



Specialty Photonics Division
Your Optical Fiber Solutions Partner

Aerospace Optical Cables

for Commercial Aerospace, Government, and Defense



Specialty Optical Fibers

Cables

OFS aerospace cables are designed to offer optimal performance in the special conditions found in aircraft, where requirements commonly include:

- High reliability
- Long lifetime
- High strength
- Light weight
- Wider temperature ranges than standard telecommunications grade fiber/cable.

At OFS we make our own optical fiber, standard and specialty. Our broad portfolio of specialty coating, buffering and cabling materials allows our engineers to design to key requirements such as high temperatures, resistance to fluids they might encounter (such as solvents and jet fuel), and specific standards for smoke and toxicity, to name a few. Aircraft requirements are extensive, and testing is required to validate the performance and qualify the cable. OFS, Specialty Photonics Division, has been serving this industry for many years with both custom and standard cables. In many cases, we have on file published results of independent testing, affirming our conformance to various criteria and testing standards. This helps make the decision to use OFS cables in your aircraft an easier one.

This brochure highlights three key cables designed for the aerospace industry:

- **FlightLink™ Cable** — this newly released cable conforms to the ARINC 802 standard for commercial aircraft cables.
- **Avioptics® Cable**
- **FlightGuide® Cables** (a family of products)

Typical Avionic Applications for OFS cables:

- In-flight Entertainment Systems
- In-flight Networking Systems
- Display Systems

- Data Transmission
- Communication Systems

- High-temperature Environments
- Corrosive Chemical Environments

What is ARINC?

ARINC Specification 802 is intended to provide standardization of fiber optic cable for the air transport industry. The goal is to avoid the proliferation of different designs of cables to serve the same function on different airplane models. This specification defines generic fiber optic cables for the operational and environmental requirements for various airplane models. ... ARINC Specification 802 comprises three sections. Section 1 provides a general description of the objectives, scope, the types of cable, and the applicable environmental categories. Section 2 addresses the desired physical properties of the fiber optic cables. Section 3 defines the qualification tests that may be used to ensure the cables meet the characteristics provided by this document.” —from official documents of the ARINC Standards Committee.



FlightLink™ Graded Index



FlightLink Cables have been tested and meet or exceed the requirements of ARINC Specification 802, Appendix C (MGT) for tight-buffered cables used in commercial aircraft.

FlightLink 62.5

Subcomponent Fiber Properties

Core diameter	62.5 ± 3 µm
Cladding diameter	125 ± 2 µm
Numerical aperture	0.275 ± 0.015
Coating type	Silicone
Coating diameter	400 ± 25 µm
Buffer	Black PFA
Buffer diameter	900 ± 25 µm

Cable Optical Properties

Attenuation	≤4.0 dB/km @ 850 nm ≤2.0 dB/km @ 1300 nm
Bandwidth	≥160 MHz/km @ 850 nm ≥500 MHz/km @ 1300 nm

Cable Design

Cable construction	Tight-Buffered Simplex (MGT) with braided strength member
Outer cable diameter	1.8 ± 0.1 mm
Cable weight	≤ 4.0 kg/km
Outer jacket material	PFA
Outer jacket color	Light purple

Installation and Usage Specifications

Maximum installation tensile load	19.3 lbs. (86 N)
Maximum operating tensile load	9.7 lbs. (43 N)
Minimum bend radius under load	25 mm
Minimum bend radius unloaded	8 mm
Cable tensile strength & elongation	< 3% elongation @ 35 kg load
Operating temperature	-55 to +125°C
Storage temperature	-55 to +85°C

Flammability, Smoke, Toxicity

Flammability: FAR 25.869	
Time to extinguish	0 seconds
Maximum burn length	< 1.5 inches
Smoke density:	
Ds @ 20 minutes	< 23.5
Toxicity: Flaming mode	
ppm @ 20 minutes	HCN <10 CO 161 NOX 11 SO ₂ 36 HF <25 HCL <3

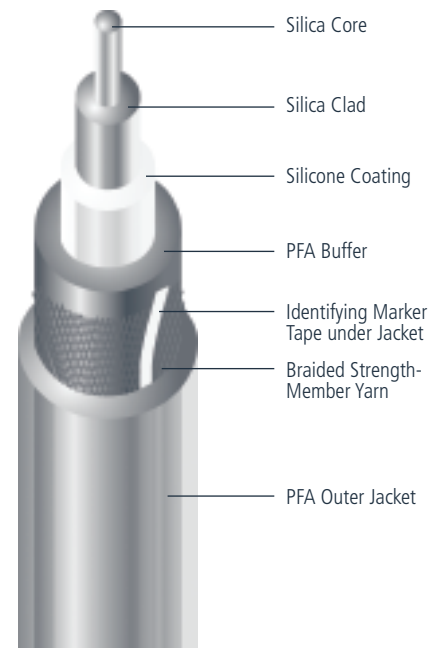
Order by Part Number: Location **A** **C22251**

Typical Applications In-flight entertainment systems, In-flight networking systems, Display systems

Epoxy/Polish Compatibility: Most commercially available connector styles

-- All testing was performed in accordance with ARINC 802 specifications by independent testing laboratories. A full qualification report is available upon request.

