CABLE TERMS GLOSSARY:

A

Abrasion resistance

Ability of cable to resist surface wear.

Alternating current

An electric current that continually reverses its direction giving a definite plus and minus waveform at fixed intervals.

Alternating current resistance

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

Ambient temperature

Any all-encompassing temperature within a given area.

American Wire Gage (AWG)

The standard system used for designating wire diameter.

Ampacity

The maximum current an insulated conductor or cable can continuously carry without exceeding its temperature rating.

Anneal

The act of softening the copper by means of heat to render it less brittle.

Anti-oxidant

A substance that prevents or slows down oxygen decomposition of a material.

Anti-ozonant

A substance that prevents or slows down material degradation due to ozone reaction.

Armor

Mechanical protection usually accomplished by a metallic layer of tape, braid or served wires. Normally found only over the outer sheath.

Armored cable

A cable provided with a wrapping of metal, usually steel wires, flat tapes, or interlocked tapes, primarily for the purpose of mechanical protection.

Attentuation

Power loss in an electrical system.

B

Binder

A helically applied tape or thread used for holding assembled cable components in place until additional manufacturing operations are performed.

Boot

A protective covering over any portion of a cable or conductor in addition to its jacket or insulation.

Braid

A fibrous or metallic group of filaments interwoven in cylindrical form to form a covering over one or more wires.

Breakdown (puncture)

A disruptive discharge through insulation due to failure under electrostatic stress.

Breakdown voltage

The voltage at which the insulation between two conductors, or a conductor and ground, will break down.

Building wire

Wire used for light and power in permanent installations utilizing 600 volts or less. Usually in an enclosure and not exposed to outdoor environments.

Bunch stranding

A method of stranding where a single conductor is formed from any number of wires twisted together in the same direction, such that all strands have the same lay length, but no specific geometric arrangement.

Butt joint

A splice or connection formed by placing the ends of two conductors together and joining them by welding, brazing or soldering.

Butt wrap

Tape wrapped in an edge-to-edge manner with no overlapping between adjacent turns.

C

Cable core

A cable core is the portion of an insulated cable lying under the protective covering or coverings.

Cable filler

The material used in multiple conductor cables to occupy the spaces formed by the assembly of components, thus forming a core of the desired shape.

Capacitance

The property of a system of conductors and dielectrics that permits the storage of electricity when a potential difference exists between the conductors.

Capacitive coupling

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

Capillary action

The phenomenon of liquid rising in a small interstice due to surface tension.

Carbon black

A black pigment. It imparts useful ultraviolet protective properties and is frequently suspended into plastic and elastomeric compounds intended for outside weather exposure.

Charging current

The current produced when a DC voltage is first applied to conductors of an unterminated cable. It is caused by the capacitive reactance of the cable, and decreases exponentially with time.

Chlorinated Polyethylene (CPE)

A synthetic rubber jacketing compound.

Chlorosuflonated Polyethylene (CSPE)

A synthetic rubber jacketing compound manufactured by DuPont under trade name of Hypalon.

Circular mil

A unit of area equal to the area of a circle whose diameter is 1 mil (0.001 inch). Used chiefly in specifying cross-sectional areas of round conductors.

Coating

A material applied to the surface of a conductor to prevent environmental deterioration, facilitate soldering or improve electrical performance.

Coaxial cable

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

Cold flow

Any permanent deformation due to pressure or mechanical force without the aid of heat softening.

Cold joint

A soldered joint made with insufficient heat.

Cold test

Any test to determine the performance of cables during or after subjection to a specified low temperature for a specified time.

Cold work

The hardening and embrittlement of metal by repeated flexing action.

Color code

A color system for circuit identification by use of solid color tracers, braids or surface printing.

Compact round conductor

A conductor constructed with a central core surrounded by one or more layers of helically laid wires and formed into final shape by rolling, drawing, or other means.

Compact stranded constructor

A unidirectional or conventional concentric conductor manufactured to a specified diameter, approximately 8 to 10% below the nominal diameter of a noncompact conductor of the same cross-sectional area.

