

# Glossary Of Terms

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**ANSI** - American National Standards Institute.

**Armor** - A sheath, serving, braid or other layer of metal applied over a cable to increase its mechanical protection.

**ARR** - Association of American Railroads

**ASTM** - American Society for Testing and Materials.

**AWG** - American Wire Gauge.

**Binder Tape** - A helically applied tape used for holding assembled cable components in place until additional manufacturing operations are performed.

**Braid** - A flexible cable covering, armor, core binder or shield of interwoven yarns, fine wires, fibers or flat metal strips.

**Cable** - A cable is either an insulated conductor (one conductor cable) or a combination of conductors insulated from one another (multiple conductor cable).

**Circular Mil (Cmil)** - The area of a circle one thousandth of an inch (or one mil) in diameter.

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

**Color Code** - A color system for circuit identification by use of solid colors, tracers, braids, surface printing, etc.

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

**CPE (Chlorinated Polyethylene)** A flame retardant thermoplastic jacketing material.

**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.

**CSA** - Canadian Standards Association.

**CSPE (Chlorosulfonated Polyethylene)** A rubbery polymer made by treating polyethylene with chlorine and sulfur

dioxide. Manufactured by E.I. Du Pont under the trade name of Hypalon.

**CT USE** - UL designation for "Cable Tray Use" indicating that the cable has been evaluated for use in cable trays in accordance with NEC Articles 310, 318 and other applicable Articles.

**Drain Wire** - An uninsulated conductor utilized in a shielded cable in direct contact with the metallic shield. It provides shield continuity and aids in terminating.

**Elastomer** - A polymeric, rubber-like material that at room temperature returns rapidly to approximately its initial dimensions and shape after being substantially deformed by a weak stress and the weak stress is released.

**EPR (Ethylene Propylene Rubber)** Rubber-like copolymer of ethylene and propylene. It is compounded and vulcanized or crosslinked for specific end uses most commonly as a thermoset insulation material.

**Exane<sup>®</sup>** A family of proprietary crosslinked polyolefin materials.

**Filler** - Any material used in multiconductor cables to occupy the interstices between insulated conductors or to form a core into a desired shape (usually circular).

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

**FR** - Abbreviation for flame retardant, often used as a prefix to further describe materials (i.e. FR-XLPE).

**Gardex<sup>®</sup> CC** - Rockbestos trade name for continuously welded and corrugated aluminum armor.

**Ground Wire** - The conductor leading from a current consuming device to a ground connection.

**Halogen** - Any of the elements Fluorine, Chlorine, Bromine or Iodine that form group VII A of the periodic table. In cable insulation and jackets, Chlorine, Bromine or Fluorine are typically uti-

lized as flame retardants. They have the undesirable effect of generating corrosive acid gas in the event of fire.

**ICEA** - Insulated Cable Engineers Association (Formerly IPCEA).

**IEEE** - Institute of Electrical and Electronics Engineers (Formerly AIEE).

**Insulation** - Material having a high resistance to the flow of electric current to prevent leakage of current from a conductor.

**Irradiation** - The exposure of a material to high energy emissions. In insulations and jackets for the purpose of favorably altering the molecular structure (i.e., to crosslink).

**Jacket** - An extruded plastic or elastomeric material covering applied over an insulation or an assembly of components to provide protection or act as a barrier.

**Kcmil** - A unit of conductor area in thousands of circular mils (formerly MCM).

**KV (Kilovolt)** - A term denoting one thousand volts.

**LOCA** - Extended test procedure in IEEE 323 to establish performance of nuclear cables by subjecting them to thermal, chemical and radiation exposure designed to simulate a nuclear design base event (Loss of Coolant Accident).

**MC** - UL type designation for metal-clad cables. These cable designs contain continuously welded (smooth or corrugated) or interlocked armor utilizing aluminum or steel (NEC Article 334 & UL Standard No. 1569).

**Method 1** - ICEA circuit identification method which utilizes base colors with tracers in accordance with color sequence tables K-1 or K-2.

**Method 3** - ICEA circuit identification method which utilizes single color insulation or covering on all conductors with printed conductor numbers and color designations in accordance with color sequence tables K-1 or K-2 (i.e. 1-Black, 2-Red, 3-Blue, etc. for K-2).

# Glossary Of Terms

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**Method 4** - ICEA circuit identification method which utilizes a single color insulation or covering on all conductors with each conductor numbered in sequence by surface printing, beginning with the number 1.

**Mica** - A transparent to semi-transparent mineral silicate which can be separated into very thin leaves. It is useful as an electrical insulating material and performs at temperatures up to 900°C. When combined with glass or polyester tape it forms the basis for a functional, high temperature cable insulation system.

**Mil** - The one thousandth part of an inch (.005" = 5 mils).

**Multiconductor** - More than one insulated conductor within a single cable.

**MV-90** - UL type designation for medium voltage (2001 Volts & higher) cables rated at 90°C conductor temperature (NEC Article 326 & UL Standard No. 1072).

**Neoprene (Polychloroprene)**

Synthetic rubber compound used for cable jacket when thermoset materials are required.

**Nominal** - Name or identifying value of a measurable property by which cable components or performance is identified and to which tolerances may be applied.

**Pair** - A group of two insulated conductors which are twisted together.

**PTFE (Polytetrafluoroethylene)**

A high temperature fluoropolymer used as cable insulation. Because it is not melt processable, it is applied as a paste extrusion and then sintered or used in tape form.

**PVC (Polyvinyl Chloride)** - A thermoplastic material composed of polymers of vinyl chloride which is used as insulation or jackets.

**RHH** - UL type designation for one conductor cables covered with heat resistant or crosslinked synthetic polymer (NEC Article 310 and UL Standard No. 44).

**RHW** - UL type designation for one conductor cables covered with moisture and heat resistant or crosslinked synthetic polymer (NEC Article 310 & UL Standard No. 44).

**Rockhide®** - Rockbestos trade name for a proprietary blend of aramid and other high temperature synthetic fibers typically used as braid and filler material.

**Rocktherm®** - Rockbestos trade name for a proprietary blend of high performance silicone rubber insulation.

**Semiconducting** - A material of such resistance that when applied between two elements of a cable (typically the conductor and insulation) the adjacent surfaces of the two elements will maintain substantially the same potential.

**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 tape, braid, foil or wire serve.

**Silicone Rubber** - Rubber made from silicone polymers and characterized by its retention of flexibility, resilience and tensile strength over a wide temperature range and by the formation of non-conducting ash during combustion.

