ABR

Available Bit Rate.

Abrasion Resistance

Ability of a wire, cable or material to resist surface wear. It is an important criterion for the life-cycle of a cable and is specified as A [mm³].

Absorption

Cause for attenuation of a fiber optic cable.

AC (Alternating current)

In AC the direction of electron movement changes many times, each second. The electrons move one way, then the other, and so on i.e. the Current's direction switches rapidly to and fro. When it reverses its direction 50 or 60 times each second - its frequency is 50 or 60 Hz (cycles per second). In other words it is the electric current that continually reverses its direction/polarity in a cyclic manner and is expressed in cycles per second (hertz or Hz).

AC Resistance

Total resistance offered by a device, in an alternating current circuit, due to inductive and capacitive effects, as well as the direct current resistance.

Accelerated Aging

Test that stimulates long time environmental conditions, to observe deterioration in relatively a shorter period of time. The plotted results give expected service life under normal conditions.

ACM

Aluminum conductor material.

ACR (Attenuation Crosstalk Ratio)

Difference between attenuation and crosstalk, measured in dB, at a given frequency. It's an important characteristic in networking transmission to assure that signal sent down a twisted pair is stronger at the receiving end of the cable, than any interfering signals imposed on that same pair by crosstalk from the other pairs. The interfering signal arises from crosstalk of adjacent cables and EMC influence from outside. For shielded cables the external influence is very small and can be neglected, but an un-shielded cable can be negatively influenced by adjacent signal cables and additionally influence the ACR negatively.

Address

Number which uniquely identifies each node in a network (MAC address).

Address Bus

System of associated cables, to which address bits can be transferred.

Adhesion

Adhesive, cohesive and density property of the outer jacket of a cable. "Low adhesion" property is important for drag chain use in order to avoid the cables from sticking to each other.

Adhesion Value

Force required to be applied onto the defined connection length, to separate two cable elements mechanically and is specified in N/100 mm.

Adjacent Conductor

Conductor next to another conductor, either in the same multi-conductor cable layer or in adjacent layers.

Admittance

Measure of ease with which an alternating current flows in a circuit. It is the reciprocal of impedance.

AENOR

Spanish Association for Standardization and Certification.

Aerial Cable

Cable suspended in air on poles or other overhead structures.

AF

Audio frequency.

Aging

Irreversible change in properties or appearance of a material with time, and under specific conditions (usually accelerated representations of environmental states, such as high temperature, oxygen or other various conditions or media).

Ageing of Cables

Ageing of cables depends on various factors; temperature, microorganisms & level of the voltage used. The ageing process related to electrical values is important especially for coaxial cables. The corrosion of the braiding caused by the softening agents from the PVC as well as water vapours is of great importance. The increase in damping is noticeable in frequencies > 1000 MHz.

Aging Resistance

As cables are often subject to environmental influences over decades (life cycle), i. e. chemical, electrical and climatic exposure, it is these properties that are to be tested. Here, all the materials found in cables are briefly tested under extreme conditions. All materials should have a very high aging resistance.

Air Gap

Minimum gap of air between two conducting surfaces permissible at given voltages.

Air-Gap Dielectric

Co-axial design in which a monofilament of plastic holds the center conductor in place in a hollow plastic tube allowing the remainder of the dielectric to be air. Typical velocities of up to 84% can be achieved in this design.

Aldrey

Aluminium alloy (AlMgSi) for conductors with higher mechanical use (higher tensile strength). Aldrey is often used for overhead cables.

Alloy

Combination of two or more different polymers / metals, usually combined to make use of different properties of each polymer / metal.

Aluminium Conductor

Aluminium is used as a conductor material for cables because of its low price and lower specific gravity. Its importance as a conductor material in electrical engineering is in second place after copper and mainly used for overhead lines due to its low weight. If copper wire is replaced by an equivalent aluminium wire, it reduces the weight by half, even with a 1.6 fold cross-section. The larger cross-section requires more material for all subsequent material elements like sheathing and protective sheathing.

AM

Amplitude Modulation.

Ambient

Conditions which exist in the environment, around the cable. Conditions existing at a test or operating location prior to energizing equipment (viz. ambient temperature).

Ampacity

Current handling capability expressed in amperes. The maximum current a conductor can carry without being heated beyond a safe limit.

Ampere; Amp (A)

Unit of current, defined as the amount of current that flows when one volt of electromotive force (EMF) is applied across one ohm of resistance. One ampere of current is produced by one coulomb of charge passing a point in one second.

Amorphous

Irregular arrangement of molecules in a chemical. Plastics are called amorphous (Greek: without structure), whose molecules are not arranged in a regular crystal lattice pattern compared to crystalline.

Amplitude

Magnitude of a current or voltage which can be maximum, minimum, average, or RMS value of an alternating current (AC) signal. These four magnitudes are the same for a direct current (DC) signal.

Analog

Representation of data by continuously variable quantities as opposed to a finite number of discrete quantities in digital form.

Analog Signal

Transmission of continuously variable signals with which the light output is modulated.

Anneal

Process of softening and relieving strains in any solid material, such as metal or glass, by heating to just below its melting point and then slowly cooling it. Annealing generally lowers the tensile strength of the material, while improving its flex life and flexibility and making it less brittle.

Annular Conductor

Number of wires stranded in three reversed concentric layers around a core.

ANSI

American National Standards Institute, a Committee of the USA which develops standards and compares to the German DIN standards.

Antenna Cable

High-frequency co-axial cables for receiver connections, domestic distribution grids and single antenna installations. They are mainly used in receiving and distribution stations for sound and television broadcasting. They must guarantee a low-reflection signal transmission.

Antioxidant; Oxidation Inhibitor

Antioxidants prevent the compounds from becoming brittle too early. As antioxidants can color rubber compounds, they are generally only used for dark compounds.

Aramid Yarn

Strength elements that provide tensile strength, support, and additional protection for fiber bundles. Kevlar is a brand name of aramid fiber.

Armour; Armouring

Additional protective element beneath a cable outer jacket to provide higher level protection to the inner cable components, generally steel tapes, strips or wires.

Arrhenius Equation

Equation states that if the temperature increases by 8-10 Kelvin, the ageing speed doubles. Impact on the life-cycle includes; water treeing, thermal decomposition, migration, electrical ageing & chemical ageing.

AS

Australian Standard.

Assembly

Ready-to-install cable, cut to the appropriate length and fitted with connecting elements (plugs, cable lugs, etc.) at the ends.

ASTM

American Society for Testing and Materials (USA), international standards organization, which suggests test methods, definitions and practices.

ATEX

Approval required for the intended use of devices and protection systems in areas at risk to explosions.

ATM (Asynchronous Transfer Modus / Asynchronuos Transmission Mode)

Transmission standard, which forms the basis for ISDN and Backbone networks. It encodes data into small fixed-sized cells and sends to the receiver via switch-networking.

Attenuation

Decrease in magnitude of a signal during transmission within a medium viz. cable or circuitry, caused by emitting electrical power because of conductors acting as transmitting antennas. It is usually expressed logarithmically as the ratio of the original and decreased signal amplitudes, and is expressed in decibels (dB). The smaller the value, the better the reduction of signal amplitude. The attenuation increases with the increase in frequency and cable lengths, resulting in a lower signal level.

Attenuation A

Reduction of the optical signal power between two cross-sectional surfaces of a fibre optic cable due to losses. The unit of measurement is decibels (dB).

Attenuation Coefficient A

Attenuation relative to the length of a fibre optic cable. The standard unit of measurement is decibel / kilometer (dB/km).

Audio

Term used to describe sounds within the range of human hearing (20 Hz to 20 kHz). It is also used to describe devices designed to operate within this range.

Audio Frequency

Frequency within the range of human hearing (approximately 20 Hz to 20 kHz).

Automotive Wires/Cables

Vehicle wires/cables used in passenger cars and trucks.

AWG

American Wire Gauge, a coding for the wire diameter mainly used in North-America. It marks the electrical cables made of stranded and solid wires and is used in electrical engineering to describe the cross-section of wires. The smaller the AWG number, the greater the conductor cross-section.

AWM (Appliance Wiring Material)

UL or CSA designation for Appliance Wiring Material.

Backbone

Cable used to connect all systems of a multi-level distributed system to an intermediate system, in a structured wiring system.

Backbone Cabling

Portion of premises cabling that provides connections between primary data and telecommunications equipment and infrastructure access points.

Back-shell

Housing on a connector that covers the area where the cable conductors connect to the connector contacts. It can be a metal housing providing continuity of the shield through IDC connectors.

Back-twist

Term that relates to the stranding process. The technical design of the stranding machine twists the elements to be processed into a strand without torsion.

Balanced Line

Cable having two identical conductors which carry voltages opposite in polarity, but equal in magnitude with respect to ground, suitable for differential signal transmission.

Balun

Balanced to unbalanced (Bal-un) transformer used to connect an unbalanced transmission line (i.e. co-axial cable) to a balanced system or cable, or vice versa. It can also provide impedance transformation, as 300 ohm balanced to 75 ohm unbalanced.

Bandwidth

Range of frequency of a fiber optic cable, which can be transmitted or received in a certain time and is expressed in hertz. The wider the bandwidth the more data can be transmitted, as it takes more bandwidth to download a photograph in a second than to download a page of text. Virtual reality and three-dimensional audio/visual presentations require even more. The transmitting speed depends on the bandwidth of the entire network.

Bare Conductor

Conductor made of metal, where the wires are not coated with an additional metal.

Baseband

Transmission technique that allows only one signal at one time to travel on a cable

BASEC

British Approvals Service for Cables (Certification Authority of Great Britain and Ireland)

Basic Conductor Load

Limiting conductor-load per unit length assumed for the purposes of design.

Battery Cables

Link between battery and generator in the engine. These cable are developed, manufactured and delivered in accordance with customer requirements/product specifications.

Baud

Unit of symbol rate for the transmission of messages; per symbol rate one second; 1 bit/s = baud, 1Mbit/s = 1 Mbaud

Bending Capacity

Indicates how far a product can bend without forfeiting function.

Bending Cycle

Number of bends repeated in the drag chain (how often can a cable actively be stressed during testing or during application)

Bending Radius

Permissible radius for occasional or constant bending of cables. The bending radius is defined as a multiple of the cable diameter. The construction of the cables determines the minimum permissible bending radius, which allows it to be increased or reduced. The permissible bending radii must be adhered to when laying power lines and cables. The standard values are between 15 x D and 30 x D, depending on construction type and regulation, where D is the outer diameter of the cable.

Bending Test at Low Temperature

Cold flexibility test for cables where a cold cable is wrapped around a pin and no cracks should occur in the insulation.

Binder

Spirally served tape or thread used for holding assembled cable components in place awaiting subsequent manufacturing operations.

Bit

Smallest unit for representing binary data, significance either 0 or 1. It is the basic unit for transmission information in digital systems. A byte is a group of 8 bits.

Braid

Group of textile or metallic filaments interwoven to form a tubular flexible structure which may be applied over one or more wires, or flattened to form a strap.

Braiding

Electrical equipments are much more sensitive towards interfering influences, and the numbers of equipments which create electrical fields are currently on rise because of which it has become necessary to shield the interfering equipments prone to radiation of electrical fields. A metallic shield is used for this purpose, which can act as braiding as well as metal foil. Disturbing pulses from the outside to the inside and reverse can be avoided by using braiding.

Breakdown

Electrical breakdown between two conductors, or a conductor, in water during the testing process, when the insulation can no longer withstand the constantly increasing voltage (breakdown voltage) or if a fault in the insulation results in a breakdown within a specified time at a constant voltage.

Breakdown of Insulation

Failure of an insulation resulting in a flow of current through the insulation. It can be caused by the application of too high voltage or by defects or decay.

Breakdown Voltage

Voltage at which the electricity flows through the insulation, onto a metallic conductor, resulting in an electrical puncture.

Breaking Load; Ultimate Load

Product of nominal cross-section and tensile strength.

Breaking Strain

Material parameter, which gives the remaining elongation of the sample after breakage related to the starting measured length. During bending of a cable the surface of insulation and sheathings are stretched. Through improper bending over the length of the own diameter the stretching in the outer phase is not more than 50% and is way below the allowed minimum stretching of e.g. PVC. PUR has a breaking strain of approximately 500 %.

Breakout

Point at which a conductor or conductors are separated from a multi-conductor cable to complete circuits at various points along the main cable.

Breakout Cable

Multiple fiber cable used in more heavy duty applications. Each fiber in the cable (12 or 24) is individually padded and wrapped. It handles pressure, strain, impact, and repetitive motion very well.

Broadband

Technique used to multiplex multiple networks on a single cable without interfering with each other. Technologies that allow you to transmit or receive higher volumes of data at higher speeds, by transmitting signals by a high number of oscillations per second (viz. glass fibre technology).

BS

British Standard, a Standards body for Great Britain, similar to VDE in Germany.