Composite cable

A cable containing more than one gauge size or a variety of circuit types.

Concentric stranding

A method of stranding, wherein a single conductor is formed from a central wire surrounded by one or more layers of helically layed wires. Each layer is applied with an opposite direction of lay. The first layer has six wires, and each additional layer has six more wires than does the previous one.

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 circular insulation.

Concentric-lay cable

A concentric-lay conductor, or a multiple-conductor cable composed of a central core surrounded by one or more layers of helically laid insulated conductors.

Conductivity

A term used in describing the capability of a material to carry an electrical charge. Usually expressed as a percentage of copper conductivity—copper being one hundred (100%) percent. Conductivity is expressed for a standard configuration of conductor.

Conductor

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

Conductor core

The center strand or member about which one or more layers of wires or members are laid helically to form a concentric-lay or rope-lay conductor.

Conduit

A tube through which insulated wires and cables are run.

Continuous vulcanization

Simultaneous extrusion and vulcanization of wire coating materials.

Contrahelical

A term meaning the application of two or more layers of spirally twisted, served, or wrapped materials where each successive layer is wrapped in the opposite direction to the preceding layer.

Conventional concentric conductor

Conductor constructed with a central core surrounded by one or more layers of helically laid wires. The direction of lay is reversed in successive layers and generally with an increase in length of lay for successive layers.

Cord

Small, flexible insulated cable usually size 10 AWG or smaller.

Core

Any portion of a cable over which some other cable component, such as a shield, jacket, sheath or armor, is applied.

Corona

A luminous discharge due to ionization of the gas surrounding a conductor in which exists a voltage gradient exceeding a certain critical value.

Corona resistance

The time that insulation will withstand a specified level field-intensified ionization that does not result in the immediate complete breakdown of the insulation. Also called voltage endurance.

Corona test

A test to determine the ability of a cable to withstand the formation of corona under an increasing applied voltage, and to extinguish corona when a corona-producing voltage is reduced.

Creep

The dimensional change with time of a material under load. At room temperature, it is sometimes called cold flow.

Creepage

Electrical leakage on a solid dielectric surface.

Crimp termination

A wire termination that is applied by physical pressure of terminal to wire.

Cross linking

The establishment of chemical bonds between polymer molecule chains. It may be accomplished by heat, vulcanization, irradiation or the addition of a suitable chemical agent.

Cross sectional area

The area of the cut surface of an object cut at right angles to the length of the object.

Cross sectional area of a conductor

The sum of cross sectional areas of all the individual wires composing the conductor. It is generally expressed in circular mils.

Cross-linked

Intermolecular bonds between long chain thermoplastic polymers are changed by chemical or electron bombardment means. The properties of the resulting thermosetting material are usually improved.

Crosstalk

Signal interference between nearby conductors caused by pickup of stray energy. It is also called induced interference.

Crush resistance test

A test to determine the ability of a cable to resist damage from radial compression, such as might be encountered in service.

Cure

An irreversible process during which a rubber compound through a change in its chemical structure (for example, cross-linking), becomes less plastic and more resistant to swelling by organic liquids and elastic properties are conferred, improved, or extended over a greater range of temperature.

Cut-through resistance

The ability of a given material to withstand penetration by a solid object of specified dimensions and weight, which is permitted to free fall onto this material from a specified height.

Cycle

One complete sequence of variations in an alternating current. The number of cycles occurring in one second is called the frequency.

D

Decibel

Unit to express differences of power level. It is used to express power loss in cables.

Density

The weight per unit volume of a substance.

Derating factor

A factor used to reduce a current carrying capacity of a wire when used in other environments from that for which the value was established.

Dielectric

Any insulating medium that intervenes between two conductors and permits electrostatic attraction and repulsion to take place across it.

Dielectric breakdown

The voltage at which a dielectric material is punctured.

Dielectric

The voltage which an insulating material can withstand before breakdown occurs, usually expressed as a voltage gradient (such as volts per mil).

Direct burial cable

A cable installed directly in the earth.

Direct current

Electrical current whose electrons flow in one direction only; it may be constant or pulsating as long as their movement is in the same direction.

