

Production of Communication Power Optical Cables



AI Overview

Power communication optical cables are manufactured through a multi-stage process involving fiber preform fabrication, fiber drawing, coating, cabling, sheathing, and rigorous quality testing.

Fiber Preform FabricationThe process begins with the creation of a fiber preform, a cylindrical rod of ultra-pure silica glass. Techniques such as Modified Chemical Vapor Deposition (MCVD), Plasma Chemical Vapor Deposition (PCVD), and Outside Vapor Deposition (OVD) are used to deposit layers of doped silica inside or on the surface of a quartz tube or rod. These layers form the core and cladding of the optical fiber, which determine its refractive index and light-guiding properties. Dopants like germanium or phosphorus are added to tailor optical characteristics.

Fiber DrawingThe preform is then heated in a furnace and drawn into long, thin fibers with diameters typically around 125 microns. This step requires precise control of temperature and tension to maintain uniformity. The drawn fibers are immediately coated with a protective polymer layer to prevent mechanical damage and moisture ingress.

Fiber Coating and StrandingAfter drawing, fibers undergo stranding, where multiple fibers are bundled together around a central strength member made of steel or fiberglass. This provides mechanical support and prevents bending or breakage. Some designs use loose-tube or tight-buffer configurations, often with water-blocking gels or dry materials to protect against moisture.

Cable Sheathing and AssemblyThe stranded fibers are then encased in outer protective jackets made of materials like polyethylene or flame-retardant compounds. Additional strength members may be added to enhance tensile strength, crush resistance, and flexibility. The assembly process ensures the cable meets specifications for tensile strength, bend radius, and environmental resistance. Quali...

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