Building Wire

Wire used for light and power, 600 volts or less, usually not exposed to an outdoor environment.

Bunch Strand

Conductors twisted together with the same lay and direction without regard to geometric pattern.

Bundle

Several cores or pairs that are stranded into a group that in turn make up one element of a strand assembly.

Bus-bar Wire

Un-insulated tinned copper wire used as a common lead.

Bus Cables

Bus is a sum of a multitude of parallel cables onto which multiple function units or components of a computer are connected to. Through the use of bus technology it is possible to reduce costs of approximately 40% during cabling, commissioning and maintenance compared to conventional technology.

Butyl Rubber

Synthetic rubber manufactured co-polymer made of isobutylene and butadiene or isoprene which displays great resistant to ageing, chemicals and low gas penetration.

Cable

Combination of several cores with protective layers (sheath) or sheathing of a single core. The sheathing protects the cores against all kinds of harmful influences. Cables are used to transport electric current (power cables), transmit information using an electric current (data cables) or to transfer information using light waves (light waveguide cables). The term line is also commonly used, depending on the application. It is not possible to exactly delineate the two terms. In general, the term "cable" is used for installations outside buildings. In practice, however, the terms are used interchangeably.

Cable Assembly

Cable that has connectors installed on one or both ends. General use of these cable assemblies includes the interconnection of the cable systems and electronic equipments. If connectors are attached to only one end of a cable, it is commonly known as a pigtail. If connectors are attached to both ends it is commonly called a jumper or patch cord.

Cable Bend Radius

Cable bend radius during installation infers that the cable is experiencing a tensile load (pulling force). Free bend infers a smaller allowable bend radius since it is at a condition of no load (after installation).

Cable Drag Chain

Cable drag chain is a component part made of interlinked hinged components. The flexible cable guides, protects pneumatic and hydraulic elements. These cables are connected to machines which move to & fro, and without such a guidance the cable would be destroyed very quickly, as it ensures that the allowed minimum bending radius is kept.

Cable Gland

Device that is designed to guide a cable or an insulated conductor into a sheath and provides a seal and a restraint mechanism. It can also have other functions, e. g. kink prevention, strain relief, potential equalization, earthing, insulation or a combination of these.

Cable Grip

Woven tubular device, which is placed onto a cable, and whose diameter decreases by pulling and griping the cable tightly.

Cabling

Grouping or twisting together of two or more insulated conductors or subcomponents to form a cable.

Cable Shield

Earthed metallic sheathing to reduce the effect of electric fields onto the inside of the cable and/or to protect the cable from outside electrical influences. Metallic sheathings, foils, braiding, reinforcement elements and earthed concentric conductors can also act as shields.

Cable Tree

Combination of individual cores or cables tied together with nylon ties, spirals or hose sheathing. The form of the harness is created when joining the wires, as the various consumers in the device and system circuits are physically separated and the connection with the individual cables makes constant branches necessary.

Caloric Load Values

Energy that is released when cables and other building materials are burned.

CAP

Carrier less Amplitude Phase Modulation

Capacitance

Ability of a dielectric material, between conductors, to store energy when a difference of potential exists between the conductors. The unit of measurement is farad. Cable capacitance is usually measured in pico-farads (pF).

Capacitance Direct

Capacitance measured directly from conductor to conductor through a single insulating layer.

Capacitance Mutual

Capacitance between two conductors with all other conductors, including shield, connected to ground.

Capacitive Crosstalk

Cable crosstalk/interference resulting from the coupling of the electrostatic field of one conductor, upon one or more.

Capacitive Reactance

Opposition to alternating current due to the capacitance of a capacitor, cable, or circuit. It is measured in ohms and is $1/(2 \pi f C)$ where π is approximately 3.142, f is the frequency in Hz, and C is the capacitance in farads.

Capacity

Measure of signal transmission. High capacity, for example, can change the incoming signal in a way that will result in an error message at the cable end.

Category

Rating of a local area network (LAN) cable established by TIA/EIA, to indicate the level of electrical performance.

Category Cables

Category 3 to 7 cables are all high performance twisted pair data cables. The higher the category number, the greater is the bandwidth. Category 7 is currently the highest performance telecommunication wire available.

CATV

Community Antenna Television. CATV - cables mainly used for television distribution and can also be used for transmissions up to 1 gigahertz.

CCC

China Compulsory Certificate. Products requiring certification can only be imported to China, sold in China or used in Chinese business activities after the relevant CCC certification has been requested and granted.

CE

Communauté Européenne (European Community)

CE Marking

Comprises the "CE" symbol which indicates products compliance with all applicable EU directives. CE indicates that the natural or legal entity which carries out or initiates the connection is satisfied that the product meets the requirements of all relevant harmonized standards and has been subjected to all mandatory conformity assessment procedures.

CEBEC

Committee for Electrotechnical Belgium Community (Certification Authority of Belgium)

CEC

Canadian Electrical Code, the Canadian version of the National Electrical Code (NEC).

CEE

Commission on the Rules for the Approval of the Electrical Equipment for Europe.

CEI

Commission Electrotechnique Internationale - International.

Cellular Polyethylene

Expanded or "foam" polyethylene, consisting of individual closed cells of inert gas suspended in a polyethylene medium, which reduces the dielectric constant, compared to solid polyethylene, decreasing attenuation and increasing the velocity of propagation.

CENELEC

Comité Européen de Normalisation Électrotechnique; European Committee for Electrical Standardization.

Characteristic Impedance

Impedance is a size indication which states the relationship between electric and magnetic waves of a data cable. In a transmission cable of infinite length, it is the ratio of the applied voltage to the resultant current at the point the voltage is applied, or the impedance which makes a transmission cable seem infinitely long, when connected across the cable's output terminals.

Chloroprene Polymers / Chloroprene Rubber

Synthetic plastic manufactured through polymerization of Chloroprene. It is a high grade very expensive flame-resistant rubber which is resistant to solvents, with very good mechanical strength, and acts as thermal insulation.

Chocked Conductor

Stranded conductor, whose single wires are arranged helically, randomly and in the same direction and lay length.

Chrominance Signal

Portion of a video signal that contains the color information.

Circular Conductor

Stranded conductor where the single wires are helically wound in one or more separated concentric layers with changing direction of lay.

Circuit

Complete path through which a current flows.

Circular Mil

Area of a wire that is one-thousandth of an inch (.001 inch, one mil) in diameter, which is π/4 of a square mil. The circular mil area (CMA, cmil) equals the diameter in mils squared. By knowing the CMA of various conductors, one can determine what conductivity and gage size various combinations will produce.

Cladding

Low refractive index material that surrounds the core of an optical fiber causing the transmitted light to travel down the core and protect against surface contaminant scattering or a layer of metal applied over another. Cladding is often chosen to improve conductivity or to resist corrosion.

Clamping Voltage

Underwriters Laboratories (UL) rates the clamping voltage of surge protectors, the lower the rating, the better the protection.

CM

Chlorinated polyethylene, an elastomeric sheathing material which is ozone resistant.

CMX

Generic term for communication cable according to UL 444.

CN

Cyanides, which are salts and other compounds of prussic acid. Like PUR results from the polyaddition reaction of Diolen or Polyolen with polyisocyanates.

Coating

Material applied to the surface of a conductor to prevent environmental deterioration and helps to facilitate soldering.

Co-axial Cable

Cylindrical transmission line comprised of a conductor centered inside a metallic tube or shield (second current path), separated by a dielectric material, and usually covered by an insulating jacket. Co-axial means that the axis of the inner conductor is in line with the axis of the shielding sleeve. These Cable are used by Cable TV companies to distribute signals to homes and businesses. It is also used by telephone companies in some applications and by cellular telephone, radio, and television installations.

Coaxial cable with tinned copper braiding as outer conductor in new condition shows a 15-20% higher attenuation than bare braiding, but has a more stabile attenuation behavior. Co-axial cables with silver copper braiding have the same attenuation behavior as cables with bare copper braiding. In its long-term behavior it can be evaluated equal to cable with tinned braiding.

Cold Bend

Test procedure where a sample of wire or cable is wound around a mandrel of a specified size, at a specified temperature, for a given number of turns, at a given rate of speed, and examined for defects.

Cold Flow

Permanent deformation of the insulation due to mechanical force or pressure (not due to heat softening).

Cold Test

Determines the performance of cables during/after subjecting to a specified low temperature, for a specified time.

Compensating Cable

Cables used together with a thermal element for temp. measurements. (Thermal elements such as Fe/CuNi iron-constantan (blue); NiCr/Ni nickel-chromium-nickel (green); PtRh/Pt platinum-rhodium-platinum (white). A thermal element consists of two conductors made from different materials, between which there is an electric potential depending on temperature. Compensating cable transmits this potential from the thermal element to a cold junction. There, based on the value of the potential, the temperature can be assigned at the point of measurement.

Composite Cable

Cables having conductors with two or more AWG sizes or more than one cable type.

Compressed Conductor

Stranded conductor, where the cavities between the single wires are reduced through mechanical pressing or pulling, or through selected choice of the profile, or the arrangement of wires.

Concentric Conductors

Conductor enclosing one or more insulated conductors in a concentric manner.

Concentric Stranded Conductor

A group of un-insulated wires twisted together and containing a center core conductor with subsequent layers spirally wrapped around the core with alternating lay directions to form a single conductor.

Concentricity

Measurement of the location of the center of the conductor, with respect to the geometric center of the surrounding insulation, in a wire or cable.

Concentric Stranded Wire

Wire that possesses a uniform diameter, the electrical properties of a concentric wire/cable manufactured with tight tolerances and smallest wall thicknesses are possible.

Conductance

Ability of a conductor to carry electric current, measured in mhos and is the reciprocal of resistance.

Conductivity

Capability of a material to carry electrical current, usually expressed as a percentage of copper conductivity (copper being 100%).

Conductor

Conducting part of an electrical cable consisting of one or more single wires.

Conductor Shield

Extrusion of black semi-conducting thermoset material over the conductor to provide a smooth interface with the insulation, for even distribution of electrical stress.

Conductor Layer

Conductor layers are used to reduce microphony attenuation as a result of cable movements (friction plastic/conductor material). A thin and easily removable layer of conductive plastic is applied onto the insulation (extrusion; solidly over-moulded with talcum). This layer is mechanically or electrically connected with the D or C shielding.

Contact

Part of a connector, which actually carries the electrical current, and is either open or close to control the flow of current.

Control Cable

Multi-wire/cable for the transmission of control, measuring and display signals in electrical installations.

Control Wire/ Test Wire

Insulated conductor in an energy cable used to transfer signals.

Copolymer

Compound polymerized from two or three monomers to form an intra molecular chain.

Copper

Electrolytic manufactured conductor material with a purity grade of 99.9% with a symbol as Cu, special form is OF Cu. It has an excellent conductivity of heat and electricity and has very good ductility and good strength properties.

Cord

Small, flexible insulated cable.

Cordset

Portable cords fitted with a wiring device at one or both end.

Core

Component/assembly of components over which additional components (shield, jacket, etc.) are applied, in cables.

Core Filler

Filler used as a core element, or as a wire replacement incorporated into the stranding structure, which helps in achieving a round stranding construction.

Corona Treatment

Treatment in which the foreign layers of plastics are evaporated through oxidation on the insulation surface which increases the wettability and stickiness of the color. The corona treatment differentiates itself from the electrical short-circuit by creating a discharge spark that is quickly extinguished. This restriction allows the spatial even spreading of the discharge over the complete discharge electrode. It prevents local over-heating and damage to the cable insulation. The cable is exposed to the discharge for only 1/100 – 1/10 seconds. Even thin cable insulations are solely modified on their surface. The oxygen concentration is only measurable up to a depth of approx. 5nm (8 atomic layers). The background is that cable insulations must display an outer surface energy of a minimum of 38nM/m to guarantee the required color adhesion. Polyvinyl chloride achieves this requirement with 39 nM/m, Polyethylene with 30 nM/m is rather difficult wettable and in addition is non-polar. For the printing of polyolefines a corona treatment is always required. This ensures that the printing color is not rejected by the material. All PE, PP, TPE-O belong to the group of polyolefines.

Coupling Resistance

Parameter to determine the shielding of cables, a unit for the quality of shielding and defines the relation of the voltage along the shielding of the disturbed system to the current of the interfering system. The size and the frequency response of the coupling resistance depends on the structure of the shielding. For DC current and low frequencies the transfer impedance is identical to the DC resistance of the shielding. With increasing frequencies and, depending on the structure, the behaviour is completely different. The attenuation of shielding for shielded symmetrical cable can only be determined by measurement. There are various different measuring methods, which are measuring frequency specific.

Coverage

Specifies how well a metal shield covers the underlying surface and is measured in percent.

CR

Polychloroprene made by polymerisation of 2-chlorobutadien.

Crimping

Mechanical compression joint between conductor and metal sleeve of terminals with the help of a crimping tool/machine.

