

FLEXOGRAPHIC PRINTING

Flexographic printing is the major process used to print packaging materials. In a typical flexographic printing sequence, the substrate is fed through the press from a master roll. The substrate is printed as it is pulled through a series of rollers and ink stations. Pro-Line can print from 1 to 10 colors and up to 60" in width.

ADHESIVE LAMINATION

Adhesive lamination is the process of bonding two substrates by joining them together with a layer of adhesive material. Pro-Line's specially formulated adhesive is designed for prolonged use underground and is cured in a drying oven. After the substrates have been run through the glue and heat, the materials are rewound into roll form for the next manufacturing process.



PRO-LINE
SAFETY PRODUCTS

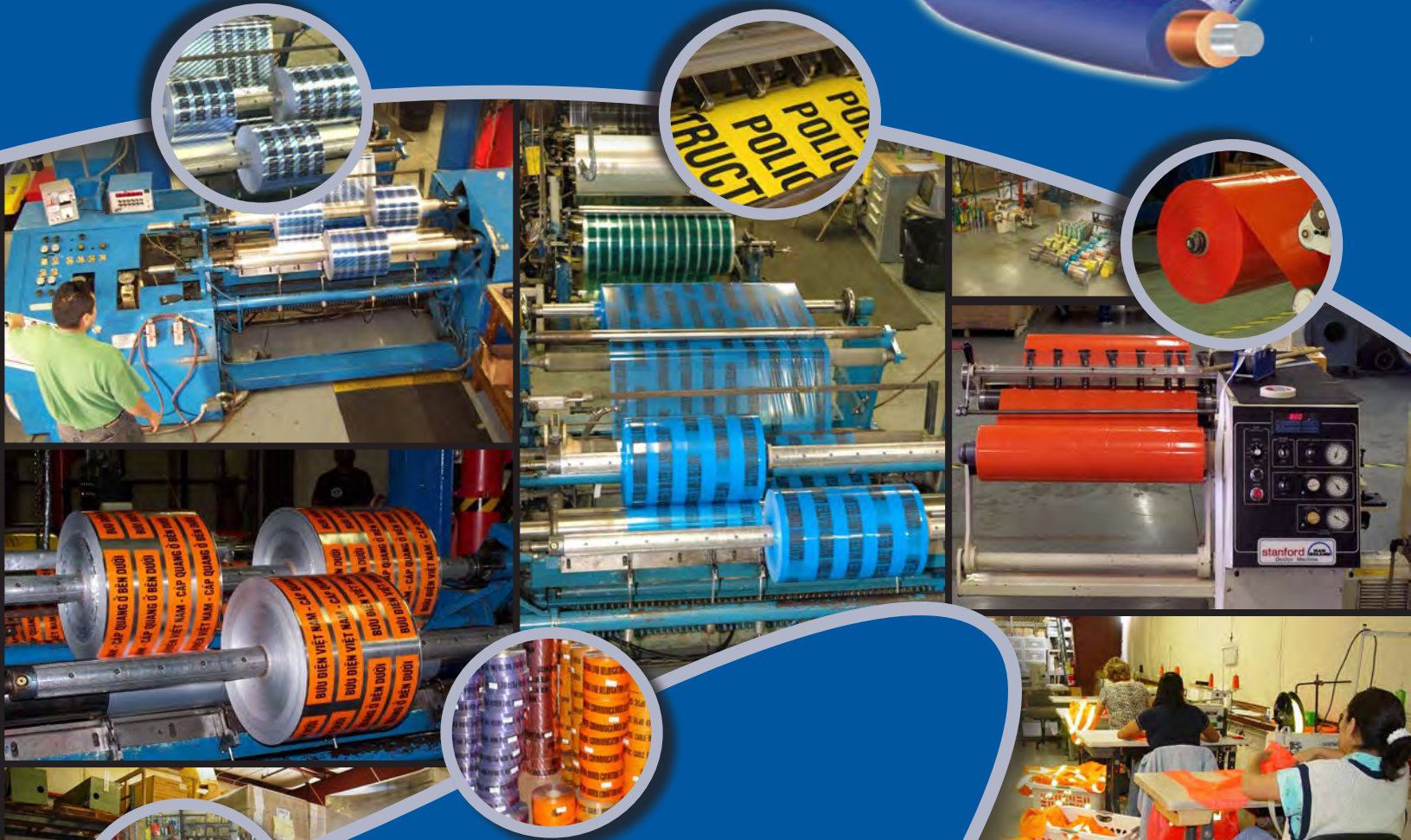
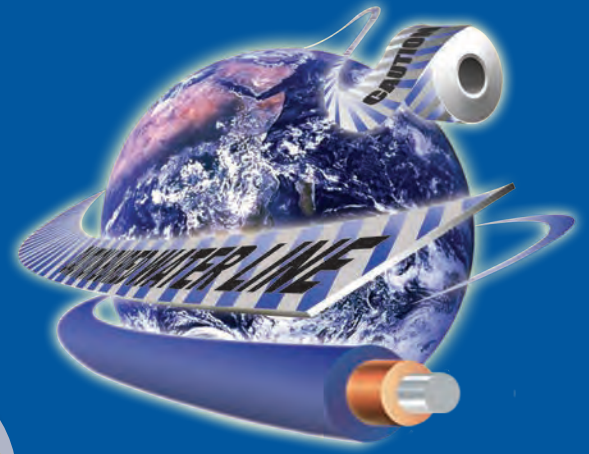
A DIVISION OF PRO-PAK IND. INC.

