GORE® Tethered Drone Cables

Typical Applications

- Electro-optical infrared (EO/IR) sensors
- HD 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)

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 1). 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 1). 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.

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 2). 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 3). 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 1: High-Strength, Weather-Proof Materials

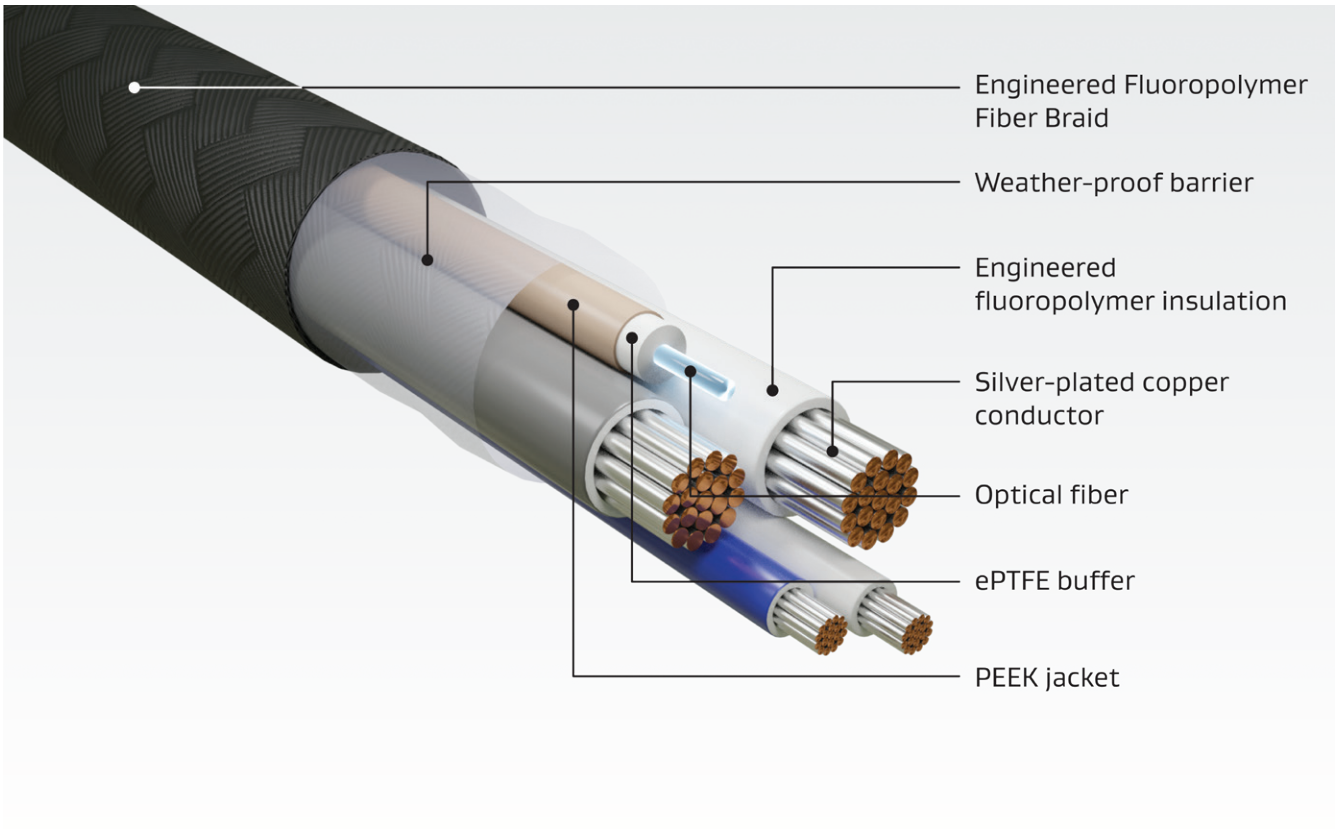


Figure 2: Tensile Strength of GORE® Tethered Drone Cables

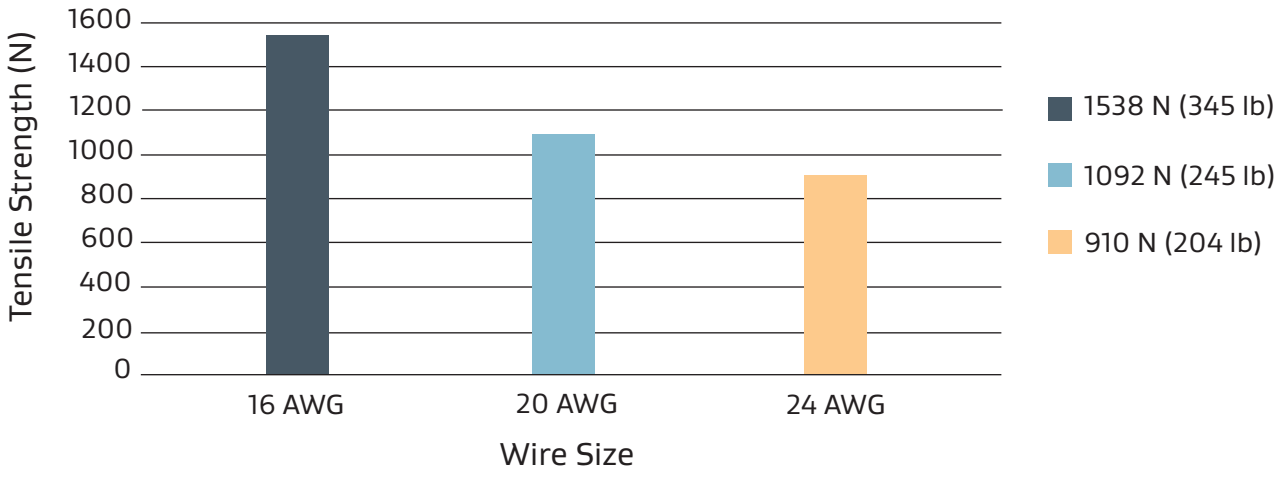


Figure 3: Comparison of Weight Stability After Fluid Immersion

