

ADSL (Asymmetric Digital Subscriber Line) Technology serving to transmit at high speeds over telephone lines. The bit rate is asymmetric, in other words higher in the incoming direction (data received by the subscriber) than in the outgoing direction (e.g.: 640/1 500 kbps).

ADSS (All Dielectric Self Supported) This is a self-supported cable that contains no metal element whatsoever and can be added to existing high and medium voltage lines.

ALUPE Circular shaped transversal watertight barrier made of copolymere laminated aluminium tape bonded to the outer jacket preventing any penetration of liquid into the cable.

ATM (Asynchronous Transfer Mode) Packet switching and transmission technique that consists in dividing the data flow into fixed size cells, these being generated at the frequency of the bit rates to be transmitted and switched: voice, data, video. ATM is standardised by the ITU-T.

ATTENUATION The attenuation "A" is the difference in power of the light signal between two points (connectors, splices, defects, lengths of fibre, etc.). The attenuation is expressed in dB per unit length and calculated according to the equation: $A = 10 \log_{10} [P \text{ input (or Pi)} / P \text{ output (Po)}]$.

ATTENUATION PER UNIT LENGTH Attenuation of a fibre referred back to a unit of length. Expressed in dB/km.

BACKBONE Main network to which are connected all networks and sub networks.

BANDWIDTH The bandwidth of a fibre is defined as the maximum transmission frequency in MHz at which the transmitted signal experiences an attenuation of 3 dB. The wider the bandwidth, the greater the capacity to carry high bit rate transmissions. It is expressed in MHz/km or GHz/km. It depends on the transmission wavelength and the physical parameters of the fibre (core diameter, materials, etc.).

BAUD Unit of speed of modulation, or more technically, the number of discrete events signalled per second on a communication channel. Typically enables the transmission of one bit per second with monovalent coding or more with multivalent coding.

BENDING RADIUS The bending radius is the minimum radius of the curve through which a fibre can be bent without damage.

BIREFRINGENCE property of transmitting light unequally in two directions.

BIT/S Bit Per Second. Unit of rate of data transfer expressing the number of bits transmitted per second. Maximum amount of data that a channel can transmit per second by coded signal.

CATV (Community Antenna TeleVision) Wireline television signal distribution network.

COAXIAL CABLE Cable consisting of a central conducting wire, surrounded by an insulator, a metallic sheath and a protective envelope.

COLORLOCK™ Technique for colouring fibre coatings in a single phase during the fibre drawing process.

CONNECTOR Technological concept for achieving a removable connection between two elements of a link (fibre, transmitter-receiver), and allowing a potentially large number of operations (500 to 1 000 cycles) while ensuring a minimum loss of energy (0.3 dB), the lowest possible reflection and the best possible reproducibility (0.1 dB).

CUG (Closed User Group) Set of nodes of an X.25 network forming a virtual private network, insofar as the communications are limited to that network. CUGs can be either strict CUGs in which all incoming and outgoing communications are subject to this restriction, or "incoming" or "outgoing" CUGs in which address restrictions apply respectively to incoming or outgoing communications only. The term "CSG" (Closed Subscriber Group) is also used.

CUT-OFF WAVELENGTH Wavelength above which only the fundamental mode propagates through a fibre by "cutting" all other modes. Noted λ_c .

CWDM (Coarse Wave Division Multiplexing).

DARK FIBRE Non-activated optical fibre.

DRY CABLE CONSTRUCTION Technique for ensuring the longitudinal watertightness of cables using the properties of materials that swell in the presence of humidity.

DWDM (Dense Wave Division Multiplexing or Dense WDM). Optical multiplexing technique operating at around 1 550 nm.

EFM (Ethernet in the first mile).

FDI (Fibre Distributed Data Interface) Transmission and access standard that enables optical fibre LANs with a double token ring structure offering a bit rate of 100 Mbps. The standard is defined by the ANSI committee X3T9.

FRESNEL LOSSES When light passes through a connector, a mechanical splice, certain couplers, or any dioptre in general, it is not only refracted by the dioptre, but also reflected, leading to a corresponding loss of energy transmission.

FRP (Fibre Reinforced Plastic) Mechanical strengthening element of a cable.

FTTB (Fibre To The Building) Telecommunication infrastructure deployment policy involving the deployment of optical fibre up to the company's premises, the building's internal cable structure remaining inaccessible to the cable operator.

FTTC (Fibre To The Curb) Telecommunication infrastructure deployment involving the deployment of optical fibre up to the curb side, i.e. in immediate proximity to a group of buildings.

FTTH (Fibre To The Home) Involving the deployment of optical fibre up to the subscriber's home.

HERTZ Unit of measurement of frequency of a periodic phenomenon.