"A VIEW FROM WITHIN"

Pro-Line Safety Products Company state of the art manufacturing and distribution facility is located in West Chicago, Illinois. We are approximately 30 miles west of downtown Chicago, IL. Pro-Line Safety Product's manufacturing capabilities include wide-web flexo-graphic printing of up to 10 colors, adhesive lamination, wide-web and narrow-web slitting. We also manufacture a complete line of safety vests which includes our cut and sew operation, graphic arts department, screen printing and embroidery departments for all your custom safety vests and apparel needs.

RAZOR SLITTING

Pro-Line Safety's in-house standards and custom slitting capabilities give us tremendous flexibility in our manufacturing and production of marking tapes and packaging products. Pro-Line's state of the art slitting equipment utilizes the razor method, with slitting capabilities of up to 60" in width. Microprocessors control tension and web guidance. Machines are capable of rewinding and slitting up to 1,000 feet per minute. Slitting is the operation of cutting raw stock, master rolls, or processed film into smaller widths within customers specified requirements.



SEWING OPERATIONS

Pro-Line Safety Products is a premier manufacturer of custom sewn goods that carry the "Made in the USA" label. Pro-Line offers cut and sew services for a wide variety of products including safety vests, flags, pennants, premium incentives, and more.

CREATIVE IMPRESSIONS

Creative Impressions prides itself on taking your ideas and turning them into working prototypes. Our services include designing, cutting, sewing, screen printing, embroidery, and custom packaging of your finished products. Creative Impressions is a proud member of ASI and also offers a complete line of advertising and promotional products.



HDD-CCS PE45

(DIRECTIONAL DRILLING)

Tracer Wire • Horizontal Directional Drilling Copper Clad Steel (HDD-CCS) • 21% IACS Conductivity • Corrosion Resistant High-Density, High Molecular Weight Polyethylene (HMWPE-HDPE) Insulation • Moisture, Chemical, and Oil Resistant Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Buy American / AIS Compliant

“PRO-TRACE® HDD-CCS -- DIRECTIONAL BORING DONE RIGHT THE FIRST TIME -- EVERY TIME!”



Applications and Information

- **PRO-TRACE® HDD-CCS PE45** is also referred to as Extra High-Strength (EHS-CCS).
- **PRO-TRACE® HDD-CCS PE45** conductor is equal to copper in signal tracing performance for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **PRO-TRACE® HDD-CCS PE45** has almost **700%** the break load of copper, which allows 1 wire to be installed in critical installations like directional boring and pipe bursting.
- Has 2-4% elongation, providing the perfect balance between tensile strength, ductility, and decreasing brittleness. Higher elongation causes wire deformation in boring.
- Considerably lower in cost and great price stability compared to copper.
- RoHS Compliant and works with connectors you already use.

Standards and References

PRO-TRACE® HDD-CCS PE45 conductors meets or exceeds all applicable ASTM specifications, and requirements of the National Electrical Code. Buy American / AIS Compliant.

- ASTM B869: Specification for 21% Conductivity, Hard Drawn, Copper-Clad Steel Wire
- ASTM B170: Specification for Oxygen-Free Electrolytic Copper
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

Construction

PRO-TRACE® HDD-CCS PE45 is an extra high-strength, copper clad steel tracer wire. A high carbon steel core, metallurgically bonded with a copper cladding, that is uniform and continuous, creating a bi-metal conductor that acts as one and is corrosion resistant. The high break load allows only 1 conductor to be used in any tracer wire application while providing the perfect balance between break load, ductility, and decreasing brittleness. It is the best performing tracer wire on the market.

PRO-TRACE® HDD-CCS PE45 is protected with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE insulation provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.

Specification Example

Tracer wire for directional boring installation shall be a 12 AWG solid, PRO-TRACE HDD-CCS PE45. Conductor shall be hard-drawn, 21% IACS, copper-clad steel, utilizing a AISI 1055 high carbon steel core with minimum break load of 1,330 lbs or 260,000 psi (required to meet break load). Conductor shall be extruded with a 45 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE HDD-CCS PE45 as manufactured by **Pro-Line Safety Products**.

Specification Updated: 1.3.2017 15:10:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

www.prolinesafety.com

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 14 AWG | 12 AWG | 10 AWG | 8 AWG | 6 AWG 7x7 |
|--|-------------|-------------|-------------|-------------|-------------|
| Conductor Type | HDD-CCS | HDD-CCS | HDD-CCS | HDD-CCS | HDD-CCS |
| Conductor Temper | Hard-Drawn | Hard-Drawn | Hard-Drawn | Hard-Drawn | Hard-Drawn |
| Steel Grade | AISI 1065 | AISI 1055 | AISI 1055 | AISI 1065 | AISI 1065 |
| Copper Grade | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 |
| Rated Break Load (Minimum) | 725 lbs | 1,330 lbs | 1,940 lbs | 2,785 lbs | 4,705 lbs |
| Rated Tensile Strength (Minimum) | 225,000 psi | 260,000 psi | 238,000 psi | 215,000 psi | 252,000 psi |
| Elongation (ASTM B869) | ≥ 1.0% | ≥ 1.0% | ≥ 1.0% | ≥ 1.0% | ≥ 1.0% |
| Nominal Copper Thickness (% of Diameter) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Nominal Copper Weight (Per 1,000') | 13.0% | 13.0% | 13.0% | 13.0% | 13% |
| Nominal DC Resistance | 12.024 ohms | 7.562 ohms | 4.756 ohms | 2.991 ohms | 2.010 ohms |

