

**Abrasion Resistance:** Ability of a wire, cable or material to resist surface wear.

**Accelerated Aging:** A test in which voltage, temperature, etc., are increased above normal operating values to obtain observable deterioration in a relatively short period of time.

**Aerial Cable:** A cable suspended in the air on poles or other overhead structure.

**Accessories** - Mechanical devices, such as cable clamps, added to connector shells and other such hardware which is attachable to connectors to make up the total connector configuration.

**Assembling, Laying up:** The operation which allows putting together the various elements of the cable into its core, can be done in one or several steps

**Additive:** A chemical added in small quantity to the polymer to modify its properties (e.g. plasticizer, added to PVC to make it flexible)

**Alloy** - A mixture of two or more metals combined to achieve properties, such as a lower melting point or greater strength, that the individual metals do not possess.

**Ampacity:** The maximum current an insulated wire or cable can safely carry without exceeding either the insulation or jacket material limitations (same as Current Carrying Capacity).

**Ampere:** The unit of current. One ampere is the current flowing through one ohm of resistance at one volt potential.

**Ambient** - The atmospheric conditions surrounding a given item. Normally in terms of factors which influence or modify, such as temperature, humidity, etc.

**Amplitude** - The magnitude of variation in a changing quantity from its zero value. The word frequently requires modification—as with adjectives such as peak, maximum, rms, etc.—to designate the specific amplitude in question.

**Analog** - The representation of information by means of continuously variable signal.

**Armored cable:** A mechanical protection around the cable, often formed by lapping steel tapes or wires around the cable.

**Attenuation** - The decrease of a signal with the distance in the direction of propagation. Attenuation may be expressed as the scalar ratio of the output power to the input power, or as the ratio of the output signal voltage to the input signal voltage.

**Annealed Wire:** Wire, which after final draw down, has been heated and slowly cooled to remove the effects of cold working.

**ANSI:** Abbreviation for American National Standards Institute.

**AWG** - American Wire Gauge. Standards for wire diameter.

**Bandwidth** - The range of frequencies for which performance, with respect to certain characteristics, falls within specific limits.

**Band Marking:** A continuous circumferential band applied to a conductor at regular intervals for identification.

**Base Material** - Metal from which the connector, contact or other piece part accessory is made and on which one or more metals or coatings may be deposited.

**Bend Radius** - Radius of curvature that a flat, round, fiber optic or metallic cable can bend without any adverse effects.

**Bedding:** A material used to fill the cable core to make it round, for the esthetic, to prevent water ingress, or to make subsequent operations possible (jacket, armor).

**Binder:** A spirally served tape or thread used for holding assembled cable components in place awaiting subsequent manufacturing operations.

**Braid** - A weave of metal or metal-clad fibers used as a shield covering for an insulated conductor or group of insulated conductors.

**Braid Angle** - The smaller of the two angles formed by the shielding strand and the axis of the cable being shielded.

**Braid Carrier** - A spool or bobbin on a braider which holds one group of strands or filaments consisting of a specific number of ends. The carrier revolves during braiding operations.

**Braid Coverage** - A calculated percentage which defines the completeness with which a braid or shield covers the surface of the underlying component.

**Braid Ends** - The number of strands used to make up one carrier. The strands are wound side by side on the carrier bobbin and lie parallel in the finished braid.

**Breakdown Voltage** - The voltage at which the insulation between two conductors is destroyed.

**Breakout** - The point at which a conductor or group of conductors is separated from a multi-conductor cable to complete circuits at various points along the main cable.

**Bunch Strand** - Conductors twisted together with the same lay and direction without regard to geometric pattern.

**C** - Symbol designation for Capacitance (electrical), and Celsius (temperature).

**Cable** - An insulated conductor or multi-conductors twisted together.

**Cable Assembly** - A length of cable with connectors on one or both ends.

**Cable Sheath** - The protective covering applied to cables.

**Cable Accessories:** Any device used around the cable, to connect, organize, terminate, install it.

**Coil:** For small cable quantities, the cables are delivered in coils, generally under a foil wrap.

**Connector:** A Junction which can be easily realized or dismantled.

**Cabling:** The process of twisting together individual copper wires to form a multiple-wire conductor.

**Cabling pitch:** When the assembling is done by twisting the elements together (general case) is the length over which they do a complete turn.

**Crosslinking:** A process which converts a thermoplastic polymer into a thermoset polymer (Polyethylene and rubbers). This process is most often akin to "cooking".

**Compound:** An homogeneous mixture of polymer, additives and fillers.

**Continuous casting:** A process where liquid copper is cast on a grooved wheel, to produce 8 mm copper wire from copper plates (cathodes).

**Conducting material:** A material which allows electrical current to flow (not necessarily used in the cable core).

**Conductor:** In cable technology, the conductor is a metallic wire (typically copper or aluminium) responsible for carrying the electric current.

**Core:** The ensemble of insulated conductors which assure the electrical functions of the cable.

**CV line:** Continuous Vulcanization line. The most common method for crosslinking, "cooks" the polymer in a hot, pressurized tube (Steam or Nitrogen).

