abrasion resistance Ability of a wire or cable 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. The plotted results give expected service life under normal conditions.

accelerator A chemical additive which hastens a chemical reaction under specific conditions.

adhesive lined For heat-shrink tubing, an inner lining that, when heated, adheres to the substrate, providing additional strength and environmental sealing.

admittance The measure of the ease with which an alternating current flows in a circuit. The reciprocal of impedance.

aging The change in properties of a material with time under specific conditions.

air-spaced coaxial cable One in which air is the essential dielectric material. A spirally wound synthetic filament or spacer may be used to center the conductor.

alloy A metal formed by combining two or more different metals to obtain desirable properties.

ALS A type of cable consisting of insulated conductors enclosed in a continuous, closely fitting aluminum tube.

alternating current (AC) Electric current that continually reverses its direction. It is expressed in cycles per second (hertz or Hz).

ambient temperature The temperature of a medium surrounding an object.

ampacity See current-carrying capacity.

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

analog circuit Output of electrical signals as a continuous function of input, as contrasted with digital circuit.

anneal Relief of mechanical stress through heat and gradual cooling. Annealing copper renders it less brittle.

annealed wire Wire, which after final drawdown, has been heated and slowly cooled to remove the effects of cold working.

ANSI American National Standards Institute.

anti-oxidant A substance which prevents or slows down oxidation of material exposed to air.

arc resistance The time required for an arc to establish a conductive path in a material.

armor A braid or wrapping of metal, usually steel, used for mechanical protection. Generally placed over the outer jacket.

ASA American Standards Association. Former name of ANSI.

ASCII American Standard Code for Information Interchange.

ASME American Society of Mechanical Engineers.

ASTM American Society for Testing and Materials, a nonprofit industry-wide organization which publishes standards, methods of test, recommended practices, definitions and other related material.

attenuation Power loss in an electrical system. In cables, generally expressed in dB per unit length, usually 1000 ft.

audio frequency The range of frequencies audible to the human ear. Usually 30 Hz to 20,000 Hz.

AWG American Wire Gauge. A standard system for designating wire diameter.

AWM Appliance Wiring Material.

backbone wiring The physical/ electrical interconnections between telecommunications closets and equipment rooms. Cross-connect hardware and cabling in the main and intermediate cross-connects are considered part of the backbone wiring.

balanced circuit A circuit so arranged that the impressed voltages on each conductor of the pair are equal in magnitude but opposite in polarity with respect to ground.

band marking A continuous circumferential band applied to a conductor at regular intervals for identification.

bandwidth The difference between the upper and lower limits of a given band of frequencies. Expressed in hertz (Hz).

baud Unit of data transmission speed representing bits per second. 9600 baud = 9600 bits per second.

bend radius The radius of curvature that a wire or cable can bend without causing any damaging effects.

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

bit error rate (BER) Discrepancy between outgoing and incoming bits transmitted between data equipment.

bit One binary digit.

bond strength Amount of adhesion between surfaces, e.g. in cemented ribbon cable.

braid A fibrous or metallic group filaments interwoven in cylindrical form to form a covering over one (1) or more wires.

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 ends The number of strands used to make up one carrier. The stands 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 multiconductor cable to complete circuits at various points along the main cable.

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

550

bunch stranding A group of wires of the same diameter twisted together without a predetermined pattern.

buried cable A cable installed directly into the earth without the use of underground conduit. Also called "direct burial cable."

byte A group of eight binary digits.

CSA Canadian Standards Association a nonprofit, independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriters Laboratories.

cable An insulated conductor or group of individually insulated conductors in twisted or parallel configuration with a protective jacket.

cable assembly A length of cable with connectors on one or both ends.

cable track, C track Flexible plastic or metallic tray, used to guide and protect cables in high speed motion applications.

cabling The twisting together of two or more insulated conductors to form a cable.

cabling factor Used in the formula for calculating the diameter of an unshielded, unjacketed cable. D=Kd, where the D is the cable diameter, K is the factor, and d is the diameter of one insulated conductor.

CAD/CAM Computer aided design/ computer aided manufacturing.

campus backbone Wiring between buildings that share telecommunications facilities. **capacitance** The ratio of the electrostatic charge on a conductor to the potential difference between the conductors required to maintain that charge.

capacitance, direct The

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

capacitance, mutual The

capacitance between two conductors with all other conductors, including shield, short circuited to ground.

capacitive coupling Electrical interaction between two conductors caused by the capacitance between them.

carrier frequency The

electromagnetic wave frequency selected to transmit information. Optical carrier frequency is from the infrared, visible range or ultraviolet spectrum areas (1012 Hz and above).

CE (Conformité Européenne)

European Economic Community approval indicating that a product complies with a European Directive.

cellular (foamed) polyethylene

Expanded or "foam" polyethylene consisting of individual closed cells suspended in a polyethylene medium.