TABLE 2: INSULATION & PRINTING (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

| PRODUCT PART NO. | PRODUCT DESCRIPTION | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|---|------------------------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | | | | | | CCS WEIGHT | FINISHED WEIGHT | |
| PRO-TRACE HDD-CCS PE45 TRACER WIRE - DIRECTIONAL DRILLING and PIPE BURSTING | | | | | | | | |
| 74642.XXXX | 14 AWG HDD-CCS PE45 | 725 lbs | 225,000 psi | 0.045" | 0.154" | 11.1800 | 19.00 | **NEW - CALL US |
| 74642.XXXX | 12 AWG HDD-CCS PE45 | 1,330 lbs | 260,000 psi | 0.045" | 0.171" | 17.7644 | 27.00 | 500' / 1000' / 2500' |
| 74643.XXXX | 10 AWG HDD-CCS PE45 | 1,940 lbs | 238,000 psi | 0.045" | 0.192" | 28.2537 | 40.00 | 500' / 1000' / 2500' |
| 74644.XXXX | 8 AWG HDD-CCS PE45 | 2,785 lbs | 215,000 psi | 0.045" | 0.219" | 44.9297 | 58.00 | 500' / 1000' / 2500' |
| 74666.XXXX | 6 STR 7x7 HDD-CCS PE60 | 4,705 lbs | 252,000 psi | 0.060" | 0.324" | 81.80 | 104.00 | **NEW - CALL US |

PRO-TRACE® • 12 AWG SOLID HDD-CCS • 45 MIL HDPE • DIRECTIONAL DRILLING TRACER WIRE (1,330 LBS) • 30V • DIRECT BURIAL • CAUTION GAS LINE BELOW

| INSULATION COLOR AND REEL SIZE | | | |
|--------------------------------|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| BROWN | 0332 | 0341 | 0347 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |

*** Some colors and sizes may be subject to mins ***

| REEL AND PACKAGING INFORMATION | | | | | |
|--------------------------------|--------|--------------------|----------------|------------|-----------------|
| SIZE | LENGTH | MATERIAL | REEL DIMENSION | ARBOR HOLE | PALLET QUANTITY |
| 12 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 108,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 112,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 120,000 FT |
| 10 AWG | 500 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 72,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 64,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 16" x 10" | 1.5" | 67,500 FT |
| 8 AWG | 500 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 48,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 9" | 1.5" | 48,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 16" x 12" | 1.5" | 45,000 FT |

*** Custom length reels are available upon request, some restrictions may apply ***

*** Bulk reels up to 60,000' are available, some restrictions may apply ***



Specification Updated: 1.3.2017 15:10:00 CST

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Ph: 800.554.3424 • Fx: 630-876-1038
www.prolinesafety.com

HF-CCS PE30

(HIGH-FLEX / OPEN-TRENCH)

Tracer Wire • High-Flex Copper Clad Steel (HF-CCS) • 21% IACS Conductivity • Corrosion Resistant
High-Density, High Molecular Weight Polyethylene (HMWPE-HDPE) Insulation • Moisture, Chemical, and Oil Resistant
Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Buy American / AIS Compliant

“PRO-TRACE® HF-CCS -- FLEXIBILITY & STRENGTH -- IT’S THE FUTURE OF TRACER WIRE”



Applications and Information

- **PRO-TRACE® HF-CCS PE30** is used for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **PRO-TRACE® HF-CCS PE30** is designed to embody the flexibility, memory, and feel of copper. It also has a 43% higher break-load, minimizing damage during installation and while in service. Equal to copper in signal tracing performance. It simply outperforms copper tracer wire. Designed for open-trench and plow-in installations using 1 wire.
- Considerably lower in cost and great price stability compared to copper.
- RoHS Compliant and works with connectors you already use.

Standards and References

PRO-TRACE® HF-CCS PE30 conductors meets or exceeds all applicable ASTM specifications, and requirements of the National Electrical Code. Buy American / AIS Compliant.

- ASTM B910 / B190M: Standard Specification for Annealed Copper-Clad Steel Wire
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable

Construction

PRO-TRACE® HF-CCS PE30 is a flexible, copper-clad steel tracer wire. A low carbon steel core, metallurgically bonded with a copper cladding, that is uniform and continuous, creating a bi-metal conductor that acts as one and is corrosion resistant. Special annealing processes are performed during the cladding process giving HF-CCS the flexibility and feel of copper, but 43% higher in strength which means less breaks than copper tracer wire.

PRO-TRACE® HF-CCS PE30 uses a 30 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.

Specification Example

Tracer wire for open-cut installation shall be a 12 AWG solid, PRO-TRACE® HF-CCS PE30. Conductor shall be annealed, 21% IACS, copper-clad steel, utilizing a AISI 1006 low carbon steel core with minimum break load of 282 lbs or 55,000 psi (required to meet break load, flexibility, and ASTM B910). Conductor shall be extruded with a 30 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE® HF-CCS PE30 as manufactured by **Pro-Line Safety Products**.

