Probes, Cables, & Accessories

Product Data Sheet

Optical Fiber Probes, Connections Accessories and Deployment

Overview

SensorTran offers a wide range of optical fiber and accessory products that complement their range of Distributed Temperature Sensing (DTS) systems.

Because our DTS systems are designed for use with standard telecommunication-grade optical fiber, we can easily supply custom and/or specialized designs to meet project requirements.

We offer fiber optic probes that operate in temperatures from -185° [-301°F] to +600°C [+1112°F] for deployment above-ground, underground, sub-sea, and in hazardous areas, as well as harsh H_2 and radiation environments.

We offer a wide range of connection accessories, including multi-core fiber-optic transit cable, connectors, and fiber-optic junction boxes.

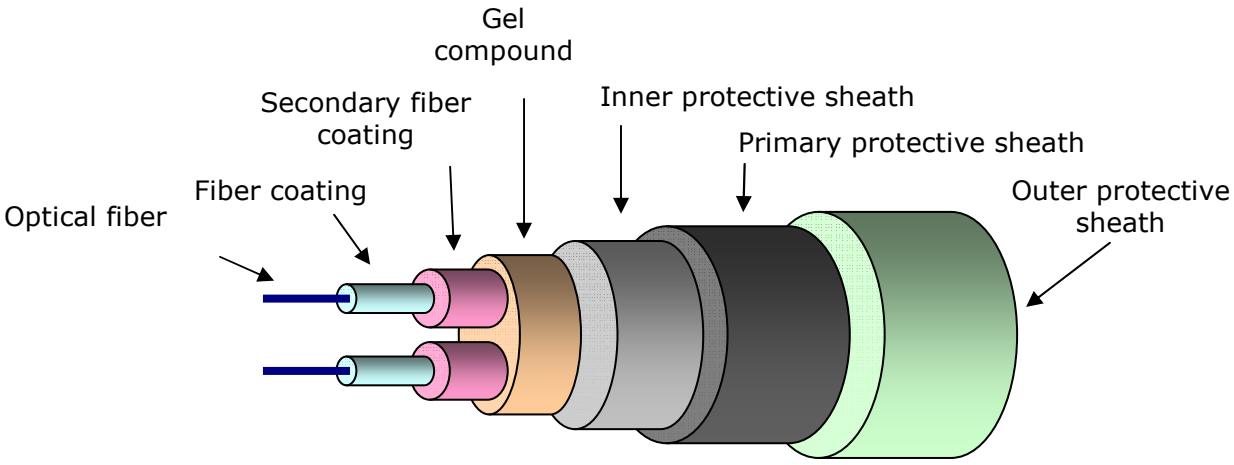
SensorTran has also developed application-specific probe deployment techniques to suit individual application needs.

Probe Construction

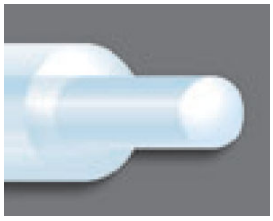
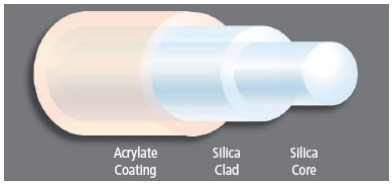
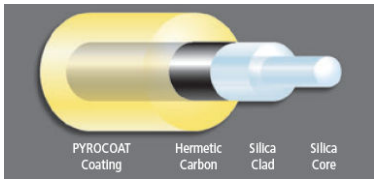
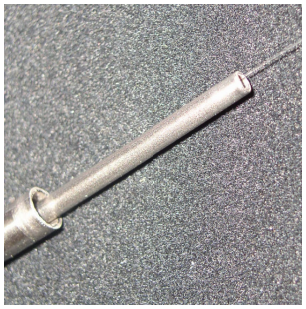
For every project, the probe construction, deployment method, and associated accessories must be carefully designed and selected for the application and duties required.

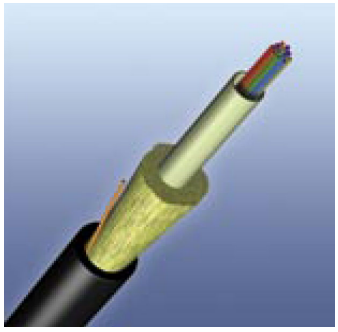
Probes are available with either acrylate or polyimide fiber coating with a range of secondary coatings and protective sheaths including metallic types (fiber-in-metal tube – FIMT).

The diagram below highlights the typical components of constructed probes.



