWG)	120	GSC-03-85752-24D
	Single Pair (26 AWG)	120	GSC-03-85752-26D
Ethernet (Cat8)	4 Pairs (24 AWG)	100	RCN9235-24
	4 Pairs (26 AWG)	100	RCN9235-26
Ethernet (Cat5e/6A)	4 Pairs (24 AWG)	100	GSC-01-85237-VG
	4 Pairs (24 AWG)[a]	100	RCN8966-24
	4 Pairs (24 AWG)	100	RCN9034-24
	4 Pairs (26 AWG)[a]	100	RCN8966-26
	4 Pairs (26 AWG)	100	RCN9047-26
	4 Pairs (28 AWG)	100	RCN9034-28
Ethernet (Cat5e)	2 Pairs (26 AWG)	100	RCN9133-26
Ethernet (Cat5e)	Quadrax (24 AWG)	100	GSC-03-84608-00
	Quadrax (26 AWG)	100	GSC-03-84820-00
Quad	Quadrax (24 AWG)	100	RCN8752
	Quadrax (26 AWG)	100	RCN8982
	Quadrax (28 AWG)	100	RCN8973
FireWire® (IEEE 1394b)	Quadrax (22 AWG)	110	RCN8645
	Quadrax (24 AWG)	110	RCN8647
	Quadrax (26 AWG)	110	RCN8652
Fibre Channel	Quadrax (26 AWG)	150	RCN8328

a. See table 7 **(page 22)** for Ethernet interconnect options.

Table 49: Inventory of Gore's Standard Copper Cables (continued)

Cable Type/Protocol	Construction	Standard Impedance Ohms	Gore Part Number
USB (2.0)	Data/Power (22 AWG)	90	RCN8800-22D-22P-H
	Data (24 AWG) Power (22 AWG)	90	RCN8800-24D-22P-H
	Data (26 AWG) Power (24 AWG)	90	RCN8800-26D-24P-H
USB (3.0)	Data (26 AWG) Power (22 AWG)	90	GSC-01-85201-VG
USB (3.1)	Data (26 AWG) Power (24 AWG)	90	GSC-03-84761-24D
HDMI (2.0)	Hybrid	100	RCN9121
DVI (Digital Only)	4 Pairs (24 AWG)	100	GSC-01-85249-24S

Table 50: Inventory of Gore's Standard Fiber Optic Cables

Cable Type/Protocol	Construction	Core/Cladding/ Coating	Gore Part Number
Simplex	1.8 mm, OM1	62.5/125/245	GSC-13-84640-07
	1.8 mm, OM2	50/125/245	GSC-13-84639-07
	1.8 mm, OM3	50/125/245	GSC-13-84943-07
	1.8 mm, OM4	50/125/245	GSC-13-85423-07
Simplex	1.2 mm, OM2	50/125/250	FON1307
Simplex	900 micron, OM1	62.5/125/245	GSC-13-85067-00
Ribbon	12 fiber, OM2 12 fiber, OM3	50/125/245 50/125/245	FON1214/4/12 FON1256/4/12

Table 51: Inventory of Gore's Tethered Drone Cables

Cable Type / Protocol	Construction	Operating Voltage Vrms	Core/Cladding/ Coating	Gore Part Number
Power Pair	Single Pair (20 AWG)	600	—	RCN9188
Power Pair	Single Pair (24 AWG)	600	—	RCN9190
Hybrid	Power Pair: 16 AWG Fiber: 900 micron	600	8/125/245	RCN9164
Hybrid	Power Pair: 20 AWG Fiber: 900 micron	600	8/125/245	RCN9166
Hybrid	Power Pair: 24 AWG Fiber: 900 micron	600	8/125/245	RCN9168

W. L. Gore & Associates
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ACS1007-R4-BRC-US-APR24