Specification Updated: 1.4.2017 12:03:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

www.prolinesafety.com

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 18 AWG | 16 AWG | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|--|-------------|-------------|-------------|------------|------------|------------|
| Conductor Type | HF-CCS | HF-CCS | HF-CCS | HF-CCS | HF-CCS | HF-CCS |
| Conductor Temper | Annealed | Annealed | Annealed | Annealed | Annealed | Annealed |
| Steel Grade | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 |
| Copper Grade | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 |
| Rated Break Load (Minimum) | 70 lbs | 111 lbs | 177 lbs | 282 lbs | 448 lbs | 713 lbs |
| Rated Tensile Strength (Minimum) | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi |
| Elongation (ASTM B869) | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% |
| Nominal Copper Thickness (% of Diameter) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Nominal Copper Weight (Per 1,000') | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% |
| Nominal DC Resistance | 30.399 ohms | 19.119 ohms | 12.024 ohms | 7.562 ohms | 4.756 ohms | 2.991 ohms |

TABLE 2: INSULATION & PRINTING (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

| PRODUCT PART NO. | PRODUCT DESCRIPTION | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|---|------------------------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | | | | | | CCS WEIGHT | FINISHED WEIGHT | |
| PRO-TRACE HF-CCS PE30 TRACER WIRE -- OPEN-CUT, PLOW-IN, BLOW-IN | | | | | | | | |
| 74418.XXXX | 18 AWG HF-CCS PE30 | 70 lbs | 55,000 psi | 0.030" | 0.101" | 4.4191 | 7.14 | 500' / 1000' / 2500' |
| 74416.XXXX | 16 AWG HF-CCS PE30 | 112 lbs | 55,000 psi | 0.030" | 0.111" | 7.0219 | 10.15 | 500' / 1000' / 2500' |
| 74411.XXXX | 14 AWG HF-CCS PE30 | 177 lbs | 55,000 psi | 0.030" | 0.124" | 11.1800 | 14.82 | 500' / 1000' / 2500' |
| 74412.XXXX | 12 AWG HF-CCS PE30 | 282 lbs | 55,000 psi | 0.030" | 0.141" | 17.7644 | 22.05 | 500' / 1000' / 2500' |
| 74413.XXXX | 10 AWG HF-CCS PE30 | 448 lbs | 55,000 psi | 0.030" | 0.162" | 28.2537 | 33.35 | 500' / 1000' / 2500' |
| 74414.XXXX | 8 AWG HF-CCS PE30 | 713 lbs | 55,000 psi | 0.030" | 0.189" | 44.9297 | 51.05 | CUSTOM ORDER |

PRO-TRACE® • 12 AWG SOLID HF-CCS • 30 MIL HDPE • HIGH-FLEX TRACER WIRE (282 LBS) • 30V • DIRECT BURIAL • CAUTION GAS LINE BELOW

| INSULATION COLOR AND REEL SIZE | | | |
|--------------------------------|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| BROWN | 0332 | 0341 | 0347 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |

*** Some colors and sizes may be subject to mins ***

| REEL AND PACKAGING INFORMATION | | | | | |
|--------------------------------|--------|--------------------|----------------|------------|-----------------|
| SIZE | LENGTH | MATERIAL | REEL DIMENSION | ARBOR HOLE | PALLET QUANTITY |
| 14 AWG | 500 | PLYWOOD or PLASTIC | 8" x 4" | 1.5" | 162,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 180,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 180,000 FT |
| 12 AWG | 500 | PLYWOOD or PLASTIC | 8" x 4" | 1.5" | 126,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 108,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 9" | 1.5" | 120,000 FT |
| 10 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 72,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 80,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 80,000 FT |

*** Custom length reels are available upon request, some restrictions may apply ***
 *** Bulk reels up to 60,000' are available, some restrictions may apply ***



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- **PRO-TRACE® HF-CCS PE45** is designed to embody the flexibility, memory, and feel of copper. It also has a 43% higher break-load, minimizing damage during installation and while in service. Equal to copper in signal tracing performance. It simply outperforms copper tracer wire. Designed for open-trench and plow-in installations using 1 wire.
- Considerably lower in cost and great price stability compared to copper.
- RoHS Compliant and works with connectors you already use.

Standards and References

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Construction

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PRO-TRACE® HF-CCS PE45 uses a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.

Specification Example

Tracer wire for open-cut installation shall be a 12 AWG solid, PRO-TRACE® HF-CCS PE45. Conductor shall be annealed, 21% IACS, copper-clad steel, utilizing a AISI 1006 low carbon steel core with minimum break load of 282 lbs or 55,000 psi (required to meet break load, flexibility, and ASTM B910). Conductor shall be extruded with a 45 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE® HF-CCS PE45 as manufactured by **Pro-Line Safety Products**.