CENELEC European Economic Community Committee for Standardization of technical requirements.

center-to-center distance See *pitch*.

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 customer's specifications.

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certified test report (CTR) A

report providing actual test data on a cable. Tests are normally run by a quality control department, which shows that the product being shipped conforms to test specifications.

characteristic impedance The

impedance that, when connected to the output terminals of a transmission line of any length, makes the line appear infinitely long. The ratio of voltage to current at every point along a transmission line on which there are no standing waves.

CIP Common Industrial Protocol. A media-inpdendent applicationlayer protocol used by DeviceNet, ControlNet, and EtherNet/IP. Trademark of OVDA.

circuit The entire route of an electric current.

circular mil The area of a circle one mil (0.001") in diameter; 7.845 x 10⁻⁷ sq. in. Used in expressing wire cross sectional area.

cladding A method of applying a layer of metal over another metal whereby the junction of the two metals is continuously welded.

coaxial cable A cable consisting of two cylindrical conductors with a common axis, separated by a dielectric.

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

color code A system for circuit identification through use of solld colors and contrasting tracers.

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 and ESI.

common mode noise Noise, caused by a difference in "group potential." By grounding at either end rather than both ends (usually arounded at source) one can reduce this interference.

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

compound An insulating or jacketing material made by mixing two or more ingredients.

concentric stranding A central wire surrounded by one or more layers of helically wound strands in a fixed round geometric arrangement.

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 capability of a material to carry electrical currentusually expressed as a percentage of copper conductivity (copper being 100%).

conductor An uninsulated wire suitable for carrying electrical current.

conductor spacing Distance between the closest edges of two adjacent conductors.

conduit A tube or trough in which insulated wires and cables are passed.

connector A device used to physically and electrically connect two or more conductors.

connector adapter A special type of connector that allows mating of otherwise incompatible connectors. Examples include a female adapter that mates two male connectors; or a connector that mates a 9-position connector to a 25-position connector.

contact The parts of a connector which actually carry the electrical current and are touched together or separated to control the flow.

continuity check A test to determine whether electrical current flows continuously throughout the length of a single wire or individual wires in a cable.

continuous vulcanization

Simultaneous extrusion and vulcanization of rubber-like wire coating materials.

control cable A multiconductor cable made for operation in control or signal circuits.

ControlNet An industrial automation protocol that is highly scheduled and deterministic, operates at 5 Mb/s, and uses the same CIP application layer protocol as DeviceNet and EtherNET/IP. Trademark of ODVA.

copolymer A compound resulting from the polymerization of two different monomers.

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copper A reddish metal that is an excellent conductor of electricity.

copper-clad Steel with a coating of copper welded to it.

Copperweld Copperweld Steel's trademark for copper-covered steel conductor.

cord A small, flexible insulated cable.

core In cables, a component or assembly of components over which additional components (shield, sheath, etc.) are applied.

corona A discharge due to ionization of air around a conductor due to potential gradient exceeding a certain critical value.

corona resistance The time that the insulation will withstand a specified level of field-intensified ionization that does not result in the immediate complete breakdown of the insulation.

corrosion The deterioration of a material by chemical reaction or galvanic action.

coverage The percent of completeness with which a metal braid covers the underlying surface.

CRCS Continuous rigid cable support. Synonymous with *tray*.

creep The dimensional change with time of a material under load.

cross-linked Inter-molecular bonds between long chain thermoplastic polymers by chemical of electron bombardment means. The properties of the resulting thermosetting material are usually improved. **cross-linked polyethylene** A form of polyethylene whose molecules are more closely linked to produce a greater balance of physical and electrical properties.

crosstalk A type of interference caused by signals from one circuit being coupled into adjacent circuits.

C-track A cable guide mechanism manufactured of either plastic or metal used in continuous flexing applications.

current Flow of electricity, measured in amps.

current-carrying capacity The maximum current an insulated conductor can safely carry with out exceeding its insulation and jacket temperature limitations.

cut-through resistance The ability of a material to withstand mechanical pressure, (usually a sharp edge or small radius) without separation.

CV Continuous vulcanization.

cycle life The number of repetitive flex motions that a wire or cable can withstand prior to breakdown.

decibel (dB) A unit to express differences of power level. A term that expresses two power levels used to indicate gains or losses in a system.

delay line A cable made to provide a very low velocity of propagation with long electrical delay for transmitted signals.

