GORE® Tethered Drone Cables

For Commercial & Military Applications

Fly higher, see farther and do more with a durable, low-weight hybrid cable solution

Standard materials used in tethered drone cables pose ongoing challenges for both military and commercial industries. Traditional durable materials are bulky and heavy often weighing drones down, while lighter weight materials absorb moisture and lack adequate protection to withstand harsh environments. As a result, standard cables limit the altitude that drones can operate, affecting the line of sight or coverage. These challenges can significantly limit opportunities for more payload options and decrease the capability of tethered drones.

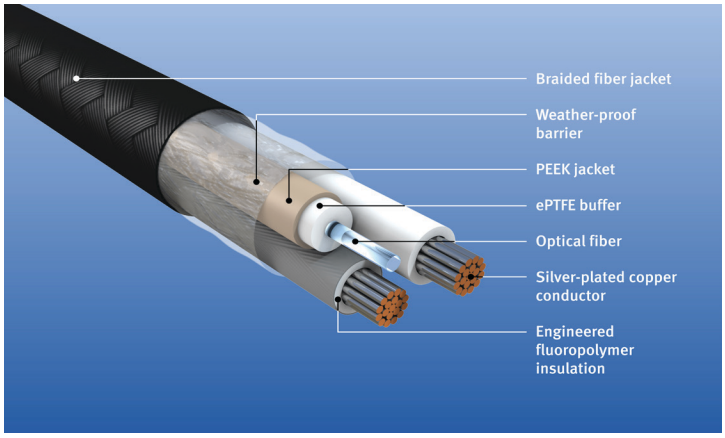
Do Not Let Your Tether Hold You Down

GORE® Tethered Drone Cables strike a balance by combining power and fiber optic cables with unique materials in a hybrid solution that yields exceptional benefits. These game-changing cables offer a rugged, small-scale design with high performance that maximizes Tether Management System (TMS) availability, provides increased design options and payload, and enables greater drone operational capability.

Lighter Weight. More Payload. Longer Lengths

Gore's innovative cable technology considerably reduces size and weight without sacrificing mechanical durability or electrical performance (Figure 1). GORE® Tethered Drone Cables are 20 percent smaller in size than standard cables constructed with nylon, which also makes them inherently lighter in weight. Therefore, they take up less space inside the TMS, which means more design options and extra payload during operation. These cables also provide greater weight stability in harsh fluids that further increases design options/payload and operating height (Table 1).

Figure 1: High-Strength Construction



Benefits of GORE® Tethered Drone Cables

- More design/payload options with smaller, lighter weight constructions
- Greater weight stability in harsh fluids for higher operating elevations/expanded line of site
- High-strength materials withstand challenging conditions such as extreme temperatures/repeated reeling
- Proven crush-resistant fiber optic cable that meets ARINC 802-2 requirements
- Durable protection against abrasion/easier handling due to low-friction fiber braid cable jacket
- Deliver continuous high-voltage power and secure, high-bandwidth data transfer

Typical Applications

- Video streaming
- News, events, commercial photography, search and rescue
- Industrial/land inspections
- Telecommunications
- Intelligence, surveillance and reconnaissance (ISR)
- Electro-optical infrared (EO/IR) sensors
- Signals intelligence

GORE® Tethered Drone Cables

Table 1: Cable Properties

	Property	Value	
		Power Pair	Fiber Optic
Electrical	Operating Voltage (Vrms)[a]	600	N/A
	Maximum Optical Loss at 1310 nm (dB/km)	N/A	0.35
	Maximum Optical Loss at 1550 nm (dB/km)	N/A	0.20
Mechanical / Environmental	Jacket Material	Engineered Fluoropolymer Fiber Braid	
	Jacket Color	Black	
	Insulation Color	Gray / White	Brown
	Insulation Wall Thickness (mm [in])	0.14 (0.006)	N/A
	Conductor	Silver-Plated Copper	N/A
	Mode Type (µm)	N/A	Single (900)
	Core / Cladding / Coating	N/A	8 / 125 / 245
	Coating Type	N/A	High-Temperature Acrylate
	Buffer	N/A	ePTFE
	Dielectric Material	ePTFE / PTFE	
	Crush / Impact Resistance[b] (ARINC 802-2 / kgf/cm [lbs/in])	N/A	Pass
	Tensile Strength (lbs)[b]	› 219	
	Scrape Abrasion Resistance (Cycles)[b] (AS4373 / 500 g [1.1 lbs])	› 36,000	
	Fluid Immersion / Weight Stability[b] (AS4373 / % Absorption)	Pass ‹ 1 (Salt Water, Diesel) / ‹ 2.5 (Hydraulic)	
	Cold Bend Resistance (AS4373)[b]	Pass	
	Temperature Range (°C)	Fiber Optic: - 60 to +85[c] Materials: -60 to +200	

[a] Based on a NEMA HP3 wire.
[b] Testing based on size 22 AWG.
[c] Attenuation may increase above 85°C.