FlightLink Cable





Avioptics / Harsh Environment

Step-Index 200 μm HCS



A Furukawa Company

Our top multimode step-index choice for high-performance aircraft and military vehicles, Avioptics brand simplex cable offers many advantages.

Based on standard HCS® fiber, it is configured to withstand exposure to corrosive and other chemicals, including jet fuel, oil, solvents, and hydrolytic liquids.

Avioptics Simplex Step-Index 200 μm

Optical Properties

Attenuation @ 850 ≤8 dB/km

Cable Design

Fiber core diameter 200 μm ± 4 μm

Outer cable diameter 1.8 ± 0.1 mm

Cable weight ≤4.0 kg/km

Outer jacket material ETFE

Outer jacket color Violet

Installation and Usage Specifications

Maximum installation tensile load 100 lbs. (445 N)

Maximum operating tensile load 30 lbs. (133 N)

Minimum bend radius under load 25 mm

Minimum bend radius unloaded 10 mm

Operating temperature -65 to +125°C

Storage temperature -65 to +85°C

Product Description Code: HCP-M0200T-001FS

Order by Part Number: Location **AC02201-10**

Typical Applications

Aircraft sensors • Data transmission • Radio systems • Communication systems • Land vehicle wire harnesses • High temperature environments • Corrosive chemical environments • Laser power delivery • Laser initiation • Spectroscopy

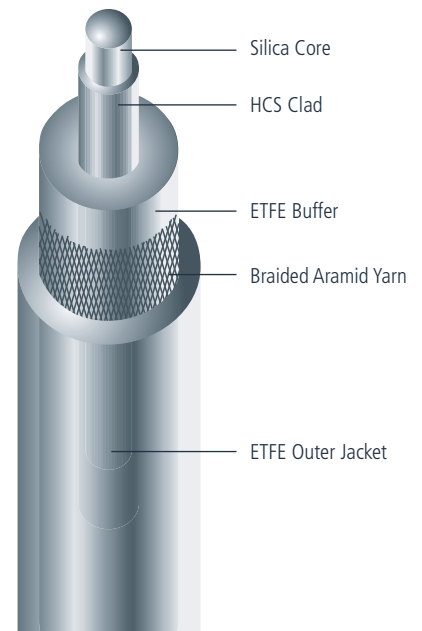
Crimp & Cleave Compatibility:

SMA Connector

Customization

OFS staff is available to recommend and assist in fiber and cable design decisions, and OFS can build and test a cable customized to your specifications.

Avioptics Cable





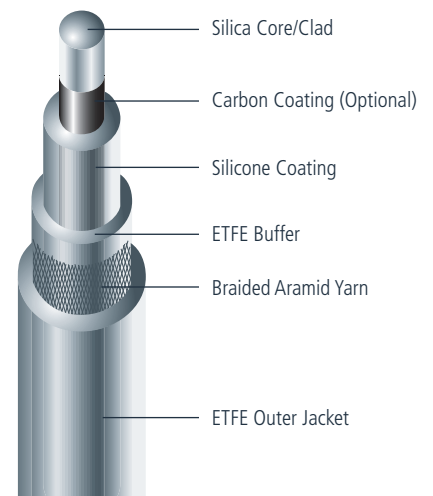
FlightGuide Cables

A wide choice of fiber designs is offered in the FlightGuide cable construction. These cables also have the highest temperature performance of our standard aerospace cables.

