Extrusion of ribbon optical cables

Overview

A method of hot rolling or extrusion of a textured-surface sheet can be used to produce a large one dimensional array of fibers; these arrays can be stacked to form the two dimensional matrix...

Key Takeaways

Ribbon optical cables can be manufactured using extrusion, a process that forms multiple optical fibers into a flat, high-density ribbon for efficient splicing and installation.

Overview of Ribbon Optical Cables

Ribbon optical cables consist of multiple optical fibers aligned side by side in a flat ribbon format, allowing high fiber density and enabling mass-fusion splicing, where multiple fibers can be spliced simultaneously. Modern designs, such as Prysmian's FlexRibbon® and SWCC's e-Ribbon®, incorporate intermittent bonding or rollable structures to improve flexibility, reduce cable diameter, and facilitate installation in tight spaces.

Extrusion Process

Extrusion is a key method for forming ribbon optical cables. In this process, optical fibers are coated and aligned, then passed through an extrusion die that shapes them into a flat ribbon. The extrusion die can be designed to produce either a flat ribbon or a textured surface ribbon, depending on the desired cable properties.

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The fibers are connected at reduced-thickness areas along the edges, which minimizes crosstalk while maintaining structural integrity. Extrusion offers several advantages over other methods like hot rolling: Precision shaping: The extrusion die ensures uniform fiber spacing and ribbon thickness. Scalability: Wider ribbons with many fibers can be produced efficiently.

Material flexibility: Cladding or low-index layers can be applied during or after extrusion to optimize optical performance.

Machinery and Optimization

Specialized cable extruders, such as the ROEX series, are used for ribbon cable production. These machines provide high output, precise temperature control, and energy efficiency, which are critical for maintaining fiber quality and minimizing defects. Extruders are the largest energy consumers in a cable production line, so optimizing screw design, feeding sections, and heating/cooling systems is essential for cost-effective manufacturing.

Modern Innovations

Recent developments in ribbon cable technology include: Rollable ribbons (e-Ribbon®): Fibers are intermittently bonded, allowing the ribbon to bend and roll like individual fibers, reducing strain and enabling high-density installation. FlexRibbon® Technology: Intermittent bonding allows compact, flexible ribbons that can be folded or routed in tight spaces without performance loss. High fiber counts: Ribbon cables can now accommodate thousands of fibers in a single cable, significantly reducing installation time and labor costs.

Benefits of Extruded Ribbon Cables

Faster installation: Mass-fusion splicing reduces splicing time by splicing multiple fibers simultaneously. Reduced cable diameter: Efficient fiber packing allows up to 60% smaller cable diameters compared to loose tube designs. Improved handling: Rollable and flexible ribbons reduce fiber strain and simplify deployment in dense networks.

Cost efficiency: Fewer reels, reduced labor, and lower material usage decrease overall installation costs and environmental impact. Extrusion remains a critical process in producing high-performance ribbon optical cables, enabling modern high-density, flexible, and efficient fiber optic networks.

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Article Content

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Ribbon Fiber Optic Cable

Fiber Optic Ribbon Cable Ribbon cables offer higher fiber counts and greater fiber density than any other cable construction designed for the outside plant (OSP), four times the highest-fiber-count

produce rollable ribbon bundles with OFC 79

Nextrom''s OFC 79 is a part of a high-performance solution for producing high fiber count cables with rollable ribbon bundles, optimizing fiber density and cable efficiency.

FlexRibbon® Technology | Prysmian

The result is a ribbon fiber optic cable that can be rolled, folded, or routed in tight spaces without sacrificing performance, offering superior handling, higher fiber

Wire & Cable Extruder

Our extruder series is available for a comprehensive range of different materials. All Rosendahl extruders are 100% made in Europe and can be customized to your

What is Ribbon Fiber Optic Cable? A Guide to Its Benefits

Explore what ribbon fiber optic cable is. Our guide covers its flat structure, types, and key benefits like mass fusion splicing and space-saving design for high-density data centers.

Ribbon Fiber Optic Cable and Splicing: Key Points and

This article will provide a brief discussion of ribbon fiber optic cables and ribbon fiber splicing, as well as the advantages of, challenges with, and best

Ribbon end-to-end solution

OptiRibbon cables revolutionize fiber splicing with their unique design, allowing for up to 60% faster splicing times compared to traditional fiber. These cables are

Ribbon Fiber Optic Cable Maintenance and Future Trends

Learn best practices for maintaining ribbon fiber cables, including splicing, cleaning, testing, and future trends shaping high-speed fiber networks.

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Ribbon Fiber Optic Cable for High-Density Networks | Data Center ...

Learn what ribbon fiber optic cable is, how it supports high-density data centers, telecom backbones, metro networks and FTTx projects, and how to choose the right ribbon cable structure

Manufacturing Technician, Fiber Optic Cable

This includes but is not limited to safety, extrusion, braiding and stranding, re-spooling, bobbin winding, cable packaging, optical testing and database entries.

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High Fiber Count Optical Cables Solutions with FREEFORM Ribbon™

High Density Sumitomo Electric, the pioneer of high-fiber-count cable for decades, has been offering up to 6912-fiber count Ribbon Slotted-Core cables with advanced FREEFORM Ribbon™ technology.

Wire & Cable Extruder

The latest wire & cable extruder (ROEX) for higher output, longer lifetime, lower energy consumption, lower noise emission and space requirement.

Machines for the production of special cables

There are fields in which cable products must deliver exceptional performance. Where even greater precision is required, where exclusive materials are used,

Extrusion Lines for Fiber Optic Cables | Bausano

Fiber optic technology has revolutionized telecommunications, enabling high-speed data transmission over vast distances with unparalleled reliability. At the heart of

Cable Extrusion Machine

Find more Cable Extrusion Machine, including Cable Extruder, Cable Extrusion Machine, Wire Extruder, Cable Extrusion Line, Power Cable Extruder, Lan Cable Extruder, Optic Fiber Extruder, USB Cable

The art of ribbonizing: A step towards efficient fiber splicing

In the world of fiber optics, efficiency and adaptability are key. What makes ribbonizing especially valuable is its ability to transform non-ribbon fiber cables into a format suitable for ribbon

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