Cross-linked Elastomeric Insulation

Insulation made of thermoplastic resin, a copolymer or a composite out of these materials, where molecular structure is changed through a chemical reaction like cross-linking or curing and/or physical process like irradiation.

Cross-linking

Irradiation is one of the methods adopted to optimize thermally resilient cables i.e. cross-linking, which improves the properties of insulations and cable sheathings…higher operating temperature, resistance against welding splashes, improved tensile strength, improved flexural strength, improved oil resistance, improved ageing resistance. The radiation technology influences the radiation doses, absorbs radiation energy per unit of mass, and modification of the characteristics of the radiated product.

Cross-linking Agents

Cross-linking agents or vulcanizing materials in rubber compounds are either sulphur (for natural or synthetic rubber) or peroxide (for silicone, EPDM). Sulphur cross linking begins at room temperature and intensifies as the temperature is increased. With peroxide cross linking, oxygen is released for cross linking at a specific temperature.

Cross-section Area

A distinction is made between the geometrically defined nominal cross-section and the conductive cross-section, which is derived from the electrical resistance. A certain maximum resistance is assigned to the nominal cross-section, within which the conductor structure is specified. The cross-section is normally specified in mm^2. However, for certain types of cables, which are always made up of single-core conductors (telecommunications cables), the conductor diameter is used for marking or description.

Crosstalk (Induced Interference)

Interference caused by signals from one pair or cable being coupled into adjacent pairs or cables, which can occur with audio, data, or RF signals.

Crosstalk Attenuation

Influence of signals, in parallel running conductors, onto each other through electromagnetic coupling. In multi-paired communication the field effects of the signal transmission of one pair induces an interfering signal onto the neighbouring pair. This interfering signal is frequency dependent and increases with rising frequency. The difference between the wanted signal and the measurable interfering signal of the neighbouring pair is called crosstalk attenuation (NEXT).

CSA

Canadian Standards Association (Technical Testing Organization, Canada), the Canadian version of the Underwriters Laboratories.

CSMA/D

Carrier Sense Multiple Access/Collision Detection.

Current

Amount of electric charge flowing through a particular area in a unit time which flows from the positive terminal of the cell to the negative terminal. Current flows within a circuit in a direction opposite to the direction of flowing electrons, and is measured in amperes.

Current Carrying Capacity (Ampacity)

The max. current which can be transmitted by a conductor prior to melting of the conductor or insulation. The heat which is generated by the flow of the electrical current through the conductor, determines the current which can flow through the conductor. A multitude of factors restrict the current carrying capacity of a conductor. The most important factors are as follows:

1) Conductor cross-section: The greater the cross-section, the greater the current carrying capacity.
2) Insulation: The generated temperature should not exceed the maximum permitted temperature of the insulation material.
3) Amount of conductors: The generation of heat is reduced if the amount of individual insulated bundled conductors are increased.

Cut-through Resistance

Test to determine the ability of a material to withstand the application of blades or sharp edges without being cut.

Daisy Chain

Cable assembly with three or more termination areas.

Data Cable

Cables whose structure makes them suitable for transmitting electric data processing pulses with minimum errors. Simple (pair) or more complex (screening) constructions are required depending on the susceptibility of the data pulses to faults. Computer cables (Li2YCY-PIMF) or other, at least twisted in pairs, normally screened and often individually screened cables with twisted pair, telephone cable, also light waveguide cables.

DAVIC

Digital Audio Video Council.

Decible (dB)

Non-dimensional numerical ratio, which is the tenth part of a BEL and is the common measuring unit for the attenuation of high frequency engineering.

Degree of polymerization

Number of monomers which create a macromolecule.

Delay Line

Transmission line or equivalent device designed to delay a wave or signal for a specific length of time.

DEMKO

Denmark Elektriska Materialkontroll, Denmark, Governmental Test and Certification Authority.

Density

Ratio between mass and volume of a body. The mass is m and the volume is V, so the ratio of density is p= m/V.

Density Unit

Result of the density of a body, relative to the density of water (= 1), corresponding to the specific weight.

De-rating Factor

Multiplying factor used to reduce the current carrying capacity of conductors in more adverse environments, such as higher temperature, or where multiple conductors are together in one conduit.

DESINA

Decentralized and Standardized Installation technology, a comprehensive overall concept for standardization of electrical installation of equipment and machinery. Color codes of cables: Servo cable, screened: Sheath color orange RAL 2003 Cable for measuring systems, screened: Sheath color green RAL 6018 Power cable, unscreened: Sheath color black RAL 9005 24 Volt control cable, unscreened: Sheath color grey RAL 7040 (similar to 7001) Field bus hybrid cable, Cu and light waveguide: Sheath color violet RAL 4001 Sensor/actuator cable, unscreened: Sheath color yellow RAL 1021.

Dielectric

Insulating (non-conducting) medium/material used in a signal-carrying design, having electrical insulating properties.

Dielectric Breakdown

Any change in the properties of a dielectric that causes it to become conductive, normally a catastrophic failure of an insulation because of excessive voltage.

Dielectric Constant (K); Relative Permittivity

Ratio of capacitance between two electrodes with a solid, liquid or gaseous dielectric, to the capacitance with air between the electrodes. A number which indicates the quality of a material to resist holding an electrical charge when placed between two conductors. It is based on a vacuum, which has a dielectric constant of 1. Generally low values are desirable for insulation. It is also called Permittivity and Specific Inductive Capacity. As the frequency of signals, in Co-axial cables, is in Megahertz, the mutual capacitance between two conductors should be minimum, to reduce the loss of signal. **Polyethylene** with dielectric constant of 2.3 is the ideal for insulation of these cables. Air has got the min. dielectric constant of 1.0 and efforts are made to approach it by making polyethylene porous. Multiplying the DC of the empty space by the dielectric constant gives the DC of the dielectric.

Dielectric Heating

Heating of an insulating material when placed in a radio-frequency field, caused by internal losses during the rapid polarization reversal of molecules in the material.

Dielectric Loss

Power dissipated in a dielectric as the result of the friction produced by molecular motion when an alternating electric field is applied.

Dielectric Loss Factor

A portion of the energy flowing into insulation does not return to the system but is lost in the form of heat. For a given voltage and power frequency this heat, known as dielectric loss, is directly proportional to the product of dielectric constant and power factor.

Dielectric Strength; Dielectric withstand Voltage

Voltage at which an insulator breaks down electrically and abruptly becomes a conductor. The measurement to withstand electrical stresses without failure is obtained by dividing the breakdown voltage by the thickness of the insulation between the electrodes, and is usually expressed in 'volts per mil'.

Dieselhorst-Martin Stranding

The DM stranding is made of two stranded pairs, whilst the star quad is stranded in layers. With this stranding it is possible, through suitable circuitry, to have multiple conversations simultaneously on the existing wire pairs (phantom circuit).

Digital Signal

Electrical signal which possesses two distinct states (on/off, positive/negative).

DIN

Deutsches Institute für Normung [German Standardisation Institution], based in Berlin, Germany.

DIN EN

European standards added to the German body of standards.

Direct Burial Cable

A cable installed directly into the earth.

Direct Current (DC)

In DC the electrons move in the same direction all the time the electricity flows i.e. the electric current flows in only one direction and has zero frequency.

Direct Current Resistance (DCR)

Resistance offered by any circuit to the flow of direct current.

Dissipation Factor

Ratio between the permittivity and conductivity of the dielectric. It is dependent on capacity, frequency and the temperature of the conductor.

Distribution Cable

Transmission cable between the distribution amplifier and the drop cable in a CATV system.

Drain Wire

An un-insulated tinned copper wire in continuous contact with shield of the cable, used for termination of the shield as a ground connection. The drain wire serves the direct electrical connection of the shielding with the reference potential and generally has a compact strand construction.

Drop Cable

Transmission cable between the station and the network in a CATV system which connects the station with the transceiver.

Earth

British terminology for zero-reference ground.

Earthing

Earthing guarantees a clear reference potential for screening the active and passive components of a network.

EIA

Electronic Industries Association (formerly RMA or RETMA).

Elastomers

High-molecular materials, whose elasticity depends on the degree of cross-linking and are widely used for insulation & sheathing in cables because of their excellent electrical & mechanical properties. They are elastically mouldable plastics, which return to their original dimensions after being stretched or distorted. Unlike thermoplastics, the vulcanizates have no melting point or melting range, not meaning that they are stabile at high temperatures also. Thermal decomposition takes place depending on temperature and duration of exposure.

Electric Circuit

The continuous and a closed path of an electric current is called an electric circuit.

Electric Current

Amount of electric charge flowing through a particular area in a unit time and it flows from the positive terminal of the cell to the negative terminal. Current flows within a circuit in a direction opposite to the direction of flowing electrons. It is expressed as I = Q / t (Where I is electric current in ampere (A), Q is electric charge in coulomb (C) & t is the time taken.

Electric Field

When voltages are applied to cables, electrical fields are formed, which can take on different shapes depending on the cable construction. In the low voltage range, up to approx. 1 kV, electrical fields have only a negligible influence on the dimensions of the insulating walls. To guarantee operational safety, there are high demands on the materials and dimensions in the high voltage range. An electrical field is represented by field lines. The density of these field lines indicates the force that exists between the two points on a field line (voltage).

Electric Resistance

Resistance with which an electric circuit opposes the passage of the current, is specified & measured in Ohms.

Electricity

Form of energy based on the flow of free electrons. Electricity is produced in generators.

Electromagnetic

Combined electric and magnetic fields caused by electron motion through conductors.

Electromagnetic Coupling; Inductive Coupling

Transfer of energy by means of a varying magnetic field.

Electromagnetic Protection

Protection against faults that could affect the cable from outside (immisions). Protection against faults caused by the cable (emissions). Braid, e. g. copper (tin plated) → flexible → coverage. Protection against external influences: mechanical, e. g. cables over edges; stepping on; pulling of cables; chemical: e. g. oils; thermal: heat, cold.

Electrostatic

Static electricity, or electricity at rest, an electric charge as an example.

Electrostatic Coupling; Capacitive Coupling

Transfer of energy by means of a varying electrostatic field.

Elongation

Increase in length of a wire/cable, caused by longitudinal tension.

Elongation at Break; Ultimate Elongation

Ratio of the elongation, to the initial length when a break occurs.

ELOT

Hellenic Organization for Standardization, certification body for Greece.

EMC (Electromagnetic Compatibility)

The ability of electrical equipment to operate satisfactorily in an electromagnetic surrounding and at the same time not influence other equipments. All electrical equipments can be a source or a victim. The transmission of the interference takes place via coupling. The cable itself can be seen as source. The generation of interference must be reduced as far as possible so that operation of radio transmission and telecommunications can take place. It is possible, through suitable cable design to reduce, or shield interfering signals, so that no negative effects are expected. Influencing factors are: optical cover of the braiding, angle of twist, amount of braiding wires, combination of braiding and St-shielding and/or copper fleece. EMC views parallel placed single wires or flat cables as a bad solution and should be avoided if EMC problems occur. The data cables should always be placed separately and distant from interfering power cables.

EMF (Electromotive Force)

Pushing strength of electricity which is measured in volts. For electric current to flow, the potential difference must be great enough to overcome the resistance of the path. The force that moves the electrons from one point to another is known as the potential difference or an electromotive (electron moving force). The electromotive force creates the electric pressure that causes the current to flow through a conductor. Another name for this force is voltage and its unit of measurement in volt. The **volt** is defined as that electromotive force that is necessary to cause one ampere of current to flow through a resistance of one ohm.

EMI (Electromagnetic Interference)

Process plants are loaded with stray magnetic fields. Any time a current passes through a conductor, a magnetic field is produced radially around it. As a result, all power lines, motor, generators radiate magnetic fields in varying strengths.

Any time a closed circuit cuts this magnetic field, a current is induced in the circuit to oppose the magnetic field. This current causes an interference which will get superimposed on the signal in the circuit. The most economical way to combat this is to twist the cores in the circuit. Twisting causes the interference to be cancelled as the current induced in two wires are in opposite direction. The other way to combat this interference is to provide screening of low resistance ferro magnetic material.

Electrostatic Interference

Any voltage source radiates electric field, which in turn induces emf in the circuit which is capacitively coupled to the voltage source. The most effective way to protect the circuit is to place it inside a totally covered shield which is earthed. The two methods of providing shielding are as follows:

1. Aluminum Polyester Tape is wrapped around a circuit with 25% overlapp.
2. By braiding copper wires around the circuit.

To measure the effectiveness of the shield the following test is carried out.

Fifty feet shielded single pair cable is wrapped around four inch diameter aluminum mandrel. One end of the pair is connected to 600 ohm resistor and the other end to a voltage measuring device. The mandrel is driven with a voltage of 20 volts peak at a frequency of 1000 hertz. The voltage pickup in the cable with the shield ungrounded and again with the shield grounded are recorded. The ratio of voltage with ungrounded shield to the voltage with grounded shield is called noise rejection ration. The higher the ratio the better is the shield effectiveness.