Direction of lay

The lateral direction, designated as left-hand or right-hand, in which the wires of a member or units of a conductor run over the top of the member or conductor as they recede from an observer looking along the axis of the member or conductor.

Dissipation

Unusable or lost energy, as the production of unused heat in a circuit.

Drain wire

An uninsulated wire, usually placed directly beneath and in electrical contact with a grounded shield, which is used for making ground connections.

Drawing

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

Duct

An underground or overhead tube through which electrical conductors are pulled. Gives mechanical protection.

Durometer

A measurement used to denote the hardness of a substance (usually of thermosetting and thermoplastic materials).

E

Eccentricity

A measure of the lack of coincidence of longitudinal axes of a circular cross-sectional wire and its surrounding circular cross-sectional insulation. It is expressed as the percentage ratio of the distance between wire and insulation centers to the difference between wire and insulation radii.

Elastic deformation

A change in a substance whereby it reverts to its original dimensions on release of an applied stress.

Elastometer

A material that at room temperature returns rapidly to approximately its initial dimensions and shape after substantial deformation by a weak stress and release of the stress.

Elongation

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

Embossing

A means of marker identification by means of thermal indentation leaving raised lettering on the sheath material of cable.

Environmental stress cracking resistance

The ability of a material to resist crack formation and crack propagation when subjected to stress within a contaminating environment.

Equilay conductor

Conductor constructed with a central core surrounded by more than one layer of helically laid wires with all layers having a common length of lay and the direction of lay being reversed for successive layers.

Ethylene Propylene Rubber (EPR)

An ozone resistant rubber consisting primarily of ethylene propylene copolymer (EPM) or ethylene propylene diene terpolymer (EDPM).

Extrusion

The process of continuously forcing either a plastic or elastomer and a conductor or core through a die, thereby applying an insulation or jacket to the conductor or core.

F

Fatigue resistance

The ability of a repeatedly deformed material to resist crystallization and accompanying failure.

Fault current

The maximum electrical current that will flow in a short-circuited system prior to the actuation of any current-limiting device. It is far in excess of normal current flow and is limited only by a system's generating capacity and a cable's impedence.

FEB

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

Fiber optic

A lightwave or optical communications system in which electrical information is converted to light energy, transmitted to another location through optical fibers, and is there converted back into electrical information.

Fibrous filler

A material used to fill interstices in cables made from fibers, such as jute, polypropylene, cotton, glass, etc.

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 8.

Filler

Any material used in multiconductor cables to occupy interstices between insulated conductors or form a core into a desired shape (usually circular). Also, any substance, often inert, added to a plastic or elastomer to improve its properties or decrease its cost.

Film

Thin, plastic sheeting having nominal thickness usually not greater than 0.010 inch.

Flame resistance

The ability of a burning material to extinguish its own flame, once its flame-initiating heat source is removed.

Flame retardance

Ability of a material to prevent the spread of combustion by a low rate of travel so the flame will not be conveyed.

Flex life

The number of bends or twists, of specified type, that a cable will withstand before failure.

Flexing test

Any test to determine the ability of a cable to withstand repeated bending and twisting.

G

Ground

A conducting connection, intentional or accidental, between an electric circuit or equipment and the earth or some conducting body serving in place of the earth.

Ground potential

Zero potential with respect to the ground or earth.

Grounded neutral

A circuit operates with grounded neutral when the neutral is metallically connected to ground and there is a provision for immediate removal of a faulted element

Grounding conductor

A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes; usually colored green.

H

Hard-drawn wire

As applied to aluminum and copper, wire that has been cold drawn to final size so as to approach the maximum strength obtainable.

Heat endurance

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

Heat resistance

Ability of a substance to maintain physical and chemical identity and electrical integrity under specified temperature conditions.

Heat shock

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

Helix

A spiral winding.

Hertz

A term that is rapidly replacing cycles-per-second as an indication of frequency.

High voltage time test

A high-voltage time test is an accelerated life test on a cable sample in which voltage is the factor increased.

Hygroscopic

Attracting or absorbing moisture from the ambient atmosphere.

