

Article Overview

Logging optical cables are designed to withstand high tension, elevated temperatures, and harsh downhole conditions, with specifications defined by mechanical, thermal, and optical performance standards.

Mechanical and Dimensional Specifications

Logging optical cables, often used in wireline operations, must handle high tensile loads due to the weight of the tool string and well depth. Typical tensile strength of alloy wires in these cables ranges from 270 to 330 KPSI, with individual steel wires having diameters of 0.035 inches or larger and coated with zinc for corrosion protection . The overall cable diameter is determined by the number of conductors, optical fibers, and protective layers, balancing flexibility with mechanical strength. Cables are designed to endure repeated drum winding, sheave contact, and vertical or deviated well deployment .

Thermal and Environmental Ratings

Downhole optical cables must maintain performance under elevated temperatures and pressures. Standard cables are rated for ordinary borehole conditions, but temperature ratings should be reduced for highly deviated wells, geothermal wells, or high-temperature production environments . Materials for conductor insulation, fillers, and jacketing are selected to resist thermal degradation over the cable's operational life. LSZH or other protective sheaths may be used to prevent mechanical damage during installation .

Optical and Electrical Performance

Logging optical cables integrate optical fiber elements to transmit data, video, and tool control signals. Specifications ensure stable impedance, low noise, and continuous data transmission from the downhole tool to surface acquisition systems . Electro-optical designs combine mechanical strength with optical performance, ensuring reliable formation evaluation, resistivity, porosity, and lithology measurements.

Installation and Handling Guidelines

- o Minimize bending and sharp turns: Smooth curves prevent fiber breakage and maintain signal integrity .
- o Figure-8 loops: Used during cable deployment to prevent twisting; typical loop sizes range from 2 to 4 meters, depending on cable stiffness .
- o Tension limits: Maximum pulling tension must not be exceeded; residual tension after placement should remain below long-term load ratings .
- o Clamping intervals: Vertical installations require frequent clamping to support cable weight and prevent movement .
- o Protective measures: Use protective material if the cable remains exposed for extended periods to prevent

Logging Optical Cable Size Standards

mechanical or environmental damage .

Standards and References

- o FOA Installation Standards: Provide general fiber optic installation guidelines, including handling, bending radius, and environmental considerations .
- o NECA/NEIS Standards: Define minimum quality and workmanship for fiber optic installations, including compliance with NEC and OSHA regulations .
- o Manufacturer Specifications: Logging cable manufacturers, such as Rochester Cable and Camesa, provide detailed catalogs specifying tensile strength, temperature ratings, optical fiber types, and construction for specific logging applications .

Summary

Logging optical cables are specialized fiber optic cables engineered for mechanical durability, thermal stability, and reliable optical performance in demanding downhole environments. Proper selection, handling, and adherence to installation standards are critical to ensure data integrity, tool safety, and operational efficiency during logging operations. Compliance with FOA, NECA, and manufacturer-specific standards ensures that cables meet both mechanical and optical performance requirements for repeated deployment in high-pressure, high-temperature wells.

An ultralow stretch armored cable containing 3 optical fibers and 8 electrical conductors has been developed for use in oil well

This standard describes procedures for installing and testing cabling networks that use fiber optic cables and related components to

A well logging cable 10 includes an optical fibre 2 and a pressure sealed enclosure 26 surrounding the fibre. The enclosure is

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PubMed® comprises more than 40 million citations for biomedical literature from MEDLINE, life science journals, and online books.

INTRODUCTION This publication is a revised and updated version of the old APA publication 95-A-14, The Loggers

Logging Optical Cable Size Standards

All Fiber Optic Cable reels should be stored upright Laying the reel on its side may cause damage to the reel flange and/or cause the

By many measures, Logging is the most hazardous industry in the United States, particularly the activity of manual felling. This eTool

The following language is recommended for use in project documents: Fiber optic cables shall be installed in accordance with the

Marketplace is an online marketplace where you can buy products from Marketplace Sellers, and they'll

Difference between Optic-Fiber logging and traditional cable logging The electrical-based sensors used in cable logging can not work

Cable logging is mainly used to harvest timber from steep slopes where conventional retrieval methods are unsuitable due to the risk

There are a number of ways of finding out more about cabling standards. You can buy a complete copy of the EIA/TIA or ISO/IEC

The range of cables includes metallic and dielectric cables that cover the fiber up to several hundred fibers. Resistant to high

MW250 - Winch for shallow slimhole applications The ICDP owned super-light MW250 mini winch is especially designed for logging

This document provides specifications for single mode and multimode optical fibers according to various ITU-T and IEC standards.

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