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. **DeviceNet** An industrial automation protocol operating in either a master/slave or distributed fashion to connect controllers to sensors. Trademark of ODVA.

dielectric Any insulating (nonconducting) material between two conductors.

dielectric constant (k) The ratio of the capacitance using the material in question as the dielectric, to the capacitance resulting when the material is replaced by air.

dielectric strength The voltage which an insulation can withstand before breakdown occurs. Usually expressed as a voltage gradient (such as volts per mil).

dielectric test A test in which a voltage higher than the rated voltage is applied for a specified time to determine the adequacy of the insulation under normal conditions.

digital Representation of data by discrete characters.

direct burial cable A cable installed directly in the earth, without a conduit.

direct current (DC) An electric current which flows in one direction.

direct current resistance (DCR)

The resistance offered by any circuit to the flow of direct current.

direction of lay The lateral direction in which the strands of a conductor run over the top of the cable conductor as they recede from an observer looking along the axis of the conductor or cable. Also applies to twisted cable.

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dissipation factor The tangent of the loss angle of the insulating material. (Also referred to as loss tangent, tan δ , and approximate power factor.)

drain wire In a cable, the uninsulated wire in intimate contact with a shield to provide for easier termination of such a shield to ground.

drawing In wire manufacture, pulling the metal through a die or series of dies to reduce diameter to a specified size.

dual wall With heat shrink tubing, a construction having a doublelayer construction, with the inner wall typically having an adhesive or meltable structure to bond and seal the tubing to the substrate.

duct An underground or overhead tube for carrying electrical cables.

duplex insulated In the thermocouple industry, a combination of dissimilar metal conductors of a thermocouple or thermocouple extension wire.

eccentricity Like concentricity, a measure of the center of a conductor's location with respect to the circular cross section of the insulation. Expressed as a percentage of displacement of the circle within the other.

ECTFE Ethylene chlorotrifluoroethylene.

EIA Electronic Industries Alliance.

elastomer A class of long-chain polymers capable of being crosslinked to produce elastic compounds, e.g. polychloroprene and ethylene propylene rubber.

electromagnetic Pertaining to the combined electric and magnetic fields associated with movements of electrons through conductors.

electromotive force (EMF)

Pressure or voltage. The force which causes current to flow in a circuit.

electrostatic Pertaining to static electricity or electricity at rest. A constant intensity electric charge.

elongation The fractional increase in length of a material stressed in tension.

EMC Electromagnetic compatibility. No emission of interference exceeding FCC limits.

EMF See electromotive force.

EMI Electromagnetic interference.

EMP Electromagnetic pulse.

ends In braiding, the number of essentially parallel wires or threads on a carrier.

EPOS Abbreviation for electronic point-of-sale.

EPR Ethylene-propylene rubber, having similar physical properties to butyl rubber. The polymer is chemically cross-linked.

epoxy An adhesive used in the connector termination process.

EtherNet/IP An industrial automation protocol using CIP for upper layers and Ethernet for the lower layers. Trademark of ODVA.

ETFE Ethylene tetrafluoroethylene.

ETPC Abbreviation for electrolytic tough pitch copper. It has a minimum conductivity of 99.9%.

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

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).

FAA Federal Aeronautics Administration.

farad (F) Unit of capacitance whereby a charge of one coulomb produces a one volt potential difference.

fatigue resistance Resistance to metal crystallization which leads to conductors breaking from flexing.

feedback Transfer of some output energy of an amplifier to its input, so as to modify its characteristic.

FEP Fluorinated ethylene propylene.

FHDPE Foamed high-density polyethylene.

Fieldbus (1) A generic term for communication protocols used in industrial networks for instrumentation and control. (2) A specific set of protocols that includes Foundation Fieldbus and HSE (High-Speed Ethernet).

figure 8 cable An aerial cable configuration in which the conductors and the steel strand which supports the cable are integrally jacketed. A cross section of the finished cable approximates the figure "eight."

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filled cable A telephone cable construction in which the cable core is filled with a material that will prevent moisture from entering or passing through the cable.

filler (1) A material used in multiconductor cables to occupy large interstices formed by the assembled conductors. (2) An inert substance added to a compound to improve properties or decrease cost.

film A thin plastic sheet.

FIT[®] Alpha Wire registered trademark for shrinkable tubing and wire management products.

flame resistance The ability of a material not to propagate flame once the flame source is removed.

flammability The measure of the material's ability to support combustion.

flat cable Multiconductor cable arranged in a parallel type configuration manufactured with controlled tolerance spacing.

flat conductor A wire having a rectangular cross section as opposed to round or square conductors.

flat conductor cable A cable with several flat conductors.

FLC Fluorocopolymer insulating and/or jacketing compounds.

flex life The measurement of the ability of a conductor or cable to withstand repeated bending.

flexibility That quality of a cable or cable component which allows for bending under the influence of outside force, as opposed to limpness which is bending due to the cable's own weight.

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foam polyethylene See *cellular polyethylene*.

foamed plastics Insulations having a cellular structure.

FPE Foam polyethylene.