**Capacitance (C)** - That property of a system of conductors and dielectrics which permits the storage of electricity when potential difference exists between the conductors. Its value is expressed as a ratio of a quantity of electricity to a potential difference.

**Capacitance Reactance** - The opposition to alternating current due to the capacitance of a capacitor, cable or circuit. It is measured in ohms and is equal to  $1/6.28fC$  where  $f$  is the frequency in Hz and  $C$  is the capacitance in farads.

**Capacitor** - Two conducting surfaces separated by a dielectric material. The capacitance is determined by the area of the surfaces, type of dielectric and spacing between the conducting surfaces.

**Certificate of Compliance (C of C)** - A certificate which is normally generated by a Quality Control Department, which shows that the product being shipped meets the customer's specifications.

**Certificate Test Report (CTR)** - A report providing actual test data on cable. Tests are normally run by a Quality Control Department, which shows that the product being shipped conforms to test specifications.

**Characteristic Impedance** - Characteristic impedance of a uniform line is the ratio of an applied potential difference to the resultant current at the point where the potential difference is applied, when the line is of infinite length. Coaxial cable is such a uniform line.

**Coaxial Cable** - A cylindrical transmission line composed of a conductor centered inside a metallic tube or shield, separated by a dielectric material, and usually covered by an insulating jacket.

**Cold Flow** - Deformation of the insulation due to mechanical force of pressure (not due to heat softening).

**Color Code** - Method of identifying different conductors by means of colors, numbers, printing, etc.

**Common Axis Cabling** - In multiple cable constructions, a twisting of all conductors about a "common axis" with two conductor groups then selected as pairs. This practice yields smaller diameter constructions than does a separate axis construction, but tends to yield greater susceptance to EMI.

**Composite Cable** - A cable containing more than one gauge size or a variety of circuit types, e.g. pairs, triples, quads, coaxials, etc.

**Concentric Stranding** - A group of uninsulated wires twisted together and containing a center core with subsequent layers spirally wrapped around the core to form a single conductor.

**Concentricity** - In a wire or cable, the measurement of the location of the center of the conductor with respect to the geometric center of the surrounding insulation.

**Conductance** - The ability of a conductor to carry an electrical charge. The ratio of the current flow to the potential difference causing the flow. The reciprocal of resistance.

**Conductivity** - The ability of a material to allow electrons to flow, measured by the current per unit of voltage applied. It is the reciprocal of resistivity and is measured in Siemens (S) or Mhos.

**Conductor** - A wire or combination of wires not insulated from one another, suitable for carrying electric current.

**Conduit** - A tube or trough in which insulated wires and cables are passed.

**Conformable Cable** - See Semi-Flexible Cable.

**Connector Assembly** - Includes housing and contact plus additional components such as hardware used to hold the assembly together and/or make the assembly a functional connector.

**Connector Insertion Loss (Attenuation)** - The loss of power in a mated pair of connectors.

**Control Cable** - A multi-conductor cable made for operation in control or signal circuits.

**Convection** - The transfer of heat from an object by movement of air surrounding the object.

**Copolymer** - A compound resulting from the polymerization of two different monomers.

**Copper** - A reddish metal that is an excellent conductor of electricity.

**Copper-Clad** - Steel with a coating of copper welded to it, as distinguished from copper-plated.

**Corona** - A localized discharge resulting from transient gaseous ionization in an insulating system when the voltage stress exceeds a critical value.

**Coaxial cable:** A cable where the conductors share a common axis.

**Corona Extinction Voltage (CEV)** - The voltage below which previously initiated corona pulses cease.

**Corrosion** - The deterioration of a material by chemical reaction or galvanic action.

**Coupling** - The transfer of energy between two or more cables or components of a circuit.

**Crimp** - Act of compressing (deforming) a connector ferrule around a cable in order to make an electrical connection.

**Crimping Dies** - A term used to identify the shaping tools that, when moved toward each other, produce a certain desirable shape to the barrel of the terminal or contact that has been placed between them. Crimping dies are often referred to as die sets or as die inserts.

**Crimping Termination** - Connection in which a metal sleeve is secured to a conductor by mechanically crimping the sleeve with pliers, presses or crimp dies.

**Crimping Tool** - A term commonly used to identify a hand-held mechanical device or table press that is used to crimp a contact, terminal or splice.

**Cross Talk** - A magnetic or electrostatic coupling which causes the unwanted transfer of energy from one signal path (disturbing circuit) to another signal path (disturbed circuit).

**Cryogenic** - Use of cables in very low temperature environments.

**CSA** - Canadian Standards Association.

**CTIA** - Cellular Telecommunications Industry Association.

**Current, Alternating (AC)** - An electric current that periodically reverses direction of electron flow. The rate at which a full cycle occurs in a given unit of time (generally a second) is called the frequency of the current.

**Current, Direct (DC)** - Electric current whose electrons flow in one direction only. It may be constant or pulsating as long as its movement is in the same direction.

**Cut-through Resistance** - The ability of a material to withstand mechanical pressure without damage.



**CXC** - Coaxial Cable, CSA (Canadian Standards Association) Cable Designation.

**Cycle** - One complete sequence of values of an alternating quantity, including a rise to maximum in one direction and of return to zero. The number of cycles occurring in one second is called the frequency.

