

# Self-supporting butterfly-shaped optical cable laying

## Article Overview

Self-supporting butterfly optical cables are designed for aerial and indoor deployment, combining optical transmission with mechanical self-support to simplify installation and reduce infrastructure requirements.

## Cable Structure and Features

Self-supporting butterfly optical cables feature a butterfly-shaped sheath with an optical communication unit centrally located and electrical conductors or wires on either side, often with a messenger wire on top for aerial support. The V-shaped groove in the sheath facilitates separation of the optical and electrical units, making splicing and connection safer and more convenient. These cables typically use bend-insensitive single-mode fibers (ITU-T G.657 standard), allowing tight bend radii without signal loss, which is critical for routing through conduits or irregular surfaces. The cables are available in indoor (FRP only) and outdoor self-supporting variants. Outdoor self-supporting types (e.g., GJYXFCH/GJXFH) include a steel messenger wire, enabling spans up to 50 meters without additional support. The outer sheath is often LSZH (Low Smoke Zero Halogen) or flame-retardant PVC, providing protection and safety in both indoor and outdoor environments.

## Installation Considerations

- o **Aerial Deployment:** The messenger wire allows the cable to be suspended between poles or building structures. Proper tensioning is essential to avoid sagging or overstressing the fiber. Typical spans are up to 50 meters, but longer spans may require intermediate supports.
- o **Indoor Routing:** Cables can be laid in vertical shafts, concealed pipes, cable trays, walls, or under floorboards. Their compact, lightweight design and small bending radius make them suitable for tight spaces.
- o **Termination and Splicing:** Butterfly cables can be pre-terminated or spliced on-site. The V-shaped groove and central optical unit simplify separation for connection to optical network terminals (ONTs) or joint boxes.
- o **Mechanical Handling:** The self-supporting design reduces the need for additional support structures, but care must be taken to avoid sharp bends, crushing, or excessive pulling forces during installation.

## Fiber and Strength Member Selection

- o **Fiber Type:** G.657.A1 is commonly used for residential deployments due to its 10 mm bend radius tolerance and compatibility with legacy G.652.D fibers. G.657.A2 is preferred for routing through tight conduits or irregular surfaces.
- o **Strength Members:** Steel wire provides high tensile strength for aerial spans, while FRP or KFRP members offer corrosion resistance and flexibility for constrained routing.

## Market and Deployment Trends

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The global market for self-supporting butterfly optical cables is growing rapidly, driven by FTTH expansion, rural broadband initiatives, and 5G small cell integration. The Asia-Pacific region leads in adoption, with North America also seeing significant growth due to government broadband programs . Technological trends include the use of LSZH sheaths and optimized cable architectures to balance mechanical robustness with cost efficiency .

## Summary

Self-supporting butterfly optical cables are versatile, mechanically robust, and suitable for both aerial and indoor FTTH deployments. Their design simplifies installation, reduces infrastructure needs, and supports high-speed optical transmission with bend-insensitive fibers. Proper attention to tensioning, routing, and termination ensures reliable performance and long-term durability in both residential and commercial networks .

Self-supporting Butterfly Drop Cable with central fiber core and dual strength members. Ideal for FTTH, aerial/duct installations, and

When long-distance signal transmission is carried out, a plurality of pairs of optical cables are laid in an overhead mode, the cost is

A technology for introducing optical cables and butterfly optical cables, applied in the direction of fiber mechanical

The GJYXFC butterfly drop cable is engineered for FTTH networks. Its steel wire core allows for aerial self-support, while the LSZH

The cable features a central optical fiber unit, two parallel strength members on either side, and an additional stranded steel wire for

The ultra-flexible self-supporting type butterfly-shaped introducing optical cable is good in mechanical property, strong in plasticity,

The invention discloses a self-supporting butterfly-shaped optical cable, which comprises a reversing device and a tightening device,

A self-supporting technology of introducing optical cables, applied in the directions of light guides, optics, optical components, etc.,

# Self-supporting butterfly-shaped optical cable laying

Each butterfly-shaped optical cable unit comprises an outer sheath, an optical cable core is arranged in the outer sheath, reinforcing

Self-supporting Butterfly-shaped Introduction Indoor Optical Cable for Access Network77 For self-supporting access network, the

The self-supporting butterfly optical cable-bundled optical cable is advantageous in convenience in construction, reduction of material

2?Description (GJYXFCH) Indoor/Outdoor self-supporting butterfly drop cable, the optical fiber unit is positioned in the centre. two

It can be used for laying in indoor environments such as vertical shafts, concealed pipes, cable trays, walls,

For self-supporting access network, the butterfly introduction of indoor optical cable positions the communication unit in the center,

The butterfly-shaped optical cable can strengthen the strength of the butterfly-shaped optical cable and effectively prevent the

A butterfly-shaped optical cable, self-supporting technology, applied in the direction of optical fiber/cable installation, optics, light

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