FPP Foam polypropylene.

frequency Number of times an alternating current reverses itself in one second. Express in Hertz (hz), which is one cycle per second.

gang strip Simultaneous stripping all conductors in a flat or ribbon cable.

Gauge A term used to denote the physical size of a wire.

Giga- A numerical prefix denoting one billion (10⁹).

gigahertz (GHz) A unit of frequency equal to one billion hertz.

ground A conducting connection between an electrical circuit and the earth or other large conducting body to serve as an earth thus making a complete electrical circuit.

ground fault A failure of transmission involving insulationto-shield or insulation-toground wire.

halogen Elements such as fluorine, chlorine, bromine, and iodine that are highly reactive and can be harmful to people and animals.

hard-drawn copper wire Copper wire that has not been annealed after drawing.

harmonized Products meeting requirements of CENELEC for use in European Economic Community. harness An arrangement of wires and cables, usually with many breakouts, which have been tied together or pulled into a rubber or plastic sheath, used to interconnect electric circuits.

hash mark stripe A noncontinuous helical stripe applied to a conductor for identification.

heat distortion Distortion or flow of a material or configuration due to application of heat.

heat endurance The time of heat aging that a material can withstand before failing a specific physical test.

heat shock A test to determine stability of a material by sudden exposure to a high temperature for a short period of time.

helical stripe A continuous, colored, spiral stripe applied to a conductor for circuit identification.

henry (H) The unit of inductance.

hertz (Hz) The unit of frequency, expressing cycles per second.

high voltage Generally, a wire or cable with an operating voltage of over 600 volts.

hi-pot A test designed to determine the highest voltage that can be applied to a conductor without electrically breaking down the insulation.

hook-up wire A single insulated conductor used for low current, low voltage (usually under 1000 volts) applications within enclosed electronic equipment.

hygroscopic Readily absorbing and retaining moisture.

ICEA Insulated Cable Engineers Association.

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IDC Insulation displacement connector.

IEC International Electrotechnical Commission.

IEEE Institute of Electrical and Electronic Engineers.

IEEE-488 A standard for connecting test equipment. Also know as General-Purpose Interface Bus (GPIB).

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. It is a combination of resistance R and reactance X. measured in ohms.

IMSA International Municipal Signal Association.

index edge See reference edge.

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.

inductive coupling Crosstalk resulting from the action of the electromagnetic field of one conductor on the other.

insulation A material having high resistance to the flow of electric current. Often called a dielectric in radio frequency (coaxial) cable.

insulation resistance The ratio of the applied voltage to the current between two electrodes in contact with a specific insulation.

Insulation A material having high resistance to the flow of electric current.

interconnecting cable The wiring between modules, between units, or the larger portions of a system.

interference Electrical or electromagnetic disturbances which introduce undesirable responses into other electronic equipment.

interstices Voids or valleys between individual strands in a conductor or between insulated conductors in a multiconductor cable during extreme flexing.

IPCEA Insulated Power Cable Engineers Association.

irradiated Exposure to highenergy radiation resulting in crosslinking of molecules.

irradiation In insulations, the exposure of the material to high energy emissions for the purpose of favorably altering the molecular structure.

ISA Originally, Instrument Society of America, now called International Society of Automation.

ISO International Standards Organization.

jacket An outer covering, usually non-metallic, mainly used for protection against the environment.

jumper cable A short flat cable interconnecting two wiring boards or devices.

kilo- (k) A numerical prefix denoting 1000 (10³).

kilometer (km) 1000 meters or 3281 feet (0.621 miles).

kpsi Tensile strength in thousands of pounds per square inch.

kV kilovolt. 1000 volts

laminated tape A tape consisting of two or more layers of different materials bonded together.

lay The length measured along the axis of a wire or cable required for a single strand (in stranded wire) or conductor (in cable) to make one complete turn about the axis of the conductor or cable.

leakage current The undesirable flow of current through or over the surface of an insulation.

life cycle A test to determine the length of time before failure in a controlled, usually accelerated, environment.

limits of error The maximum deviation (in degrees or percent) of a thermocouple or thermocouple extension wire from standard EMF-temperature to be measured.

link The complete point-to-point communications path between transmitter and receiver.

litz A type of specialty cable designed to reduces AC losses in conductors from skin and proximity effects at high frequencies to make transformers and motors more efficient. Litz wire consists of individually insulated strands woven or twisted in a specific pattern so that each tends to occupy all possible positions in the cross section, thereby equalizing flux linkages and reactances.