**Cycle Life** - The number of repetitive flex motions that a wire or cable can withstand prior to breakdown.

**D/A** - Digital-to-analog.

**DC Resistance** - See Resistance.

**Data cable:** A cable designed to carry data signals.

**Decibel (dB)** - A relative unit without dimensions calculated as ten times the logarithm to the base 10 of a power ratio or as twenty times the logarithm to the base 10 of a voltage ratio. Note: What is commonly measured as VSWR in the RF world is referred to as return loss and measured in dB in the CATV industry.

**Derating Factor** - A factor used to reduce the current-carrying capacity of a wire when used in environments other than that for which the value was established.

**Dielectric** - In a coaxial cable, the insulation between inner and outer conductor. It significantly influences electrical characteristics such as impedance, capacitance and velocity of propagation.

**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** - Also called permittivity. That property of a dielectric which determines the amount of electrostatic energy that can be stored by the material when a given voltage is applied to it. Actually, the ratio of the capacitance of a capacitor using the dielectric to the capacitance of an identical capacitor using a vacuum as a dielectric.

**Dielectric Heating** - The 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** - In a coaxial cable, the losses caused by transformation of electromagnetic energy into heat within the dielectric material.

**Dielectric Strength** - The voltage which an insulating material can withstand before breakdown occurs.

**Dielectric Withstanding Voltage** - The maximum potential gradient that a dielectric material can withstand without failure.

**Direct Current (DC)** - An electric current which flows in only one direction.

**Dissipation** - Unusable or lost energy, such as the production of unused heat in a circuit.

**Distortion** - An unwanted change or addition to a signal or waveform when it is amplified. This definition excludes noise, which is an extraneous signal superimposed on the desired signal.

**Drain Wire** - An uninsulated wire in contact with a shield throughout its length. Used for terminating the shield.

**Drum Reel, bobbin:** a wooden, plastic or metallic reel used for the delivery of cable.

**Drawing** - The process of pulling metal through a die or a series of dies to achieve a desired diameter.

**Duct** - An underground or overhead tube for carrying electrical cables.

**Earth** - British terminology for zero-reference ground.

**Eccentricity** - A measure of a conductor's location with respect to the circular cross-section of the insulation. Expressed as a percentage of center displacement of one circle within the other.

**Elastomer** - A rubber-like synthetic polymer, such as silicon rubber.

**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.

**Electrolytic copper:** Copper which has been refined to very high purity through an electrolytic process (offers the best conductivity).

**EPDM** - Ethylene propylene diene monomer rubber. A material with good electrical insulating properties.

**Epoxy** - An adhesive used in the connector termination process.

**EPR** - Ethylene-propylene rubber. A material with good electrical insulating properties.

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

**ETFE** - Ethylene tetrafluoroethylene (Teflon®).

**Expanded Diameter** - Diameter of shrink tubing as supplied. When heated, the tubing will shrink to its extruded diameter.

**Expanded Polyethylene** - See Cellular Polyethylene.

**External Interference** - The effects of electrical waves or fields which cause spurious signals other than the desired intelligence, e.g. noise.

**Extrusion** - A process of continuously applying an insulation over a conductor or jacket (rubber or plastic compounds).

**F** - Symbol for frequency or farad.

**Fluoropolymer**: A family of halogenated polymers (Fluor), some thermoplastic, some not, very difficult to burn, but release toxic fumes when burning.

**Filler**: A material added in large quantities to the polymer to modify its properties (e.g. Hydroxides to make HFFR

Compounds)**rad (F)** - The capacitance of a capacitor in which a

charge of 1 coulomb produces a 1-volt potential difference between its terminals.

**Fatigue Resistance** - Resistance of metal crystallization which leads to conductors breaking from flexing.

**FCC** - Federal Communications Commission.

**FEP (Fluorinated Ethylene-Propylene)** - Copolymer of PTFE and hexafluoropropylene. Electrical properties similar to PTFE, but temperature limited to 400°F (204°C).

**Ferrous** - Composed of and/or containing iron. A ferrous metal exhibits magnetic characteristics.

**FHPE** - Foamed high-density polyethylene.

**Field** - An area through which electric and/or magnetic lines of force pass.

**Fillers** - Non-conducting components cabled with the uninsulated conductors or optical fibers to impart roundness, flexibility, tensile strength, or a combination of all three, to the cable.

**Fire performance:** Characterizes the properties of the cable in case of fire. Many standards describe various performance levels in different conditions.

**Fire resistant:** Describes a safety cable which is able to continue assuring its function even after burning (in standardized conditions).

**Fire retardant:** In general, fire or flame retardant, non-flame-propagating.. designate cable which will not burn easily in case of fire. The actual performance is described by the applicable standards.

**Flame Resistance** - The ability of material not to propagate flame once the flame source is removed.

**Flammability** - The measure of a material's ability to support combustion.

**Flange** - A projection extending from, or around the periphery of, a connector and provided with holes to permit mounting the connector to a panel, or to another mating connector half.