Specification Updated: 1.4.2017 12:37:00 CST

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www.prolinesafety.com

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 18 AWG | 16 AWG | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|--|-------------|-------------|-------------|------------|------------|------------|
| Conductor Type | HF-CCS | HF-CCS | HF-CCS | HF-CCS | HF-CCS | HF-CCS |
| Conductor Temper | Annealed | Annealed | Annealed | Annealed | Annealed | Annealed |
| Steel Grade | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 | AISI 1006 |
| Copper Grade | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 |
| Rated Break Load (Minimum) | 70 lbs | 111 lbs | 177 lbs | 282 lbs | 448 lbs | 713 lbs |
| Rated Tensile Strength (Minimum) | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi | 55,000 psi |
| Elongation (ASTM B869) | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% |
| Nominal Copper Thickness (% of Diameter) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Nominal Copper Weight (Per 1,000') | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% |
| Nominal DC Resistance | 30.399 ohms | 19.119 ohms | 12.024 ohms | 7.562 ohms | 4.756 ohms | 2.991 ohms |

TABLE 2: INSULATION & PRINTING (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

| PRODUCT PART NO. | PRODUCT DESCRIPTION | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|---|------------------------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | | | | | | CCS WEIGHT | FINISHED WEIGHT | |
| PRO-TRACE HF-CCS PE45 TRACER WIRE -- OPEN-CUT, PLOW-IN, BLOW-IN | | | | | | | | |
| 74448.XXXX | 18 AWG HF-CCS PE45 | 70 lbs | 55,000 psi | 0.045" | 0.131" | 4.4191 | 7.14 | 500' / 1000' / 2500' |
| 74446.XXXX | 16 AWG HF-CCS PE45 | 112 lbs | 55,000 psi | 0.045" | 0.141" | 7.0219 | 10.15 | 500' / 1000' / 2500' |
| 74441.XXXX | 14 AWG HF-CCS PE45 | 177 lbs | 55,000 psi | 0.045" | 0.154" | 11.1800 | 19.00 | 500' / 1000' / 2500' |
| 74442.XXXX | 12 AWG HF-CCS PE45 | 282 lbs | 55,000 psi | 0.045" | 0.171" | 17.7644 | 27.00 | 500' / 1000' / 2500' |
| 74443.XXXX | 10 AWG HF-CCS PE45 | 448 lbs | 55,000 psi | 0.045" | 0.192" | 28.2537 | 40.00 | 500' / 1000' / 2500' |
| 74444.XXXX | 8 AWG HF-CCS PE45 | 713 lbs | 55,000 psi | 0.045" | 0.219" | 44.9297 | 58.00 | CUSTOM ORDER |

PRO-TRACE® • 12 AWG SOLID HF-CCS • 45 MIL HDPE • HIGH-FLEX TRACER WIRE (282 LBS) • 30V • DIRECT BURIAL • CAUTION GAS LINE BELOW

| INSULATION COLOR AND REEL SIZE | | | |
|--------------------------------|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| BROWN | 0332 | 0341 | 0347 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |

*** Some colors and sizes may be subject to mins ***

| REEL AND PACKAGING INFORMATION | | | | | |
|--------------------------------|--------|--------------------|----------------|------------|-----------------|
| SIZE | LENGTH | MATERIAL | REEL DIMENSION | ARBOR HOLE | PALLET QUANTITY |
| 14 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 144,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 144,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 160,000 FT |
| 12 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 108,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 112,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 120,000 FT |
| 10 AWG | 500 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 72,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 64,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 16" x 10" | 1.5" | 67,500 FT |

*** Custom length reels are available upon request, some restrictions may apply ***
 *** Bulk reels up to 60,000' are available, some restrictions may apply ***

HS-CCS PE30

(HIGH-STRENGTH / OPEN-CUT)

Tracer Wire • High-Strength Copper Clad Steel (HS-CCS) • 21% IACS Conductivity • Corrosion Resistant
High-Density, High Molecular Weight Polyethylene (HMWPE-HDPE) Insulation • Moisture, Chemical, and Oil Resistant
Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Buy American / AIS Compliant



Applications and Information

- **PRO-TRACE® HS-CCS PE30** is used for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **PRO-TRACE® HS-CCS PE30** has 227% the break load of copper, greatly reducing damage and breaks during installations. Equal to copper in signal tracing performance. It simply outperforms copper tracer wire. Designed for open-cut and plow-in installations using 1 wire.
- Considerably lower in cost and great price stability compared to copper.
- RoHS Compliant and works with connectors you already use.

Standards and References

PRO-TRACE® HS-CCS PE30 conductors meets or exceeds all applicable ASTM specifications, and requirements of the National Electrical Code. Buy American / AIS Compliant.

- ASTM B910 / B190M: Standard Specification for Annealed Copper-Clad Steel Wire
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable

Construction

PRO-TRACE® HS-CCS PE30 is a high-strength, copper-clad steel tracer wire. A high carbon steel core, metallurgically bonded with a copper cladding, that is uniform and continuous, creating a bi-metal conductor that acts as one and is corrosion resistant. Special annealing processes are performed during the cladding process to giving HS-CCS twice the tensile strength and significantly reducing line breakage experienced with copper trace wire.

PRO-TRACE® HS-CCS PE30 uses a 30 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.

Specification Example

Tracer wire for open-cut installation shall be a 12 AWG solid, PRO-TRACE® HS-CCS PE30. Conductor shall be annealed, 21% IACS, copper-clad steel, utilizing a AISI 1055 high carbon steel core with minimum break load of 452 lbs or 87,500 psi (required to meet break load and ASTM B910). Conductor shall be extruded with a 30 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE® HS-CCS PE30 as manufactured by **Pro-Line Safety Products**.