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Loc-Trac[®] Alpha Wire's registered trademark for a zipper tubing closure track which does not require any sealants to keep it closed.

local area network (LAN)

A baseband or broadband interactive bidirectional communication system for voice, video or data use on a common cable medium.

longitudinal shield A tape shield, flat or corrugated, applied parallel to the axis of the core being shielded.

longitudinal shrinkage A term generally applied to shrink products denoting the discrete axial length lost through heating in order to obtain the recovered diameter.

loop resistance The total resistance of two conductors measured round trip from one end.

loss Energy dissipated without accomplishing useful work.

loss factor The product of the dissipation and dielectric constant of an insulating material.

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 polyethylene or PTFE.

LSZH Low-smoke, zero halogen. An insulating material that contains no halogens or other potentially toxic materials and that generates very low levels of smoke when burned.

magnetic field The region within which a body or current experiences magnetic forces.

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magnetic flux The rate of flow of magnetic energy across or through a surface (real or imaginary).

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

mastic A meltable coating used on the inside of some shrink products which, when heated, flows to encapsulate the interstitial air voids.

MCM Thousand circular mils.

mega- (M) A numerical prefix denoting 1,000,000 (10⁶).

meter Unit of measurement, one meter equals 3.28 feet.

mho The unit of conductivity. The reciprocal of an ohm.

MHz Megahertz (one million cycles per second).

micro- A numerical prefix denoting one-millionth (10⁻⁶).

microwave A short (usually less than 30 cm) electrical wave.

mil A unit used in measuring diameter of a wire or thickness of insulation over a conductor. Oneone thousandth of an inch (.001").

milli- (m) Prefix meaning 1/1000 (10⁻³).

millimeter One millimeter equals 0.03937 inches.

MIL-SPEC Military Specification. A document of the U.S. Government, issued to define a product that will be used in military end-use applications.

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mismatch A termination having a different impedance than that for which a circuit or cable is designed.

modulation The coding of information onto the carrier frequency. Modulation means include (among others) amplitude, frequency, or phase pulse many 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.

monomer The basic chemical unit used in building a polymer.

MSHA Mine Safety and Health Administration.

MTW Machine tool wire.

multiconductor More than one conductor within a single cable complex.

mutual capacitance Capacitance between two conductors when all other conductors including ground are connected together and then regarded as an ignored ground.

nano- A numerical prefix denoting one-billionth (10⁻⁹).

nanosecond One billionth of a second (10⁻⁹ second).

NBFU National Board of Fire Underwriters.

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NBS National Bureau of Standards.

NEC National Electrical Code. A consensus standard published by the National Fire Protection Association (NFPA) and incorporated in OSHA regulations.

NEMA National Electrical Manufacturers Association.

neoprene Thermosetting material, chemically known as polychloroprene, with excellent flame retarding and abrasion resisting qualities used as a jacketing material.

NFPA National Fire Protection Association, group that publishes the NEC.

noncontaminating PVC A

polyvinylchloride formulation, which does not produce electrical contamination.

nylon A group of polyamide polymers which are used for wire and cable jacketing.

ODVA Formerly Open DeviceNet Vendors Association.

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

ohm Unit of resistance such that a constant current of one ampere produces a force of one Volt.

Ohm's law 1) volts = current x resistance; 2) current = volts/ resistance; 3) resistance = volts/ current.

operating temperature range

Indicates the range of temperature at which the cable or tubing can be used without loss of its physical properties. **OSHA** Occupational Safety and Health Act.

outgassing Percentage of a gas released during the combustion of insulation or jacketing material.

overlap The amount the trailing edge laps over the leading edge of a tape wrap.

oxygen index Percentage of oxygen necessary to support combustion in gas mixture.

ozone Form of oxygen, produced by discharge of electricity into air and harmful to certain insulation.

pairing The union of two insulated single conductors through twisting.

PE Polyethylene.

percent conductivity Conductivity of a material expressed as a percentage of that of copper.

permittivity See *dielectric constant.*

phase 360 degrees represents one cycle. A fraction of one cycle is called a phase.

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

pico- (p) A numerical prefix denoting one-millionth of one-millionth (10⁻¹²).

picofarad (pF) One trillionth of a farad (10⁻¹²).

pitch In flat cable, the nominal distance between the index edges of two adjacent conductors.

pitch diameter Diameter of a circle passing through the center of the conductors in any layer of a multiconductor cable.

plastic deformation Change in dimensions under load that is not recovered when the load is removed.

plasticizer A chemical agent added to plastics to make them softer and more pliable.

plenum The air return path of a central air handling system, either ductwork or open space over a dropped ceiling.

plenum cable Cable approved by Underwriters Laboratories for installation in plenums without the need for conduit.

PLTC Power-limited tray cable.

point-to-point wiring Continuous conductors terminated at each end to circuit destinations.

polychloroprene Chemical name of neoprene.

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

polyethylene A family of insulations derived from the polymerization of ethylene gas and characterized by outstanding electrical properties, including high IR, low dielectric constant, and low dielectric loss across the frequency spectrum. Mechanically rugged, it resists abrasion and cold flow.

polyhalocarbon A general name for polymers containing halogen atoms. The halogens are fluorine, chlorine and bromine.

polymer A material of high molecular weight formed by the chemical union of monomers.