**Flex Life** - The ability of a cable to bend many times before breaking.

**Flexibility** - The ability of a cable to bend in a short radius (also see Limpness).

**Foam Polyethylene** - See Cellular Polyethylene.

**Foamed Plastics** - Insulations having a cellular structure.

**Frequency (f)** - The number of times an alternating current repeats its cycle in one second.

**Frequency Response** - The characteristic of a device denoting the range of frequencies over which it may be used effectively.

**Gauge** - Term to denote size of wire, as in American Wire Gauge (AWG). Can also be used in reference to determining connector interface critical dimensions.

**Geophysical Cable** - Cable used in exploring for underground oil deposits.

**GHz** - See Gigahertz.

**Gigahertz (GHz)** - One billion cycles per second (10<sup>9</sup> cps).

**HV:** High Voltage power cables, typically above 60 kV (and up to above 1000 kV).

**H** - Symbol designation for magnetic intensity and henry (a unit of inductance).

**Hard Drawn** - Refers to metal that has not been annealed.

**Harness** - Group of conductors, and cables for special hook-ups.

**Halogen free:** A polymer which contains no halogen

**Halogenated polymer:** A polymer containing halogens, a family of chemicals including in particular Chlorine and Fluorine, which combine with hydrogen to produce dangerous fumes when burning.

**HFFR:** Halogen Free Fire Retardant, a compound made on a polyethylene base, with a high proportion of specific fillers to make it fire retardant.

**Heat Shock** - Test to determine the stability of a material when exposed to a sudden high-temperature change for a short period of time.

**Henry (H)** - A practical unit of inductance that will produce an electromotive force of one volt when the current changes at the rate of one ampere per second.

**Hertz (Hz)** - International standard term for cycles per second (e.g. 60 cycles per second is equal to 60 hertz or 60 Hz). Named after the German physicist Heinrich R. Hertz.

**High Frequency (HF)** - The band from 3 MHz to 30 MHz in the radio spectrum, as designated by the Federal Communications Commission.

**Hipot** - Term used for high-voltage dielectric test and/or equipment. The acronym stands for High Potential.

**Hygroscopic** - Readily absorbing and retaining moisture.

**Industrial cable:** A cable designed to operate in an industrial environment, or for industrial applications.

**Interstices** - Space between adjacent structures.

**I** - Symbol used to designate current.

**I<sup>2</sup>R** - Formula for power in watts, where I = current in amperes, R = resistance in ohms. Also see Watt.

**IEC** - International Electrotechnical Commission.

**IEEE (Institute of Electrical and Electronic Engineers)** - An international professional society that issues its own standards and is a member of ANSI and ISO.

**IF** - Intermediate frequency.

**Impact Strength** - A test for determining the mechanical punishment a cable can withstand without physical or electrical



breakdown by impacting with a given weight, dropped a given distance, in a controlled environment.

**Impedance** - The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency.

**Inductance** - The property of a circuit or circuit element that opposes a change in current flow, thus causing current changes to lag behind voltage changes. It is measured in Henrys.

**Induction** - The phenomenon of a voltage, magnetic field or electrostatic charge being produced in an object by lines of force from the source of such fields.

**Induction Heating** - Heating a conducting material by placing it in a rapidly changing magnetic field. The changing field induces electric currents in the material and  $I^2R$  losses account for the resultant heat.

**Input** - A signal (or power) which is applied to a piece of electric apparatus or the terminals on the apparatus to which a signal or power is applied.

**Insert** - The part which holds the connector contacts in their proper arrangement and electrically insulates them from each other and from the shell.

**Insertion Loss** - The loss in load power due to the insertion of a component, connector or device at some point in a RF transmission system. Generally expressed in decibels as the ratio of the power received at the load before insertion of the apparatus, to the power received at the load after insertion.

**Insulation** - A material having high resistance to the flow of electric current. Often called a dielectric in microwave cable.

**Insulation Resistance** - The electrical resistance of the insulating material (determined under specified conditions) between any pair of contacts, conductors or grounding device in various combinations.

**Insulation Stress** - The molecule separation pressure caused by a potential difference across an insulator. The practical stress on insulation is expressed in volts per mil.

**IR Drop** - The designation of a voltage drop in terms of current and resistance.

**Irradiated** - Exposure to high-energy radiation resulting in cross-linking of molecules.

**ISO** - International Standards Organization.

**Isolation** - The ability of a circuit or component to reject interference, usually expressed in dB.

**Jacket** - An outer non-metallic protective cover applied over an insulated wire or cable.

**Junction:** A device allowing to connect two lengths of cable to assure a continuity over a greater length

**Kilometer (km)** - 1000 meters or 3,281 feet (0.621 miles); the standard measurement for fiber optics.

**KPSI** - Tensile strength in thousands of pounds per square inch.

**Ku-Band** - Radio spectrum in the 12 GHz to 18 GHz range used by satellite communication systems.

**kV** - Kilovolt (1000 volts). Also see volt and voltage.

**kVA** - Kilovolt Ampere. A designation of power in terms of voltage and current.

**KW** - Kilowatt. A unit of electrical power.

**L** - Symbol for inductance.

**LAN Cable:** Local Area Network Cable, 4 pair, or fiber optic cable for computer networks e.g. in office buildings.

**LV:** Low voltage power cables, typically from 0 to a few kV.

**Lay** - Pertaining to wire and cable, the axial distance required for one cabled conductor or conductor strand to complete one revolution about the axis around which it is cabled.

