Butterfly-shaped optical cable manufacturing

Article Overview

Butterfly-shaped optical cables are produced using a multi-layered design with a butterfly-shaped cable unit, foaming filling, and an outer sheath, manufactured on specialized extrusion and pay-off production lines.

Cable Structure

A butterfly-shaped optical cable consists of three main layers arranged from inside to outside:
o Butterfly-shaped cable unit: Contains the optical fibers enclosed in a butterfly-shaped sheath with embedded reinforcing members. Tearing grooves are added along the long axis to facilitate easy stripping and maintenance .
o Foaming filling unit: Positioned between the cable unit and the outer sheath, this layer improves compression resistance, impact resistance, heat insulation, and water resistance. It is often coated with hot melt adhesive and may include water-blocking powder .
o Outer sheath: Typically elliptical with a rectangular inner cavity, the outer sheath houses the cable unit and foaming filling. Fiber yarns embedded in the sheath enhance mechanical strength and bending performance .

Production Process

The production of butterfly-shaped optical cables involves several key steps:

o Optical fiber preparation: Fibers are preheated and dehumidified using far-infrared heating to ensure proper handling and adhesion .
o Cable unit assembly: Optical fibers are arranged in ribbons or bundles within the butterfly-shaped sheath. Reinforcing members, such as steel wires or FRP rods, are embedded to improve mechanical strength .
o Foaming filling application: The foaming material is applied around the cable unit in multiple subunits, often using air-blowing coating methods to fix water-blocking powders .
o Outer sheath extrusion: The outer sheath is extruded over the foaming filling and cable unit using LSZH (low-smoke, halogen-free) materials for fire resistance. Fiber yarns are embedded symmetrically to enhance tensile and bending performance .
o Tension control and pay-off: Specialized pay-off mechanisms with AC frequency conversion motors, reducers, and precision tension controllers ensure smooth unwinding of fibers and reinforcing members during extrusion .

Advantages

Butterfly-shaped optical cables are widely used in fiber-to-the-home (FTTH) and last-mile connectivity due to their:

o Lightweight and compact design for easy installation
o Enhanced mechanical performance against lateral pressure and impact
o Improved bending and flexibility for complex routing
o Water-blocking and thermal insulation properties

Market Context

The global market for self-supporting butterfly optical fiber cables is growing rapidly, driven by FTTH deployment. Steel wire strength members dominate the market, and the demand for aerial installations and last-mile connectivity is expected to continue expanding, with projected market growth from USD 945.5 million in 2025 to USD 1.56 billion by 2032 . This combination of advanced design, precise manufacturing, and market demand makes butterfly-shaped optical cables a key component in modern telecommunications infrastructure.

The invention belongs to the technical field of optical cables, and discloses a butterfly-shaped drop-in optical cable for

Pipeline Butterfly-shaped Introduction Optical Cable is engineered for efficient conduit entry of optical cables, offering robust

Butterfly-shaped optical fiber cables are a popular type of fiber optic cable that is commonly used for data transmission in

One of the hallmark features of FTTH butterfly optic cables lies in their ability to optimize bandwidth utilization and

Optic Cable Outer Sheathing Extrusion Production Line for Butterfly-Shaped Fiber Optical Cables^, Find

The invention relates to a butterfly-shaped cluster optical cable and a manufacturing method thereof, in particular to a compact

The Self-Supporting Butterfly Optical Fibre Cable Market was valued at USD 945.5 Million in 2025 and is projected to

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Introduction:The butterfly-shaped optical cable is a type of fiber optic cable that is widely used in

telecommunications

As a manufacturer and supplier of butterfly cables, we specialize in producing cables that are easy to

Butterfly FTTH drop cable is a popular type of fiber access optical cable, according to the different application environment and laying

The invention relates to the field of optical cable production, in particular to a butterfly-shaped optical cable production device which

When the butterfly drop cable connector is under tension, the optical fiber will give priority to release the bending allowance to ensure

The cable is simple in structure, easy to manufacture, low in material consumption, low in cost, easy to strip, high in universality,

In this article, we will discuss the four-end connection methods of butterfly-shaped optical fiber

Fusion splicing is a popular method of connecting butterfly-shaped optical fiber cables. It

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