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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.

polyurethane A family of flexible, abrasion resistant jackets used for Xtra-Guard[®] 2 harsh environment cables.

polyvinylchloride A general purpose family of insulations whose basic constituent is polyvinylchloride or its copolymer with vinyl acetate. Plasticizers, stabilizers, pigments and fillers are added in lesser quantity to improve mechanical and/or electrical properties of this material.

porosity Multiple air voids in an insulation or jacket wall.

potting The sealing of a cable termination or other component with a liquid which thermosets into an elastomer.

power Rate at which work is done in moving current, measured in watts. Power = Pressure x Current.

power factor The ratio of resistance to impedance. The ratio of the actual power of an alternating current to apparent power. Mathematically, the cosine of the angle between the voltage applied and the current resulting.

primary insulation The first layer of nonconductive material applied over a conductor, whose prime function is to act as electrical barrier (insulation).

PROFIBUS An industrial automation fieldbus.

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propagation delay Time required for an electrical wave to travel between two points on a transmission line.

propagation time Time required for a wave to travel between two points on a transmission line.

propagation velocity See Velocity of Propagation.

psi Pound per square inch.

PTFE Polytetrafluoroethylene.

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 cable A type of coaxial cable constructed to transmit repeated high voltage pulses without degradation.

put-up and packaging The method of packaging product. May be expressed in units or footage. May show 4 foot lengths, spools, coils or long lengths of wire, cable and tubing products.

PV Photovoltaic.

PVC Polyvinylchloride.

PVDF Polyvinylidene fluofide.

QPL Qualified parts list.

quad A four-conductor cable.

rad The unit of radian dose which is absorbed, equal to .01 joule/kilogram.

radio frequency One suitable for radio transmission, above 104 Hz and below 3 GHz.

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

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

REACH Registration, Evaluation and Authorization of Chemical Substances. An EU framework for regulating the production and use of chemical substances.

reactance The opposition offered to the flow of alternation current by inductance or capacitance of a component or circuit.

recovered diameter Diameter of shrinkable products after heating has caused it to return to its extruded diameter.

reference edge Edge of cable or conductor from which measurements are made. Sometimes indicated by a thread, stripe, printing or other identifying mark. Conductors are usually identified by their sequential position from the reference edge, with number one conductor closest to the edge.

reference junction The junction of a thermocouple which is at a known reference temperature. Also known as the "cold" junction, it is usually located at the emf measuring device.

reflection loss The part of a signal which is lost due to reflection of power at a line discontinuity.

reflow soldering The process of connecting two solder-coated conductive surfaces by remelting of the solder to cause fusion.

repeater A transmitter and receiver combination used to regenerate a signal along the communications path.

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

resistance A measure of the difficulty in moving electrical current through a medium when voltage is applied. It is measured in ohms.

retractile cord A cable that returns by its own stored energy from an extended condition to its original contracted form.

RF Radio frequency.

RFI Radio frequency interference.

RG/U Radio Government, Universal. RG is the military designation for coaxial cable in MIL-DTL-17 and U stands for "general utility."

ribbon cable A flat cable of individually insulated conductors lying parallel and held together by means of adhesive film laminate.

ridge marker One or more ridges running laterally along the outer surface of an insulated wire for purposes of identification.

ringing out The process of locating or identifying specific conductive paths by means of passing current through selected conductors.

RJ-11 A 6-position modular plug and jack connector system.

RJ-45 An 8-position modular plug and jack connector system, widely used in local- and widearea networks.

Rockwell hardness A test for determining hardness in which a hardened steel ball or diamond point is pressed into the material under test. **RoHS** Restriction of Hardardous Substances. A regulatory framework for restricting the amounts of hazardous substances, including lead, mercury, cadmium, haxavent chromium, PBB, and PBDE, in materials.

root mean square (RMS) The effective value of an alternating current or voltage.

rope lay Cable composed of central core surrounded by one or more layers of helically laid groups of wires. Usually extremely flexible.

routing The path followed by a cable or conductor.

RS-232 A serial communications protocol using single-ended signaling for connecting data equipment at speeds up to 230.4 kb/s.

RS-422 A serial communications protocol using differential signaling for connecting equipment, at speeds to 10 Mb/s.

RS-423 A serial communications protocol using single-ended signaling for connecting data terminal equipment to data circuitterminating equipment.

RS-485 A serial communications protocol using balanced signaling for connecting data terminal equipment to data circuitterminating equipment, at speeds to 10 Mb/s over long distances and in noisy environments.