**Lay Direction** - The direction of the progressing spiral twist in a cable while looking along the axis of the cable away from the observer. The lay direction can be either "left" or "right".

**Lead-in** - The cable that provides the path for RF energy between the antenna and the receiver or transmitter.

**Leakage** - The undesirable passage of current over the surface of or through an insulator.

**Level** - A measure of the difference between a quantity or value and an established reference.

**Life Cycle** - A test to determine the length of time before failure in a controlled, usually accelerated, environment.

**Line Level** - Refers to the output voltage level of a piece of electronic equipment. Usually expressed in decibels (e.g., 0 dBv).

**Line Voltage** - The value of the potential existing on a supply or power line.

**Load** - A device that consumes power from a source and uses that power to perform a function.

**Longitudinal Shield** - A tape shield, flat or corrugated, applied parallel to the axis of the core being shielded.

**Loop Resistance** - The total resistance of two conductors measured round trip from one end.

**Loss** - The portion of energy applied to a system that is dissipated and performs no useful work.

**Lossy** - Having poor efficiency.

**Low Frequency (LF)** - A band of frequencies extending from 30 kHz to 300 kHz in the radio spectrum, designated by the Federal Communications Commission.

**Low Loss** - A cable that has relatively small power loss over long lengths.

**Low Loss Dielectric** - An insulating material that has a relatively low dielectric loss, such as formed polyethylene or microporous Teflon.

**Low Noise Cable** - Cable specially constructed to avoid spurious electrical disturbances caused by mechanical movements.

**mA** - Milliampere (one-thousandth of an ampere). A measurement of electrical current.

**Magnetic Field** - The region within which a body or current experiences magnetic forces.

**Magnetic Flux** - The rate of flow of magnetic energy across or through a surface (real or imaginary).

**Magnetic Noise** - Caused by a change in current level, e.g., AC powerline (creates magnetic field around that cable), this magnetic field causes the magnetic noise.

**Mega** - Prefix meaning million.( $10^6$ )

**Megahertz (MHz)** - Unit of frequency equal to one million hertz ( $10^6$  cycles per second).

**Meter (m)** - One meter equals 3.281 feet.

**Micro** - Prefix meaning one-millionth.( $10^{-6}$ )

**Microfarad (MF)** - One-millionth of a farad (uf, ufd, mf and mfd are common abbreviations).

**Micromicrofarad** - One millionth of a microfarad (uuf, uufd, mmfd are common abbreviations). Also a picofarad (pf or pfd).

**Micron (um)** - Millionth of a meter =  $10^{-6}$  meter.

**MIL** - Military (e.g. as in Military Standards).

**MIL-DTL-17** - DSCC specification for Radio Frequency cables, flexible and semi-rigid.

**Milli** - Prefix meaning one-thousandth.

**Millimeter (mm)** - One millimeter equals 0.03937 inches.

**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.

**Modulus of Elasticity** - The ratio of stress to strain in an elastic material.

**Moisture Absorption** - The amount of moisture, in percentage, that a material will absorb under specified conditions.

**Moisture Resistance** - The ability of a material to resist absorbing moisture from the air or when immersed in water.

**Multi-conductor** - A combination of 2 or more conductors cabled together under a common jacket.

**MV**: Medium Voltage power cables, typically from 10 to 50 kV.

**mV (Millivolt)** - One thousandth of a volt.

**mW (Milliwatt)** - One thousandth of a watt.

**Nanometer (nm)** - A unit of measure equal to  $10^{-9}$  (one billionth) meter. Used to measure the wavelength of light.

**Nanosecond (ns)** - One billionth of a second ( $10^{-9}$  seconds).

**OEM:** Original Equipment Manufacturer: a company which purchases a product (cable) to incorporate it into its own production.

**OFHC** - Abbreviation for oxygen-free, high-conductivity copper. It has no residual deoxidant, 99.95% minimum copper content and an average annealed conductivity of 101%.

**Ohm** - The unit of measurement for electrical resistance. A circuit is said to have a resistance of one ohm when an applied emf of one volt causes a current of one ampere to flow.

**Ohm's Law** - Stated  $E = IR$ ,  $I = E/R$ , or  $R = E/I$ , the current  $I$  in a circuit is directly proportional to the voltage  $E$ , and inversely proportional to the resistance  $R$ .

**OSHA** - Occupational Safety and Health Act relating to safety in places of employment.

**Overlap** - The amount of trailing edge laps over the leading edge of a tape wrap.

**Power cable:** A cable designed to carry power.

**Pair:** Two insulated conductors twisted together. Is the basic element of telecommunications and data cables.

**Payoff:** The place (reel, tank, basket) from which the elements to be processed are issued into the processing machine.

**PE** - Abbreviation for polyethylene. A thermoplastic insulation having excellent electrical properties.

**Paper:** Used in cable technology as for the insulation, and for covering the core (traditional technology, now obsolete for many applications).

