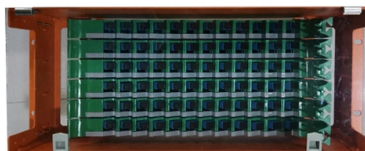


Year-end summary of optical cable coating process



Overview

Introduction This document includes the consolidated and separate financial statements of FiberCop S.p.A.

Key Takeaways

Optical fiber coatings continue to evolve with advanced materials and processes that enhance durability, microbending resistance, and environmental stability, supporting high-speed telecommunications and 5G deployment.

Technical Developments

Modern optical fiber coatings are primarily designed to protect the glass fiber from mechanical damage, moisture, and environmental stress while maintaining optical performance. Coatings typically account for 75% of the fiber's volume, with the remaining 25% being the glass core and cladding, highlighting their critical role in fiber reliability. Key parameters include modulus of elasticity, refractive index, temperature tolerance, viscosity, and cure speed, all of which influence fiber performance during drawing and in-field operation.

Recent innovations focus on next-generation primary coatings that are microbending resistant and maintain low in-situ modulus, reducing stress-induced signal loss. These coatings have demonstrated superior performance under accelerated aging conditions (85°C/85% relative humidity) and are compatible with fast fiber draw speeds, optimized helium consumption, and UVLED curing. Such advancements are crucial for high-bandwidth networks and 5G infrastructure.

Coating Methods

Several coating methods are employed depending on production scale and application: Dip coating: Immerses fibers in liquid coatings, allowing precise control of film thickness. Ideal for research, prototyping, and small-lot production due to flexibility in adjusting process parameters. Melt coating: Suitable for mass production but requires careful control to achieve uniform thickness.

UV-curable coatings: Widely used for high-speed fiber drawing, providing rapid curing and long-term durability. Material selection is critical. Acrylic coatings are cost-effective but less resistant to UV and humidity, while silicone and polyimide coatings offer superior heat resistance, flexibility, and longevity, reducing maintenance and lifecycle costs.

Market and Industry Trends

The optical fiber coating market is experiencing significant growth, driven by the global demand for high-speed internet, 5G deployment, cloud computing, and IoT applications. The market is projected to reach \$1.6 billion by 2025, with a CAGR of 13%.

Leading companies like Covestro, Shin-Etsu Chemical, and Daikin are investing in R&D to develop coatings that meet evolving telecom requirements, including environmental resistance, mechanical stability, and compatibility with high-speed fiber draw processes. Challenges include raw material price volatility, supply chain disruptions, and the need for skilled labor for advanced manufacturing.

Despite these, continuous innovation in coating materials and processes ensures improved fiber performance and network reliability.

Summary

Over the past year, the optical cable coating process has advanced through: Development of microbending-resistant, low-modulus primary coatings. Optimization of UV-curable and high-speed draw processes. Adoption of durable materials like silicone and polyimide for harsh environments.

Market growth fueled by 5G, cloud computing, and IoT, with strong R&D investment from leading manufacturers. These improvements collectively enhance fiber longevity, optical performance, and network reliability, ensuring that modern telecommunications infrastructure can meet increasing bandwidth and environmental demands.

Article Content

Optical Fiber Coatings Explained

This article continues FOC's latest series on optical fiber manufacturing processes, providing an overview of coatings for a wide range of standard communication and specialty optical

ANNUAL REPORT December 31, 2025

Introduction This document includes the consolidated and separate financial statements of FiberCop S.p.A. (hereinafter "FiberCop" or the "Company" and together with its consolidated subsidiary, the

Covestro Coatings for Optical Fibers

The packaged quartz optical fiber samples were subjected to gradient temperature rise annealing treatment in a tube furnace to uniformly release the residual stress.

Optical Fiber Resource Center White Papers | Optical ...

Corning scientists and engineers regularly publish white papers on various properties of optical fiber. As seen below, the white papers are organized by subject area.

Global Optical Fiber Cable Coating Material Market Research Report

The coating material also helps to improve the signal transmission performance of the optical fibers by reducing signal attenuation and increasing bandwidth. The most commonly used optical fiber cable

Optical Fiber Manufacturing Process And Methods

The production process executes a dimensional reduction by five orders of magnitude, while preserving materials purity and optical characteristics. Each step plays a unique role – vapor

Optical Cable Corporation Annual Report 2025

Optical Cable Corporation and its subsidiaries (collectively, the “Company” or “OCC®”) is a leading manufacturer of a broad range of fiber optic and copper data communication cabling and connectivity

From acrylates to silicones: A review of common optical fibre coatings ...

This review summarises the origin, evolution, and key properties of the four most commonly utilised optical fibre coatings. Each coating's strengths and drawbacks for different in-service

Covestro Coatings for Optical Fibers

In this paper, a newly developed high temperature resistant dual layer UV-curable coating system is introduced, consisting of primary coating HT-P and secondary coating HT-S.

UV-Curable Fiber Optic Cable Coating Material Market Size, Share ...

Evaluate comprehensive data on UV-Curable Fiber Optic Cable Coating Material Market, projected to grow from USD 1.2 billion in 2024 to USD 2.5 billion by 2033, exhibiting a CAGR of 9.5%. This report

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A new polyimide coating for optical fibers: demonstration of ...

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Optical Coatings Market Size, Competitors & Forecast to 2032

The Optical Coatings Market, valued at USD 19.06B in 2026, is projected to reach USD 32.04B by 2032, growing at a 8.9% CAGR.

From acrylates to silicones: A review of common optical fibre coatings ...

This review provides a comparison among four most utilised, commercially available types of coating material: conventional and specialty acrylates, polyimides and silicones. It details the history of their

Comparing Optical Fiber Coating Methods: Application-Specific ...

Combining these factors enables the development of a stable and consistent coating process. Summary This article compared key aspects of optical fiber coating methods, focusing on

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Optical Fiber Cable Coating Material Market Size, Share, Competitive ...

A key component within the Optical Fiber Cable Coating Material Market is the coating process, which involves applying a protective layer that adheres to the fiber's surface. This process is crucial for

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