For Aluminium polyester tape the noise rejection ratio is more than 6000 while that with copper wire braiding with 85% coverage is about 100. Thus Aluminium polyester tape which provides 100% coverage is more effective than copper braiding in combating Electrostatic Interference.

EMK

Electromotive force.

EMS

Electromagnetic Susceptibility, a functional resistance of a specific object to electromagnetic interference factors.

EN

European Standards.

Enameled Wire

Wires insulated with lacquer, with low wall thickness of the insulation.

Energy Dissipation

Loss of energy from a system due to the conversion of work energy into an undesirable form usually heat. Dissipation of electrical energy occurs when current flows through a resistance.

EPDM

Ethylene-propylene-diene-monomer-synthetic-rubber, a terpolymer elastomer with good ozone and ageing resistance, excellent electrical properties, resistant to cold, is suitable for peroxidically linking (rubber insulated cables and wires).

EPM/EPR

Ethylene-propylene-rubber.

Equilay

More than one layer of helically laid wires with the same lay length for each layer.

ETFE

Ethylene-tetrafluoroethylene is a fluorinated copolymer specially suitable for the Wire-Wrap-Technology. Poly(ethylene-tetrafluoroethylene) is a result of copolymerization of ethylene and tetrafluoroethylene.

Ethernet

Local area network (LAN) which uses the CSMA/CD (Carrier Sense Multiple Access with Collision Detection) access method on a bus topography.

ETSI

European Telecommunication Standards Institute, which develops harmonized standards for an integrated European communication system.

EVA

Ethylene-vinylacetate-copolymer is a group of copolymers manufactured with ethylene and vinylacetate. EVA shows a high thermal and ageing stability compared to other plastics.

Expanded Polyethylene

Expanded or "foam" polyethylene, consists of individual closed cells of inert gas suspended in a polyethylene medium, resulting in a desirable reduction of the dielectric constant.

Expansive Tapes

Tape that is positioned underneath the sheathing, or in the cavities of the conductor, to avoid longitudinal water ingress underneath the sheathing or through the conductor of the cable.

Extension Cord

Mobile cable assembled with a coupling connector and socket. The couplings are integrally moulded onto the cable using thermoplastics and contain protective contacts.

Extrinsic Loss

Coupling attenuation of the radiated power caused by lack of or missing connections.

Extrusion

Continuous fusing of plastic material; extruded through shaping die/nozzles in an extruder with subsequent cooling for the production of semi-finished products and end products, e.g. cable insulations or sheathings.

Farad

Unit of electrical capacity that will store one coulomb of electrical charge when one volt of electrical pressure is applied.

FAS

Fire Alarm and Signal Cable, CSA (Canadian Standards Association) Cable Designation.

Fatigue Resistance

Resistance to metal crystallization which leads to conductors or wires breaking from flexing.

FCFC

Flat Core Flat Cable.

FDDI

Fibre Distributed Data Interface: Interface for data which is transmitted via fibre optic cable. FDDI is a high-speed network technology based on the token ring. FDDI offers a transmission rate of 100 Mbit.

Feedback

The energy that is extracted from a high-level point in a circuit and applied to a lower level. Positive feedback reduces the stability of a device and is used to increase the sensitivity or produce oscillation in a system. Negative feedback, also called inverse feedback, increases the stability of a system as the feedback improves stability and fidelity.

Feeder Cable; Trunk Cable

Transmission cable from the head end (signal pickup) to the trunk amplifier in a CATY system.

FEP

Fluorinated Ethylene Propylene is a "Teflon" fluorocarbon resin and a registered TM of the DuPont. This is a melt extrudable fluorocarbon resin.

FFT-frequency analysis

The Fast Fourier Transformation is algorithm which states a mathematical variable process measured over a certain time period. Preferably used by cable manufacturing for the production of communication cables to avoid cable parameter fluctuations if they occur periodically. The production of modern cable products, like coaxial cable require a constant monitoring of the cable diameter, the eccentricity and the capacity of the cable with regards to periodic fluctuations. The online analysis of these measurements in the frequency range poses as an efficient supervising tool for the recognition of periodic appearing irregularities by cable extrusions.

Field bus

The field bus is a system of cables and field equipment like sensors and actuators connected to its system for the purpose of communication with a control device.

Sensors and actuators are conventionally connected to a controller or evaluation unit using an analogue 4 – 20 mA signal. With this technology, a 2-core cable is necessary for each connection between the sensor or actuator and the controller. In addition, an input/output circuit (I/O) must be provided for each sensor and actuator in the controller (normally a PLC or PC). The picture looks very different when using a field bus system. In this case, all devices are connected to a bus cable (2, 4 or 5 cores depending on the field bus system). An interface card is used instead of the input/output circuits. This saves on I/O cards, reduces the space required in the control cabinet and permanently cuts the wiring costs. In conventional systems, information (e. g. measured values or a fault signal) can only be transmitted in one direction and in very limited amounts. This can be from the sensor to the controller or from the controller to the actuator. By contrast, in a field bus system information can be exchanged bi-directionally via the digital bus. As well as the actual process data such as measured values (e. g. temperature) and control variables (e. g. speed), parameters such as the measuring range, measuring point codes (TAG), filter properties, maintenance or fault signals etc. can be transmitted. The advantages that this brings are obvious. Commissioning and maintenance are simplified and the flexibility of the system (e. g. with central measuring range selection) is improved. This normally also enables cost benefits to be achieved compared to conventional solutions.

Fillers

Dummy cores or fiber thread for filling of cavities around wires of a multi conductor cable.

Fine Stranded Wire

Stranded wires with component strands of 36 AWG or smaller.

Fire Behaviour

Property which describes the fire behaviour of a cable in fire conditions and is classified as non-flammable, flame-retardant, normal flammable and easily inflammable.

Fire Load Values

The energy which is released upon combustion of a cable, described in VDE 0108, Part 1 and the datasheets fire load (measuring unit kJ/kg).

Fire Test

Test for determination of fire behaviour, and is classified into categories A, B and C in dependency to the total volume (litre).

Flame Resistance

Ability of a material not to fuel a flame once the source of heat is removed and describes the flammability of cables exposed to flames. Materials with an oxygen index value above 27 are flame retardant and self-extinguishing. PE has an oxygen index value of 17 and burns like candle.

Flame Retardance

Ability of a material to prevent the spread of combustion by a low rate of travel such that the flame doesn't propagate.

Flame Retardant

Thermoplastic & elastomer compounds for insulation/sheathing which retard fire because of the additives added to them.

Flammability

Measure of the material's ability to support combustion.

Flammability Test

Test to determine the ability of a cable to resist ignition when placed near a source of heat or flame and to self-extinguish when removed the heat source.

Flat Cable

Multi conductor cable, which contains wires or groups of wires in a parallel or flat arrangement.

Flex Life

Measurement of the ability of a conductor or cable to withstand repeated bending.

Flexibility

All cables & cores are liable to mechanical stress, they are also checked for flexibility, i.e. bent several times around various bending radii. There shouldn't be any visible damage to the cables, sheaths, inner or outer protective covers during & after test and all stranded elements, braidings and wrappings must also remain correctly in place. In addition to the diameter of the strand assembly and the number of elements to be stranded, the lay length plays a significant role in the flexibility of a cable. Based on this principle; the shorter the lay length, more flexible will be the strand assembly.

Flexible Cable

Cable which requires flexibility during its operation & the materials and design used for its production meet the requirements.

Floating

Circuit which has no connection to ground.

Foamed Insulation Material

Advantages of foamed products are; small cable diameter with equivalent product characteristics, low material costs and weight reduction.

Foaming/Chemical

Chemical foaming takes place through the addition of kick-start PE. The KF melt is foamed in the cylinder of the extruder. The foam protective layer (foam skin) is process-related by the chemical foaming, but the foaming level is limited. It can only be influenced through machine parameters like extruder temp. & cooling trough temp. and is around 5 pF.

Foaming/Physical

Physical foaming during extruding process by adding nitrogen. Physical foaming takes place through a co-extruder, where a separate layer, depending on the wanted properties, can be used for extruding, i.e. LDPE, MDPE or HDPE. The maximum foaming rate is 70%.

Frequency

Number of times an alternating current reverses itself in one second and is expressed in Hertz (Hz), which is one cycle per second.

FTP

Foil Shielded Twisted Pairs; in these cables the twisted pairs of cores are screened by a common plastic clad aluminium foil.

Gain

Increase of voltage, current, or power over a standard or previous reading and is expressed in decibels.

Glass Fibre Cable (Fibre)

Cable used for data transmission, using light as the transmission medium rather than electric current. Dielectric waveguide are used to transmit signals using light waves.

GOST

Standards institute in Russia (comparable to the VDE in Germany, British Standards in the UK, IMQ in Italy and UTE in France).

Graded Index

Type of optical fiber in which the refractive index of the core is in the form of a parabolic curve, decreasing toward the cladding. This type of fiber provides high bandwidth capabilities.

Ground

Conducting connection between an electrical circuit & the earth, or other large conducting body to serve as an earth, completing the electrical circuit.

Ground Potential

Potential of earth. A circuit, terminal, or chassis is said to be at ground potential when it is used as a reference point for other potentials in the system.

Guage

Standard for expressing wire diameter. As the AWG/SWG number gets smaller, the wire diameter gets larger.

Gusset

Cavities that inevitably occur between the cores twisted into a strand due to their circular cross-section. Using sector-shaped conductors, practically no gussets occur.

Gy / Gray

Measuring unit derived from Joule and Kilogram and defines the absorbed dose caused by ionised radiation and describes the absorbed energy per mass.

Halar

Thermoplastic fluoro-polymer material with excellent chemical resistance, electrical properties, thermal characteristics & impact resistance.

Halogen-free

Insulation/sheathing materials free of halogens viz. bromine, chlorine, fluorine & iodine. Absence of these elements reduces the toxic fume emission.

HAR

Quality mark for a harmonized cable complying with CENELEC HD standards, issued only by HAR testing bodies, e. g. VDE, USE, BASEC, USE, SEV.

Harness

Group of wires/cables, usually with many breakouts with the wire ends prepared for termination or terminated to connectors and ready to install.

HD

Harmonization document. In the EU, HDs have the status of a harmonized European standard (like ENs).

Heat Pressure Test

Test where the depth of indentation is measured under influence of heat (standardized procedure).

Heat Resistance

Ability of a substance to maintain physical, chemical & electrical integrity under specified higher temperature conditions.

Heat Stabilizer

Heat stabilizers prevent the decomposition of macromolecules in plastics, under the influence of heat.

Heat Shock Test

Test where the insulation/sheath of wire/cable is tested for heat shock, by wrapping the wire/cable around a defined mandrel and kept at 150^{0}C for 1 hour in an oven. After cooling down, the test sample should be free from distinguishable cracks.

Henry

Unit of inductance in which the induced voltage in volts is numerically equal to the rate of change in current in amperes per second.

Hertz (Hz)

Unit of measure for the frequency of an alternating current (in India & Germany 50 Hz for mains cables).

Heterogeneous Insulation

Cable insulating system composed of two or more layers of different insulating materials.

Homogeneous Insulation

Complete cable insulation structure whose components cannot be identified as layers of different materials.

High Temperature Wires / Cables

Electrical wires/cables having thermal operating characteristics of 150°C and above.

Hook-up Wire

Single insulated conductor used for low-current, low voltage (usually under 600 volts) applications within enclosed electronic equipment.

Hybrid Cable

Cable with different transmission media, such as light waveguide, copper conductor, HF conductor.

Hydrolysis

Irreversible breakdown of the molecular chains occurring due to longer storage in warm water, saturated steam or tropical climate.

Hypalon

DuPont trade name for a synthetic rubber (chlorosulfonated polyethylene) used as insulating and jacketing material for wire and cable.

IEC

International Electrotechnical Commission, a standards committee for international standardization of electrical materials and international commission for standardization in the electrical engineering and electronics sector.

Impact strength

Ability of a material to absorb impact energy without breaking. The impact strength is the ratio of impact energy and sample cross-section (unit kJ/m^2).

Impedance

Total opposition that a circuit offers to the flow of alternating current, or any other varying current, at a particular frequency.

Impedance Match

A condition where the impedance of a particular circuit cable, or component is the same as the impedance of the circuit, cable, or the device to which it is connected.

Impedance Characteristic

The ratio of the applied voltage to the resultant current at the point the voltage is applied in a transmission cable of infinite length. Or the impedance which makes a transmission cable seem infinitely long, when connected across the cable's output terminals.

Impedance High

Generally, the area of 25,000 ohms or higher.

Impedance Low

Generally, the area of 1 through 600 ohms.

Inductance

Inductive reactance or inductive ac resistance, a property of wire which stores electrical current in a magnetic field around the wire and is measured in Henrys. By coiling the wire, the effect can be intensified.