SAE Society of Automotive Engineers.

self-extinguishing The characteristic of a material whose flame is extinguished after the igniting flame is removed.

semiconductor A material that has a resistance characteristic between that of insulators and conductors.

semirigid PVC A hard semi-flexible polyvinylchloride compound with low plasticizer content.

separator A layer of insulating material such as textile, paper, polyester, etc. Used to improve stripping qualities, flexibility, mechanical or electrical protection to the components.

serve A filament or group of filaments such as fibers or wires, wound around a central core.

sheath The outer covering or jacket of a multiconductor cable.

shelf life Length of time under specified conditions that a material retains its usability.

shield A metallic layer, commonly aluminum or copper, of tape, braid or spiral wrapped wire construction. Its primary purpose is to prevent electrostatic or electromagnetic interference between adjacent wires and external sources.

shield coverage The physical area of a cable that is actually covered by the shielding material and is expressed in percent.

shield effectiveness The relative ability of a shield to screen out undesirable signals.

shrink ratio The ratio of shrinkage of tubing inside diameter from the expanded size to the fully recovered dimension.

shrink temperature That

temperature which effects complete recovery of a shrinkable product from the expanded state.

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shrink tubing Tubing which has been extruded, cross-linked and non cross-linked, and mechanically expanded which when reheated will return to its original diameter.

signal A current used to convey information, either digital, analog, audio or video.

signal cable A cable designed to carry current of usually less than one ampere per conductor.

simplex Mode of data transmission in one direction only. Usually on a two-wire facility.

sintering A method of heat sealing. Fusion of a spirally applied tape wrap jacket by the use of high heat to a homogenous continuum. Usually employed for fluorocarbon, non-extrudable materials.

SIS XLP switchboard wire.

skin effect The phenomenon in which the depth of penetration of electric currents into a conductor decreases as the frequency increases.

sleeving A braided, extruded or woven tube.

SNR Signal-to-noise ratio.

soldering sleeves Shrinkable tubing with a solder preform used for highest reliability soldering connections or shield grounding.

solid conductor A conductor consisting of a single wire.

span In flat cables, the distance from the reference edge of the first conductor to the reference edge of the last conductor (in cables having flat conductors), or the distance between the centers of the first and last conductors (in cables having round conductors), expressed in inches or centimeters.

spark test A test designed to locate imperfections (usually pin-holes) in the insulation of a wire or cable by application of a voltage for a very short period of time while the wire is being drawn through the electrode field.

specific gravity The ratio of the density (mass per unit volume) of a material to that of water.

specific inductive capacity (SIC) See dielectric constant.

spiral wrap The helical wrap of a material over a core.

splice A mechanical device or fusion process that permanently bonds two fibers together without a connector producing extremely low loss.

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

stability factor The difference between the percentage power factor at 80 volts/mil and at 40 volts/mil measured on wire immersed in water at 75°C for a specified time.

static condition Used to denote the environmental conditions of an installed cable rather than the conditions existing during cable installation.

STP Shielded twisted pair cable.

strand A single uninsulated wire.

stranded conductor A conductor composed of single solid wires twisted together, either singly or in groups.

strip force The force required to remove a small section of insulating material from the conductor it covers.

structural return loss (SRL)

Expresses the amount of signal lost in negative terms, and occurs when signals reflect back to points of transmission.

suggested working voltage

AC voltage that can be applied between adjacent conductors.

Supra-Shield[®] Alpha Wire's trade name for foil/braid combination used for maximum shielding effectiveness.

surface resistivity The resistance of a material between two opposite sides of a unit square of its surface. It is usually expressed in ohms.

surge A temporary, large increase in the voltage or current in an electric circuit or cable.

sweep test A method to determine the frequency response of a cable, by generating an RF voltage whose frequency is varied at a rapid constant rate over a given range.

switchboard cable The cable used within and between the central office main frames and the switchboard.

tank test A voltage dielectric test in which the test sample is submerged in water and voltage is applied between the conductor and water as ground.



tape wrap A spirally applied tape over an insulated or uninsulated wire.

TC Tray cable.

TC-ER Tray cable, extended run.

tear strength The force required to initiate or continue a tear in a material under specified conditions.

temperature coefficient of

resistance The amount of resistance change of material per degree of temperature rise.

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

Tempest Classified procedure which details the complex measurement of the combined reduction of all electromagnetic emissions from specified equipment.

tensile strength The pull stress required to break a given specimen.