Specification Updated: 1.3.2017 14:16:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

www.prolinesafety.com

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 18 AWG | 16 AWG | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|--|-------------|-------------|-------------|------------|------------|------------|
| Conductor Type | HS-CCS | HS-CCS | HS-CCS | HS-CCS | HS-CCS | HS-CCS |
| Conductor Temper | Annealed | Annealed | Annealed | Annealed | Annealed | Annealed |
| Steel Grade | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 |
| Copper Grade | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 |
| Rated Break Load (Minimum) | 111 lbs | 177 lbs | 282 lbs | 452 lbs | 685 lbs | 972 lbs |
| Rated Tensile Strength (Minimum) | 87,500 psi | 87,500 psi | 87,500 psi | 87,500 psi | 84,000 psi | 75,000 psi |
| Elongation (ASTM B869) | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% |
| Nominal Copper Thickness (% of Diameter) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Nominal Copper Weight (Per 1,000') | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% |
| Nominal DC Resistance | 30.399 ohms | 19.119 ohms | 12.024 ohms | 7.562 ohms | 4.756 ohms | 2.991 ohms |

TABLE 2: INSULATION & PRINTING (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

| PRODUCT PART NO. | PRODUCT DESCRIPTION | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|---|------------------------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | | | | | | CCS WEIGHT | FINISHED WEIGHT | |
| PRO-TRACE HS-CCS PE30 TRACER WIRE -- OPEN-CUT, PLOW-IN, BLOW-IN | | | | | | | | |
| 74518.XXXX | 18 AWG HS-CCS PE30 | 111 lbs | 87,500 psi | 0.030" | 0.101" | 4.4191 | 7.14 | 500' / 1000' / 2500' |
| 74516.XXXX | 16 AWG HS-CCS PE30 | 177 lbs | 87,500 psi | 0.030" | 0.111" | 7.0219 | 10.15 | 500' / 1000' / 2500' |
| 74511.XXXX | 14 AWG HS-CCS PE30 | 282 lbs | 87,500 psi | 0.030" | 0.124" | 11.1800 | 14.82 | 500' / 1000' / 2500' |
| 74512.XXXX | 12 AWG HS-CCS PE30 | 452 lbs | 87,500 psi | 0.030" | 0.141" | 17.7644 | 22.05 | 500' / 1000' / 2500' |
| 74513.XXXX | 10 AWG HS-CCS PE30 | 685 lbs | 84,000 psi | 0.030" | 0.162" | 28.2537 | 33.35 | 500' / 1000' / 2500' |
| 74514.XXXX | 8 AWG HS-CCS PE30 | 972 lbs | 75,000 psi | 0.030" | 0.189" | 44.9297 | 51.05 | CUSTOM ORDER |

PRO-TRACE® • 12 AWG SOLID HS-CCS • 30 MIL HDPE • HIGH-STRENGTH TRACER WIRE (452 LBS) • 30V • DIRECT BURIAL • CAUTION GAS LINE BELOW

| INSULATION COLOR AND REEL SIZE | | | |
|--------------------------------|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| BROWN | 0332 | 0341 | 0347 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |

*** Some colors and sizes may be subject to mins ***

| REEL AND PACKAGING INFORMATION | | | | | |
|--------------------------------|--------|--------------------|----------------|------------|-----------------|
| SIZE | LENGTH | MATERIAL | REEL DIMENSION | ARBOR HOLE | PALLET QUANTITY |
| 14 AWG | 500 | PLYWOOD or PLASTIC | 8" x 4" | 1.5" | 162,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 180,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 180,000 FT |
| 12 AWG | 500 | PLYWOOD or PLASTIC | 8" x 4" | 1.5" | 126,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 108,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 9" | 1.5" | 120,000 FT |
| 10 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 72,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 80,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 80,000 FT |

*** Custom length reels are available upon request, some restrictions may apply ***
 *** Bulk reels up to 60,000' are available, some restrictions may apply ***

HS-CCS PE45

(HIGH-STRENGTH / OPEN-CUT)

Tracer Wire • High-Strength Copper Clad Steel (HS-CCS) • 21% IACS Conductivity • Corrosion Resistant
High-Density, High Molecular Weight Polyethylene (HMWPE-HDPE) Insulation • Moisture, Chemical, and Oil Resistant
Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Buy American / AIS Compliant



Applications and Information

- **PRO-TRACE® HS-CCS PE30** is used for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **PRO-TRACE® HS-CCS PE30** has 227% the break load of copper, greatly reducing damage and breaks during installations. Equal to copper in signal tracing performance. It simply outperforms copper tracer wire. Designed for open-cut and plow-in installations using 1 wire.
- Considerably lower in cost and great price stability compared to copper.
- RoHS Compliant and works with connectors you already use.

Standards and References

PRO-TRACE® HS-CCS PE30 conductors meets or exceeds all applicable ASTM specifications, and requirements of the National Electrical Code. Buy American / AIS Compliant.

- ASTM B910 / B190M: Standard Specification for Annealed Copper-Clad Steel Wire
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable

Construction

PRO-TRACE® HS-CCS PE45 is a high-strength, copper-clad steel tracer wire. A high carbon steel core, metallurgically bonded with a copper cladding, that is uniform and continuous, creating a bi-metal conductor that acts as one and is corrosion resistant. Special annealing processes are performed during the cladding process to giving HS-CCS twice the tensile strength and significantly reducing line breakage experienced with copper trace wire.

PRO-TRACE® HS-CCS PE45 uses a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.