Hypalon

DuPont trademark for chlorosulfonated polyethylene (CSPE) synthetic rubber.

I

Irradiation

The exposure of a material to high energy emissions. In insulations for the purpose of favorably altering the molecular structure. Excessive exposure can be detrimental to the physical and electrical properties.

J

Jacket

A material covering over a wire insulation or an assembly of components, usually an extruded plastic or elastomer.

Jumper

A short length of conductor used to make a connection between terminals, around a break in a circuit, or around an instrument.

L

Lap slice

A permanent joint formed in a short overlapping region of two parallel conductors or tapes.

Lay

The distance along a cable occupied by one complete helix of a strand or conductor. The direction of lay (left or right hand) is the direction of the helix looking away from an observer. Also to arrange the wires or members of a conductor either by twisting them or by forming them into one or more layers helically applied.

Length of lay

The axial length of one turn of the helix of a wire or member.

Longitudinal shield

A tape shield, flat or corrugated, applied lengthwise with the axis of the core being shielded.

M

Marker type

A narrow strip of fabric, paper or plastic laid longitudinally within a cable; it bears printed information such as the specification to which the cable was made and the name of the cable's manufacturer.

Marker threads

Colored strings laid parallel and adjacent to the strands of an insulated conductor to reveal information such as the conductor's manufacturer, the specification to which it was made, and its thermal capability.

Messenger wire

A metallic supporting member either solid or stranded which may also perform the function of a conductor.

Migration

The loss of plasticizer from a plastic, usually due to heat or aging. It is undesirable since it will make the plastic hard and brittle. It is also called leaching.

Mil

Unit of measure equal to 1/1000 of an inch.

Moisture absorption

The amount of water that an insulation or jacket, which is initially dry, will absorb under specified conditions. It is expressed as the percentage ratio of the absorbed water's weight to the weight of the jacket or insulation alone.

N

Neoprene

Trade name for polychloroprene, used for jacketing.

Nitrile rubber

A rubbery copolymer of butadiene and acrylonitrile. It is usually compounded and vulcanized.

Nominal

Name or identifying value of a measurable property by which a conductor or component or property of a conductor is identified, and to which tolerances are applied.

Nylon

A strong polyamide polymer used for wire, cable jacketing, fillers and rope.

O

Oxygen bomb test

A test to determine the ability of conductors and insulations to withstand physical and electrical change when immersed in pure oxygen gas of specified temperature and pressure for a specified time.

P

Plasticizer

A substance incorporated into a material to increase its workability or flexibility.

Plating

Any thin metallic coating applied over a metallic substratum.

Plenum

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

Polychloroprene

Chemical name for neoprene. A rubber-like compound used for jacketing where wire and cable will be subject to rough usage, moisture, oil, greases, solvents and chemicals.

Polyester

A resin generally used as a thin film in tape form.

Polyethylene

A thermoplastic material composed of polymers of ethylene.

Polymer

A material formed by the chemical combination of monomers having either the same or different chemical composition.

Polypropylene

A thermoplastic polymer of propylene.

Polyvinyl Chloride (PC)

A thermoplastic material composed of polymers of vinyl chloride, which may be rigid or elastomeric, depending on specific formulation.

Q

Quad

A structural unit employed in cables, consisting of four separately insulated conductors twisted together.

R

Resistance

Property of a conductor that opposes the current flow produced by a given difference of potential. The ohm is the practical unit of resistance.

Riser

Pathways for indoor cables that pass between floors. It is normally a vertical shaft or space. A riser cable rating indicates good flammability characteristics, but not necessarily low smoke as in a plenum type.

Rope-lay conductor

Conductor constructed of a bunch-stranded or a concentric-stranded member or members, as a central core, around which are laid one or more helical layers of such members.

S

Secondary insulation

Any extremely high resistance material which is placed over primary insulation to protect it from abrasion.

Semi-conductor

A solid material characterized by comparatively high resistivities.

Serve

Any helical wrapping applied over a wire or cable core. It may consist of wires, fibers, yarns or tapes.