**Polymer:** A chemical element of heavy molecular weight obtained by assembling (polymerization of) many lighter elements (monomers).

**Polyethylene:** A polymer obtained from ethylene monomer. The material of choice for the insulation. Thermoplastic, Burns easily, and softens around 80°C.

**PVC:** Polyvinyl Chloride, a thermoplastic, halogenated polymer (Chlorine), difficult to burn, but releases toxic fumes when burning.

**Permittivity** - The ratio of the capacitance of a capacitor using the dielectric to the capacitance of an identical capacitor using a vacuum as a dielectric. Also see Dielectric Constant.

**Permittivity, Relative** - Synonymous term for relative dielectric constant  $\epsilon_r$ .

**Phase** - An angular relationship between waves.



**Phase Shift** - Change in phase of a voltage or current after passing through a circuit or cable.

**Phase Stability** - Variation of the electrical length of a cable that can result from temperature or mechanical stress due to bending or torsion.

**Pick** - Distance between two adjacent crossover points of braid filaments. The measurement in picks per inch indicates the degree of coverage.

**Pico** - Prefix meaning one-millionth of one-millionth ( $10^{-12}$ ).

**Picofarad (pF)** - One-millionth of one-millionth of a farad. A micromicrofarad or picofarad (abbreviation pf).

**Plastic** - High polymeric substances, including both natural and synthetic products, but excluding the rubbers that are capable of flowing under heat and pressure.

**Plastic Deformation** - Change in dimensions under load that is not recovered when the load is removed.

**Plasticizer** - A chemical added to plastics to make them softer and more flexible.

**Polyester** - Polyethylene terephthalate, which is used extensively in the production of a high-strength moisture-resistant film used as a cable core wrap.

**Polyethylene (PE)** - A thermoplastic material having excellent electrical properties.

**Polymer** - A substance made of many repeating chemical units or molecules. The term polymer is often used in place of plastic, rubber or elastomer.

**Polyolefin** - A 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** - A thermoplastic similar to polyethylene but stiffer and having a higher softening point (temperature).

**Polyurethane** - Broad class of polymers noted for good abrasion and solvent resistance. Can be solid or cellular form.

**Porosity** - Multiple voids in an insulation or jacket wall.

**Potting** - Sealing by filling with a substance to exclude moisture.

**Power** - The amount of work per unit of time. Usually expressed in watts and equal to  $I^2R$ .

**Power Factor (Fp)** - The ratio of resistance to impedance. The ratio of an actual power of an alternating current to apparent power. Mathematically the cosine of the angle between the voltage applied and the current resulting.

**Power Loss** - The difference between the total power delivered to a circuit, cable or device and the power delivered by that device to a load.

**Power Ratio** - The ratio of power appearing at the load to the input power. Expressed in dB, it is equal to  $10 \log_{10} (P_2/P_1)$  where  $P_1$  is input power and  $P_2$  is the power at that load.

**Primary Insulation** - The first layer of non-conductive material applied over a conductor, whose prime function is to act as electrical barrier (see insulation).

**Propagation Delay** - Time required for an electronic digital device, or transmission network to transfer information from its input to its output.

**Prototype** - A model suitable for use in the complete evaluation of form, design and performance.

**PSI** - Pounds per square inch.

**PTFE (polytetrafluoroethylene)** - The thermally most stable and chemically most resistant carbonaceous compound. It is unaffected by sunlight, moisture, and virtually all chemicals. Temperature range is  $-200^{\circ}\text{C}$  to  $+260^{\circ}\text{C}$  /  $-392^{\circ}\text{F}$  to  $+500^{\circ}\text{F}$ . Electrical properties are very constant over temperature and wide range of frequencies.

**Pulling Eye** - A device fastened to a cable to which a hook may be attached in order to pull the cable into or from a duct.

**Pulse** - A current or voltage which changes abruptly from one value to another and back to the original value in a finite length of time. Used to describe one particular variation in a series of wave motions.

**Pulse Width** - The length of time that the pulse voltage is at the transient level. Electronic pulse widths are usually in the millisecond ( $10^{-3}$ ), microsecond ( $10^{-6}$ ) or nanosecond ( $10^{-9}$ ) range.

**PVC (Polyvinyl Chloride)** - The material most commonly used for the insulation and jacketing of cable.

**PVD** - Polyvinylidene Fluoride (see also Kynar®).

**PVDF** - Polyvinylidene Fluoride (see also Kynar®)

**QPL** - Qualified Parts List.

**Radio Frequency** - The frequencies in the electromagnetic spectrum that are used for radio communications.

**Regulation:** A set of rules mandated by a Government or international body, which applies to all products sold under their jurisdiction.

**Range** - Number of sizes of connectors or cables of a particular type.

**Reactance** - A 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.

**Recovered Diameter** - Diameter of shrinkable products after heating has caused it to return to its extruded diameter.

**Repeatability** - The amount of power lost due to the number of matings (de-matings) a connector experiences.

**Resin** - A synthetic organic material formed by the union (polymerization) of one or more monomers with one or more acids.