**Solid Wire** - A conductor consisting of a single member or strand as distinguished from a stranded conductor.

**Stranded Conductor** - A conductor composed of a group of wires or combination of groups of wires.

**TC** - UL type designation for low voltage power and control tray cable (NEC & UL Standard No. 1277).

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

**Thermoplastic** - A classification of material that can be readily softened and reformed by heating and be rehardened by cooling.

**Thermoset** - A classification of material which cures (crosslinks) by chemical reaction and then is resistant to the heat related softening effect exhibited by thermoplastic materials.

**Triad** - A group of three insulated conductors which are twisted together.

**UL** - Underwriters Laboratories, Inc.

**USE** - UL type designation for underground service entrance cable (NEC & UL Standard No. 854).

**Volt** - The practical unit of electromotive force. One volt is required to send one ampere of current through a circuit whose resistance is one ohm.

**Voltage Rating** - The maximum voltage at which a given cable or insulated conductor may be safely maintained during continuous use in a normal manner.

**Vulcanization** - An irreversible process during which a rubber or polymeric compound through a change in its chemical structure (i.e. crosslinking), becomes thermoset (usually improving chemical resistance and conferring, improving or extending elastic properties over a greater range of temperature).

**XHHW** - UL type designation for one conductor cables covered with moisture and heat resistant crosslinked synthetic polymer (NEC Article 310 & UL Standard No. 44).

**XLPE (Crosslinked Polyethylene)**

A tough thermoset insulation material made by crosslinking polyethylene polymers by either heat or irradiation processing. (It is classified under the more generic category of crosslinked polyolefins - see below).

**XLPO (Crosslinked Polyolefin)**

A thermoset material used for insulation or jackets. A polyolefin is a class of hydrocarbon polymers characterized by at least one double bond in the carbon chain. The polyolefins include mainly the polymers and copolymers of ethylene (polyethylene) and propylene (polypropylene). They are made thermosetting (or crosslinked) by chemical means (heating with organic peroxides) or by irradiation (high energy electron beam).

# Copper Conductor

| ASTM Class B      |  |              |                 |                  |      |                |       |
|-------------------|--|--------------|-----------------|------------------|------|----------------|-------|
| Size<br>AWG/kcmil | Stranding<br>#/Strand Diameter<br>(Inch) | NOMINAL AREA |                 | NOMINAL DIAMETER |      | NOMINAL WEIGHT |       |
|                   |  | kcmil        | mm <sup>2</sup> | Inches           | mm   | lbs/kft        | kg/km |
| 22                | 7/.0100                                  | 0.64         | 0.32            | 0.030            | 0.76 | 2.2            | 3.3   |
| 20                | 7/.0121                                  | 1.02         | 0.52            | 0.036            | 0.91 | 3.2            | 4.8   |
| 18                | 7/.0152                                  | 1.62         | 0.82            | 0.045            | 1.14 | 5.0            | 7.4   |
| 16                | 7/.0192                                  | 2.58         | 1.31            | 0.056            | 1.42 | 8.0            | 12    |
| 14                | 7/.0242                                  | 4.11         | 2.08            | 0.071            | 1.80 | 12.7           | 18.9  |
| 12                | 7/.0305                                  | 6.53         | 3.31            | 0.090            | 2.29 | 20.2           | 30.1  |
| 10                | 7/.0385                                  | 10.38        | 5.26            | 0.113            | 2.87 | 32.1           | 47.8  |
| 9                 | 7/.0432                                  | 13.09        | 6.63            | 0.127            | 3.23 | 40.4           | 60.1  |
| 8                 | 7/.0486                                  | 16.51        | 8.37            | 0.143            | 3.63 | 51.0           | 74.4  |
| 7                 | 7/.0545                                  | 20.82        | 10.5            | 0.160            | 4.06 | 64.3           | 95.7  |
| 6                 | 7/.0612                                  | 26.24        | 13.3            | 0.180            | 4.57 | 81.1           | 121   |
| 5                 | 7/.0688                                  | 33.09        | 16.8            | 0.202            | 5.13 | 102            | 152   |
| 4                 | 7/.0772                                  | 41.74        | 21.2            | 0.227            | 5.77 | 129            | 192   |
| 3                 | 7/.0867                                  | 52.62        | 26.7            | 0.255            | 6.48 | 163            | 243   |
| 2                 | 7/.0974                                  | 66.36        | 33.6            | 0.286            | 7.26 | 205            | 305   |
| 1                 | 19/.0664                                 | 83.69        | 42.4            | 0.324            | 8.23 | 258            | 384   |
| 1/0               | 19/.0745                                 | 105.6        | 53.5            | 0.363            | 9.22 | 326            | 485   |
| 2/0               | 19/.0837                                 | 133.1        | 67.4            | 0.408            | 10.4 | 411            | 612   |
| 3/0               | 19/.0940                                 | 167.8        | 85.0            | 0.458            | 11.6 | 518            | 771   |
| 4/0               | 19/.1055                                 | 211.6        | 107             | 0.514            | 13.1 | 653            | 972   |
| 250               | 37/.0822                                 | 250          | 127             | 0.561            | 14.2 | 772            | 1150  |
| 262.6             | -  | -            | -               | -                | -    | -              | -     |
| 300               | 37/.0900                                 | 300          | 152             | 0.614            | 15.6 | 926            | 1380  |
| 313.1             | -  | -            | -               | -                | -    | -              | -     |
| 350               | 37/.0973                                 | 350          | 177             | 0.664            | 16.9 | 1080           | 1607  |
| 373.7             | -  | -            | -               | -                | -    | -              | -     |
| 400               | 37/.1040                                 | 400          | 203             | 0.710            | 18.0 | 1235           | 1838  |
| 444.4             | -  | -            | -               | -                | -    | -              | -     |
| 500               | 37/.1162                                 | 500          | 253             | 0.793            | 20.1 | 1544           | 2297  |
| 535.3             | -  | -            | -               | -                | -    | -              | -     |
| 592               | -  | -            | -               | -                | -    | -              | -     |
| 600               | 61/.0992                                 | 600          | 304             | 0.871            | 22.1 | 1853           | 2757  |
| 646.4             | -  | -            | -               | -                | -    | -              | -     |
| 750               | 61/.1109                                 | 750          | 380             | 0.973            | 24.7 | 2316           | 3446  |
| 777.7             | -  | -            | -               | -                | -    | -              | -     |
| 1000              | 61/.1280                                 | 1000         | 507             | 1.123            | 28.5 | 3088           | 4595  |
| 1111              | -  | -            | -               | -                | -    | -              | -     |

