

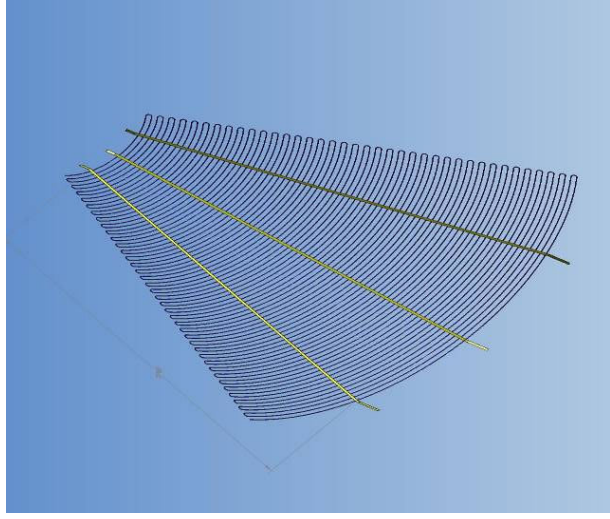
## Deployment Methods and Installation Services

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.

SensorTran has made every effort to ensure information contained in this document is accurate at the time of printing, however, product specifications and features are subject to change without notice.

## Contact



**SENSORTRAN**

Distributed Monitoring  
Solutions

### Corporate HQ & Manufacturing

4401 Freidrich Lane, Suite 307  
Austin, TX 78744  
USA

+1-512-583-3520

e-mail inquiries to [sales@sensortran.com](mailto:sales@sensortran.com)

[www.sensortran.com](http://www.sensortran.com)

### International Sales Office

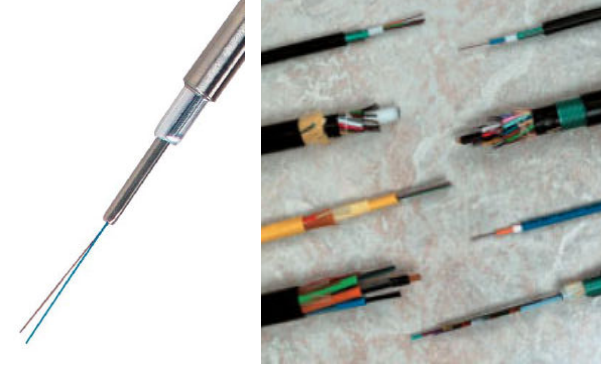
Regus House, George Curl Way  
Southampton, SO 18 2RZ  
England

+44 2380 30 2705

# Probes, Cables, & Accessories

## Product Data Sheet

### Optical Fiber Probes, Connections Accessories and Deployment



## Overview

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

Because our DTS systems are designed for use with standard telecommunication grade optical fiber, custom and specialized designs can be easily supplied to meet project requirements.

Fiber optic probes can be supplied to operate in temperatures from -185° [-301°F] to +700°C [+1292°F] for deployment above-ground, underground, sub-sea and in hazardous areas as well as harsh H<sub>2</sub> and radiation environments.

A wide range of connection accessories is also available including multi-core fiber-optic transit cable, connectors and fiber-optic junction boxes.

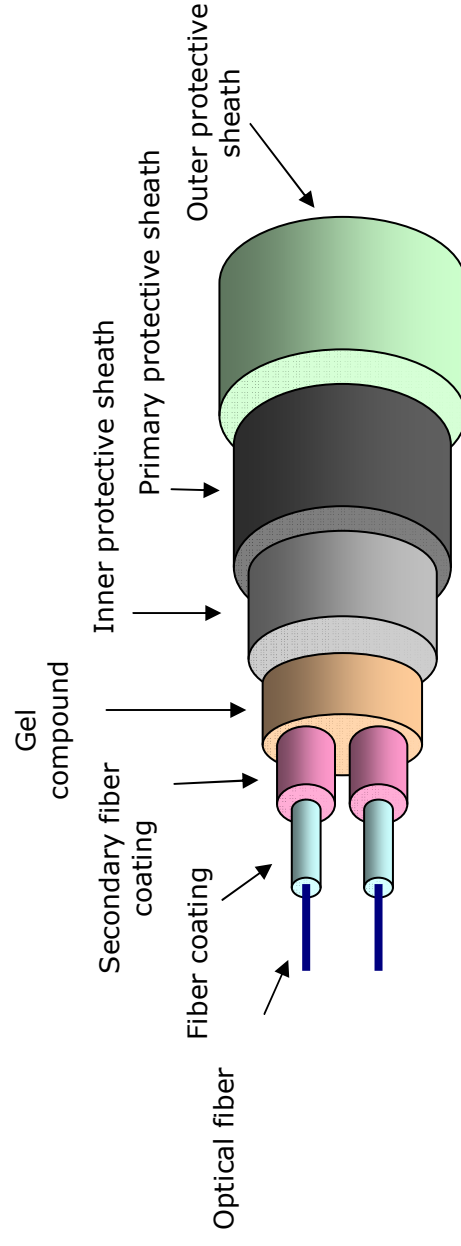
SensorTran has also developed application-specific probe deployment techniques to suit individual application needs.

