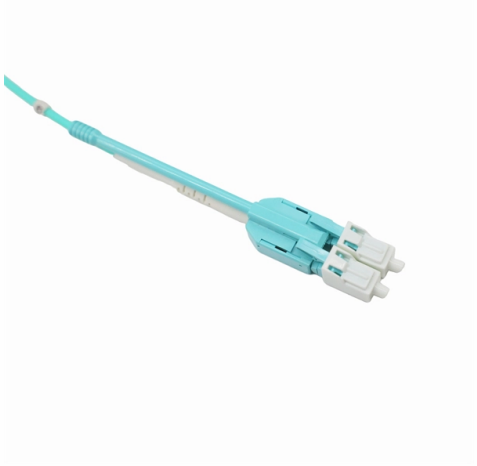
Production of Optical Cable Loose Tubes



Overview

What fibers can count on: High-speed production equipment for outdoor and indoor fiber optical cables.

Key Takeaways

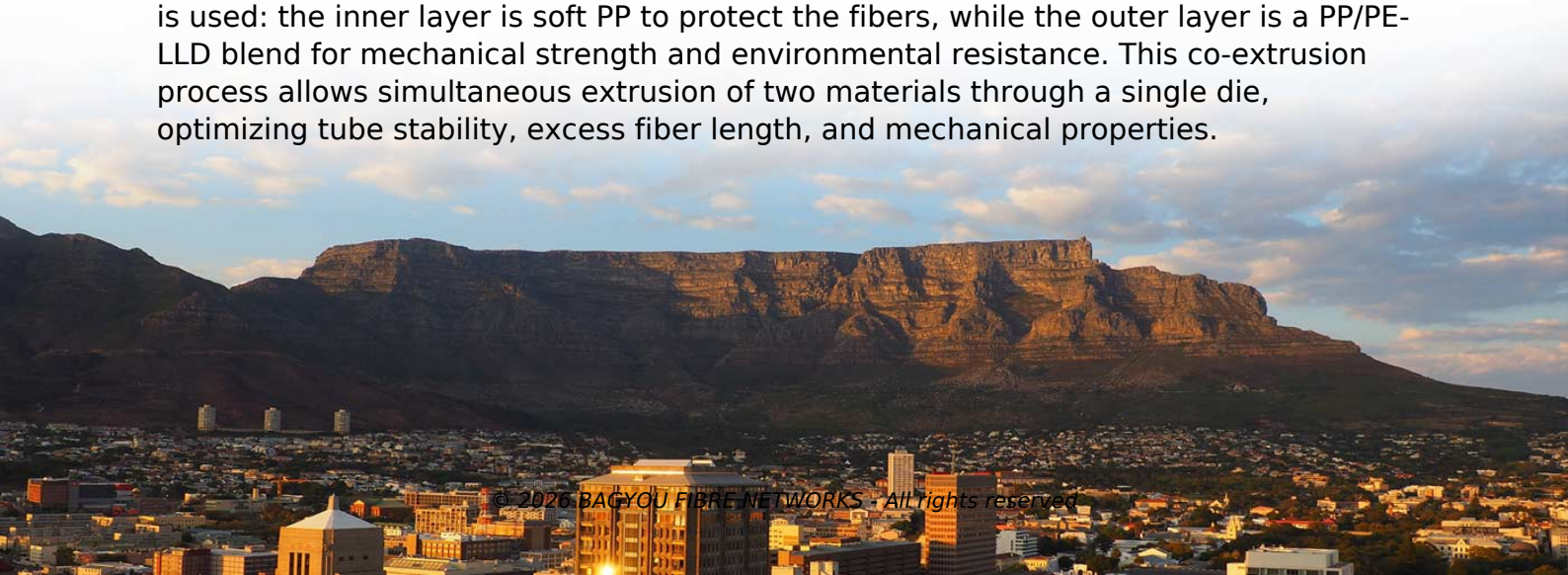
Loose tube optical cables are produced by extruding protective plastic tubes around optical fibers, often using co-extrusion and gel-filling techniques to ensure flexibility, protection, and performance.

Overview of Loose Tube Construction

Loose tube cables are designed for harsh outdoor environments, where optical fibers are enclosed within semi-rigid protective tubes that allow the fibers to move freely and absorb mechanical stress, temperature variations, and bending forces. Each tube can contain multiple fibers, and the fibers are often surrounded by a gel or water-blocking material to prevent moisture ingress and provide additional protection.

Materials and Tube Formation

The tubes are typically made from polypropylene (PP) or a mixture of PP and low-density linear polyethylene (PE-LLD). In modern production, double-layer co-extrusion is used: the inner layer is soft PP to protect the fibers, while the outer layer is a PP/PE-LLD blend for mechanical strength and environmental resistance. This co-extrusion process allows simultaneous extrusion of two materials through a single die, optimizing tube stability, excess fiber length, and mechanical properties.



