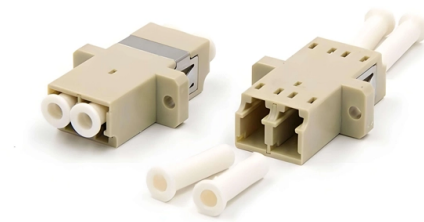


Application of French Downhole Temperature Measurement Optical Cable



Article Overview

Downhole temperature measurement optical cables use fiber-optic technology to provide continuous, high-resolution temperature profiles along the wellbore, enabling real-time monitoring of reservoir and well performance.

Overview of Technology

Downhole optical cables for temperature measurement rely on Distributed Temperature Sensing (DTS), which uses Raman scattering in optical fibers to detect temperature changes along the cable length . A laser pulse is sent through the fiber, and the backscattered light is analyzed to determine temperature at multiple points, providing a continuous thermal profile. DTS systems can detect temperature changes as small as 0.01°C, allowing precise identification of fluid movement, leaks, or thermal anomalies in the wellbore .

Cable Design and Construction

Permanent downhole fiber-optic cables are engineered to withstand extreme downhole conditions, including high pressure, elevated temperatures, mechanical shock, and corrosive fluids . Key design features include:

- Fiber-in-Metal Tube (FIMT): Optical fibers are hermetically sealed in stainless steel or INCONEL® tubes, protecting against chemical ingress and microbending .
- Multi-mode and single-mode fibers: Multi-mode fibers are typically used for DTS,...

Article Content

Apr 06, 2026

(PDF) A Review of Downhole Communication Technologies

Also, measures the environmental and reliable measurements such as downhole flow rate, density and water cut

Mar 12, 2026

(PDF) Distributed temperature sensing in the oil and gas industry ...

The use of fibre optic cables is not limited to temperature measurements, also acoustic vibrations can be detected and

May 25, 2026

Applications of Distributed Fiber Optic Strain Sensing for Real-Time ...

This contribution focuses on the potential of real-time downhole monitoring techniques along fiber optic cables which are

Nov 04, 2025

Distributed Temperature Sensing as a downhole tool in hydrogeology

The purpose of this review is to outline and discuss the various applications and limitations of DTS in down-hole

Jul 24, 2025

Fiber optics

Our proven fiber optics technologies also support point measurement pressure/temperature gauges to monitor downhole pressure

Aug 29, 2025

Fiber Optic Distributed Temperature Sensing | US EPA

Abstract: Distributed Temperature Sensing (DTS) technology enables downhole temperature monitoring to study

May 28, 2026

Fiber optic pressure and temperature sensors for oil down hole application

One cable with two DAS fibers, two DTS fibers, and one fiber for a downhole fiber optic pressure/temperature gauge

Apr 30, 2026

Fiber Optics | GEO PSI

Distributed Temperature Sensing (DTS) utilizes multi-mode Fiber Optic cables to measure distributed temperature

Nov 18, 2025

PHOTONICS APPLIED: OPTICAL SENSING: Downhole sensing puts fiber optics ...

Unfortunately, the downhole environment is not kind to optics: Extremely high temperatures and pressures along with vibration and

Mar 25, 2026

High-Temperature Downhole Cable

High-Temperature Downhole Cable As the leading supplier of downhole fiber optic cable used in the oil and gas industry, AFL

Jan 21, 2026

Real-Time Fiber Optic Monitoring Applications in

The field cases presented showed some applications of the fiber optic monitoring system,

Feb 19, 2026

Downhole Cables

TEF cable is a key enabler of modern well management technologies. TEF cable is the sensor element for modern distributed fiber

May 01, 2026

A Module of Fiber Optic Communication for High-Temperature Downhole ...

Compared to traditional downhole transmission methods, fiber optic communication enables real-time, high data rate transmission.

Feb 14, 2026

An Industry Overview of Downhole Monitoring Using Distributed ...

Abstract Distributed Temperature Sensing (DTS) system using optical fiber has been deployed for downhole

Apr 29, 2026

Downhole fiber optic temperature-pressure innovative measuring

In this study, fiber optic Bragg grating (FBG) measurement technology is utilized applied in an attempt to replace more

Sep 03, 2025

Brochure_Application_Well_Reservoir_Monitoring_2025-08_EN_A11

It provides many benefits, such as the ability to perform different measurement types (e.g., temperature, acoustic, strain) using a

Apr 18, 2026

Smart Fibres DPTS Brochure

Distributed permanent downhole pressure and temperature gauges Multiple gauges integrated on a single 1/4" control line Factory

Jun 13, 2026

Permanent fiber-optic cable

Permanent downhole fiber-optic cables are critical infrastructure in wellbore monitoring systems, ensuring reliable transmission of

Aug 12, 2025

Application of Coiled Tubing Distributed Optical Fiber Temperature ...

The distributed optical fiber temperature sensing (DTS) system is used to collect the high frequency temperature

Nov 08, 2025

Distributed <fc>T</fc>emperature <fc>S</fc>ensing as a downhole

Our review confirms that the application of DTS has significant advantages over discrete point temperature measurements,

Mar 24, 2026

Downhole Fiber-Optic Monitoring: An Evolving Technology

Fiber Optics It has been an impressive comeback for a technology that once stood on the brink of failure. The upstream

Mar 14, 2026

An improved fiber optic pressure and temperature sensor for downhole ...

Abstract We report on the fabrication of a high pressure extrinsic Fabryâ€‘Perot interferometric (EFPI) fiber optic

Feb 22, 2026

Distributed Temperature Sensing as a downhole tool in hydrogeology ...

Section of a temperature-depth profile collected in an open well at the Ploemeur research site, France, showing (a)

May 18, 2026

Downhole Cables

TEF cable is the sensor element for modern distributed fiber optic sensing technologies of DTS and DAS, which have become

Sep 09, 2025

How Fiber Optics Are Used in the Oil & Gas Industry

DAS and DVS technology uses optical fibers to monitor and analyze acoustic signals generated by

Feb 10, 2026

Fiber Optics | GEO PSI

By pairing fiber optics with gauge sensing technology, we give you a more complete picture of downhole conditions

Jun 25, 2026

Distributed Pressure and Temperature Sensing | DPTS

Our DPTS technology is comprised of a string of optical SmartPort pressure/temperature gauges,

Aug 30, 2025

Application of Downhole Distributed Fiber Grating Monitoring

Petroleum is an essential strategic resource in various countries" economic and industrial development. The environment of high

May 24, 2026

Research on calibration method of downhole optical fiber temperature ...

Hydrologic research is a very demanding application of fiber-optic distributed temperature sensing (DTS) in terms of

Jan 27, 2026

FIBER OPTIC SENSING IN THE OIL AND GAS INDUSTRY

It discusses downhole fiber cables and how they are deployed. The chapter also discusses drivers for fiber optic

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