

# Distributed Temperature Sensing Fiber Optic Cable (GTSXY)

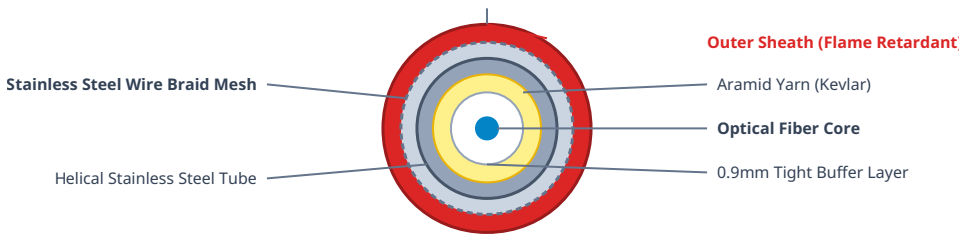
## Armored High-Temperature Sensing Optical Cable Technical Datasheet

### Product Description

The **Distributed Temperature Sensing Fiber Optic Cable (GTSXY)** (Armored / High-Temperature Resistant) utilizes highest-grade single-mode or multi-mode optical fiber cores. Based on actual application requirements, corresponding tight-buffered layers are applied. The cable is protected by an armor layer composed of a stainless steel capillary tube and a tensile stainless steel wire braid mesh, safeguarding the optical fiber from physical damage.

The outer sheath is made of high-performance flame-retardant material featuring excellent thermal conductivity, superior mechanical durability, robust waterproofing, and high corrosion resistance, enabling it to withstand harsh construction conditions and demanding operational environments.

### Cable Cross-Section & Component Structure



### Product Features

**Stainless Steel Armoring Protection:** Stainless steel capillary tube & tensile wire braid mesh protect fibers against damage.

**Rapid Temperature Response:** High thermal conductivity construction ensures quick and accurate thermal detection.

**Aramid Yarn Reinforcement:** High-tensile aramid fibers significantly strengthen cable tensile capability.

**High-Performance Flame Retardance:** Outer sheath provides thermal conductivity, mechanical stability, waterproofing, and corrosion resistance.

**Weak Field Interference Immunity:** Resists low electromagnetic field disturbance (Note: Not for extreme EMF environments).

**Customized Engineering:** Fully customizable based on site construction requirements and operating environments.

### Measurement Principle

Utilizes **Spontaneous Raman Scattering** and **Optical Time-Domain Reflectometry (OTDR)** in optical fiber to retrieve spatial distributed temperature data.

When laser pulses of specific energy and width are launched into the optical fiber, backward Raman scattering waves are generated during propagation. The intensity of the backscattered Raman light wave shifts in direct proportion to the ambient temperature at the scattering point. By analyzing the backscattered Raman wave, continuous temperature variations along the optical fiber can be precisely demodulated.

### Technical Parameters

| Item             | Sub-Item                   | Parameter Value                                                    |
|------------------|----------------------------|--------------------------------------------------------------------|
| Outer Dimensions | Cable Outer Diameter       | 3.0 mm $\pm$ 0.1 mm                                                |
|                  | Armoring Tube              | Stainless Steel Armored Tube                                       |
| Materials        | Strength Member            | Aramid Yarn / Stainless Steel Braid Mesh                           |
|                  | Outer Sheath               | Flame-Retardant PVC or LSZH                                        |
| Optical Fiber    | Fiber Type                 | Multimode 62.5/125; Singlemode 9/125                               |
|                  | Fiber Core Count           | 1-Core / 2-Core                                                    |
| Optical Specs    | Attenuation Rate           | < 3.0 dB/km (850nm)<br>< 1.5 dB/km (970nm)<br>< 0.7 dB/km (1300nm) |
|                  | Effective Refractive Index | 1.481 (850nm), 1.476 (1300nm)                                      |
|                  | Allowable Tensile Force    | Long-Term: 200 N<br>Short-Term: 400 N/10cm                         |
| Mechanical Specs | Allowable Crush Resistance | Long-Term: 200 N/10cm<br>Short-Term: 400 N/10cm                    |
|                  | Bending Radius             | 60 mm (Unloaded)<br>80 mm (Under Load)                             |
|                  | Flexing Endurance (100N)   | 500 cycles (Radius 50mm)                                           |
| Electrical Specs | Outer Sheath Insulation    | 5000 VDC                                                           |
| Physical Specs   | Operating Temperature      | -30°C to +90°C (up to 120°C for $\geq$ 48h)                        |
|                  | Cable Net Weight           | 22 kg/km                                                           |

| Item              | Sub-Item                  | Parameter Value     |
|-------------------|---------------------------|---------------------|
| Lifespan & Rating | Service Life / Protection | ≥ 30 Years / ≥ IP67 |

*Note: Storage & Operating Temp Range: -40°C to +70°C. Data for engineering reference.*

## Product Standards

**Compliance Standards:** GTSXY Optical Sensing Cable fully complies with **YD/T 2488-2013** and **IECA-596** industry standards.