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Extrusion and Cooling Process

The production begins with a resin extruder, which coats the optical fiber bundle with molten plastic. The extruded tube is then cooled in a water tank with a sizing die to maintain the tube's shape and dimensions. Air pumps and cooling water suction mechanisms are often integrated to ensure uniform tube formation and prevent deformation during cooling.

Fiber Launching and Process Efficiency

To improve production efficiency, Fiber Launching Systems (FLS) are used. These systems feed fiber bundles into the extrusion line at production speed, reducing manual handling, minimizing scrap, and allowing continuous operation. This is particularly important during start-up or when switching production batches.

Gel-

Filling and ProtectionFor outdoor applications, the loose tubes are often filled with a gel or water-blocking compound using specialized jelly dies or needle-like dispensing nozzles. This step ensures moisture protection and stabilizes the fibers within the tube. Advanced jelly die systems improve gel flow, reduce turbulence, and enhance process stability, resulting in better quality and reliability.

Advantages of Modern Loose Tube Production

Flexibility and fiber protection: Tubes allow fibers to move and absorb bending stresses. Enhanced mechanical properties: Co-extrusion and optimized materials improve tensile strength and durability. Process efficiency: Fiber launching systems and advanced jelly dies reduce downtime and scrap.

Environmental resistance: Gel-filling and material selection protect against moisture, temperature extremes, and mechanical damage. Modern loose tube production combines material science, extrusion technology, and automation to produce high-quality optical cables suitable for demanding outdoor installations.

Article Content

machines for fiber optical cable production

What fibers can count on: High-speed production equipment for outdoor and indoor fiber optical cables. Loose tube production | Tight buffering | SZ-stranding | and more

Optical cable. Materials and manufacturing process.

On KCEP production, a modern loose tube machine by the Austrian company “Rosendahl” is used. On these machines, loose tubes of various

A new structural totally dry optical fiber cable via co-extrusion ...

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In this paper, a new fully dry optical fiber cable was introduced, which used co-extrusion technology for double-layer loose tube. The soft polypropylene (PP) material was used as the loose tube.

WO2021132376A1

The present invention: produces a loose tube-type optical cable that has no flatness in the cross-section shape thereof (circular) and no creases formed on the tube surface; and...

fiber optic cable production lines and equipment

High-speed production and short set-up times with minimized start-up scrap for production of single, dual layer, jelly filled and dry loose tubes. The design of the line, in combination with the material and

Optical Fibre Manufacturing Process

When tight buffered the individual optical fibre is covered directly with a layer of thermoplastic material or one or more fibres can be contained within a loose tube which is filled with a thixotropic gel. These

Loose tube production line-optical cable machine

Loose tube production line is used for extruding 1~12/24 core optical fiber loose tube, the jacketing material is PBT, loose tube is round and smooth surface, its dimeter is uniform.

Jelly Dies for Loose Tube Production | expometals

In the production of fiber optic cables for outdoor applications, loose tube manufacturing is a common method employed. It involves the creation of individual tubes, typically made of plastic,

PBT Loose Tube Fiber Optic Cable Production Line

This fiber secondary coating line is used for extruding 1~12/24 core optical fiber loose tube, the jacketing material is PBT, loose tube is round and smooth surface, its dimeter is uniform.

Fiber Cable Bend Radius Engineering Limits and Guidelines

Fiber optic cable bend radius is a critical mechanical parameter that determines how sharply a cable can be bent without risking microbending, macrobending, signal loss, or long-term

TLC Indoor/Outdoor Fiber Optic Cable with Aluminum Interlocking

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This 48-fiber indoor/outdoor cable utilizes Corning SMF-28 Ultra optical fiber, housed within a robust aluminum interlocking armor construction. The cable features a gel-free, loose tube design rated for

24 Cores ADSS Fiber Optic Cable Price & Datasheet

24 Cores ADSS Fiber Optic Cable ADSS optic cable adopts loose tube layer stranded structure, and the loose tube is filled with water blocking compound. Then, two layers of aramid fibers are twisted

Fiber Indoor & Outdoor Cables

Portfolio: CommScope® Cable Type: Stranded loose tube Construction Type: Armored Jacket Color: Black Environmental Space: Plenum Regional Availability: Asia | Australia/New Zealand | Latin

i-Net Networks 2000m 4-Core Singlemode Fiber Optic Cable, G652.D

Fiber Optic Loose Tube Patch Cord Optical fiber 9/125µ, 62.5/125µ, 50/125µ Simplex and duplex for singlemode and multimode High precision and improved reliability

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