HFC (Hybrid Fibre Coax) Networks using a combination of optical fibre and coaxial cable.

HIGH BIT RATE High speed networks are becoming more widely available, through to the offer of cable, radio local loop and optical fibre xDSL access solutions. The transfer rates are in excess of 128 Kbps and can be as high as several Mbps.

IEC International Electrotechnical Commission Standardisation organisation.

ITU-T (formerly CCITT) International Telecommunication Union-international body responsible for specifying the methods of interconnection of telecommunication equipment.

JUMPER A certain length of optical cable containing 1 or 2 fibres fitted with end connectors.

LAN (Local Area Network) Network covering a range of a few hundred metres to a few kilometres).

LRL (Local Radio Loop) Public network subscriber termination by radio link, providing a high speed Internet access comparable or better than ADSL. A significant limitation is the need for a direct line of sight between the user's antenna and that of the concentrator.

LSOH (Low Smoke Zero Halogen).

MAN (Metropolitan Area Network) Network of which the distance between the two most distant points can be up to several tens of kilometres and which servers to connect items of equipment and departmental networks of a large company or a campus. Optical fibre is most frequently used.

NUMERICAL APERTURE Value that corresponds to the property of a fibre to receive light for propagation. Defined as the sinus of half the angle of the acceptance cone (called the acceptance or critical angle).

NZDS (Non Zero Dispersion Shift) Fibre (ITU G655 standard).

OPTICAL REPEATER Connection device that serves to regenerate the signal between two segments of fibre.

OTDR (Optical Time Domain Reflectometer) Apparatus for qualifying optical network cables.

PMD (Polarisation Mode Dispersion) One of the inherent physical phenomena of optical fibres and other optical components that causes stretching of the light pulses as they travel along the fibre. This phenomenon affects the transmission of the signal.

POF (Plastic Optical Fibre).

POLYETHYLENE (PE) Sheathing material having excellent mechanical properties. HDPE: High Density Polyethylene.

PON (Passive Optical Network) Optical distribution network with no active repeater.

POP (Point Of Presence).

PRIMARY COATING Thin coating applied directly to the cladding of an optical fibre during drawing to preserve the integrity of the cladding surface.

PULLING CHAMBER Buried civil engineering structure forming the junction between two ducts, for pulling, connecting and dividing the cables.

SECONDARY COATING Coating applied directly to the primary coating to increase the protection of the optical fibre during handling.

SDH (Synchronous Digital Hierarchy) Hierarchical set of digital transport structures, standardised for the transport of adapted payloads over physical transmission networks. The transmission rates are offered on the basis of multiples of 155 Mbps. SDH is fully digital and intended for use with an optical fibre infrastructure, which alone is able to cope with the necessary bit rates.

SINGLE-MODE (MONOMODE) FIBRE Optical fibre in which a single mode, the fundamental mode, is able to propagate at the operating wavelength.

SONET (Synchronous Optical Network) Physical interface that defines standard optical signals, a synchronous frame structure for multiplexing digital traffic. SDH and SONET are equivalent but for historical reasons, some of the transmission rates they propose are different.

SPECTRAL ATTENUATION Attenuation of a fibre according to the wavelength used. *E.g.: 3 dB/km at 850 nm and 1 dB/km at 1 300 nm for the same fibre.*

TOKEN RING Local network standardised by IEEE 802.5 which defines a ring topology with a method of access by means of a token. A variation (802.5-J) covers optical fibre applications.

WAN (Wide Area Network) Network without limitation of distance, using the operators' transmission media and services.

WAVELENGTH Measure of oscillation of a wave. Defined as the speed of the wave divided by its frequency. It is represented by the symbol λ (Lambda) and expressed in units of length (μm or nm).

WELDING Procedure by which a splice is formed by softening or melting the ends of two optical fibres or two groups of fibres using a local heat source in such a way as to obtain continuity of the fibres having first taken care to optimise the position of the cores of the fibres to be joined (Local Injection/Detection [LID] or Profile Alignment System [PAS] or Video analysis) in order to ensure minimum attenuation at the splice formed.

Synchronous	SONET (US) Terminology	SDH (Europe) Terminology
51.84 Mbps	OC-1	STM-0
155.52 Mbps	OC-3	STM-1
622.08 Mbps	OC-12	STM-4
2.488 Gbps	OC-48	STM-16
9.953 Gbps	OC-192	STM-64
39.813 Gbps	OC-768	STM-256

This glossary covers the most frequently encountered optical fibre terms. Other terms can be found in the Glossary of cabling terms produced by the CREDO (Cercle de Réflexion et d'Etude pour le Développement de l'Optique) in collaboration with ACOME.