Inductive Crosstalk

Crosstalk resulting from the coupling of the electromagnetic field of one conductor upon another.

Inner Sheath

Non-metallic sheath applied to offer pressure protection or reinforcement.

Inner Conductive Layer

Conductive layer made of non-metal and/or metallic material, covering the conductor.

Insertion Loss; Insertion Attenuation

Attenuation caused by inserting an optical component, like a plug or a coupler, in an optical transmission system.

Insulated Wire

Conductor of electricity covered with a non-conducting material.

Insulation

Material having good dielectric properties used to separate close electrical components, such as cable conductors and circuit components.

Insulation Resistance

Insulation materials place high resistances onto the electrical current flow which is inversely proportional to the cable length. The insulation resistance is a value for the quality of the insulation material between two conductors or between one conductor and a shield. The insulation material determines the insulation resistance and the insulation thickness is not as crucial as the material characteristics. The insulation resistance depends on the cable length and is measured in Ohm x m or G Ohm x km. The value should be around 1 G Ohm x km. The insulation resistance drops with lengths of longer distances.

Insulation Stress

Molecule separation pressure caused by a potential difference that across an insulator. The practical stress on insulation is expressed in volts per mil.

Interface

Transmission point between different hardware units.

Interference

Various waves in a room are overlaid (Two waves of the same amplitudes and same phase strengthen themselves. If wavelengths are moved against each other then they are erased).

Interstices

Voids or valleys between individual strands in a conductor or between insulated conductors in a multi-conductor cable.

Intrinsically safe cables

Cables (VDE 0165) for use in rooms at risk of explosion. These cables must have a blue outer sheathing as marking.

Intermediate Frequency

Frequency to which a signal is converted for the ease of handling. The name comes from the fact that it is an intermediate step between the initial and final conversion or detection stages.

Ionization

Formation of ions when polar compounds are dissolved in a solvent and when a liquid, gas, or solid is caused to lose or gain electrons due to the passage of an electric current.

Ionization Voltage

Potential at which a material ionizes or the potential at which an atom gives up an electron.

Irradiation

Exposure of the insulating material to high-energy emissions for the purpose of favorably altering the molecular structure by cross-linking.

ISDN

Integrated Services Digital Telecommunication Network suitable for transmission of voice, text, images and data.

Isolation

Ability of a circuit or component to reject interference, usually expressed in dB.

Jacket

Outer protective covering in a wire/cable that also provides an additional insulation.

Kevlar

This is the same material as used in bullet-proof vests, described earlier in Aramid Fiber.

Kink

Plastic deformation of the individual strands and wires, in a cable forcefully bent over a sharp edge, resulting in grooves that promote breakages on the individual wires.

K-value

The K-value is a measurement for the average polymerization grade (average length of the PVC molecules). A higher K-value indicates longer PVC molecules, which also entails better mechanical properties of the cable but at the same time the processing of the cable gets more difficult. A K-value of 70 or 65 is a good compromise between physical characteristics and still satisfactory processing characteristics.

LAN (Local Area Network)

Data network connecting number of users, intended to serve a small area. A group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area.

Lay Length

The axial length of a complete twist of a cable structural element.

Lay Length Direction

Direction of the progressing spiral twist in a cable while looking along the axis of the cable away from the observer, which can be either "left" or "right" hand.

Lay Length Ratio

Ratio of the lay length, to the diameter of a structural element.

Laying Temperature

When installed, the cable temperature should not be below +3^{0}C. Cables with sheathing and insulation are sensitive to bending and impacts when exposed to cold.

Leakage

Undesirable passage of current over the surface of, or through, an insulator.

Leakage Current

In low voltage & electronics Leakage Current is any current that flows when the ideal current is zero. In medium and high voltage applications it is the current that flows either through the body or over the surface of an insulator. Leakage current often arises when outdoor insulation is submitted to conductive fog (sea mist/spray, industrial smogs) or when a pollution layer containing soluble salts is formed on the insulator surface and then wetted, for example by dew or mist. These currents can reach several hundred mA and may lead to flashover of the insulation.

Leakage current is the current that flows via the functional insulation of a consumable to earth or an external conductive part. It can appear as a pure active current or as an active current with a capacitive value. When taking leakage currents for an entire system (also important for residual current protective equipment) into consideration, both the leakage current (residual current) of the cables and the leakage current of the consumable must be accounted for.

Lift Cable

Control cables with strain relief used for lifts and cranes etc.

Line Equalizer

Reactance (inductance and/or capacitance) connected in series with a transmission line to alter the frequency-response characteristics of the line.

Line Voltage

Value of the potential existing on a supply or power line.

Liquidus Temperature

Limiting temperature of soldering, where the tin solder is present as melting. Temperature <= 450 degrees gives soft soldering and temperature >= 450 degrees gives hard soldering.

Longitudinal Water Resistance

Damage to the protective sheathing of earth cables can result in water ingress because of the longitudinal spreading of water, making long cable sections unusable. To avoid this happening swellable materials like swelling powder or petroleum jelly are incorporated between the stranded bundle and sheathing.

Loop Resistance

The sum of the DC resistances of 2 wires (forward and return line of a main circuit).

Magnetic Noise

It is caused by change in current level, e.g., AC power line (creates magnetic field around the cable which causes the magnetic noise).

MAN (Metropolitan Area Network)

Data network intended to serve the area of a city or an area of similar size.

Mating Cycles

Mating cycles are the number of insertion and extraction cycles a connector can withstand before electrical or mechanical failure in relationship to the connector's design specification.

MATV

Master Antenna Television.

Melt Index

The most important parameter of a plastic processing is the flowability of the melt, which should be homogeneous in a batch. The melt index states the mass in grams of a thermoplastic melt, which is pushed through a standardized nozzle in 10 min. with defined piston force and temperature.

Migratory Behaviour

If soft PVC is in contact with other plastics, then the plasticizer can migrate to the other material in contact. The plasticizer only migrates if the other material in contact is migration compatible, if not then migration doesn't take place. The migration of plasticizer depends on the temperature and pressure.

Mil

Unit used in measuring diameter of a wire or thickness of insulation over a conductor, one thousandth of an inch (.001").

MIL (STD)

Military Specification, Military Standard (USA).

Modulation

Altering the characteristics of a carrier wave to convey information. Modulation techniques include amplitude frequency, phase, plus many other forms of on-off digital coding.

Moisture Absorption

Amount of moisture, in percentage, that a material will absorb under specified conditions.

Moisture Resistance

Ability of a material to resist absorbing moisture from the air or when immersed in water.

Molecular Weight

Molecular weight defines the sum of atomic weight of all atoms in a molecule. Mechanical robustness, solvability and stretching amongst other things are dependent of the molecular weight.

Mutual Capacitance

The effective capacitance between two conductors when the effects of the other conductors and shield, if present, are removed.

Mylar

DuPont trademark for polyethylene terephtalate (PETP - Polyester) film.

National Electrical Code (NEC)

Publication of the National Fire Protection Association (NFPA) which outlines requirements for electrical wiring and building construction.

Near-end Cross Talk; Far-end cross Talk

In multi-pair data cables, the field effect of the signal transmission for one pair induces an interference signal in adjacent pairs. Crosstalk does not depend on the length and is greater as the frequency increases. The difference between the effective signal and the interference signal measurable at the adjacent pair is referred to as crosstalk attenuation and is specified in dB. NEXT (Near End Crosstalk) and FEXT (Far End Crosstalk) are different.

NEMA

National Electrical Manufacturers Association.

NEMCO

Norwegian testing body, similar to the VDE in Germany.

Neoprene

Trade name for polychloroprene synthetic rubber, a compound used for jacketing.

NFPA

National Fire Protection Association.

Non-Paired Cable

Cable with two or more cabled conductors that are not in a paired configuration.

Nominal Voltage

Voltage to which the structure of the cable relates in terms of its electrical properties. The nominal voltage is expressed by specifying two AC voltages U0/U in V: U_0=Effective value between an outer conductor and earth (non-insulating environment). U=Effective value between two outer conductors in a multi-core cable or a system of single-core cables.

Nylon

Group of polymers that are used for the jacketing of wire and cable.

OF Cu

Copper with a purity grade of 99.5%.

Ohmic Resistance

The resistance per unit length records the losses in the metallic conductors. The conductor dimensions, material and the temperature determine the DC resistance. Because of skin effect, the conductor resistance increases as the frequency rises. It is directly proportional to the cable length.

Ohms Law

The Ohm's law defines that the electrical current (ampere) is directly proportional to the voltage (volt) and is reverse proportional to the electrical resistance (Ohm). Ampere= Volt/Ohm.

Operating Temperature Range

Range between the lower (lowest permissible temperature) and upper (highest permissible temperature) limit temperature that can be utilized by the operator.

Operating Voltage

Voltage of an electrical circuit in volts, which is required for its operation. It is the actual current in the net and can change by about 5% through variable use by the electricity consumer.

OTDR (Optical Time Domain Reflectometer)

Measuring method for testing glass fibres for faults or transmission quality.

Outdoor Cable

Cables suitable for outdoor laying in the ground, in pipes, in the air, in rivers and lakes, in mines, on ships, for interior spaces or the most varied of industrial plants, etc. The design of the cable depends on the electrical, thermal, mechanical and chemical laying and operating conditions.

Outer Conductor

Conductor made of non-metal and /or metal, which is covering the insulation.

Outer Sheathing

One or more non-extruding layers on the exterior of a cable.

Over-current

Condition of exceeding the permitted ampacity.

Oxygen Index

Percentage oxygen content in the ambient air that is necessary to maintain combustion after removal of a flame. As the natural oxygen content in the air is approx. 23%, materials with an oxygen index of greater than 24 are generally self-extinguishing when the flame is removed. This term comes up primarily in connection with FRLS and halogen free cables.

Ozone Resistance

The ability of a material to resist the deteriorating effects of ozone exposure. High voltage cables for some applications like spark plugs and X-ray tubes produce ozone through high electrical field strength, which corrode the insulation by additional mechanical use (crack formation). Ozone is a bond of three oxygen atoms (O^3) and is produced under the effects of high-energy UV radiation by using the oxygen present in the air. Through its structure ozone is very reactive and reacts easily with organic substances, which can be avoided with ozone resistant materials like Kynar, EPDM & butyl rubber etc.

PA

Polyamide is a polymer containing monomers of amides joined by peptide bonds. They can occur both naturally and artificially, examples being proteins, such as wool and silk, and can be made artificially through step-growth polymerization or solid-phase synthesis, examples being nylons, aramids, and sodium poly (aspartate). Polyamides are commonly used in cables, textiles, automotives, carpet and sportswear due to their extreme durability and strength.

Packet

Basic unit of data transfer in LANs.

Pair

Two insulated cores stranded/twisted together form a pair. The inductive coupling of two parallel conductors is reduced by twisting the two cores together as tightly as possible.

Paired Cable

Data of instrumentation cable, with insulated cores cabled in groups of two.

Parallel Circuit

Circuit in which the identical voltage is presented to all components, with current dividing among the components according to the resistances or the impedances of the components.

Parallel Digital

Digital information transmitted in parallel form, where the digits are sent on separate conductors rather than sequentially on one transmission line. It also refers to parallel digital television signals.

Patch Cord

Short length flexible cable terminated at both ends with plugs, used for interconnecting circuits on a patchboard, in a wiring closet, or at the work area.

PE

Polyethylene, which is made through polymerisation of ethylene. It is a manufactured thermoplastic resin with the simplified chain structure formula and belongs to the group of polyolefins. It has low water absorption and shows good electrical and dielectric properties.

Peak

The maximum instantaneous value of a varying current or voltage.

PETE

Polyethylene terephtalate, a plastic with very good electrical characteristics, thermal behaviour and excellent mechanical stability. It is also resistant to plasticizer migration.

Petroleum jelly

Material with cream-like structure (Vaseline) extracted from crude oil and used to produce longitudinal water tight cable.

Phase

Angular relationship between waves.

Phase Shift

Change in the phase relationship between two alternating quantities.

Photo Voltaic

It refers to the direct conversion of solar energy into electrical energy using solar cells. Photo-voltaics is a branch of solar technology, which includes other technical uses of solar energy.

PI

Polyimides are polycondensation products of tetrabasic aromatic acids and aromatic diamines.

Pick

Distance between two adjacent crossover points of a braid filament, and the picks per inch measurement indicates the degree of coverage.

PIMF

Pairs in metal foil.

Planar Cable

Ribbon cable with many conducting wires running parallel to each other on the same flat plane, making the cable wide and flat. Ribbon cables are usually seen for internal peripherals in computers, such as hard drives, CD drives and floppy drives. Unfortunately the ribbon-like shape interferes with computer cooling by disrupting airflow within the case and also makes the cables awkward to handle, especially when there are a lot of them; round cables have almost entirely replaced ribbon cables for external connections and are increasingly being used internally as well.