TFE Polytetrafluoroethylene.

thermal shock A test to determine the ability of a material to withstand heat and cold by subjecting it to rapid and wide changes in temperature.

thermocouple A device for measuring temperature, at the point where two dissimilar metals are joined, and EMF output is generated when heated.

thermocouple element A

thermocouple designed to be used as part of an assembly, but without associated parts such as the terminal block, connecting head, or protecting tube.

thermocouple extension cable A cable comprised of one or more twisted thermocouple extension

wires under a common sheath.

thermocouple extension wire A

pair of wires of dissimilar alloys having such EMF-temperature characteristics complimenting the thermocouple which is intended to be used, such that when properly connected allows the EMF to be faithfully transmitted to the reference junction.

thermocouple wire (grade) A pair of wires of dissimilar alloys having EMF-temperature characteristics calibrated to higher temperature levels than the extension type of thermocouple wire. Unlike the thermocouple extension wire, this wire may be employed as the thermocouple hot junction in addition to serving as the entire wire connection between hot and cold reference junctions.

thermoplastic A material which softens when heated or reheated and becomes firm on cooling.

thermoset A material which hardens or sets by heat, chemical or radiation cross-linking techniques and which, once set, cannot be resoftened by heating.

THHN 90°C, 600 volt, nylon jacketing building wire for dry locations.

THWN 75°C, 600 volt, nylon jacketed building wire for wet and dry locations.

tinned copper Tin coating added to copper to aid in soldering and inhibit corrosion.

topcoat conductor A conductor construction in which bare copper wires are first stranded and then coated with tin.

transformer A device for converting AC current from one voltage to another either "stepped up" or "stepped down."

transmission cable Two or more transmission lines. If the structure is flat, it is sometimes called *flat transmission cable* to differentiate it from a round structure such as a jacketed group of coaxial cables. See transmission line.

transmission line A signalcarrying circuit with controlled electrical characteristics used to transmit high-frequency or narrow-pulse signals.

transmission loss The decrease or loss in power during transmission of energy from one point to another. Usually expressed in decibels.

tray A cable tray system is a unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible materials forming a rigid structural system used to support cables. Cable tray systems (previously termed continuous rigid cable supports) include ladders, troughs, channels, solid bottom trays, and similar structures.

tray cable A factory-assembled multiconductor control, signal and power cable specifically approved under the National Electrical Code for installation of trays.

triad A group of 3 insulated conductors twisted together without (or with) a sheath overall. Usually color coded for identification. Also called triplex.

triaxial cable A cable construction having three coincident axes, such as conductor, first shield and second shield all insulated from one another.

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tubing A tube of extruded nonsupported plastic or metallic material.

twinning Synonymous with pairing.

UF Thermoplastic underground feeder and branch circuit cable.

UHF Ultra high frequency, 300 to 3000 MHz.

UL Underwriters Laboratories, a nonprofit, independent organization, which operates a listing service for electrical and electronic materials and equipment.

UN Ungrounded neutral (refers to a type of power system).

unbalanced circuit A transmission line in which voltages on the two conductors are unequal with respect to ground; e.g. a coaxial cable.

unilay A conductor constructed with a central core surrounded by more than one layer of helicallylaid strands, with all layers having a common length and direction of lay.

UTP Unshielded twisted pair cable.

UV Ultraviolet.

VDE German Society of Engineers that establishes standards and testing requirements.

velocity of propagation The

speed of an electrical signal down a length of cable compared to speed in free space expressed as a percent. It is the reciprocal of the square root of the dielectric constant of the cable insulation.

VFD Variable-frequency drive.

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VHF Very high frequency, 30 to 300 MHz.

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 in place of electromotive force, potential, potential difference, or voltage drop to designate the electric pressure that exists between two points and is capable of producing a current when a closed circuit is connected between two points.

voltage drop The amount of voltage loss from original input to point of electrical device.

voltage rating The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.

voltage standing wave ratio

(VSWR) The ratio of the maximum effective voltage to the minimum effective voltage measured along the length of a mismatched radio frequency transmission line.

volume resistivity (specific insulation resistance) The electrical resistance between

opposite faces of a 1 cm cube.

VSWR Voltage standing wave ratio.

vulcanize To fuse under heat and pressure.

wall thickness The thickness of the applied insulation or jacket material.

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

Watt (W) A unit of electric power. The watt is the power required to do work at the rate of one joule per second.

waveguide Hollow pipe (round or rectangular) used as transmission line for the propagation of microwaves.

wavelength The distance, measured in the direction of propagation, of a repetitive electrical pulse or waveform between two successive points.

wicking The longitudinal flow of a liquid in a wire or cable due to capillary action.

wire A slender rod or filament of drawn metal.

WTTC Wind turbine tray cable.

XLPE Cross-linked polyethylene.

Xtra-Guard[®] The Alpha Wire trade name for cable constructions designed for use in virtually any type of environment.

yield strength The minimum stress at which a material will start to physically deform without further increase in load.

Zipper Tubing[™] Alpha Wire's trade name for a harnessing/jacketing material containing a zippertrack type closure. The zipper arrangement allows installation with no need to disconnect previously wired schemes for its installation. (See Loc-Trac®).

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