# Copper Conductor

| ASTM Class C      |  |              |                 |                  |      |                |       |
|-------------------|--|--------------|-----------------|------------------|------|----------------|-------|
| Size<br>AWG/kcmil | Stranding<br>#/Strand Diameter<br>(Inch) | NOMINAL AREA |                 | NOMINAL DIAMETER |      | NOMINAL WEIGHT |       |
|                   |  | kcmil        | mm <sup>2</sup> | Inches           | mm   | lbs/kft        | kg/km |
| 22                | 19/.0063                                 | 0.64         | 0.32            | 0.031            | 0.79 | 2.3            | 3.4   |
| 20                | 19/.0080                                 | 1.02         | 0.52            | 0.038            | 0.97 | 3.8            | 5.7   |
| 18                | 19/.0092                                 | 1.62         | 0.82            | 0.044            | 1.12 | 5.0            | 7.4   |
| 16                | 19/.0117                                 | 2.58         | 1.31            | 0.056            | 1.42 | 8.0            | 12    |
| 14                | 19/.0147                                 | 4.11         | 2.08            | 0.071            | 1.80 | 12.7           | 18.9  |
| 12                | 19/.0185                                 | 6.53         | 3.31            | 0.089            | 2.26 | 20.2           | 30.1  |
| 10                | 19/.0234                                 | 10.38        | 5.26            | 0.112            | 2.85 | 32.1           | 47.8  |
| 9                 | 19/.0262                                 | 13.09        | 6.63            | 0.123            | 3.12 | 40.4           | 60.1  |
| 8                 | 19/.0295                                 | 16.51        | 8.37            | 0.139            | 3.53 | 51.0           | 74.4  |
| 7                 | 19/.0331                                 | 20.82        | 10.5            | 0.156            | 3.96 | 64.3           | 95.7  |
| 6                 | 19/.0372                                 | 26.24        | 13.3            | 0.175            | 4.45 | 81.0           | 121   |
| 5                 | 19/.0417                                 | 33.09        | 16.8            | 0.203            | 5.16 | 102            | 152   |
| 4                 | 19/.0469                                 | 41.74        | 21.2            | 0.229            | 5.82 | 129            | 192   |
| 3                 | 19/.0526                                 | 52.62        | 26.7            | 0.256            | 6.50 | 163            | 243   |
| 2                 | 19/.0591                                 | 66.36        | 33.6            | 0.288            | 7.32 | 205            | 305   |
| 1                 | 37/.0476                                 | 83.69        | 42.4            | 0.325            | 8.26 | 258            | 384   |
| 1/0               | 37/.0534                                 | 105.6        | 53.5            | 0.364            | 9.25 | 326            | 485   |
| 2/0               | 37/.0600                                 | 133.1        | 67.4            | 0.410            | 10.4 | 411            | 612   |
| 3/0               | 37/.0673                                 | 167.8        | 85.0            | 0.459            | 11.7 | 518            | 771   |
| 4/0               | 37/.0756                                 | 211.6        | 107             | 0.516            | 13.1 | 653            | 972   |
| 250               | 61/.0640                                 | 250          | 127             | 0.562            | 14.3 | 774            | 1150  |
| 262.6             | -  | -            | -               | -                | -    | -              | -     |
| 300               | 61/.0701                                 | 300          | 152             | 0.615            | 15.6 | 927            | 1380  |
| 313.1             | -  | -            | -               | -                | -    | -              | -     |
| 350               | 61/.0757                                 | 350          | 177             | 0.664            | 16.9 | 1082           | 1610  |
| 373.7             | -  | -            | -               | -                | -    | -              | -     |
| 400               | 61/.0810                                 | 400          | 203             | 0.711            | 18.1 | 1235           | 1838  |
| 444.4             | -  | -            | -               | -                | -    | -              | -     |
| 500               | 61/.0905                                 | 500          | 253             | 0.794            | 20.2 | 1545           | 2299  |
| 535.3             | -  | -            | -               | -                | -    | -              | -     |
| 592               | -  | -            | -               | -                | -    | -              | -     |
| 600               | 91/.0812                                 | 600          | 304             | 0.893            | 22.7 | 1853           | 2757  |
| 646.4             | -  | -            | -               | -                | -    | -              | -     |
| 750               | 91/.0908                                 | 750          | 380             | 0.999            | 25.4 | 2316           | 3446  |
| 777.7             | -  | -            | -               | -                | -    | -              | -     |
| 1000              | 91/.1048                                 | 1000         | 507             | 1.153            | 29.3 | 3088           | 4595  |
| 1111              | -  | -            | -               | -                | -    | -              | -     |