## Probe Construction

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


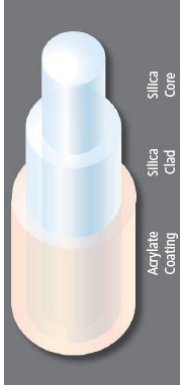
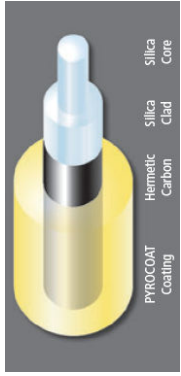


Probes are available with either acrylate or polyimide fiber coating with a range of secondary coatings and protective sheaths including metallic types (fiber-in-metal tube – FIMT).

Typical construction elements are specified below.

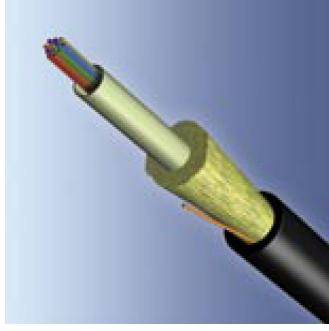




Probe Specification

<p><b>Optical Fiber</b></p> 	<p>The optical fiber is standard telecommunications grade. It is available as either 50/125µm graded-index <b>multimode</b> or 9/125µm step-index <b>singlemode</b>, for compatibility with either the DTS5100-M Series (multimode systems) or DTS5100-S Series (singlemode systems) respectively.</p> <p>Single or multiple fibers can be constructed into the probe.</p>
<p><b>Fiber Coating</b></p> 	<p><b>Acrylate</b> 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°F].</p> <p><b>Polyimide</b> coated fibers are good for applications where the probe is exposed to a continuous temperature of -185°C [-301°F] to +350°C [+662°F].</p> <p>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:</p> <p>Acrylate coated: +90°C [+194°F] Polyimide coated: +400°C [+752°F]</p>
<p><b>Secondary Fiber Coating</b></p> 	<p>An additional <b>carbon</b> coating can be added to ensure longer-term operation within harsh environments such as in the presence of high H<sub>2</sub> levels. Carbon coating is only suitable for environment temperatures up to 150°C [302°F].</p> <p>Other metallic and rare-metal secondary coatings are also available such as aluminium and gold. These allow probes to operate in temperatures up to +700°C [+1292°F].</p>
<p><b>Gel Compound</b></p> 	<p><b>Gel</b> 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.</p> <p>A probe with a metallic protective sheath with no gel compound is often referred to as a "loose tube" construction.</p>
<p><b>Inner Protective Sheath</b></p> 	<p>The inner protective sheath is usually a metallic tube made either of aluminium or stainless steel. This 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 "<b>tube-in-tube</b>" construction.</p> <p>The benefit of an aluminium inner protective sheath is that it provides additional protection to the optical fiber(s) when in high H<sub>2</sub> environments.</p> <p>As an alternative, non-metallic probe constructions can be provided where the inner protective sheath is a <b>semi-loose buffer tube</b>.</p>

Primary Protective Sheath



The primary protective sheath is usually 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 [1/4"] or 6.4mm [1/2"], with a typical wall thickness of 0.5mm [0.020"] and [0.035"] respectively.

As an alternative, non-metallic probe constructions can be provided where 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 to reduce the risk associated with sparking where the main protective sheath is metallic.

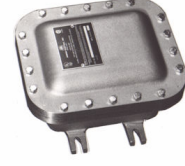
Special Constructions



SensorTran can also supply multi-fiber steel-wired or steel-strip **armored** optical fiber probe constructions to meet specific project requirements as may be necessary for subsea or underground constructions or those 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 include diamond push-fit, screw and bayonet types.

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