Plastic

Wide range of synthetic or semi-synthetic organic solids that are moldable and flowing under heat and pressure and are generally called thermoplastics. Plastics are typically organic polymers of high molecular mass, but they often contain other substances. They are usually synthetic, most commonly derived from petrochemicals, but many are partially natural. Unlike rubber and other thermoset compounds, plastics can be re-melted and reused.

Plasticizer

Additives/chemicals which when added to plastics; make them softer and more flexible. They influence the bendability, extensibility and elasticity module, and by reducing the intermolecular strength they increase the mobility of the molecules.

Plenum

Open space found above a building's dropped ceilings, and it is often used for air circulation in heating and air-conditioning systems. In addition to being utilized for routing air, plenum spaces often house telephone and network communication cables which are being run from one location to another.

Plenum Cable

Fire and smoke resistant cable listed by UL/NFPA for installation in plenums without the need for conduit.

Polarization

The orientation of a flat cable or a rectangular connector. e.g., for a flat cable, the colored edge indicating the number one conductor.

Polyaddition

Polymerization in which macromolecules are attached through reactive groups to each other.

Polyamide

Polymer which is cold resistant with impact loads, impact resistant and abrasion resistant.

Polybutadine

Synthetic rubber often blended with other synthetic rubbers to improve their properties.

Polycholorprene Rubber

Synthetic rubber resistant to solvents, with good strength properties and is flame resistant, however very expensive.

Polycondensation

Step-growth polymerization which refers to a type of polymerization mechanism in which bi-functional or multifunctional monomers react to form first dimers, then trimers, longer oligomers and eventually long chain polymers. Many naturally occurring and some synthetic polymers are produced by step-growth polymerization, e.g. polyesters, polyamides, polyurethanes, etc. Due to the nature of the polymerization mechanism, a high extent of reaction is required to achieve high molecular weight.

Polyester (PETP)

Polyethylene terephalates is a linear saturated polyester (thermoplastics) with high resistance to stress cracking and resistant to water absorption.

Polyethylene

Thermoplastic material having the chemical identity of polymerized ethylene.

Polymer

Substance made of many repeating chemical units or molecules, a term often used for plastics, rubbers, or elastomers.

Polyolefin

Family of thermoplastics based upon the unsaturated hydrocarbons known as olefins. When combined with butylene or styrene polymers they form compounds such as polyethylene and polypropylene.

Polypropylene

Thermoplastic polymer of propylene.

Polyurethane (PUR)

A broad class of polymers known for good abrasion and solvent resistance. It is a hard thermoplastic material used primarily as a cable jacket material, which has excellent oxidation, oil, abrasion and ozone resistance and can also be made flame resistant. Its outstanding "memory" properties make it an ideal jacket material for retractile cords.

Polyvinyl Chloride

Thermoplastic material composed of polymers of vinyl chloride that may be rigid or flexible, depending on application/formulation.

Porosity

Multiple air voids in an insulation or jacket wall.

Portable Cordage (Flexible Cord)

Cable with two or more twisted conductors for flexible applications.

Power

Rate of doing work or using energy (Energy used over time) and is measured in Watt. In electricity, work is done as the electromotive force causes electrons to move through the conductor. The electric power is the product of the electromotive force and the number of electrons set flowing per unit of time. Power (Watt) = Current (Ampere) x Voltage (Volts) or P = I x V.

Power Cables

Cables of various sizes, construction and insulation, single or multi-conductor, designed to distribute primary power to various types of equipment.

Power Factor; Dissipation Factor

These two factors measure the ratio of the power loss in an insulation, to the product of the applied voltage and resultant current. The power factor and dissipation factor are numerically nearly equal to each other when the dissipation factor does not exceed appx. 0.10. In order to ensure max. efficiency and predictability of cable performance, it is necessary that the power factor of the primary insulation is kept low and as uniform as possible throughout long lengths of the cable. A perfect insulator would have a power factor of 0.0.

Specifications for electrical grade polyethylenes usually require that the power factor not exceeds 0.0005, but grades generally have power factors substantially lower – about 0.0002. An increase in density has little effect on the power factor of polyethylene; however, the addition of pigments causes slightly higher values. The power factor of polyethylene is usually increased by temp., voltage, and extreme thermal abuse.

PP

Polypropylene, like polyethylene, belongs to the group of polyolefins, produced through polymerisation of propene.

Premise Cable

Entire cabling system used for voice, data, video and power on a user's premise. For Local Area Networks, the cabling of choice includes unshielded twisted pairs (UTP), fiber optic and coaxial cables. Of these, the UTP market is the largest, with greatest demand for cables with four pairs that meet certain standards of performance, such as Category 5 and Category 5e.

Profibus

The Profibus network is based on the principle of master-slave communication. A central controller; the field bus master cyclically reads the information from the field devices; the field bus slaves, and writes their output values. In a Profibus DP network, a high-speed transmission rate of up to 12 Mbit/s is possible. It is based on the European standard EN 50170.

Propagation Delay

Time required for a signal to pass from the input, to the output of a device.

Propagation Speed

Rate of transmission of the electrical energy through the length of the cable, compared to the speed of light in free-space.

Protective Conductor (PE)

Conductor that is necessary for certain protective measures against shock currents to create the electrical connection to subsequent parts, and is marked in green/yellow (GNYE) in cables.

Pseudo Random NRZ

Wave form of binary signals that may be used in a computer system. It is called NRZ, Non-Return to Zero, because the voltage does not return to zero after each bit.

PTFE

Polytetrafluoroethylene is a high-temperature resistant plastic, produced through pyrolysis of difluorochloromethane, which is resistant to solvents and aggressive chemicals. There are no changes in properties after contact with most chemicals and its surface is so smooth and slipable that hardly any foreign substances stick to it. Neither humidity nor UV-rays change the volume or cause weathering/brittleness.

PTFE/FEP

Polytetrafluoroethylene / perfluoroethylenepropylene are insulation materials with exceptionally good electrical, thermical, chemical, and mechanical properties. Constant temperatures up to 205 degrees and application temperatures down to -90 degrees allow a large area of operation. Fluorocarbon resins are virtually resistant towards all chemicals, especially strong acids and alkalines, solvents and hydrocarbons like they appear in fules. FEP and PTFE are flame-resistant and can be seen as virtually non-flammable. Material properties are not influence by sun light, UV rays and sea water.

Pull Strength

Maximum pulling force that can be safely applied to a cable without damage.

Puncture

Electrical spark discharge by which insulation gets damaged and the electricity flows through the insulator. In this case the voltage is higher than the dielectric strength of the insulation material.

PUR

Thermoplastic polyurethane TPU is a high-performance material with a unique combination of useful properties. PUR cables are weather resistant in all climate zones. Sheathing made of TPU polyester is preferred for outside use and subsoil installation of cables.

PVC

Polyvinylchloride is an amorphous thermoplastic resin which is hard and brittle and only becomes soft after addition of plasticizer and stabilizers. It is mouldable and useable for technical applications (very good price quality ratio for plastics).

PVDF

Polyvinylidene fluoride is a highly non-reactive and pure thermoplastic fluoropolymer, made through reaction of trichloroethylene with hydrogen fluoride and subsequent reaction with zinc 1,1 producing difluoroethylene which is finally polymerised to polyvinylidene fluoride.

It is a specialty plastic material in the fluoropolymer family used generally in applications requiring the highest purity, strength, and resistance to solvents, acids, bases and heat and low smoke generation during a fire event. Compared to other fluoropolymers, it has an easier melt process because of its relatively low melting point of around 177 °C. It has a low density (1.78) and low cost compared to the other fluoropolymers. It is available as piping products, sheet, tubing, films, plate and an insulator for premium wire.

Pyrolysis

Thermochemical decomposition of organic material at elevated temperatures without the participation of oxygen. It involves the simultaneous change of chemical composition and physical phase, and is irreversible. The word is coined from the Greek-derived elements *pyr* "fire" and *lysis* "separating".

QAM

Quandrature Amplitude Modulation.

Quad

Four conductor cable also called a "star quad".

Radio Frequency (RF)

Frequencies from a few kilohertz to several hundred gigahertz used to transmit information from point to point over the airwaves or down a coaxial cable.

RAL

The RAL colors with four-digit numbers have been a yardstick in coloring for more than 70 years. The collection of colors currently includes more than 200 colors. The basic collection for mat shades is the RAL 840-HR register. The collection for gloss shades is the RAL 841-GL register. The basic collections are continuously updated in line with the requirements of industry. These collections cover a wide range of applications. The registers provide a color template for designs, but also include safety and signal colors and comply with the color specifications in DIN standards.

Rated Current

Current at which a connector can continuously (not intermittently) conduct through all contacts simultaneously without exceeding the upper limit temperature.

Rated Temperature

Maximum temperature at which an electric component can operate for extended periods without loss of its basic properties.

Rated Voltage

Maximum voltage at which an electric component can operate for extended periods without undue degradation or safety hazard.

REACH (Registration, Evaluation, Authorization & Restriction of Chemicals)

European Union Regulation of 18 December 2006 which addresses the production and use of chemical substances, and their potential impacts on both human health and the environment.

Reactance

Measure of the combined effects of capacitance and inductance on an alternating current. The amount of such opposition varies with the frequency of the current. The reactance of a capacitor decreases with an increase in frequency; the opposite occurs with an inductance.

Receptacle

Female housing with male or female contacts.

Reduced Conductor

Conductor or single wire cable, which is laid parallel to a cable, or a cable circuit, and is part of a closed circuit itself in which induced currents can flow. Its magnetic field is opposed to the field, which is caused by the current of the cable/ conductor.

Reeling

Ability of cables to withstand constant winding and unwinding over a long period of time without sustaining damage. For mobile consumers (e. g. a crane), the cable length required for the different working positions is carried on a reel. Constant winding and unwinding makes high demands on the cable construction, which means that only special cables are suitable.

Reference Earth

Part of earth considered as conductive that lies outside the zone of influence of any earthing arrangement.

Reflectance

Ratio of power reflected to the incident power at a connector junction, or other component or device, usually measured in decibels or dB. It is represented as a negative value, e.g. -30 dB. A connector that has a better reflectance performance would be a -40 dB connector or a value less than -30 dB.

Reflections

Irregularities in the cable and maladjustments cause reflections of part of the transferred energy. It is a returning wavelength which, depending on the size of the interference, can lower the effective output and transmission quality.

Reflexion

Signal reflection occurs when a signal is transmitted along a transmission medium, such as a copper cable or an optical fiber, some of the signal power may be reflected back to its origin rather than being carried all the way along the cable to the far end. This happens because imperfections in the cable cause impedance mismatches and non-linear changes in the cable characteristics. These abrupt changes in characteristics cause some of the transmitted signal to be reflected, leading to signal distortion.

Refractive Index

Ratio of light velocity in a vacuum, to its velocity in the transmitting medium.

Relative Permittivity

Relative static permittivity is used to define how much greater the capacity of a capacitator is with a defined insulating material, compared to the same capacitator with air as a dielectric.

Repeater

Receiver & transmitter combination, used to regenerate an attenuated signal.

Resistance

Greater the number of free electrons present in a substance, the lower is its resistance. Also the longer an object, the greater is the resistance. The greater the cross-sectional area, the less the resistance to current flow. Metals generally offer higher resistance at higher temperatures. The unit of resistance is ohm. The ohm is resistance to the flow of electric current offered by uniform column of mercury, 106.3 cm long, having a cross-sectional area of one Sq. mm. at 0^0c.

Resistance of a Conductor

Electrical resistance is a unit for the electrical voltage, which is required to let electrical current flow through an electrical conductor, symbol is R and its unit is Ohm (Ω). The specific electric resistance, symbol ρ. The value depends on the temperature of the matter constant, which allows a description of the resistance characteristics independent of the geometrical form of the conductor. R = resistance [W] / p = specific resistance [W*mm²/m] / l = length of the conductor [m] / A = cross-section [mm²].

$$R = \frac{\delta \cdot l}{A}$$

In dc circuits, the opposition a material offers to current flow, measured in ohms. In ac circuits, resistance is the real component of impedance, and may be higher than the value measured at dc.

Resistin

Copper-manganese-iron alloy, an electrical resistor material.

Resonance

An ac circuit condition in which inductive and capacitive reactances interact to cause a minimum, or maximum circuit impedance.

Retractile Cord

Cord having specially treated insulation or jacket which retracts like a spring.

Return loss

Ratio of input energy to backscattered energy, in metallic cables. Such backscattered energies appear through in homogeneities within the cable or the HF connector. Part of the signal energy is reflected and spreads in the cable into the opposite direction. This part of the signal energy is put in relation to the input signal level. The relation is the return loss and is stated in dB (decibel) and is in direct relationship with the Voltage Standing Wave Ratio (VSWR).

RG/U

Radio guide utility, a military name for coaxial cables.