Single-Mode

		Single-Mode 1310/1550 nm	Single-Mode 1550 nm
Subcomponent Fiber Properties			
Mode field diameter	@ 1310 nm @ 1550 nm	5.1 ± 1.0 μm 5.8 ± 1.0 μm	not applicable 7.5 ± 0.75 μm
Cladding diameter		125 ± 2 μm	125 ± 2 μm
Numerical aperture		0.21 (nominal)	0.17 (nominal)
Coating type 1		Carbon	Carbon
Coating type 2		Silicone	Silicone
Coating type 2 diameter		450 ± 25 μm	450 ± 25 μm
Buffer		ETFE	ETFE
Buffer diameter		900 ± 50 μm	900 ± 50 μm
Cable Optical Properties			
Attenuation	@ 1310 nm @ 1550 nm	≤1.5 dB/km ≤1.4 dB/km	n/a ≤1.4 dB/km
Cable Design			
Outer cable diameter		1.8 ± 0.1 mm	1.8 ± 0.1 mm
Cable weight		4.0 kg/km	4.0 kg/km
Outer jacket material		ETFE	ETFE
Standard jacket color		Yellow	Yellow
Installation and Usage Specifications			
Maximum installation tensile load		90 lbs. (400 N)	90 lbs. (400 N)
Maximum operating tensile load		30 lbs. (133 N)	30 lbs. (133 N)
Minimum bend radius under load		25 mm	25 mm
Minimum bend radius unloaded		8 mm	8 mm
Operating temperature		-55 to +150°C	-55 to +150°C
Storage temperature		-55 to +85°C	-55 to +85°C
Order by Part Number: Location A		C10026	C10025
Typical Applications		Aircraft sensors • Data transmission • Communication systems • Corrosive chemical environments • Harsh industrial environments	
Epoxy/Polish Compatibility:		SMA Connector	

FlightGuide Cable
single-mode





FlightGuide Cables

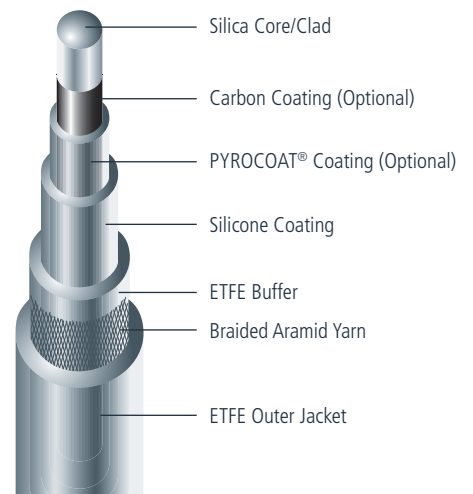


Multimode Graded-Index

	Graded Index 50/125 nm	Graded Index 62.5/125	Graded Index 100/140 Pyro
Subcomponent Fiber Properties			
Core diameter	50 ± 3 µm	62.5 ± 3 µm	100 ± 3 µm
Cladding diameter	125 ± 2 µm	125 ± 2 µm	140 ± 2 µm
Numerical aperture	0.20 ± 0.015	0.275 ± 0.015	0.29
Coating type 1	Carbon	Carbon	Carbon
Coating type 2	Silicone	Silicone	PYROCOAT
Coating type 2 diameter	450 ± 25 µm	450 ± 25 µm	171.5 ± 1 µm
Coating type 3	not applicable	not applicable	Silicone
Coating type 3 diameter	not applicable	not applicable	450 ± 25 µm
Buffer	ETFE	ETFE	ETFE
Buffer diameter	900 ± 50 µm	900 ± 50 µm	900 ± 50 µm
Cable Optical Properties			
Attenuation @ 850 nm	≤6.0 dB/km	≤6.0 dB/km	≤8.0 dB/km
Attenuation @ 1310 nm	≤4.0 dB/km	≤4.0 dB/km	≤6.0 dB/km
Bandwidth @ 850 nm	≥400 MHz/km	≥400 MHz/km	≥200 MHz/km
Bandwidth @ 1310 nm	≥400 MHz/km	≥400 MHz/km	≥200 MHz/km
Cable Design			
Outer cable diameter	1.8 ± 0.1 mm	1.8 ± 0.1 mm	1.8 ± 0.1 mm
Cable weight	4.0 kg/km	4.0 kg/km	4.0 kg/km
Outer jacket material	ETFE	ETFE	ETFE
Standard jacket color	Orange	Slate	Green
Installation and Usage Specifications			
Maximum installation tensile load	90 lbs. (400 N)	90 lbs. (400 N)	90 lbs. (400 N)
Maximum operating tensile load	30 lbs. (133 N)	30 lbs. (133 N)	30 lbs. (133 N)
Minimum bend radius under load	25 mm	25 mm	25 mm
Minimum bend radius unloaded	8 mm	8 mm	8 mm
Operating temperature	-55 to +150°C	-55 to +150°C	-55 to +150°C
Storage temperature	-55 to +85°C	-55 to +85°C	-55 to +85°C
Order by Part Number: Location A	C10027	C10028	BC05082
Typical Applications	Aircraft sensors • Data transmission • Communication systems • Corrosive chemical environments • Harsh industrial environments		

Epoxy/Polish Compatibility: SMA Connector

FlightGuide Cable
multimode 100/140 Pyro
example shown



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