Specification Example

Tracer wire for open-cut installation shall be a 12 AWG solid, PRO-TRACE® HS-CCS PE45. Conductor shall be annealed, 21% IACS, copper-clad steel, utilizing a AISI 1055 high carbon steel core with minimum break load of 452 lbs or 87,500 psi (required to meet break load and ASTM B910). Conductor shall be extruded with a 45 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE® HS-CCS PE45 as manufactured by **Pro-Line Safety Products**.

Specification Updated: 1.3.2017 14:45:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

www.prolinesafety.com

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 18 AWG | 16 AWG | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|--|-------------|-------------|-------------|------------|------------|------------|
| Conductor Type | HS-CCS | HS-CCS | HS-CCS | HS-CCS | HS-CCS | HS-CCS |
| Conductor Temper | Annealed | Annealed | Annealed | Annealed | Annealed | Annealed |
| Steel Grade | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 | AISI 1055 |
| Copper Grade | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 | UNS C10200 |
| Rated Break Load (Minimum) | 111 lbs | 177 lbs | 282 lbs | 452 lbs | 685 lbs | 972 lbs |
| Rated Tensile Strength (Minimum) | 87,500 psi | 87,500 psi | 87,500 psi | 87,500 psi | 84,000 psi | 75,000 psi |
| Elongation (ASTM B869) | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% | ≥ 15.0% |
| Nominal Copper Thickness (% of Diameter) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Nominal Copper Weight (Per 1,000') | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% |
| Nominal DC Resistance | 30.399 ohms | 19.119 ohms | 12.024 ohms | 7.562 ohms | 4.756 ohms | 2.991 ohms |

TABLE 2: INSULATION & PRINTING (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

| PRODUCT PART NO. | PRODUCT DESCRIPTION | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|---|------------------------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | | | | | | CCS WEIGHT | FINISHED WEIGHT | |
| PRO-TRACE HS-CCS PE45 TRACER WIRE -- OPEN-CUT, PLOW-IN, BLOW-IN | | | | | | | | |
| 74548.XXXX | 18 AWG HS-CCS PE45 | 111 lbs | 87,500 psi | 0.045" | 0.131" | 4.4191 | 7.14 | 500' / 1000' / 2500' |
| 74546.XXXX | 16 AWG HS-CCS PE45 | 177 lbs | 87,500 psi | 0.045" | 0.141" | 7.0219 | 10.15 | 500' / 1000' / 2500' |
| 74541.XXXX | 14 AWG HS-CCS PE45 | 282 lbs | 87,500 psi | 0.045" | 0.154" | 11.1800 | 19.00 | 500' / 1000' / 2500' |
| 74542.XXXX | 12 AWG HS-CCS PE45 | 452 lbs | 87,500 psi | 0.045" | 0.171" | 17.7644 | 27.00 | 500' / 1000' / 2500' |
| 74543.XXXX | 10 AWG HS-CCS PE45 | 685 lbs | 84,000 psi | 0.045" | 0.192" | 28.2537 | 40.00 | 500' / 1000' / 2500' |
| 74544.XXXX | 8 AWG HS-CCS PE45 | 972 lbs | 75,000 psi | 0.045" | 0.219" | 44.9297 | 58.00 | CUSTOM ORDER |

PRO-TRACE® • 12 AWG SOLID HS-CCS • 45 MIL HDPE • HIGH-STRENGTH TRACER WIRE (452 LBS) • 30V • DIRECT BURIAL • CAUTION GAS LINE BELOW

| INSULATION COLOR AND REEL SIZE | | | |
|--------------------------------|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| BROWN | 0332 | 0341 | 0347 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |

*** Some colors and sizes may be subject to mins ***

| REEL AND PACKAGING INFORMATION | | | | | |
|--------------------------------|--------|--------------------|----------------|------------|-----------------|
| SIZE | LENGTH | MATERIAL | REEL DIMENSION | ARBOR HOLE | PALLET QUANTITY |
| 14 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 144,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 144,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 160,000 FT |
| 12 AWG | 500 | PLYWOOD or PLASTIC | 8" x 6" | 1.5" | 108,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 112,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 12" x 12" | 1.5" | 120,000 FT |
| 10 AWG | 500 | PLYWOOD or PLASTIC | 8" x 9" | 1.5" | 72,000 FT |
| | 1000 | PLYWOOD or PLASTIC | 12" x 6" | 1.5" | 64,000 FT |
| | 2500 | PLYWOOD or PLASTIC | 16" x 10" | 1.5" | 67,500 FT |

*** Custom length reels are available upon request, some restrictions may apply ***
 *** Bulk reels up to 60,000' are available, some restrictions may apply ***



Specification Updated: 1.3.2017 14:45:00 CST

PRO-LINE
SAFETY PRODUCTS
 A DIVISION OF PRO-PAK IND, INC.

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 WEST CHICAGO, IL 60185
 Ph: 800.554.3424 • Fx: 630-876-1038
www.prolinesafety.com

QUESTIONS & ANSWERS

(PRO-TRACE CCS)

1. What are the inherent advantages of Copper-Clad Steel (CCS) when used as tracer wire?

- Corrosion resistant
- Signal strength that is considered equal to copper wire
- Better durability and longevity than copper wire
- Stronger in break-strength than copper resulting in fewer wire breaks
- Considerably lower in cost without the volatility of copper
- Reduced theft-threat due to lack of after-market value
- 10% lighter in weight means reduced shipping costs and easier handling



2. What is Copper-Clad Steel (CCS) wire?

Copper-Clad Steel (CCS) is a bimetal conductor that utilizes a low or high carbon steel core, metallurgically bonded with a copper cladding, that is uniform and continuous. The result is a bimetal conductor that is corrosion resistant and performs as one metal. Copper coverage is totally uniform over the entire length of our conductor and the cold-rolling process means there is no rehardening necessary eliminating flaking, pitting, chipping, and cracking.