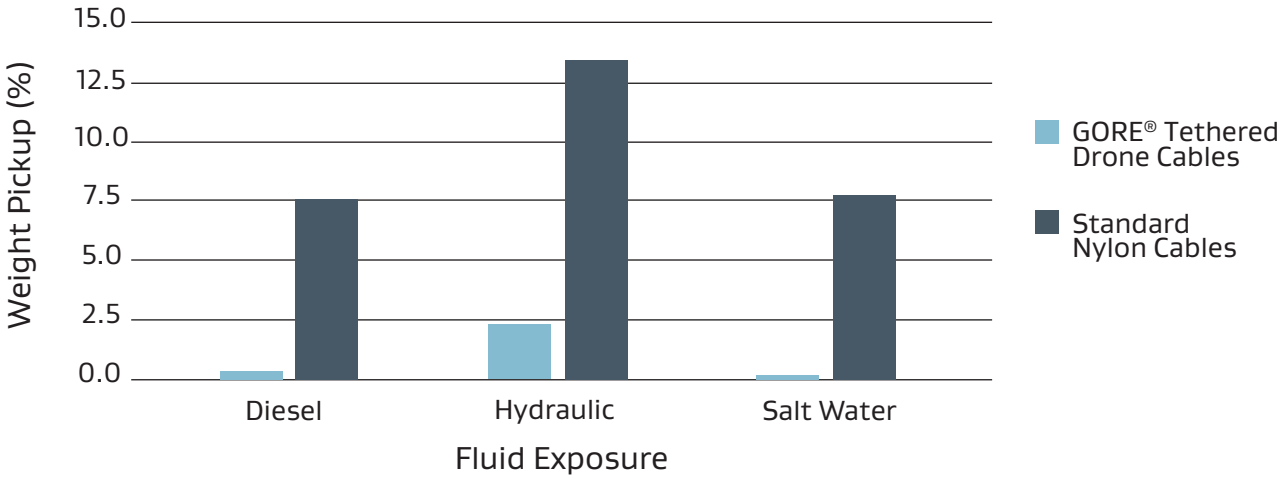


Table 1: Cable Properties

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 2: Cable Characteristics

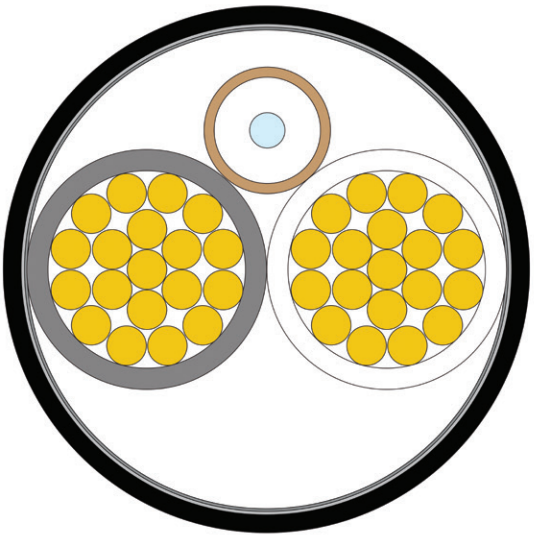
Gore Part Number	Construction	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight Kg/km (lb/100 ft)	Max Conductor DC Resistance (Ohms/1000 ft)
RCN9164	Power Pair: 16 AWG (19/29) Fiber: 1 Single Mode, 900 micron	3.8 (.148)	38 (1.48)	33.32 (2.23)	4.5
RCN9166	Power Pair: 20 AWG (19/32) 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

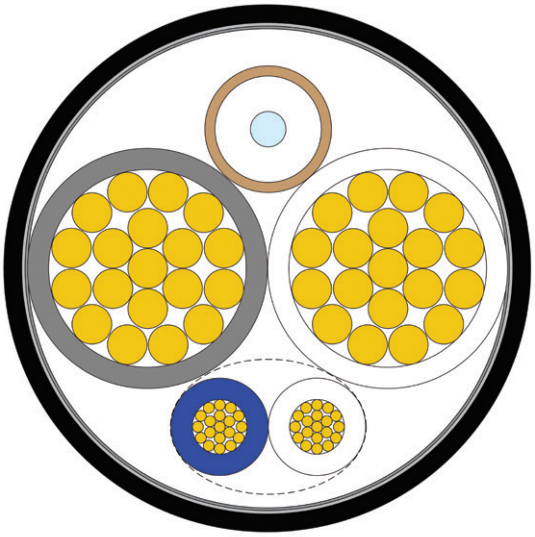
GORE® Tethered Drone Cables are available in various designs and standard sizes (Table 2 and Figure 4). To place an order, contact an authorized distributor for in-stock availability at **gore.com/cable-distributors.** To view our full inventory and order complimentary samples of selected products for prototyping and evaluation in your application, visit **gore.com/hsdc-sample-inventory-air-defense.**

For more information or to discuss specific characteristic limits and application needs, contact a Gore representative for aerospace and defense today.

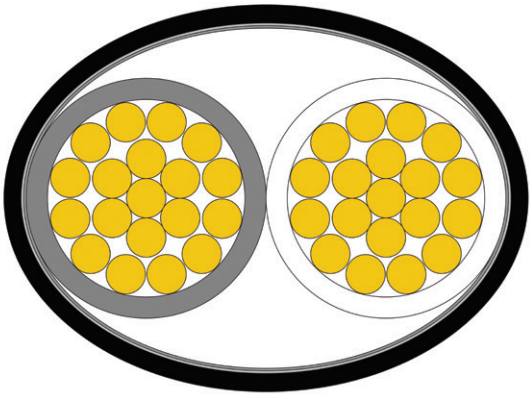
Figure 4: Cable Designs



RCN9164 through RCN9168



RCN9217 & RCN9128



RCN9188 & RCN9190

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

W. L. Gore & Associates
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