Ribbon Cable

Flat cable made with parallel round conductors in the same plane, also called a planar and/or flat cable. Any cable with two or more parallel conductors in the same plane encapsulated by insulating material.

Rise Time

Time required for the initially zero potential existing on transmission line (which is terminated in its characteristic impedance) to change from 10% to 90% of its full DC value after a DC potential source is instantaneously applied.

Rodent Protection

Protection for inner and outer cable against rodent bites, also applicable for electrical cable, co-axial cables and fibre optic cables. There are non-metallic and metallic protective designs available. For metallic rodent protection the cable is put through a metallic cover in the form of a protected layered sheathing. The non-metallic type is achieved through nylon or polyester coating of the cable or with glass roving underneath the sheathing.

RoHS Compliant

Restriction of Hazardous Substances, which regulates the use of dangerous substances in equipment and component parts and is defined in EG-directive 2002/95/EG.

Rope Strand

Conductor composed of groups of twisted strands.

Rubber (Wire Insulation)

General term used to describe wire insulations made of thermosetting elastomers, such as natural or synthetic rubbers, neoprene, Hypalon, butyl rubber etc..

Rupture

Point at which the material physically separates or comes apart in the breaking/tensile strength tests, as opposed to elongation, yield strength, etc.

SAE

Society of Automotive Engineers, an American Standards Institution for the transport technology, which also created a standard for the terms of the viscosity of lubricants.

Saponification Number (SAP)

Number specified to estimate the resistance against microorganisms. It represents the number of milligrams of potassium hydroxide or sodium hydroxide required to saponify 1g of fat under the conditions specified.

Screened Cable

Cables with screen in outer layer, over the cores, made from braiding, foil or solid metal. With the foil version, a drain wire from the filler strand is used. It is represented by "C", for copper braiding and by "CY" for an additional PVC sheathing over copper braiding.

Screening Attenuation

Measurement technology unit created to measure shielding, which is specified in dB (decibel), and is the relationship of voltages and currents to each other. To get a feeling for the performance-ratio of the screening attenuation of 30dB means that 1,000th part of the transmitted performance in a cable is emitted to the outside. For 50dB it is only the 100,000th part.

The attenuation becomes more difficult the higher the performance. Antenna cable should display a high shielding rating so that the received lower voltage is not overlaid by the interfering radiation. **Transmitters are to shield so that they emit no interference fields and receivers are to shield so that no interference can be received.** The best results are achieved by using closed shielding designs (wrapping with metal foil and additional braiding). High shielded cables with non-suitable plugs erase the complete screening attenuation.

Section Conductors

Shaped conductors, whose cross-section is close to a sector of a circle.

Segmental Conductor

Stranded conductor, which consists of several profiled stranded conductors which are lightly insulated against each other.

SEMCO

Swedish testing body, similar to the VDE.

Semi-Conductor

Materials whose electrical conductivity depends on various influences, e. g. current direction, temperature, incidence of light, by mixing with conductive materials (carbon, graphite), insulating materials (PVC) can be modified to give semiconductor properties.

Separator

Layer of insulating material such as textile, paper, Mylar, etc., in wires/cables, placed between a conductor and its dielectric, between a cable jacket and the components it covers, or between various components of a multiple-conductor cable. It can be utilized to improve stripping qualities, flexibility, or can offer additional mechanical or electrical protection to the components it separates.

Separating Agent

Liquid agent that is dropped into the wires during extrusion and functions as a separation sheathing/liquid between wire insulation and sheathing. Through its application there is no adhesion between wires or with the sheathing.

SEV

Schweizerischer Elektrotechnischer Verein (Swiss Electrical Engineering Association), testing body similar to the VDE. SEV Association for Electrical Engineering, Power and Information Technologies.

Shaped Conductor

Conductor with non-circular cross-section.

Shear Modulus

Material parameter, supplying information about linear elastic deformation of a component partly caused by shear force or shear stress. Whilst the shore hardness and the brittle point temperature give information about the stiffness at certain temperatures, the shear modulus (torsion) gives us the flexible behaviour at these temperatures.

Sheathing

Extrusion process for outer protective covering in wire/cable, also called jacket.

Shield

Metallic layer placed around a conductor or group of conductors to prevent electrostatic interference between the enclosed wire and external fields. Shielding takes various forms: a copper wire braid or → covering, copper or aluminium foil wrapping or enclosed tubular copper or aluminium bodies. For the screening, the covering density is defined in percent, relative to the area located below the braiding.

Shielding

Conductive sheathing of one or more wires to be protected from electromagnetic or electrostatic interferences.

Shield Coverage

Optical percentage of a cable actually covered by shielding material.

Shield Percentage

Percentage of physical area of a circuit or cable actually covered by shielding material.

Shore

Hardness of the cable insulation/sheath, and it is the resistance to penetration by another body, which is measured without exception before the occurrence of damage. Shore A test is used for soft plastics, Shore D test for harder plastics.

Si

Silicon rubber: Silicones and polymers on the basis of polydiorganosiloxanen.

Signal

Current used to convey information, either in digital, analog, audio or video.

Signal Propagation Speed

The signal propagation speed depends on the transmission medium and is lower than the speed of light. The lowering of the speed is caused by a so called reducing factor (NVP). The reducing factor for coaxial cable is 0.77, for twisted cable 0.6 & for fibre optic cable 0.67, which means that the signal propagation speed in coaxial cable is 77% of the speed of light. For fibre optic cables propagation speed is expressed for different wavelengths of the group velocity.

Signal to Noise Ratio

Power ratio between a signal (meaningful information) & the background noise (unwanted signal), often expressed in decibels. Commonly used interchangeably with Attenuation Crosstalk Ratio (ACR) - the difference between attenuation and crosstalk, measured in decibels, at a given frequency. Important characteristic in networking transmission to assure that signal sent down a twisted pair is stronger at the receiving end of the cable than are any interference signals imposed on that same pair by crosstalk from other pairs.

Skew Ray

Ray that does not intersect the fiber axis, generally, a light ray that enters the fiber core at a very high angle.

Skin Effect

Tendency of an alternating electric current (AC) to distribute itself within a conductor with the current density being largest near the surface of the conductor, decreasing at greater depths. The electric current flows mainly at the "skin" of the conductor, between the outer surface and a level called the skin depth.

The skin effect causes the effective resistance of the conductor to increase at higher frequencies where the skin depth is smaller, thus reducing the effective cross-section of the conductor. The skin effect is due to opposing eddy currents induced by the changing magnetic field resulting from the alternating current. At 60 Hz in copper, the skin depth is about 8.5 mm. At high frequencies the skin depth becomes much smaller. Increased AC resistance due to the skin effect can be mitigated by using specially woven litz wire. Because the interior of a large conductor carries so little of the current, tubular conductors such as pipe can be used to save weight and cost.The higher the frequency of the effective or interfering signal, the more the high frequency current is pushed towards the surface.

Skin/foam-Skin

A skin/layer is required for a very small wire diameter to improve foam structure and tight fit. The outer skin/layer protects the porous foam structure against humidity ingress and other substances. The skin protects the sensitive foam of outside mechanical impact. The better resistance of the foam/skin wire prevents changes to electrical properties caused by dents to the braiding, which can happen over time.

Smoke Density

Very important property of a material related to the fire behaviour and smoke generation. The plastics used in the cable technology are strong smoke generators and these properties can only be reduced through additives. The smoke is measured using the 3m Kubus Test according to IEC 61034-1 or CENELEC HD 606. In a cubic space with a photometric system and light source (100W) with a selenium photocell, a printer, which is connected to the photocell, records the light attenuation of the burning test sample.

Spacing

Distance between the centers of two adjacent conductors, i.e. pitch.

Span

Distance between the center of the first conductor and the center of the last conductor, in a flat cable.

Spark Test

Online test during insulation, where the insulated cores pass through high voltage throughout the extrusion.

Specific Gravity

Ratio of the density (mass per unit volume) of a material to that of water.

Specific Weight

Ratio of weight of a body to its volume or the density of a body in relation to the density of water.

Spectral Bandwidth

Difference between wavelengths at which the radiant intensity of illumination is half its peak intensity.

Spiral Cable

Flexible cables that are formed into a "spiral spring". The cable is wound onto a mandrel and the addition of heat (tempering) reduces the tensions in the plastic caused by the winding process, which helps the cable retains the spiral shape in a stress free condition after cooling. When expanded, the spiral extends and, when the force is no longer acting upon it, returns to its original condition.

Stabilizer

a) A component used in some plastics to obtain certain physical and chemical properties during processing and the usage time.
b) Additives like lead, tin or cadmium salts, for plastics which delay or counteract the decomposition and aging process that occurs when exposed to thermal loads.

STP (Shielded Twisted Pair)

In twisted pair cables with foil screening of the individual pairs and an overall braided screening (STP = Individually Screened Foil and Braid Twisted Pair), the cores are twisted in pairs and individually screened with a metallic foil, to achieve exceptionally low near end crosstalk and an additional overall screen is then added.

Standing Wave

A stationary pattern of waves produced by two waves of the same frequency traveling in opposite directions, on the same transmission line. The existence of voltage and current maxima and minima along a transmission line is a result of reflected energy from an impedance mismatch.

Standing Wave Ratio (SWR)

Ratio of the maximum amplitude, to the minimum amplitude of a standing wave stated in current or voltage amplitudes.

Stay Cord

Component of a cable, usually of high tensile strength, used to anchor the cable ends at their points of termination, and restrict any pull on the cable from being transferred to the electrical conductors.

Step Insulated

Process of applying insulation in two layers, generally used in shielded networking cables such that the outer layer of insulation can be removed and remaining conductor and insulation can be terminated in a RJ-45 type connector.

Star Quad

Layer-stranded with 4 wires (worse capacity values as DM quad). Low capacity construction of four stranded core wires. The capacity between the pairs of a star quad is 1.5 times higher than by the DM quad.

Strain Relief Elements

Special elements which take on tensile forces in the sheathing area.

Strand

Single un-insulated wire.

Strand/ Tinsel Cord

Made of polyester fibres with flattened copper, highly flexible & high tensile strength; mainly used for medical cables.

Strand/Chocked Strand

Stranded conductor, whose single wires are arranged randomly helically wound in the same direction and lay length.

Stranded Conductor

Unit made of multiple single wires arranged in helical and even layers. The lay direction of the subsequent layers is either changing or unchanging. The lay length of the individual layers can be different or equal. The cross-section of the stranded conductor can be circular or shaped.

Stranding

Process where stranding elements are combined around a common axis. It requires mutual twisting to avoid the combined units falling apart. Stranding elements can be: single wire - yarn / fibre optic cable - metal wire / braid - metal segment. The stranding procedure makes the handling of the elements easier.

Structural Return Loss

Magnitude of the internal cable reflections, measured in decibels, relative to the actual cable impedance, not the system impedance. Measure of signal reflections caused by the structure of the cable without the additional reflections from any impedance mismatch between the cable and the measuring equipment. Measure of internal cable reflections using a reference impedance in the measuring equipment that is adjusted to the nominal or average impedance of the cable.

Styrene Butadiene Rubber (SBR)

Copolymer made of butadiene & styrene, with good mechanical strength and no resistance towards solvents. It is used as insulation material for communication cable.

Suggested Working Voltage

AC voltage that can be applied between adjacent conductors.

Support element

Wire or rope, whose primary function is too carry a cable (dead weight), e.g. for an overhead cable it can be used separately to the cable or integrated into the cable like in the case of lift cables for higher rise.

Surface Resistance (Bleeder Resistor)

It is the electrical resistance, which is opposed to the current flow between two electrodes positioned on the surface of an isolator. The specific surface resistance is the resistance of a square test area, which means that length and distance of the electrodes agree. The size not only depends on the insulation but also on the air humidity, impurities on top of the surface and measurement setup. For the measuring a standardized arrangement must be used. It is inevitable that during the measuring of the surface resistance the contact resistance is also measured to a non-quantified amount, hence the results cannot be transferred onto another geometry. The measuring unit of the surface resistance and the specific surface resistance is Ohm (1 Ω = 1 VA-1).

Surge

Temporary and relatively large increase in the voltage or current in an electrical circuit or cable; also called transient.

Swellable Material/Powder

Material / Powder that is positioned underneath the sheathing or in the cavities of the conductor to help avoid longitudinal water ingress underneath the sheathing or through the conductor of the cable.

Symmetric Data Cable (PIMF)

Outer shielding especially pair shielding is used for high transmission rates. At the cable exit of the signal receiver the partial signals of both conductors are added up giving the total signal. With this addition the interfering signals, in both single conductors, are nullified so that only the wanted signal is available. In that way the symmetric transmission principal is insensitive towards outer interfering influences.

Talcum

Mineral, light greasy natural product as a powder used as a separating agent which helps in stripping of the sheath. During sheathing, talcum is used as a separating agent, applied directly onto the wires in a way that the wires do not stick to each other and to the sheath. Talcum is not used for medicine, clean room cables and cables which must not contain lacquer wetting inhibiting substances.