# Copper Conductor

| ASTM Class H      |  |              |                 |                  |      |                |       |
|-------------------|--|--------------|-----------------|------------------|------|----------------|-------|
| Size<br>AWG/kcmil | Stranding<br>#/Strand Diameter<br>(Inch) | NOMINAL AREA |                 | NOMINAL DIAMETER |      | NOMINAL WEIGHT |       |
|                   |  | kcmil        | mm <sup>2</sup> | Inches           | mm   | lbs/kft        | kg/km |
| 22                | -  | -            | -               | -                | -    | -              | -     |
| 20                | -  | -            | -               | -                | -    | -              | -     |
| 18                | -  | -            | -               | -                | -    | -              | -     |
| 16                | -  | -            | -               | -                | -    | -              | -     |
| 14                | -  | -            | -               | -                | -    | -              | -     |
| 12                | -  | -            | -               | -                | -    | -              | -     |
| 10                | -  | -            | -               | -                | -    | -              | -     |
| 9                 | -  | -            | -               | -                | -    | -              | -     |
| 8                 | 133/.0111                                | 16.51        | 8.37            | 0.164            | 4.17 | 52             | 77    |
| 7                 | 133/.0126                                | 20.82        | 10.5            | 0.190            | 4.83 | 67             | 100   |
| 6                 | 133/.0140                                | 26.24        | 13.3            | 0.204            | 5.18 | 82             | 122   |
| 5                 | 133/.0158                                | 33.09        | 16.8            | 0.231            | 5.87 | 105            | 156   |
| 4                 | 133/.0177                                | 41.74        | 21.2            | 0.260            | 6.60 | 132            | 196   |
| 3                 | 133/.0199                                | 52.62        | 26.7            | 0.292            | 7.42 | 167            | 248   |
| 2                 | 133/.0223                                | 66.36        | 33.6            | 0.327            | 8.31 | 208            | 310   |
| 1                 | 259/.0180                                | 83.69        | 42.4            | 0.363            | 9.22 | 266            | 396   |
| 1/0               | 259/.0202                                | 105.6        | 53.5            | 0.407            | 10.3 | 334            | 497   |
| 2/0               | 259/.0227                                | 133.1        | 67.4            | 0.458            | 11.6 | 422            | 628   |
| 3/0               | 259/.0255                                | 167.8        | 85.0            | 0.515            | 13.1 | 533            | 793   |
| 4/0               | 259/.0286                                | 211.6        | 107             | 0.579            | 14.7 | 670            | 997   |
| 250               | 427/.0242                                | 250          | 127             | 0.627            | 15.9 | 795            | 1183  |
| 262.6             | -  | -            | -               | -                | -    | -              | -     |
| 300               | 427/.0265                                | 300          | 152             | 0.702            | 17.8 | 953            | 1418  |
| 313.1             | -  | -            | -               | -                | -    | -              | -     |
| 350               | 427/.0286                                | 350          | 177             | 0.740            | 18.8 | 1110           | 1652  |
| 373.7             | -  | -            | -               | -                | -    | -              | -     |
| 400               | 427/.0306                                | 400          | 203             | 0.809            | 20.5 | 1270           | 1890  |
| 444.4             | -  | -            | -               | -                | -    | -              | -     |
| 500               | 427/.0342                                | 500          | 253             | 0.900            | 22.9 | 1590           | 2366  |
| 535.3             | -  | -            | -               | -                | -    | -              | -     |
| 592               | -  | -            | -               | -                | -    | -              | -     |
| 600               | 703/.0292                                | 600          | 304             | 1.022            | 26.0 | 1920           | 2857  |
| 646.4             | -  | -            | -               | -                | -    | -              | -     |
| 750               | 703/.0327                                | 750          | 380             | 1.122            | 28.5 | 2410           | 3586  |
| 777.7             | -  | -            | -               | -                | -    | -              | -     |
| 1000              | 703/.0377                                | 1000         | 507             | 1.294            | 32.9 | 3205           | 4769  |
| 1111              | -  | -            | -               | -                | -    | -              | -     |

# Copper Conductor

| Class I Type      |                    |              |                 |                  |      |                |       |
|-------------------|--------------------|--------------|-----------------|------------------|------|----------------|-------|
| Size<br>AWG/kcmil | Stranding<br>#/AWG | NOMINAL AREA |                 | NOMINAL DIAMETER |      | NOMINAL WEIGHT |       |
|                   |                    | kcmil        | mm <sup>2</sup> | Inches           | mm   | lbs/kft        | kg/km |
| 22                | –                  | –            | –               | –                | –    | –              | –     |
| 20                | –                  | –            | –               | –                | –    | –              | –     |
| 18                | –                  | –            | –               | –                | –    | –              | –     |
| 16                | –                  | –            | –               | –                | –    | –              | –     |
| 14                | –                  | –            | –               | –                | –    | –              | –     |
| 12                | –                  | –            | –               | –                | –    | –              | –     |
| 10                | 27/24              | 10.91        | 5.53            | 0.123            | 3.12 | 33.7           | 50    |
| 9                 | –                  | –            | –               | –                | –    | –              | –     |
| 8                 | 37/24              | 14.95        | 7.57            | 0.138            | 3.50 | 46.0           | 68    |
| 7                 | –                  | –            | –               | –                | –    | –              | –     |
| 6                 | 61/24              | 24.64        | 12.5            | 0.190            | 4.83 | 77             | 114   |
| 5                 | 91/24              | 36.76        | 19              | 0.240            | 6.10 | 113            | 168   |
| 4                 | 105/24             | 42.42        | 21              | 0.260            | 6.60 | 132            | 196   |
| 3                 | 125/24             | 50.5         | 25              | 0.285            | 7.24 | 155            | 231   |
| 2                 | 150/24             | 60.6         | 31              | 0.320            | 8.13 | 189            | 281   |
| 1                 | 225/24             | 90.9         | 46              | 0.385            | 9.78 | 280            | 417   |
| 1/0               | 275/24             | 111.1        | 56              | 0.435            | 11.0 | 346            | 515   |
| 2/0               | 325/24             | 131.3        | 66              | 0.470            | 11.9 | 403            | 600   |
| 3/0               | 450/24             | 181.8        | 92              | 0.545            | 13.8 | 567            | 844   |
| 4/0               | 550/24             | 222.2        | 112             | 0.580            | 14.7 | 684            | 1018  |
| 250               | –                  | –            | –               | –                | –    | –              | –     |
| 262.6             | 650/24             | 262.6        | 133             | 0.652            | 16   | 820            | 1220  |
| 300               | –                  | –            | –               | –                | –    | –              | –     |
| 313.1             | 775/24             | 313.1        | 159             | 0.700            | 18   | 960            | 1428  |
| 350               | –                  | –            | –               | –                | –    | –              | –     |
| 373.7             | 925/24             | 373.7        | 189             | 0.760            | 19   | 1105           | 1644  |
| 400               | –                  | –            | –               | –                | –    | –              | –     |
| 444.4             | 1100/24            | 444.4        | 225             | 0.850            | 21   | 1370           | 2038  |
| 500               | –                  | –            | –               | –                | –    | –              | –     |
| 535.3             | 1325/24            | 535.3        | 271             | 0.940            | 24   | 1700           | 2530  |
| 592               | 1480/24            | 597.9        | 303             | 0.970            | 25   | 1835           | 2730  |
| 600               | –                  | –            | –               | –                | –    | –              | –     |
| 646.4             | 1600/24            | 646.4        | 327             | 1.040            | 26   | 1992           | 2964  |
| 750               | –                  | –            | –               | –                | –    | –              | –     |
| 777.7             | 1925/24            | 777.7        | 394             | 1.120            | 28   | 2390           | 3556  |
| 1000              | –                  | –            | –               | –                | –    | –              | –     |
| 1111              | 2750/24            | 1111         | 563             | 1.340            | 34   | 3400           | 5059  |

