

# Model of Balin Well Temperature Measurement Optical Cable



## Article Overview

The Balin well temperature measurement optical cable is a permanent downhole fiber-optic cable designed for distributed temperature sensing (DTS) in harsh well environments.

### Cable Design and Construction

The cable typically uses a tube-in-tube design, where the optical fibers are housed inside a hermetically sealed stainless steel or INCONEL® tube known as Fiber in Metal Tube (FIMT) . This core contains a mix of single-mode and multimode fibers to support both sensing and communication. Filling gels inside the FIMT protect the fibers from microbending and chemical ingress. The FIMT is supported by an extruded polymer layer (belt), which centralizes the core and provides mechanical buffering. The outer tube acts as the primary pressure barrier and mechanical shield, allowing the cable to withstand high pressure, elevated temperatures, mechanical shock, and corrosive fluids .

### Sensing Capabilities

The cable is used for distributed temperature sensing (DTS), often combined with distributed acoustic sensing (DAS) and distributed strain sensing (DSS) . DTS works by detecting Raman or Brillouin scattering along the fiber, which varies with temperature, allowing continuous, real-time temperature profiling along the entire wellbore . The system can achieve high resolution, with temperature measurement...

## Article Content

Jan 02, 2026

Distributed fiber-optic temperature monitoring in boreholes of a ...

Abstract Monitoring the in-situ temperature is key for the characterization of a seasonal geothermal energy storage.

Apr 06, 2026

Measurement Method for Temperature Sensitivity Coefficient of

Measurement Method for Temperature Sensitivity Coefficient of Embedded Optical Fiber in High-Voltage XLPE Cable—Shorter Than

Nov 27, 2025

6.35mm Permanent Oil Well Sensor Optical Cable for

The optical cable adopts seamless steel pipe and high temperature resistant special optical fiber. The

Apr 13, 2026

Downhole Fiber Optic Cable | Fibercore

Fibercore offers a range of designs for downhole fiber optic cable to meet the specific requirements of your oil or gas well. These

Apr 03, 2026

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

Distributed fiber optic temperature and strain sensing technology are used to measure thermal as well as load signatures during the

May 10, 2026

Distributed Temperature Sensing (DTS) Brochure

Measure the temperature along a fiber optic cable or optical loss/attenuation, bend detection and integrity monitoring (Patent

Feb 15, 2026

A distributed optical fiber temperature measuring system for oil wells

This paper introduces a distributed optical fiber temperature measurement system for oil well temperature profile

Aug 25, 2025

(PDF) Monitoring cold water injections for reservoir characterization ...

Fiber optic sensing has gained importance for wellbore monitoring and reservoir characterization in geothermal fields

Feb 08, 2026

Fiber optic temperature sensing: A new tool for temperature ...

A 3 m long well model is developed from the modelling and is instrumented with different types of fibre optic cables to

Sep 15, 2025

Application of Distributed Temperature Sensing (DTS) in Geothermal

Despite its importance, downhole temperature measurements were often overlooked for many years in favor of data obtained from

Jan 16, 2026

Temperature Monitoring for 500 kV Oil-Filled Submarine Cable Based

The 500 kV oil-filled ac submarine cables in the networking project of China's southern coast are large capacity, ultrahigh-voltage

Jul 01, 2026

Distributed fiber optic temperature and strain sensing in cementing

In this study, we installed two fiber optic cables with different designs into a new well, a soft-flat cable and a stainless

Nov 20, 2025

Temperature Measurement Using Optical Fiber Methods: Overview

The paper deals with the overview of fiber optic methods suitable for temperature measurement and monitoring. The aim is to

May 31, 2026

Research on Distributed Optical Fiber in Oil Well Temperature Field ...

Distributed optical fiber temperature measurement is an emerging technology. The technology has a good application prospects in oil

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The Essentials of Fiber-Optic

The temperature measured in the well-bore at a given point above a flowing zone is flow rate and time dependent In addition to this

Feb 22, 2026

A Review of Measurement Calibration and Interpretation for ...

Using the equation of heat convection between the seepage water and the heated cable (Equation (15)), Su et al.

Sep 24, 2025

Stratified flow detection in horizontal wells based on distributed ...

A multi-physics coupling model of the fiber temperature field and fluid flow state is established to simulate the complex

Apr 21, 2026

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

Mar 25, 2026

Distributed Fiber Optic Temperature and Strain Sensing

We describe a novel fiber-optic technique for measuring distributed strain and temperature that uses a coherent optical

Aug 18, 2025

The High-Temperature Resistant Well Logging Optical Cable

The range of cables for direct buried installation includes all our four basic designs: concentric core, grooved core tape, DryTech and

Aug 18, 2025

Thermal, mechanical and chemical influences on the performance of ...

Structural well-bore integrity is an important issue for sustainable provision of geothermal energy. Raman scattering

Feb 08, 2026

Optical fiber based distributed temperature systems ...

This article is dealing with fiber optics application into the geological monitoring. The distributed temperature systems

Jul 10, 2026

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

Apr 09, 2026

Fibre optic seismic sensor for down-well monitoring in the oil industry

This technique combines heterodyne demodulation with phase-sensitive optical time domain reflectometry and we call it

Nov 30, 2025

Application of Coiled Tubing Distributed Optical Fiber Temperature ...

Combined with the casing collar magnetic locator (CCL) and the optical fiber to calibrate the depth, the temperature

Mar 04, 2026

Cable Installation Considerations for Structure Monitoring

The most prevalent sensing technology for structure monitoring applications is DSS, which monitors strain related to mechanical

Oct 10, 2025

Borehole Optical Fibre Distributed Temperature Sensing vs ...

This expertise helps to locate and monitor geothermal installations as well as observe diverse aspects of natural and

Feb 03, 2026

distributed fiber-optic sensing

99 the well will lead to thermal stresses in the material which potentially result in contraction or expansion of the 100 sucker-rod and

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