

Glossary of Terms (PDF)

Here's a **glossary of fiber optic terms** compiled from industry resources and technical references:

Core Concepts

Core: Central region of optical fiber where light travels, surrounded by cladding^[1].

Cladding: Outer layer with lower refractive index than core, enabling total internal reflection^[1].

Total Internal Reflection (TIR): Phenomenon confining light within the core by reflecting it at the core-cladding interface^[1].

Fiber Types

Single-mode fiber: Fiber with a small core (8–10 μm) allowing only one light propagation mode, ideal for long-distance communication^[1].

Multi-mode fiber: Fiber with a larger core (50–62.5 μm) supporting multiple light modes, used for shorter distances^[1].

Graded-index fiber: Multi-mode fiber with a refractive index that gradually decreases from the core's center to reduce modal dispersion^{[1] [2]}.

Step-index fiber: Fiber with abrupt refractive index change at the core-cladding boundary^[1].

Key Components

Ferrule: Tube (ceramic/plastic) protecting and aligning fiber ends in connectors^[1].

Transceiver: Device converting electrical signals to optical signals (and vice versa) for transmission^[1].

Optical Amplifier: Device boosting optical signals without electrical conversion (e.g., EDFA)^[1].

Measurement & Testing

Decibel (dB): Logarithmic unit measuring signal strength loss/gain^[1].

OTDR (Optical Time Domain Reflectometer): Device measuring fiber attenuation and locating faults using backscattered light^[1].

Numerical Aperture (NA): Measure of a fiber's light-gathering ability, determined by the maximum acceptance angle^[1].

Installation & Maintenance

Fusion Splice: Joining fibers by melting ends together for low-loss connections^[1].

Patch Cord: Pre-terminated cable for connecting devices (e.g., transceivers)^[1].

Tight Buffer: Protective coating (900 µm thick) providing durability and ease of termination^[1].

Advanced Technologies

Fiber Bragg Grating: Periodic refractive index variations in fiber acting as a wavelength-specific filter^[1].

Soliton: Self-reinforcing light pulse maintaining shape over long distances^[1].

VCSEL (Vertical Cavity Surface-Emitting Laser): Laser diode emitting light vertically, used in short-reach optics^[1].

Networking

Passive Optical Network (PON): Fiber architecture using unpowered splitters for point-to-multipoint connectivity^[1].

Dark Fiber: Unused fiber installed for future capacity expansion^[1].

Wavelength Division Multiplexing (WDM): Transmitting multiple signals simultaneously using different wavelengths^[3].

For formal documentation, refer to vendor-specific glossaries like Corning's *FTTH Glossary*^[4] or military/telecom standards^[3].

Note: "WDM" is inferred from general knowledge as it's widely used in optical communications, though not explicitly defined in the provided results.

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1. <https://www.discount-low-voltage.com/DLV/PDF/Fiber-Optic-Glossary-2021-01.pdf>

2. https://mppolytechnic.ac.in/mp-staff/notes_upload_photo/AS273fiberoptics.pdf

3. <https://apps.dtic.mil/sti/tr/pdf/ADA240284.pdf>

4. <https://www.corning.com/catalog/coc/documents/brochures/EVO-871-EN.pdf>