# Copper Conductor

| ASTM Class K      |  |              |                 |                  |      |                |       |
|-------------------|--|--------------|-----------------|------------------|------|----------------|-------|
| Size<br>AWG/kcmil | Stranding<br>#/Strand Diameter<br>(Inch) | NOMINAL AREA |                 | NOMINAL DIAMETER |      | NOMINAL WEIGHT |       |
|                   |  | kcmil        | mm <sup>2</sup> | Inches           | mm   | lbs/kft        | kg/km |
| 22                | –  | –            | –               | –                | –    | –              | –     |
| 20                | 10/.010                                  | 1.02         | 0.52            | 0.036            | 0.91 | 3.2            | 4.8   |
| 18                | 16/.010                                  | 1.62         | 0.82            | 0.046            | 1.2  | 5.0            | 7.4   |
| 16                | 26/.010                                  | 2.58         | 1.31            | 0.057            | 1.4  | 7.8            | 12    |
| 14                | 41/.010                                  | 4.11         | 2.08            | 0.071            | 1.8  | 12.8           | 19.0  |
| 12                | 65/.010                                  | 6.53         | 3.31            | 0.088            | 2.2  | 20.3           | 30.2  |
| 10                | 105/.010                                 | 10.38        | 5.26            | 0.112            | 2.8  | 33.3           | 49.6  |
| 9                 | 133/.010                                 | 13.09        | 6.63            | 0.150            | 3.8  | 42.4           | 63.1  |
| 8                 | 168/.010                                 | 16.51        | 8.37            | 0.158            | 4.0  | 54.3           | 80.8  |
| 7                 | 210/.010                                 | 20.82        | 10.5            | 0.175            | 4.4  | 66.8           | 99.4  |
| 6                 | 266/.010                                 | 26.24        | 13.3            | 0.198            | 5.0  | 84.2           | 125   |
| 5                 | 336/.010                                 | 33.09        | 16.8            | 0.261            | 6.6  | 106            | 158   |
| 4                 | 420/.010                                 | 41.74        | 21.2            | 0.249            | 6.3  | 132            | 196   |
| 3                 | 532/.010                                 | 52.62        | 26.7            | 0.298            | 7.6  | 169            | 251   |
| 2                 | 665/.010                                 | 66.36        | 33.6            | 0.317            | 8.1  | 211            | 314   |
| 1                 | 836/.010                                 | 83.69        | 42.4            | 0.356            | 9.0  | 266            | 396   |
| 1/0               | 1064/.010                                | 105.6        | 53.5            | 0.401            | 10   | 338            | 503   |
| 2/0               | 1323/.010                                | 133.1        | 67.4            | 0.501            | 13   | 425            | 632   |
| 3/0               | 1666/.010                                | 167.8        | 85.0            | 0.562            | 14   | 535            | 796   |
| 4/0               | 2107/.010                                | 211.6        | 107             | 0.632            | 16   | 676            | 1006  |
| 250               | 2499/.010                                | 250          | 127             | 0.688            | 17   | 802            | 1193  |
| 262.6             | 2220/.010                                | 222          | 112             | 0.680            | 17   | 850            | 1265  |
| 300               | 2989/.010                                | 300          | 152             | 0.753            | 19   | 960            | 1428  |
| 313.1             | 3136/.010                                | 313.6        | 159             | 0.750            | 19   | 969            | 1442  |
| 350               | 3458/.010                                | 350          | 177             | 0.818            | 21   | 1120           | 1667  |
| 373.7             | 3737/.010                                | 373.7        | 189             | 0.790            | 20   | 1210           | 1800  |
| 400               | 3990/.010                                | 400          | 203             | 0.878            | 22   | 1290           | 1920  |
| 444.4             | –  | –            | –               | –                | –    | –              | –     |
| 500               | 5054/.010                                | 500          | 253             | 0.990            | 25   | 1635           | 2433  |
| 535.3             | 5320/.010                                | 532          | 270             | 0.950            | 24   | 1641           | 2442  |
| 592               | –  | –            | –               | –                | –    | –              | –     |
| 600               | 5985/.010                                | 600          | 304             | 1.125            | 29   | 1950           | 2902  |
| 646.4             | 6466/.010                                | 646.6        | 328             | 1.040            | 26   | 1987           | 2957  |
| 750               | 7448/.010                                | 750          | 380             | 1.276            | 32   | 2427           | 3611  |
| 777.7             | –  | –            | –               | –                | –    | –              | –     |
| 1000              | 9975/.010                                | 1000         | 507             | 1.498            | 38   | 3250           | 4769  |
| 1111              | –  | –            | –               | –                | –    | –              | –     |

# Metric Conversion Data & Temperature Conversion Chart

| METRIC CONVERSION FACTORS |                |             |                        |               |                         |
|---------------------------|----------------|-------------|------------------------|---------------|-------------------------|
| TO CHANGE                 |                | MULTIPLY BY | TO CHANGE              |               | MULTIPLY BY             |
| meters                    | to inches      | 39.37       | inches                 | to meters     | 0.0254                  |
| meters                    | to feet        | 3.28        | feet                   | to meters     | 0.3048                  |
| meters                    | to centimeters | 100.00      | centimeters            | to meters     | 0.01                    |
| meters                    | to millimeters | 1000.00     | millimeters            | to meters     | 0.001                   |
| kilometers                | to meters      | 1000.00     | meters                 | to kilometers | 0.001                   |
| inches                    | to millimeters | 25.40       | millimeters            | to inches     | 0.03937                 |
| feet                      | to millimeters | 304.80      | millimeters            | to feet       | 0.00328                 |
| yards                     | to millimeters | 914.40      | millimeters            | to yards      | 0.00109                 |
| miles                     | to kilometers  | 1.61        | kilometers             | to miles      | 0.6214                  |
| pounds                    | to grams       | 453.6       | grams                  | to pounds     | 2.205 x 10 <sup>3</sup> |
| mm <sup>2</sup>           | CMA            | 1973.5      | pounds/kft             | to kg/km      | 1.488                   |
|                           |                |             | pounds force-force     | to newtons    | 4.448                   |
|                           |                |             | pounds/in <sup>2</sup> | to pascals    | 6895                    |