Probe Specification

Optical Fiber 	The optical fiber is standard telecommunications grade. It is available as either 50/125µm graded-index **multimode** or 9/125µm step-index **singlemode**, for compatibility with either the DTS5100-M Series (multimode systems) or DTS5100-S Series (singlemode systems) respectively. Single or multiple fibers can be constructed into the probe.
Fiber Coating 	**Arcylate** coated fibers are good for applications where the probe is exposed to a continuous temperature range of -20°C [-4°F] to +80°C [+176°]. **Polyimide** coated fibers are good for applications where the probe is exposed to a continuous temperatures of -185°C [-301°F] to +350°C [+662°F]. The operating temperatures of the optical fibers can be increased when used in conjunction with metallic primary protective sheaths such as stainless steel. In these cases the following maximum operating temperatures can be achieved: Acrylate coated: + 90°C [+194°F] Polyimide coated: +400°C [+752°F]
Secondary Fiber Coating 	An additional **carbon** coating can be added to ensure longer-term operation within harsh environments, such as when high H_2 levels are present. Carbon coating is only suitable for environment temperatures up to 150°C [302°F]. Other metallic and rare-metal secondary coatings are also available such as aluminium and gold. These materials allow probes to operate in temperatures up to +600°C [+1112°].
Gel Compound 	**Gel** compound aids the thermal conductance between an outer metallic sheath and the optical fibers. However, this compound suffers from accelerated aging when exposed to temperatures above +85°C [+185°F] and should be avoided at elevated temperatures. A probe with a metallic protective sheath with no gel compound is often referred to as a "loose tube" construction.
Inner Protective Sheath 	The inner protective sheath is usually a metallic tube made either of aluminium or stainless steel. This inner sheath provides additional mechanical and chemical protection when used in conjunction with a metallic primary protective sheath. In such a case, the construction is often referred to as a "**tube-in-tube**" construction. The benefit of an aluminium inner protective sheath is that it provides additional protection to the optical fiber(s) when used in high H_2 environments. As an alternative, non-metallic probe constructions can be provided where the inner protective sheath is a **semi-loose buffer tube**.

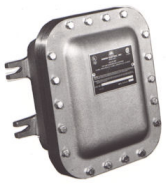
Primary Protective Sheath 	The primary protective sheath is typically a **stainless steel** tube (304, 316 or 316Ti grade) which provides excellent mechanical and chemical protection, while allowing heat to be conducted to the optical fibers. The use of a metallic protective sheath is often referred to as FIMT (fiber-in-metal-tube) construction. These can be supplied in various tube diameters, typically 3.2mm [¼"] or 6.4mm [½"], with a typical wall thickness of 0.5mm [0.020"] and [0.035"] respectively. As an alternative, we offer non-metallic probe constructions in which the primary protective sheath is an **aramid yarn** to provide the mechanical strength.
Outer Protective Sheath 	The outer protective sheath is normally a **poly-plastic** material which can be supplied to meet **flame retardant**, **low-smoke**, and/or **zero-halogen** requirements. This outer sheath can also be required in order to reduce the risk associated with sparking where the main protective sheath is metallic.
Special Constructions 	SensorTran can also supply multi-fiber steel-wired or steel-strip **armored** optical fiber probe constructions to meet specific project requirements. These constructions may be necessary for subsea or underground constructions, or for situations needing high-levels of mechanical protection. A range of "**air-blown**" probe constructions is also available upon request.

Optical Junction Boxes and Connectors

SensorTran offers a range of optical fiber junction boxes suitable for indoor, outdoor, and hazardous/explosion areas.

Our range of optical connectors includes diamond push-fit, screw, and bayonet types.

For sub-sea applications, SensorTran can also supply a range of wet-mate connectors to exacting specifications.



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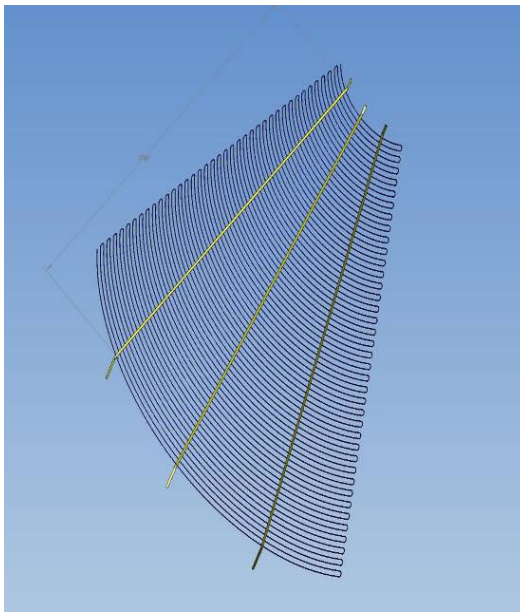
Deployment Methods and Installation Services

SensorTran provides complete optical fiber design, engineering, deployment, system installation, testing, and commissioning services worldwide for both onshore and offshore installations.

Probes with customized configurations, layouts, and forms are available either pre-constructed or constructed at site, together with highly developed attachment methods and techniques.

SensorTran also provides on-site optical fiber deployment using a variety of developed techniques for installation within, for example, existing or supplied conduit and control lines.

Specialized and qualified welding techniques and low-loss optical splicing methods are employed as required.



The SensorTran Advantage

SensorTran, a NASA technology spin-off, is committed to supplying its customers with smart distributed monitoring solutions. SensorTran's systems are conceived to have a low lifetime cost of ownership (LCO) by way of efficient design, superior engineering, and reliable construction. SensorTran's team is dedicated to providing "best-in-industry" customer care from project conception to the development of specifications, through installation, training, and beyond.

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2006 FROST & SULLIVAN North American Award for Product Innovation

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