

Application of fiber optic cable for downhole temperature measurement in the Maldives



AI Overview

Fiber optic cables, using Distributed Temperature Sensing (DTS), provide continuous, real-time downhole temperature profiles, enabling precise monitoring of well and reservoir conditions in the Maldives.

Overview of Fiber Optic Downhole Temperature Measurement

Fiber optic cables can be deployed in wells to measure temperature along the entire length of the borehole. Distributed Temperature Sensing (DTS) uses multi-mode optical fibers and laser pulses to generate a continuous temperature profile via the Raman scattering effect. The reflected light is analyzed to determine temperature variations with high spatial resolution, often down to less than one meter, and temporal resolution from sub-second to real-time. This allows operators to monitor thermal behavior continuously, unlike traditional point sensors.

Deployment Methods

Fiber optic cables can be installed on tubing or behind casing, protected by steel or plastic jacketing to withstand mechanical and chemical stresses. Proper attachment using cable clamps and centralization ensures accurate thermal coupling with the formation. The annular fill (gas, liquid, or cement) and well completion design influence the mechanical coupling and measurement accuracy. Permanent installations behind casing are preferred for long-term monitoring, especially in offshore or high-vibration environments.

Applications in the Maldives

In the Maldives, where offshore wells and geothermal or hydrocarbon exploration may be conducted, fiber optic DTS can provide:

- Real-time reservoir monitoring:** Detect temperature changes during fluid injection or production, helping optimize recovery and prevent thermal shocks.
- Well integrity assessment:** Identify zones of fluid entry...

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The application prospects of fiber optic Mach-Zehnder Interferometer (MZI) acousto-sensing technology in the field of partial discharge detection are promising.

Research Progress of Applying Distributed Fiber Optic Measurement ...

This paper describes the current application status of DASs and DSSs in hydraulic fracturing and production monitoring, respectively, from the principle of distributed fiber optic

Fiber-Optic Pressure Sensors: Recent Advances in Sensing

Fiber-optic interferometers have received considerable attention for their potential sensing applications in refractive index, temperature, pressure, and strain measurements.

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

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Fiber Bragg Grating Sensor

Canada's extreme temperature swings make optical sensors a logical choice for remote transmission lines prone to ice loading. Mexico adopts fiber arrays in automotive factories to reduce

Offshore downhole telemetry using sea floor cable

U.S. Patent Application US20200270988A1 for an offshore measured or logging-while drilling electromagnetic telemetry system includes a bottomhole assembly having a transmitter to

Distributed Fiber Optic Sensor Market Size, Share and

AI/Gen AI Impact on Distributed Fiber Optic Sensor Market Advanced technologies have gained ground in industries, and AI-powered distributed fiber optic sensors

Application of Coiled Tubing Distributed Optical Fiber Temperature ...

The distributed optical fiber temperature sensing (DTS) system is used to collect the high frequency temperature through the coiled tubing downhole optical fiber.

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Distributed Temperature Sensing Fiber Market latest Statistics on ...

These companies typically deploy fiber-based sensing in combination with completion services and reservoir analytics. Temporary and permanent downhole fiber installations have increased by nearly

Real-time fiber-optic interpretation and analysis

Distributed fiber-optic monitoring provides unmatched visibility into the reservoir. Yet in many operations, its value remains out of reach. That's because operators face four key challenges: time-consuming

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Fiber-optic Sensors - Buyer's Guide & Suppliers

This buyer's guide for fiber-optic sensors provides technical background, comparison of major types, selection criteria, and an overview of suppliers.

Fiber Optic Sensing for Downhole Monitoring in Oil & Gas

Explore how fiber optic sensing is transforming downhole monitoring for safer, more efficient oil and gas operations.

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Integrated wellbore-reservoir-geomechanics modeling for enhanced ...

Recently, distributed fiber-optic sensing has enabled monitoring of the hydraulic fracturing process and subsequent, long-term, production dynamics in fractured reservoir behavior. Distributed

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Application of fiber optics in oil and gas field development ...

In this study, we presented a comprehensive review on the application of fiber optics in monitoring well integrity, sand production, flow profiling, fracture orientation and propagation, and

Fiber optics

Our proven fiber optics technologies also support point measurement pressure/temperature gauges to monitor downhole pressure and temperature changes for ESP monitoring and sub-cool optimization.

Real-Time Fiber Optic Monitoring Applications in Various Downhole ...

Following are a few field cases where this technology has helped companies make decisions and produced outstanding results. A fiber-optic cable was permanently installed along the

FIBER OPTICS: Downhole Fiber-Optic Monitoring: An Evolving

It has been an impressive comeback for a technology that once stood on the brink of failure. The upstream oil and gas industry has largely resolved crippling technical challenges that

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