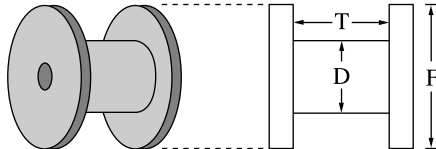
| TEMPERATURE CONVERSION FACTORS      |       |    |                                    |      |       |
|-------------------------------------|-------|----|------------------------------------|------|-------|
| Degrees Centigrade = 5/9 (° F – 32) |       |    | Degrees Fahrenheit = 9/5 (°C) + 32 |      |       |
| °C                                  | °F    | °C | °F                                 | °C   | °F    |
| -80                                 | -112. | 26 | 78.8                               | 81   | 177.8 |
| -70                                 | -94.  | 27 | 80.6                               | 82   | 179.6 |
| -60                                 | -76.  | 28 | 82.4                               | 83   | 181.4 |
| -50                                 | -58.  | 29 | 84.2                               | 84   | 183.2 |
| -45                                 | -49.  | 30 | 86.0                               | 85   | 185.0 |
| -40                                 | -40.0 | 31 | 87.8                               | 86   | 186.8 |
| -35                                 | -31.0 | 32 | 89.6                               | 87   | 188.6 |
| -30                                 | -22.0 | 33 | 91.4                               | 88   | 190.4 |
| -25                                 | -13.0 | 34 | 93.2                               | 89   | 192.2 |
| -20                                 | -4.0  | 35 | 95.0                               | 90   | 194.0 |
| -19                                 | -2.2  | 36 | 96.8                               | 91   | 195.8 |
| -18                                 | -.4   | 37 | 98.6                               | 92   | 197.6 |
| -17                                 | 1.4   | 38 | 100.4                              | 93   | 199.4 |
| -16                                 | 3.2   | 39 | 102.2                              | 94   | 201.2 |
| -15                                 | 5.0   | 40 | 104.0                              | 95   | 203.0 |
| -14                                 | 6.8   | 41 | 105.8                              | 96   | 204.8 |
| -13                                 | 8.6   | 42 | 107.6                              | 97   | 206.6 |
| -12                                 | 10.4  | 43 | 109.4                              | 98   | 208.4 |
| -11                                 | 12.2  | 44 | 111.2                              | 99   | 210.2 |
| -10                                 | 14.0  | 45 | 113.0                              | 100  | 212.0 |
| -9                                  | 15.8  | 46 | 114.8                              | 105  | 221.  |
| -8                                  | 17.6  | 47 | 116.6                              | 110  | 230.  |
| -7                                  | 19.4  | 48 | 118.4                              | 115  | 239.  |
| -6                                  | 21.2  | 49 | 120.2                              | 120  | 248.  |
| -5                                  | 23.0  | 50 | 122.0                              | 130  | 266.  |
| -4                                  | 24.8  | 51 | 123.8                              | 140  | 284.  |
| -3                                  | 26.6  | 52 | 125.6                              | 150  | 302.  |
| -2                                  | 28.4  | 53 | 127.4                              | 160  | 320.  |
| -1                                  | 30.2  | 54 | 129.2                              | 170  | 338.  |
| 0                                   | 32.0  | 55 | 131.0                              | 180  | 356.  |
| 1                                   | 33.8  | 56 | 132.8                              | 190  | 374.  |
| 2                                   | 35.6  | 57 | 134.6                              | 200  | 392.  |
| 3                                   | 37.4  | 58 | 136.4                              | 250  | 482.  |
| 4                                   | 39.2  | 59 | 138.2                              | 300  | 572.  |
| 5                                   | 41.0  | 60 | 140.0                              | 350  | 662.  |
| 6                                   | 42.8  | 61 | 141.8                              | 400  | 752.  |
| 7                                   | 44.6  | 62 | 143.6                              | 500  | 932.  |
| 8                                   | 46.4  | 63 | 145.4                              | 600  | 1112. |
| 9                                   | 48.2  | 64 | 147.2                              | 700  | 1292. |
| 10                                  | 50.0  | 65 | 149.0                              | 800  | 1472. |
| 11                                  | 51.8  | 66 | 150.8                              | 900  | 1652. |
| 12                                  | 53.6  | 67 | 152.6                              | 1000 | 1832. |
| 13                                  | 55.4  | 68 | 154.4                              | 1100 | 2012. |
| 14                                  | 57.2  | 69 | 156.2                              | 1200 | 2192. |
| 15                                  | 59.0  | 70 | 158.0                              | 1300 | 2372. |
| 16                                  | 60.8  | 71 | 159.8                              | 1400 | 2552. |
| 17                                  | 62.6  | 72 | 161.6                              | 1500 | 2732. |
| 18                                  | 64.4  | 73 | 163.4                              | 1600 | 2912. |
| 19                                  | 66.2  | 74 | 165.2                              | 1700 | 3092. |
| 20                                  | 68.0  | 75 | 167.0                              | 1800 | 3272. |
| 21                                  | 69.8  | 76 | 168.8                              | 1900 | 3452. |
| 22                                  | 71.6  | 77 | 170.6                              | 2000 | 3632. |
| 23                                  | 73.4  | 78 | 172.4                              | 2500 | 4532. |
| 24                                  | 75.2  | 79 | 174.2                              | 3000 | 5432. |
| 25                                  | 77.0  | 80 | 176.0                              | 4000 | 7232. |

# Capacities Of Standard Rockbestos-Surprenant Shipping Reels

|                       |                              |       |       |       |       |       |       |       |       |       |       |
|-----------------------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Flange (Inches)       | 14                           | 14    | 17    | 19    | 21    | 24    | 24    | 27    | 30    | 34    | 40    |
| Traverse (Inches)     | 6                            | 12    | 12    | 12    | 12    | 12    | 18    | 18    | 24    | 24    | 24    |
| Drum (Inches)         | 6                            | 6     | 8     | 8     | 10    | 10    | 12    | 12    | 14    | 14    | 16    |
| Tare Wt: (Lbs)        | 3                            | 4     | 5     | 8     | 10    | 15    | 25    | 35    | 50    | 70    | 95    |
| Max. Net: (Lbs)       | 100                          | 100   | 150   | 225   | 250   | 300   | 400   | 900   | 900   | 1,500 | 3,000 |
| <b>Cable Diameter</b> | <b>Reel Capacity In Feet</b> |       |       |       |       |       |       |       |       |       |       |
| 0.150                 | 1,983                        | 4,018 | 5,470 | 7,756 | 8,997 | -     | -     | -     | -     | -     | -     |
| 0.200                 | 1,124                        | 2,286 | 3,020 | 4,248 | 4,927 | 7,414 | 8,458 | -     | -     | -     | -     |
| 0.250                 | 724                          | 1,480 | 1,981 | 2,769 | 3,211 | 4,725 | 5,521 | 8,030 | -     | -     | -     |
| 0.300                 | 460                          | 944   | 1,292 | 1,787 | 2,073 | 3,267 | 3,568 | 5,561 | 8,904 | -     | -     |
| 0.400                 | 271                          | 562   | 698   | 1,044 | 1,211 | 1,822 | 2,091 | 3,110 | 5,066 | 7,298 | -     |
| 0.500                 | 160                          | 334   | 485   | 677   | 786   | 1,156 | 1,361 | 1,979 | 3,279 | 4,706 | 6,847 |
| 0.600                 | -                            | -     | 286   | 435   | 505   | 796   | 877   | 1,367 | 2,093 | 3,216 | 4,600 |
| 0.700                 | -                            | -     | 243   | 317   | 368   | 541   | 641   | 932   | 1,608 | 2,353 | 3,464 |
| 0.800                 | -                            | -     | -     | -     | 266   | 411   | 464   | 709   | 1,245 | 1,708 | 2,616 |
| 0.900                 | -                            | -     | -     | -     | 234   | 310   | 410   | 537   | 964   | 1,361 | 1,959 |
| 1.000                 | -                            | -     | -     | -     | 167   | 276   | 294   | 481   | 741   | 1,084 | 1,596 |
| 1.100                 | -                            | -     | -     | -     | -     | -     | 265   | 362   | 559   | 858   | 1,300 |
| 1.200                 | -                            | -     | -     | -     | -     | -     | -     | -     | 510   | 783   | 1,055 |
| 1.300                 | -                            | -     | -     | -     | -     | -     | -     | -     | 469   | 617   | 969   |
| 1.400                 | -                            | -     | -     | -     | -     | -     | -     | -     | -     | -     | 784   |
| 1.500                 | -                            | -     | -     | -     | -     | -     | -     | -     | -     | -     | 728   |

