

RIVO MULTITRADE OPTICAL SYSTEMS

Intelligent Corrugated Sheath for Optical Cables in Mining



Overview

The helically corrugated, impervious, steel sheath is formed around the cable core, welded and corrugated in a continuous operation.

Key Takeaways

Intelligent corrugated sheaths enhance the durability, flexibility, and maintainability of optical cables in harsh mining environments while enabling automated monitoring and repair.

Design and Functionality

Mining optical cables are exposed to extreme mechanical stress, moisture, chemical exposure, and rodent damage. Corrugated sheaths are often used to provide superior crush resistance, flexibility, and tear protection. The corrugated structure distributes mechanical stress evenly along the cable, preventing localized damage during installation or operation in confined tunnels and rough terrain. Some designs, like OCC's Core-Locked™ jacket, feature helical cusped ridges that interlock with subcables, maintaining circular cross-sections for better impact resistance and tear protection while allowing flexibility for difficult cable pulls .

Material and Protective Features



Intelligent corrugated sheaths are typically made from high-performance polymers or multilayer constructions such as aluminum/HDPE/PA, which provide resistance to aggressive chemicals, UV exposure, and high temperatures . Additional features include water-blocking layers using superabsorbent polymers and aramid yarns, flame retardancy, and rat-proofing, ensuring long-term reliability in underground mining conditions .

Intelligent Monitoring and Maintenance

Modern mining optical cables can be integrated with intelligent monitoring systems. Patented solutions include remote-controlled patrol vehicles equipped with cameras that inspect the cable sheath for damage and relay real-time data to a ground control center. This allows operators to detect sheath breaches caused by moisture, rodents, or mechanical wear and schedule timely repairs, reducing downtime and improving safety . Automated repair devices can store replacement sheath segments and perform maintenance operations efficiently, minimizing manual intervention in dark, humid, and hazardous mine environments.

Deployable and Hybrid Systems

In addition to permanent installations, deployable fiber optic systems with ruggedized corrugated sheaths allow quick deployment, relocation, and extension of networks as mining operations move. Hybrid cables combining fiber and copper within the same sheath can provide both high-speed data transmission and power for underground devices, such as Wi-Fi routers or IP cameras, reducing the number of separate cables required .

Advantages

- Enhanced mechanical protection against crush, impact, and tension
 - Water and chemical resistance for long-term reliability
 - Flame retardant and rodent-proof for safety in coal and metal mines
 - Intelligent monitoring and automated repair reduce maintenance time and risk
 - Flexible deployment for dynamic mining operations and hybrid power/data applications
- Intelligent corrugated sheaths thus provide a robust, flexible, and maintainable solution for optical cable networks in mining, ensuring high-capacity data transmission and operational safety in extreme underground conditions.

Article Content

CN113885149A

The invention relates to the technical field of mine maintenance construction, in particular to a repairing device for a mine optical

Fiber Optic Cable Solutions for Mining | OPTRAL

Mining is one of the industrial sectors where the cabling systems have high requirements regarding security and mechanical

US12461326B2

Disclosed are a steel fiber composite intelligent bar with a sheathing optical cable embedded in an inner core of a rebar, and a

Corrugated Metallic Cable Sheath

The helically corrugated, impervious, steel sheath is formed around the cable core, welded and corrugated in a continuous operation.

ITU-T Rec. L.4 (11/88) Aluminium cable sheaths

The sheath may be corrugated or noncorrugated, depending on the diameter of the cable core, the minimum radius of curvature

18 Cable Sheath Materials Explained

Discover 18 types of cable sheath materials. Full comparison of fire resistance, flexibility, environmental tolerance, and

Deployable Fiber Optic Systems for Harsh Mining Environments

Hybrid Cables, Connectors For applications that can benefit from fiber optics and copper, hybrid cables offer both

Dual Sheath Multi Loose Steel Tape Armoured (PSP)

Dual Sheath Multi Loose Steel Tape Armoured (PSP) 24 to 144 250um fibre dry core OM1, OM2, OM3, OM4 multimode or OS1 /OS2

Dual Sheath Multi Loose Steel Tape Armoured (PSP) Features

24 to 144 250um fibre dry core OM1, OM2, OM3, OM4 multimode or OS1 /OS2 (G.652.D) singlemode 250 µm multi loose tube

66-230kV Corrugated Aluminum Sheath HV Cable

Application 66kV to 230kV HV power cable with seamless corrugated aluminum sheath for applications requiring radial water

LSZH™ Loose Tube, Gel-Free, Corrugated Armored Cable

Common installations Outdoor aerial and duct LSZH™ Loose Tube, Gel-Free, Corrugated Armored Cable Corning LSZH™ loose

Aksh OptiFibre Ltd. :: Optical Fibre Cables::Smartcore Steel Armoured ...

The metallic cable is armoured with corrugated steel tape that provides good protection against rodents and allows the cable to

INDUSTRY SOLUTIONS: MINING

The unique demands associated with these systems for real-time high-bandwidth data transmissions, make fiber optic systems

How Optical Cable Sheath Works — In One Simple Flow (2025)

Software tools monitor sheath integrity, detecting issues like cracks or moisture intrusion early, which is vital for

Contact Us

Continue your research online:

Website: <https://rivomultitrade.co.za>

Technical inquiry: <https://rivomultitrade.co.za/contact.html>

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