**Resistance** - In DC circuits, the opposition a material offers to current flow, measured in ohms. In AC circuits, resistance is the real component of impedance, which may be higher than the value measured at DC.

**Resonance** - An AC circuit condition in which inductive and capacitive reactances interact to cause a minimum or maximum circuit impedance.

**Safe Working Voltage** - Limit of continuous voltage for cable operation. Usually specified at 70% of Corona Extinction Voltage.

**Semiconductor:** In cable technology, a material based on polyethylene, rendered very slightly conductive by the addition of carbon black. Used to even out the electric field in Medium- and High-Voltage cables.

**Screen:** A metallic envelope around an insulated conductor (MV or HV Cables), around a pair (Telecom or data cables), or around the cable core. The screen must be connected electrically to ground when installing the cable.

**Sheath** (or Jacket): A mechanical protection around the cable core, obtained by forming a metallic or polymeric tube around the cable core.

**Screening Effectiveness** - Ratio of the power fed into a coaxial cable to the power transmitted by the cable through the outer conductor.

**Self-Extinguishing** - The characteristic of a material whose flame is extinguished after the igniting flame is removed.

**Semi-Flexible Cable** - A cable consisting of a tin-filled braid outer conductor which will allow repeated flexure without damage. It will not hold a stable shape but is able to be hand bent.

**Semi-Rigid Cable** - A cable consisting of a solid metal outer conductor which may be formed into a shape which is stable. Slight flexing is possible, but repeated bending will permanently distort the outer conductor.

**Semi-Rigid PVC** - A hard semi-flexible polyvinylchloride compound with low plasticizer content.

**Separator** - Pertaining to wire and cable, a layer of insulating material such as textile, paper, Mylar<sup>®</sup>, etc., which is placed between a conductor and its dielectric, between a cable jacket and the components of a multiple-conductor cable. It can be utilized to improve stripped qualities, flexibility, or can offer additional mechanical or electrical protection to the components it separates.

**Serve** - A wrapping of wires or fibers around a central core.

**Shield** - (1) A conducting housing or screen that substantially reduces the effect of electric or magnetic fields on one side thereof, upon devices or circuits on the other side. Cable shields may be solid, braided or taped (longitudinally or spirally).

(2) In cables, a metallic layer placed around a conductor or group of conductors to prevent electrostatic or electromagnetic interference between the enclosed wires and external fields.

**Shield Coverage** - The physical area of a circuit or cable actually covered by shielding material often expressed as a percentage.

**Shield Effectiveness** - The relative ability of a shield to screen out undesirable interference. Frequently confused with the term Shield Coverage.

**Shielding** - The metal sleeve surrounding one or more of the conductors, in a wire circuit to prevent interference, interaction or current leakage.

**Shock (mechanical)** - (1) An abrupt impact applied to a stationary object (2) An abrupt or non-periodic change in position, characterized by suddenness, and by the development of substantial internal forces.

**Shrink Temperature** - The temperature which effects complete recovery of a shrinkable product from the expanded state.

**Shrinkage Ratio** - The ratio between the expanded diameter and recovered diameter of shrinkable products.

**SHV (Safe High Voltage)** - Coaxial connector with bayonet coupling mechanism. Working voltage 5 kV DC.

**Signal** - Any visible or audible indication which can convey information. Also, the information conveyed through a communication system.

**Signal Cable** - A cable designed to carry current of usually less than one ampere per conductor.

**Skin Effect** - The phenomenon wherein the depth of penetration of electric currents into a conductor decreases as the frequency of the current increases.

**Sleeving** - A braided, extruded or woven tube.

**Snap on** - Used to describe the easy removal or assembly of one part to another. A connector containing socket (female) contacts into which a plug connector having male contacts is inserted.

**Solid Conductor** - A conductor consisting of a single wire.

**Specialty cable**: A cable designed for specific applications, can be carrying power, or signals or both simultaneously.

**Spark Test** - A test to determine any defects in the insulation.

**Specific Gravity** - The ratio of the density (mass per unit volume) of a material to that of water.

**Specification**: A set of rules agreed between a vendor and a customer, to define a product. Must comply with regulations, and may require compliance with standards.

**Spool** - Circular container on which wire is wound for storage or transit, normally refers to sizes smaller than 18" in diameter.

**Standard**: A set of rules agreed by the members of a profession, to ensure compatibility or safety of their products.

**Static Conductor** - A conductor composed of single solid wires twisted together, either singly or in groups.

**Strain Gauge** - A device for determining the amount of strain (change in dimensions) when a stress is applied.



**Strand** - A single uninsulated wire.

**Strip Force** - The force required to remove a small section of insulating material from the conductor it covers.

**Surface Resistivity** - The resistance of a material between opposite sides of a unit square of its surface. It is usually expressed in ohms.

**Superconductivity:** a phenomenon by which a material offers no resistance at all to the flow of current, when at a temperature below the "critical temperature". There are two types of superconductive materials: low-temperature superconductors have a critical temperature around  $-250^{\circ}\text{C}$  (temperature of liquid helium). High-temperature superconductors have a critical temperature above that of liquid nitrogen ( $-196^{\circ}\text{C}$ ).