|                       |                              |       |       |       |       |       |       |       |        |        |        |
|-----------------------|------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Flange (Inches)       | 40                           | 40    | 48    | 50    | 60    | 66    | 72    | 78    | 84     | 84     | 84     |
| Traverse (Inches)     | 24                           | 24    | 24    | 32    | 32    | 32    | 36    | 36    | 36     | 48     | 54     |
| Drum (Inches)         | 16                           | 24    | 24    | 24    | 32    | 32    | 40    | 40    | 48     | 48     | 48     |
| Tare Wt: (Lbs)        | 95                           | 90    | 133   | 193   | 280   | 380   | 490   | 545   | 670    | 685    | 852    |
| Max. Net: (Lbs)       | 3,000                        | 3,000 | 3,000 | 6,000 | 6,000 | 9,000 | 9,000 | 9,000 | 10,000 | 10,000 | 12,000 |
| <b>Cable Diameter</b> | <b>Reel Capacity In Feet</b> |       |       |       |       |       |       |       |        |        |        |
| 0.700                 | 3,464                        | 2,392 | 4,510 | 6,649 | 8,856 | -     | -     | -     | -      | -      | -      |
| 0.800                 | 2,616                        | 1,852 | 3,405 | 5,074 | 6,815 | 9,215 | -     | -     | -      | -      | -      |
| 0.900                 | 1,959                        | 1,435 | 2,550 | 3,854 | 5,233 | 7,305 | 8,903 | -     | -      | -      | -      |
| 1.000                 | 1,596                        | 1,102 | 2,077 | 3,169 | 4,334 | 5,782 | 6,991 | 8,957 | 9,456  | -      | -      |
| 1.100                 | 1,300                        | 831   | 1,692 | 2,611 | 3,600 | 4,891 | 5,885 | 7,164 | 8,036  | -      | -      |
| 1.200                 | 1,055                        | 759   | 1,373 | 2,147 | 2,990 | 3,830 | 4,965 | 6,112 | 6,366  | 8,561  | 9,659  |
| 1.300                 | 969                          | 697   | 1,262 | 1,756 | 2,476 | 3,230 | 4,189 | 5,224 | 5,409  | 7,279  | 8,214  |
| 1.400                 | 784                          | 516   | 1,021 | 1,625 | 2,037 | 2,990 | 3,526 | 4,464 | 4,591  | 6,183  | 6,979  |
| 1.500                 | 728                          | 479   | 948   | 1,323 | 1,895 | 2,529 | 2,953 | 3,809 | 4,272  | 5,758  | 6,501  |
| 1.600                 | -                            | 447   | 759   | 1,236 | 1,549 | 2,126 | 2,761 | 3,236 | 3,631  | 4,897  | 5,530  |
| 1.700                 | -                            | 314   | 711   | 994   | 1,454 | 1,995 | 2,303 | 3,037 | 3,066  | 4,139  | 4,675  |
| 1.800                 | -                            | 295   | 557   | 936   | 1,173 | 1,669 | 2,169 | 2,574 | 2,888  | 3,901  | 4,407  |
| 1.900                 | -                            | 279   | 525   | 883   | 1,107 | 1,576 | 1,793 | 2,432 | 2,424  | 3,278  | 3,704  |
| 2.000                 | -                            | 264   | 497   | 697   | 1,049 | 1,306 | 1,698 | 2,047 | 2,297  | 3,107  | 3,512  |
| 2.100                 | -                            | 250   | 471   | 662   | 829   | 1,239 | 1,382 | 1,944 | 1,908  | 2,584  | 2,921  |
| 2.200                 | -                            | 158   | 358   | 629   | 789   | 1,179 | 1,315 | 1,619 | 1,816  | 2,461  | 2,783  |
| 2.300                 | -                            | 151   | 341   | 600   | 752   | 963   | 1,254 | 1,544 | 1,732  | 2,349  | 2,657  |
| 2.400                 | -                            | 144   | 325   | 458   | 718   | 920   | 1,199 | 1,475 | 1,418  | 1,925  | 2,178  |
| 2.500                 | -                            | -     | -     | -     | 687   | 880   | 956   | 1,412 | 1,358  | 1,844  | 2,087  |
| 2.600                 | -                            | -     | -     | -     | 527   | 703   | 916   | 1,160 | 1,302  | 1,769  | 2,003  |
| 2.700                 | -                            | -     | -     | -     | 506   | 675   | 880   | 1,114 | 1,250  | 1,700  | 1,925  |
| 2.800                 | -                            | -     | -     | -     | 486   | 648   | 846   | 1,071 | 1,001  | 1,363  | 1,544  |
| 2.900                 | -                            | -     | -     | -     | 468   | 624   | 814   | 1,031 | 964    | 1,313  | 1,488  |
| 3.000                 | -                            | -     | -     | -     | 450   | 601   | 628   | 828   | 929    | 1,266  | 1,435  |
| 3.100                 | -                            | -     | -     | -     | 434   | 580   | 606   | 799   | 896    | 1,223  | 1,386  |
| 3.200                 | -                            | -     | -     | -     | -     | -     | 585   | 771   | 865    | 1,182  | 1,340  |
| 3.300                 | -                            | -     | -     | -     | -     | -     | 566   | 746   | 837    | 1,144  | 1,297  |
| 3.400                 | -                            | -     | -     | -     | -     | -     | 547   | 722   | 648    | 886    | 1,005  |
| 3.500                 | -                            | -     | -     | -     | -     | -     | 530   | 699   | 627    | 859    | 975    |

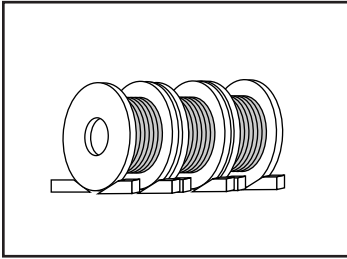
Do not use capacities in shaded areas of tables for armored or copper tape shielded cables.