Taping

Process of wrapping fleece, plastic foil, steel tape & other materials around a pair of wires, strands of wires, etc.

TDR

Time Domain Reflectometry measuring method is used to locate faults in copper cables. The running time and shape of a reflected pulse enables the possible location of the fault to be determined relatively accurately. For PVC insulated cores, this value is approx. 0.541.

Tear Resistance

Notched body resisting further tearing. The test is carried out on angle-specimen samples, which are provided with an incision.

Temperature Rating

Max. temp. at which the insulating material/cable can be used in continuous operation, without change in its basic properties.

Tensile Load

Max. force with which a cable can be loaded under defined conditions.

Tensile Strength

Pull stress required to break a given specimen. T S = F/A (N/mm^2), A = Area (mm^2) & F = Force (N).

Tension Set

Elastic materials can only be used in the elastic sector (Hook's law) without permanent deformation. Only in this range the material goes back to its original state. By overstretching the Hook's range a residual elongation remains and the greater the residual elongation the longer it takes.

Test Voltage

Vvoltage value at which a cable can be tested without affecting the properties of insulation. The test voltage is chosen as 3 ~ 5 times higher than the nominal voltage.

Thermal Compensation Cable / Thermal Element Compensating Cable

Cable with conductor, which differs in material or properties of the thermocouple element, but has such thermo-electrical properties that the resulting error for a given temperature range is within defined tolerances.

Thermal Element Connection Cable

Cable with conductors of the same kind as the thermal element which extends the cable to the measuring point and with the same thermoelectric characteristics within the entire application temperature range of the cable.

Thermal Expansion

Change to geometrical dimensions (length, area, volume) of a material caused by a temperature change affecting its makeup. The reverse process is called heat shrinkage. Plastics are subject to a temperature depending on reversible length variation. It is specified as thermal coefficient of linear thermal expansion a [1/K].

Thermal Rating

Temperature range in which a material will perform its function without undue degradation.

Thermocouple

Device consisting of two dissimilar metals in physical contact, which when heated develops an emf output.

Thermoplastic

High polymer material which displays a strong dependency on the viscosity from the temperature due to linear chain structures of the macro molecules. When heated, the linear molecule chains in these plastics drift apart and they become soft and regain their original form on cooling. Compared to thermosetting plastics, no chemical reaction occurs during manufacturing. Important thermoplastics are PVC, polyamide, polystyrene & polyethylene, but cannot be used at higher temperatures.

Thermosetting plastics

Plastics which can be initially moulded through heating and on subsequent application of heat & pressure they irreversibly harden. The hardening is a result of a large frequency of cross-linking between the various molecule chains forming intra molecular bonds because of which they can be operated at higher temperature. Vulcanized rubber, XLPE, Bakelite, Mellamine, UF Resins come in this category, but they cannot be recycled.

TIA

Telecommunications Industry Association, body which documented the TIA/EIA 568A "Commercial Building Telecommunications Wiring Standard" in conjunction with EIA.

Tinned Conductor

Metal-coated conductor with tin a coating material.

Top Coated Wire

Conductor produced by applying a layer of tin over a stranded bare copper conductor holding the strands together allowing easier soldering and preventing the fraying of strands.

Torsion

Twisting of the cable about the longitudinal axis. Flexible cables are not generally intended for torsional loads.

Train Signal Cable

Cable designed for voltages up to 600 V depending on their purpose, the cores are twisted in fours or layers and are PE insulated. Because of the strong electromagnetic fields on railways, an effective copper screen and steel tape armouring is fitted under the outer sheath.

Transceiver

Active component of an Ethernet-LAN for the connection to end equipment to the electric bus cable with functions for collision detection and signal adjustment. The word transceiver is a combination word of transmitter and receiver. It carries out monitoring, forward, receiving and interference functions.

Transceiver Cable

This cable connects the transceiver with the Stations Interface Unit on the Ethernet. It is restricted to a length of 50 m and the cable impedance is 78 Ohm.

Transducer

Device for converting one form of energy to another, such as mechanical energy to electrical energy.

Transfer Impedance

Transfer impedance relates to current on one surface of a shield, to the voltage drop generated by this current, on the opposite surface of the shield, for a specified cable length. Transfer impedance is used to determine shield effectiveness against both ingress and egress of interfering signals. Cable shields are normally designed to reduce the transfer of interference, so shields with lower transfer impedance are more effective than shields with higher transfer impedance.

Transfer Rate

Frequency at which the level of the transmission function of a light waveguide is reduced to half of its value at a frequency of zero, i. e. at which the signal attenuation has increased by 3 dB. As the transmission bandwidth of a light waveguide is approximately the reciprocal of its length (mode mixing), the bandwidth/length product is often specified as a quality feature.

Transmission Line

Arrangement of two or more conductors, a power cable, coaxial cable, or a waveguide used to transfer signal energy, from one location to another.

Transmission Line Cable

Cable with two or more conductors placed within a dielectric material in such a way as to control the electrical characteristics.

Transmitter

Electronic package that converts electrical energy to light energy in a fiber optic system. Also refers to equipment that generates RF or electrical signals for transmission through the air or space or over a transmissions line.

Triad Cable

Cable with three twisted conductors.

Tri-axial cable

Special form of coaxial cable that consists of one conductor and two isolated braid shields, all insulated from each other. A coaxial cable with a second braid applied over an inner jacket and an outer jacket applied over the outer braid. It is commonly used in television camera systems and electrical measurement technology. It is possible to measure currents of femtoamperes range with a suitable construction by use of tri-axial cables. These cables are costlier than coaxial cables.

Tribo-electric Noise

Noise generated in a shielded cable due to variations in capacitance between the shield & conductors as the cable is flexed.

Trunk Cable (Feeder Cable)

Transmission cable from the head end (signal pickup) to the trunk amplifier, in a CATV System.

Twinax Cable

Cable with two twisted conductors with established electrical properties (one pair = twinax).

Twin-lead

Transmission line having two parallel conductors separated by insulating material. Line impedance is determined by the diameter and spacing of the conductors and the insulating material and is usually 300 ohms for television receiving antennas.

Twisted Pair

Two lengths of insulated conductors twisted together. In commercial environments, performance of data transmission can be further improved by aluminium mylar shielding, making a shielded twisted pair.

Type Test

Tests performed periodically that includes all parameters which can influence the result. These tests must be performed again if advancements or new developments have been made or the material, technology or design has been changed. The frequency of type tests is set out in legislation, contracts or operationally.

U

Rated Voltage with reference to the other Field/Phase (Rated power frequency voltage between conductors for which the cable is designed). It is generally 1.7 times (root 3) of U_0.

U_0

Rated Voltage with reference to Earth/Neutral (Rated power frequency voltage between conductor & earth or metallic screen for which the cable is designed).

U_m

Max. value of the "highest system voltage" for which the equipment may be used.

UF

Underground feeder and branch circuit cable.

Ultraviolet Radiation

Invisible radiation is the section of the electromagnetic spectrum that is next to the visible range.

Unilay Concentric

Same stranding direction of all layers.

Unbalanced Line

Transmission line where voltages on the two conductors are unequal with respect to ground, a coaxial cable is a common type of unbalanced line.

Unilay Stranding

Concentric Stranding on consecutive layers with uniform lay directions and the same lay length.

Unit core of fiber optic cables

Several coated fiber optic cables lightly undulating and loose in small plastic pipes which are filled with Vaseline or swelling powder.

UTE

Union Technique de l'Electricité (France).

UV-resistance of PUR

PUR has a very good UV-resistance. Between the different PUR kinds PUR FHF (flame-retardant and halogen-free) has the best resistance. PUR FHF colored black is possibly the best UV resistant in the PUR-sector.

Vagrancy Current

Currents that do not flow through the electrical mains (L1, L2, L3, N) are referred to as vagrancy currents.

Valley

Void between the insulated conductors of a cable or between a cable core and its covering.

VDE

Verband Deutscher Elektrotechniker e.V., [German Electrical Engineering Federation], VDE testing and certification institute - VDE testing body.

Velocity of Propagation (VP)

Comparison between transmission speed of electrical energy in a length of cable and the speed of light in free space, expressed as a percentage. It is the reciprocal of the square root of the dielectric constant of the cable insulation.

Video Pair Cable

Transmission cable containing low-loss pairs with an impedance of 125 ohms, used for TV pick-ups, closed circuit TV, and telephone carrier circuits, etc.

VIMF

Four in metal foil is the German terminology for STP-cables with two twisted-pair wire cables, which are shielded through metal-foil. The way of stranding can be carried out as star quad or two twisted-pair conductors.

Volt

Unit of electrical pressure. One volt is the amount of pressure that will cause one ampere of current to flow in one ohm of resistance.

Volt-Ampere (VA, kVA)

Measuring unit for the actual power output required for the equipments. The actual power output is the product of the effective values of voltage and power consumption of the operating equipment. P (VA) = U (V) x I (A).

Voltage Drop

Voltage developed across a component or conductor by the current flow through the resistance or impedance of the component or conductor.

Voltage Rating

Highest voltage that can be continuously applied to a wire in conformance with standards or specifications, generally expressed as U_0/U, where

U_0 is the rated Voltage with reference to Earth / Neutral (Rated power frequency voltage between conductor & earth or metallic screen for which the cable is designed)

U is the rated Voltage with reference to the other Field / Phase (Rated power frequency voltage between conductors for which the cable is designed) and It is generally 1.7 times (root 3) of U_0.

U_m is the max. value of the "highest system voltage" for which the equipment may be used).

Voltage-level Classes

There are mainly four voltage classes. Everything that is less than 1000 Volt (< 1 kV) belongs to the low voltage class. Voltages > 1 kV are classed as high voltage, which is further divided into: Medium voltage 1 kV – 30 kV, high voltage 50 kV – 150 kV, extremely high voltage 150 kV – 400 kV. There are several different voltage levels within these classes.

Voltage Standing Wave Ratio (VSWR)

Ratio of the transmitted signal voltage to the reflecting signal voltage, measured along the transmission path.

VPE

Cross-linked polyethylene.

Vulcanization

An irreversible process during which rubber or a polymeric compound undergoes a change in its chemical structure by application of heat, pressure etc. (i.e. cross-linking) making it thermoset.

VW-1

Flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test (formerly designated FR-1).

Wall Thickness

Thickness of an insulation or jacket.

WAN (Wide Area Network)

Large network, which can extend worldwide. WANs normally connect LANs (Local Area Networks) via telephone cables. Routers and gateways connect the LANs using different technologies. WAN is a wide area transmission network for connecting distance users to a central network using public cables.

Water Absorption

Water, by percent weight, absorbed by a material, after a given immersion period.

Watt

Unit of electrical power which is defined as the power used when an electromotive force of one volt causes a current of one ampere to flow through a conductor. The horsepower (33,000 foot-pound per minute) is the unit of mechanical power. The kilowatt is the unit of electric power. As the mechanical energy can be converted to electric energy, the two are equated 1 KW = 1.34 HP & 1 HP = 0.746 KW.

Water Treeing / Water Trees

Water-treeing takes place when an electrical field and water simultaneously meet. Water-trees are tree-shaped, in the direction of the field gradient growing structures causing irreversible damage of the cable dielectricums.

Waveform

Graphical representation of a varying quantity. Usually, time is represented on the horizontal axis, and the current or voltage value is represented on the vertical axis.

Wavelength

Distance between positive peaks of a signal. As the frequency increases, waves get closer together, decreasing the wavelength.

Wavelength Convertors

These are active devices (powered) on a LAN to change Fiber optic wavelengths generally from Multimode Fiber (62.5 micron) to Single mode Fiber (9 micron) at various speeds such as 100 Mb/s or 1,000 Mb/s. These are generally used to gain distance using Single mode Fiber, up to 10Km or longer.

Wear Resistance

Characteristic of a cable, wire or material to withstand surface wear.

Wicking

Longitudinal flow of liquid in a wire or cable due to capillary action is called wicking.

Wire Termination Technique

Depending on the application, different wire termination methods can be chosen. Where ease of service and maintenance is required, a screw fitting is used. If large numbers of plug connectors with a reliable connection method are required, crimping is the best choice. A cage clamp combines ease of service with reliable wire termination, although the space required per contact for the wire termination is the highest of all the methods described here.

Wire-wrap Connection

Electrical connection made without soldering. The contact is made by wrapping a bare copper wire around a square rod made of bronze, brass or silver under high tension (also known as cold welding).

Working Current, Service Current

Maximum permissible current that can be transmitted.

Woven Cable

Several conductors running parallel which are held together using a thin sheath.

XLPE

Abbreviation for cross-linked polyethylene.

Zinc

In the cable industry galvanised steel tape, steel wires & strips used for armouring are coated with zinc to protect against corrosion.