Dubai Pipeline Temperature Measurement Optical Cable Specifications



Overview

Permanent fiber-optic cable One optical fiber provides temperature measurements every 0.5 m [about 1.6 ft] along its length, producing a profile of tempera.

Key Takeaways

Pipeline temperature monitoring in Dubai typically uses fiber optic cables embedded in protective tubes, providing continuous distributed temperature sensing along the pipeline.

Fiber Optic Cable Structure

For pipeline temperature measurement, distributed temperature sensing (DTS) systems use optical fibers as the sensing element. The fiber is often embedded in a small-bore stainless steel tube and wrapped between tensile armors during pipe manufacturing to protect it from mechanical stress and environmental damage. Loose tube designs may also be used, allowing the fiber to move freely within the cable, which enhances durability and strain tolerance.

These cables are designed to meet international standards such as Telcordia GR-20 and ICEA 640, ensuring reliability in harsh environments.

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Typical Dimensions and Deployment

While exact dimensions vary by manufacturer, a typical DTS fiber optic cable for pipeline monitoring has the following characteristics: Outer diameter: Usually in the range of 6–12 mm for armored cables embedded in pipelines. Fiber type: Single-mode optical fiber for long-distance temperature measurement. Protective layers: Stainless steel tube, tensile armoring, and outer polymer sheath for mechanical protection and environmental resistance.

Installation: Buried alongside pipelines or embedded within flexible pipes, allowing continuous temperature monitoring from seabed to surface. The cable is terminated at the topside end fitting with an optical connector, enabling integration with DTS interrogators such as Yokogawa DTSX3000 or VIAVI DTS systems. These systems can measure temperature over distances up to 50 km, providing high-resolution temperature profiles along the pipeline.

Sensing Capabilities

Temperature accuracy: ±0. 1°C, suitable for flow assurance and integrity monitoring. Distributed sensing: The fiber itself acts as thousands of temperature sensors along the pipeline, eliminating the need for discrete sensors.

Additional monitoring: Some cables also support strain and acoustic sensing for leak detection and intrusion monitoring.

Summary

In Dubai pipeline applications, fiber optic DTS cables are robust, armored, and designed for long-distance, high-resolution temperature monitoring. They typically feature a stainless steel tube with tensile armoring, an outer protective sheath, and single-mode optical fibers. These cables are integrated with DTS interrogators to provide continuous, real-time temperature profiles, supporting pipeline integrity, flow assurance, and early detection of anomalies.

Article Content

Permanent fiber-optic cable

One optical fiber provides temperature measurements every 0.5 m [about 1.6 ft] along its length, producing a profile of temperature effects along the production string and—when applicable—across

Raman Optical Fiber Distributed Temperature Sensor

Raman Optical Fiber Distributed Temperature Sensor by Tempsens UAE. Extended range distributed temperature sensor for pipeline & cable monitoring systems.

Distributed Temperature Sensing (DTS) Brochure

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Measure the temperature along a fiber optic cable or optical loss/attenuation, bend detection and integrity monitoring (Patent pending) with the integrated dual wavelength Rayleigh OTDR.

Fiber Optic Cable and Switches Specifications

Each cable and inner duct are to be permanently labelled at each end with a unique cable number. In addition, labels shall be affixed to the cable/inner duct at every transition of a vault, hand hole, riser

DTSX3000 Distributed Temperature Sensor

DTSX measures temperature distribution over the length of an optical fiber cable using the fiber itself as the sensing element and it is ideal for temperature monitoring over long distances and wide areas.

Distributed Temperature Sensing (DTS) | NKT

An optical laser pulse is transmitted through the fibre, and the analysis of scattered light returning to the transmitting end provides precise temperature measurements along the cable''s length.

Distributed Temperature Sensing Fiber Optic Cable (DTS)

The DTS Fiber Optic Cable enables accurate monitoring of temperature changes in the pipelines, making it possible to detect and pinpoint areas where leaks occur.

Distributed Temperature Sensing (DTS) Systems | Optromix

Optromix DTS 500 Series remotely measures temperature along a fiber optic cable of up to 16 km (10 miles) long in real-time. This fiber optic cable is not subject to electromagnetic interference, chemical

Distributed Sensing Cables for DAS & DTS

Discover how Samm Teknoloji''s distributed fiber optic sensing cables can transform your monitoring strategy—contact us for detailed specifications and tailored

Distributed Temperature Sensing (DTS) | AP Sensing

Distributed Temperature Sensing (DTS) systems provide temperature information for accurate thermal monitoring, fire detection, and condition assessment by utilizing standard fiber optic cables. These

(PDF) OFDR Distributed Temperature and Strain Measurements with Optical ...

PDF | On Jul 8, 2014, Laurent Maurin and others published OFDR Distributed Temperature and Strain Measurements with Optical Fibre Sensing Cables: Application to Drain Pipeline Monitoring in a ...

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Accuracy of Distributed Optical Fiber Temperature Sensing for Use in ...

Abstract Accurate and rapid detection of leaks is important for subsea oil pipelines to minimize environmental risks and operational/repair costs. Temperature-sensing optical fiber cables

Ansys | Engineering Simulation Software

Ansys engineering simulation and 3D design software delivers product modeling solutions with unmatched scalability and a comprehensive multiphysics foundation.

OFDR DISTRIBUTED TEMPERATURE AND STRAIN MEASUREMENTS WITH OPTICAL

Optical fibre distributed temperature measurements were then successfully compared to thermocouple reference measurements, whereas optical sensing cable data were processed to provide distributed

Principles of Distributed Temperature Sensing

Dive into the principles of Distributed Temperature Sensing (DTS) with Silixa. Explore optical fiber technologies for diverse environmental applications.

Scour Monitoring System for Subsea Pipeline Based on Active ...

A scour monitoring system for subsea pipeline based on active thermometry is proposed in this paper. The temperature reading of the proposed system is based on a distributed Brillouin

DTSX3000 Distributed Temperature Sensor

What Is Distributed Temperature Sensing? Distributed temperature sensing (DTS) measures temperature distribution over the length of an optical fiber cable using

Accuracy of distributed optical fiber temperature sensing for use in ...

The aim of this paper was to explore the use of a network of distributed fiber optical temperature sensing cables for use in detection of leaks in heated oil pipelines.

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