F = Flange Diameter  
 T = Inside Traverse Width  
 D = Drum Diameter

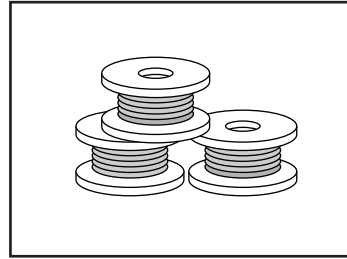
# How To Handle Cable Reels

**YES**

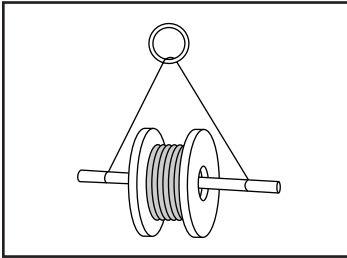


Always load and store reels upright on their flanges and block securely.

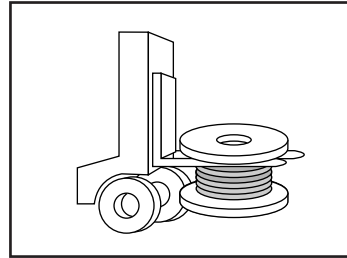
**NO**



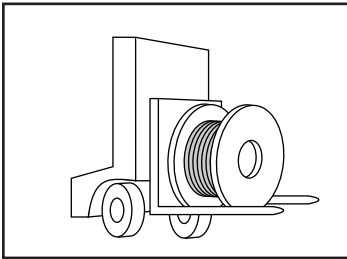
Upended heavy reels will often be damaged.



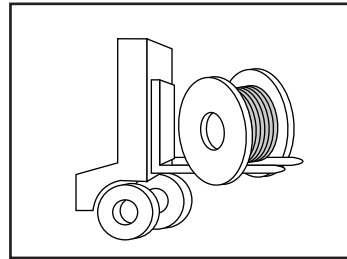
Reels can be hoisted with a properly secured shaft extending through both flanges.



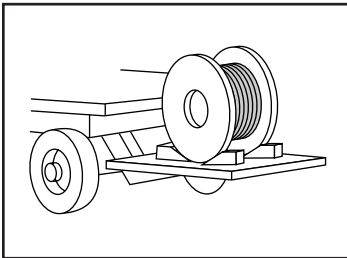
Do not lift by a single reel flange. Cable or reel may be damaged.



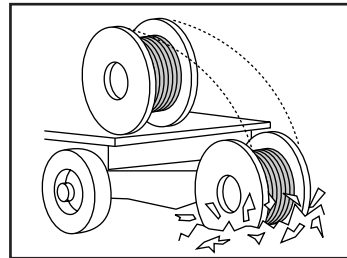
Cradle both reel flanges between fork tines.



Never allow fork tines to touch the cable surface or reel wrap.



Lower reels from a truck using a hydraulic gate, hoist or fork lift. LOWER CAREFULLY.



Never drop reels.

# Common Color Sequences

| Sequence Designation | Conductor Number | Background or Base Color | Tracer Color | Conductor Number | Background or Base Color | Tracer Color |
|----------------------|------------------|--------------------------|--------------|------------------|--------------------------|--------------|
| <b>K-1</b>           | 1                | Black                    | –            | 12               | Black                    | White        |
|                      | 2                | White                    | –            | 13               | Red                      | White        |
|                      | 3                | Red                      | –            | 14               | Green                    | White        |
|                      | 4                | Green                    | –            | 15               | Blue                     | White        |
|                      | 5                | Orange                   | –            | 16               | Black                    | Red          |
|                      | 6                | Blue                     | –            | 17               | White                    | Red          |
|                      | 7                | White                    | Black        | 18               | Orange                   | Red          |
|                      | 8                | Red                      | Black        | 19               | Blue                     | Red          |
|                      | 9                | Green                    | Black        | 20               | Red                      | Green        |
|                      | 10               | Orange                   | Black        | 21               | Orange                   | Green        |
|                      | 11               | Blue                     | Black        |                  |                          |              |

| Sequence Designation | Conductor Number | Background or Base Color | Tracer Color | Conductor Number | Background or Base Color | Tracer Color |
|----------------------|------------------|--------------------------|--------------|------------------|--------------------------|--------------|
| <b>K-2</b>           | 1                | Black                    | –            | 19               | Orange                   | Blue         |
|                      | 2                | Red                      | –            | 20               | Yellow                   | Blue         |
|                      | 3                | Blue                     | –            | 21               | Brown                    | Blue         |
|                      | 4                | Orange                   | –            | 22               | Black                    | Orange       |
|                      | 5                | Yellow                   | –            | 23               | Red                      | Orange       |
|                      | 6                | Brown                    | –            | 24               | Blue                     | Orange       |
|                      | 7                | Red                      | Black        | 25               | Yellow                   | Orange       |
|                      | 8                | Blue                     | Black        | 26               | Brown                    | Orange       |
|                      | 9                | Orange                   | Black        | 27               | Black                    | Yellow       |
|                      | 10               | Yellow                   | Black        | 28               | Red                      | Yellow       |
|                      | 11               | Brown                    | Black        | 29               | Blue                     | Yellow       |
|                      | 12               | Black                    | Red          | 30               | Orange                   | Yellow       |
|                      | 13               | Blue                     | Red          | 31               | Brown                    | Yellow       |
|                      | 14               | Orange                   | Red          | 32               | Black                    | Brown        |
|                      | 15               | Yellow                   | Red          | 33               | Red                      | Brown        |
|                      | 16               | Brown                    | Red          | 34               | Blue                     | Brown        |
|                      | 17               | Black                    | Blue         | 35               | Orange                   | Brown        |
|                      | 18               | Red                      | Blue         | 36               | Yellow                   | Brown        |