**Take-up:** The place (reel, tank, basket) where the elements are collected after processing.

**TC (Type Certificate)** - Airworthiness approval issued by a governmental authority (FAA, EASA, etc.) which confirms an aircraft is safe to operate and in compliance with the airworthiness regulations.

**Technopolymer:** A family of polymers characterized by extreme performance (e.g. aramides, a fiber much stronger than steel, used for armoring).

**TDR** - Time Domain Reflectometry/Time Domain Reflectometer. A measurement technique (or the instrument to perform these measurements) which allow observation of reflected waveforms from discontinuities in a transmission line. These discontinuities can be located in time or distance along the transmission line.

**Telecom cable:** A cable designed to carry telecom signals.

**Tear Strength** - The force required to initiate or continue a tear in a material under specified conditions.

**Tank:** For very large cables, where drums are unpractical, cables are stored in tanks. In the case of submarine cables, the loading is done directly from the shore tank to the ship's tank.

**Temperature Rating** - The maximum and minimum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.

**Tensile Strength** - The pull stress required to break a given specimen.

**Thermal Rating** - The temperature range in which a material will perform its function without undue degradation.

**Thermal Shock** - The effect of heat or cold applied at such a range that non-uniform thermal expansion or contraction occurs within a given material or combination materials. The effect can cause inserts and other insulation materials to pull away from metal parts.

**Thermocouple** - A device for measuring temperature, at the point where two dissimilar metals are joined, and emf output is generated when heated.

**Thermoplastic** - A material which will soften, flow or distort appreciably when subjected to heat and pressure.

**Thermosetting**: A polymer which hardens when heated (Crosslinking) and cannot be re melted.

**Tinned Copper** - Tin coating added to copper to aid in soldering and inhibit corrosion.

**Tolerance** - A specified allowance for error from a standard or given dimension, weight or property.

**Transmission Line Cable** - Two or more conductors placed within a dielectric material in such a way as to control the electrical characteristics.

**Transmission Loss** - The decrease or loss in power during transmission of energy from one point or another. Usually expressed in decibels.

**Triaxial** - Refers to three conductor cables with one conductor in the center, a second circular conductor concentric with the first and third circular conductor insulated from the concentric with the first and second, usually with insulation and a braid or impervious sheath overall.

**Triaxial Cable** - A cable consisting of one center conductor and two outer concentric conductors (with an insulating layer separating them). Notable for increased shielding efficiency.

**Twinaxial Cable** - Two conductors that are insulated from each other, twisted together and surrounded by a common shield.

**UG** - Symbol used to describe coaxial connectors that were made to a government specification. This specification is now obsolete.

**Unbalanced Line** - A transmission line in which voltages on the two conductors are unequal with respect to ground (e.g., a coaxial cable).

**Umbilical cable:** A cable designed to serve a specific piece of equipment, such as an oil well, a remotely operated vehicle, and supply it with all needed services (power, telecom, fluids, etc..)

**VA (Volt Ampere)** - A designation of power in terms of voltage and current.

**Velocity of Propagation** - The transmission speed of electromagnetic energy in a length of cable compared to speed in free space. Usually expressed as a percentage.

**Very High Frequency (VHF)** - A Federal Communications Commission designation for the band from 30 to 300 MHz in the radio spectrum.

**Video** - Pertaining to picture information in a television system.

**VLF (Very Low Frequency)** - The spectrum extending from 10 kHz to 30 kHz, as designated by the Federal Communications Commission (FCC).

**Volt** - A unit of electrical pressure. One volt is the electrical pressure that will cause one ampere of current to flow through one ohm of resistance.

**Voltage** - The term most often used to designate electrical pressure that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points. Voltage is measured in volts, millivolts, microvolts and kilovolts. The terms electromotive force (emf), potential, potential difference and voltage drop are often referred to as voltage.

**Voltage Drop** - The voltage developed across a component or conductor by the current flow through the resistance or impedance of the component or conductor.

**Voltage Rating** - The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.

**Volume Resistivity** - The electrical resistance between opposite faces of a one centimeter cube of insulating material, commonly expressed in ohms-centimeter.

**VSWR** - See Voltage Standing Wave Ratio and Standing Wave Ratio.

**W** - Symbol for watt or wattage.

**Winding:** The operation of winding a cable, or an element on a drum (a critical operation for the quality of the product)

**Water Absorption** - Water by percent weight absorbed by a material after a given immersion period.

**Watt (W)** - A unit of electrical power. One watt is equivalent to the power represented by one ampere of current with a pressure of one volt in a DC circuit.

**Waveform** - A 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** - The distance, measured in the direction of propagation, of a repetitive electrical pulse or waveform between two successive points that are characterized by the same phase of vibration. Increasing the frequency of the pulse or waveform shortens its wavelength.

**Wicking** - The longitudinal flow of a liquid in a wire cable due to capillary action.

**Wire** - A slender rod of metal usually referring to a single conductor, bare or insulated, #9 AWG and smaller.

**XLPE:** Crosslinked Polyethylene, has become thermosetting, but can operate around 20°C higher than thermoplastic polyethylene