Enhanced Protection. Extended Product Life

The demanding conditions in which drones operate can severely degrade lightweight cables that compromise on durability causing them to wear out long before the drone. Also, drones operating at high power can be susceptible to failure if materials are not compatible with high temperatures.

Engineered with proven high-strength and weather-proof materials, GORE® Tethered Drone Cables deliver continuous high-voltage power, secure signals, and unfailing data transmission in difficult environments. These cables are designed specifically to withstand crushing, abrasion, repeated reeling, fluctuating temperatures, humidity, rain, snow, and tough terrain.

The single-mode fiber optic cable meets ARINC 802-2 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). In addition, Gore's patent-pending fiber braid cable jacket is low friction and resists abrasion induced during operation or by the TMS. This low-friction jacket also makes it easier to handle our cables compared to standard nylon cables.

Greater Weight Stability

Every gram of weight saved on a drone allows for more payload flexibility, increased height above ground level (AGL) during operation, and greater drone responsiveness. Therefore, Gore has developed a unique cable jacket material that considerably reduces weight pickup after exposure to harsh contaminants and fluids to ensure optimal system performance and mission-critical success.

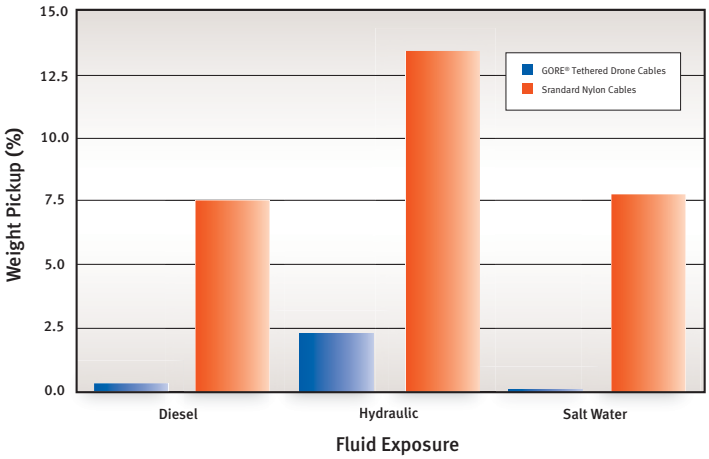
Using AS4373 Method 601, Gore compared its cable to a standard cable constructed with a nylon braid to determine weight stability after immersion in harsh fluids. Results showed that the initial weight of the cable built with nylon increased significantly by 13 percent in hydraulic fluid and more than 7.5 percent in salt water (Figure 2). However, Gore's cable showed a significant reduction in weight pickup in these harsh fluids. In particular, less than 1 percent in salt water, which translates to 90 percent less weight pickup than standard nylon cables.

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

Ordering Information

GORE® Tethered Drone Cables are available through several distributors in a variety of standard sizes (Table 2). Visit gore.com/cable-distributors for the list of distributors. For more information or to request samples with short lead times, please contact a Gore representative.

Figure 2: Comparison of Weight Stability After Fluid Immersion



Proven Track Record

For decades, Gore's products have been used successfully in many aerospace and defense applications — from the first moon landing to today's International Space Station, commercial airliners, fighter jets, combat vehicles, and naval platforms. Gore has been a trusted partner to the aerospace industry and many branches of the military, delivering cables and materials with an optimal blend of durability, reliability, and flexibility.

Table 2: Product Specifications

Part Number	AWG Size[a] (Stranding)	Nominal Outer Diameter mm (in)	Minimum Bend Radius mm (in)	Nominal Weight kg/km (lbs/100 ft)	Conductor DC Resistance (Ohms/1000 ft)
RCN9164	16	3.38 (0.133)	38.1 (1.50)	30.66 (2.06)	4.8
RCN9166	20	2.72 (0.107)	31.8 (1.25)	17.71 (1.19)	9.6
RCN9168	24	2.24 (0.088)	25.4 (1.00)	10.12 (0.68)	24.8

Contact Gore for other gauge sizes.

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Application Notes

W. L. Gore & Associates

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