New Corrugated Optical Fiber for Broadcast Transmission



Overview

Here, the authors demonstrate petabit/s transmission in a standard-sized 19-core multi-core fiber, while minimizing the required digital signal processing complexity.

Key Takeaways

Recent innovations in corrugated and multi-core optical fibers enable ultrahigh-capacity, reliable broadcast transmission for 8K video and beyond.

Multi-

Core Fiber Innovations

The National Institute of Information and Communications Technology (NICT), ASTRODESIGN, and Fujikura have developed multi-core fiber cables that integrate multiple 4-core single-mode fibers within a compact 3 mm diameter cable. This design allows a single cable to replace up to 32 conventional single-core fibers, enabling ultrahigh-capacity transmission of uncompressed 8K video over limited conduit spaces and building interiors, achieving stable operation over distances of 300 meters between cameras and video composition devices. Such multi-core fibers are particularly valuable in sports broadcasting, telemedicine, and high-resolution monitoring, where high data throughput and minimal latency are critical.



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High-

Capacity Long-

Distance TransmissionSumitomo Electric and NICT have demonstrated 19-core optical fibers with standard 0. 125 mm cladding, achieving 1. 02 petabits per second over 1,808 km, setting a world record for capacity-distance product.

This was accomplished by optimizing core arrangement and reducing optical losses across multiple wavelength bands, while using optical amplification relays to simultaneously boost signals from all cores. These fibers are suitable for long-range broadcast networks and large-scale data transmission infrastructures.

Corrugated and Mechanically Robust Broadcast Fibers

For practical deployment, companies like Optical Cable Corporation (OCC) and Optral provide corrugated and helical-stranded optical cables designed for broadcast environments. These cables feature: Helical stranding to distribute mechanical stress evenly, enhancing flexibility and survival during difficult cable pulls. Water-blocked designs combining tight-buffered and Core-Locked™ fibers with super absorbent polymers for superior moisture protection.

UV-cured acrylate and elastomeric polymer coatings for durability in harsh outdoor or stadium environments. Rugged multi-channel connectors such as Mini-Hermaphroditic Connectors (MHC II) for reliable, high-speed connections. These features ensure high-capacity, low-loss transmission in challenging broadcast installations, including mobile units, stadiums, and permanent infrastructures.

Applications in Broadcast Transmission

The combination of multi-core, corrugated, and mechanically reinforced fibers allows broadcasters to: Deploy fewer cables while maintaining or increasing data throughput. Support real-time 8K video transmission with minimal latency. Install cables in space-constrained conduits or across multiple buildings.

Ensure durability and reliability in high-stress environments such as stadiums or outdoor events. These advancements collectively represent a significant step forward in broadcast optical fiber technology, enabling high-definition, high-bandwidth video transmission with improved installation flexibility and long-term reliability.

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Article Content

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Here, the authors demonstrate petabit/s transmission in a standard-sized 19-core multi-core fiber, while minimizing the required digital signal processing complexity.

Broadcast/AV

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In our many years of collaboration with broadcasters, system integrators and manufacturers of mobile production units, we have developed a wide range of plug & play cabling solutions which now permit

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Outdoor fiber optic cables can be strung along telephone poles (aerial), installed inside underground ducts, or buried directly below ground. Cable designs vary

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Fibre optic cabling for broadcasting & TV transmissions

Broadcast Fibre optic cabling for broadcasting applications, live events and TV transmissions Whether in the studio or when transmitting live events: broadcasting applications involve the transmission of vast

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The Corrugated Optic Duct Market is uniquely positioned as the backbone of underground fiber communication, integrating durability, flexibility, and long-term performance. Approximately 68%

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

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