Served wire shield

A barrier to the passage of interference formed by a helical wrapping of wires over a cable core. It is also called spiral shield.

Sheath

The material, usually an extruded plastic or elastomer, applied outermost to a wire or cable. Very often referred to as a jacket, or an impervious metal covering usually lead.

Shield

Any barrier to the passage of interference causing electrostatic or electromagnetic fields, formed by a conductive layer surrounding a cable core. It is usually fabricated from a metallic braid, foil or wire serving.

Shield coverage

The amount of cable core surface area which is covered by a shield. It is expressed as a percentage of the cable core's total surface area. It is also called braid coverage when applied to a braided shield.

Shielding

The practice of confining the electrical field around a conductor to the primary insulation of the cable by putting a conducting layer over and/or under the insulation. (External shielding is a conducting layer on the outside of the insulation. Strand or internal shielding is a conducting layer over the conductor itself).

Skeleton braid

A braid of widely separated wires or fibers, used to reinforce a jacket, bind a cable core, or prevent the passage of electrostatic or electromagnetic fields.

Soft wire

Wire that has been drawn or rolled to final size and then heated to remove the effects of cold working.

Spark test

A test designed to locate pin-holes in an insulated wire by application of an electrical potential across the material for a very short period of time while the wire is drawn through an electrode field.

Sprial wrap

A term given to describe the helical wrap of a tape or thread over a core.

Splice

A joint used for connecting two lengths of conductor or cable with good mechanical strength as well as good conductivity.

Stabilizer

Any ingredient added to plastics to preserve their physical and chemical properties.

Static

Electrical discharges in the atmosphere such as lightning and corona.

Strand

One of the wires of any stranded conductor.

Strand lay

The distance of advance of one strand of a spirally stranded conductor in one turn, measured axially.

Stranded conductor

A conductor composed of a group of wires, usually twisted, or of any combination of such groups of wires.

T

Tape wrap

A term denoting a spirally or longitudinally applied tape material wrapped around the wire, either insulated or uninsulated, used as an insulation or mechanical barrier.

Tear strength

The force required to initiate or continue a rip in a jacket or other insulation under specified conditions.

Temperature rating

The maximum temperature at which a given insulation or jacket may be safely maintained during continuous use, without incurring any thermally-induced deterioration.

Tensile strength

The longitudinal stress required to break a specimen of prescribed dimension divided by the original cross-sectional area at the point of rupture (usually expressed in pounds per square inch).

Thermal conductivity

Ability of material to conduct heat.

Thermal rating

The maximum and/or minimum temperature at which a material will perform its function without undue degradation.

Thermoplastic

A classification of resin that can be readily softened and reformed by heating and be rehardened by cooling.

Thermoset

1. To cure through chemical reaction by heat to a point of not being resoftened by subsequent heating.
2. A resin which cures by chemical reaction.

Tinned wire

Copper wire that has been coated during manufacture with a layer of tin or solder to prevent corrosion or facilitate soldering.

Tolerance

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

Triad

Any grouping of three conductors or three assemblages of conductors, generally twisted together and found within a cable.

U

Unidirectional conductor

Conductor constructed with a central core surrounded by more than one layer of helically laid wire, all layers having a common direction of lay, with increase in length of lay for each successive layer.

Unilay conductor

Conductor constructed with a central core surrounded by more than one layer of helically laid wires, all layers having a common length and direction of lay.

V

Volt

The difference of potential required to make a current of one ampere flow through resistance of one ohm.

Voltage drop

The voltage developed between the terminals of a circuit component by the flow of current through the resistance or impedance of that part.

Voltage rating

The maximum voltage at which a given cable or insulated conductor may be safely maintained during continuous use in a normal manner. It is also called working voltage.

Vulcanization

A chemical reaction in which the physical properties of an elastomer are changed by reacting it with sulfur or other crosslinking agents.

W

Water absorption

The ratio of the weight of water absorbed by a given material under specified conditions to the weight of that material when dry. It is generally expressed as a percentage.

Y

Yield strength

The lowest stress at which a material undergoes plastic deformation. Below this stress, the material is elastic; above it, viscous.