3. What is the history of Copper-Clad Steel (CCS) along with commercial and industrial applications uses?

Copper-Clad Steel (CCS), was first produced in Rankin, PA in 1915. Through the years it has been used in many industrial and commercial markets. Telecommunications, CATV, and utility grounding are a few of the industrial applications. Commercially it is used in goods such as, coaxial cable, ground rods and wire, catenary wire, pet containment wire, antenna wire, trolley cable, guy strand, detonation wire, chain link fencing and even revetment mats to stop erosion on riverbanks.

4. How is Copper-Clad Steel (CCS) wire manufactured?

Copper-Clad Steel (CCS) is manufactured by metallurgically bonding steel rod with copper strips. The process of manufacturing starts off utilizing a steel rod and two copper strips, bonded together by heat and pressure. The result is CCS in rod form. The CCS rod is then drawn to an intermediate size and heat treated. The intermediate size is drawn down again to its' final size. An additional heat treating process is added for annealed material. Heat and pressure, along with the drawing process ensures uniform and continuous copper thicknesses throughout the wire. The metallurgical bond of both metals make CCS perform as one metal.

5. What is the difference between PRO-TRACE HF-CCS and HDD-CCS tracer wires?

PRO-TRACE® HF-CCS (High-Flex Copper-Clad Steel)

Designed specifically for open-trench installations. This product undergoes a special annealing process that is unique to PRO-TRACE® HF-CCS. This product is designed to embody the flexibility, memory, and feel of copper wire, but is 43% higher in break-strength. There is minimal spring release (recoil) on the reels making it very user friendly. This product cost less than copper wire, and is considered equal in signal strength. We use a technologically advanced annealing process on the HF-CCS giving it the unique traits of flexibility and strength.

PRO-TRACE® HDD-CCS (Horizontal-Drilling Copper-Clad Steel)

Designed specifically for directional drilling (boring) installations. This product utilizes a special high-carbon steel core that is unique to PRO-TRACE® HDD-CCS. This product is designed with almost 600% (6X) higher breaking-strength than copper wire. Only 1 wire is needed and prevents breaks or re-bores in directional drilling installations. With copper multiple wires are needed to prevent breaks and is extremely expensive. This product cost less than using copper, and provides equal locating performance. In simple terms, HDD-CCS provides the same break-load as 5-6 copper wires.

5. What happens if a gouge, nick, or cut (holiday effect) penetrates through the PE jacket and copper cladding, and exposes the steel core? Are there any potential galvanic corrosion concerns?

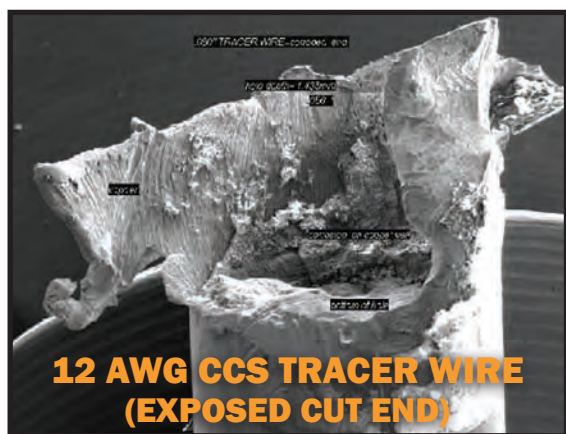
NO. The definition of galvanic corrosion can be simply stated as: *Whenever dissimilar metals are in the presence of an electrolyte, a difference in electric potential is developed between the two. One becomes the Cathode and the other becomes the Anode.* The anode will corrode while the cathode will basically remain unchanged. The key and most important point within this definition is: *"in the presence of an electrolyte"*. When metals are mechanically fastened together, there remains very small gaps between the surfaces where rain water and dissolved mineral salts can form an electrolyte. This creates an electrolytic cell and galvanic corrosion will occur based on the electromotive series. For example: Steel is above copper in this series and steel would corrode to protect the copper.

In the case of Copper Clad Steel, the copper (cathode) completely covers the entire circumference and is metallurgically bonded to the steel (anode). **Metallurgical bonding** of the copper to the steel core assures that there are no gaps between the dissimilar metals. Corrosion of the steel core requires oxygen to migrate to the anode's surface and react. Therefore, an electrolytic cell can only form at the cut end when exposed to an electrolyte. This reaction continues until the total surface area is covered with a thin oxide (or scab), and once formed, prevents further migration and corrosion. In the case of the copper cladding becoming "breached" and exposing the steel core, the same holds true. The copper would also flow into the gouge or nick minimizing the area of exposed steel. You see this same effect when you cut the wire. In simple terms, the corrosion process stops itself.

Since the early 1900's, Copper Clad Steel wire has been used for open telephone lines, power transmission, service drops, utility grounding, and ground rods. The majority of CATV coax has a center conductor of copper clad steel. Bare Copper Clad Steel is heavily used by electrical utilities and has stayed corrosion free for 40 plus years in very harsh environments and is still in service today.

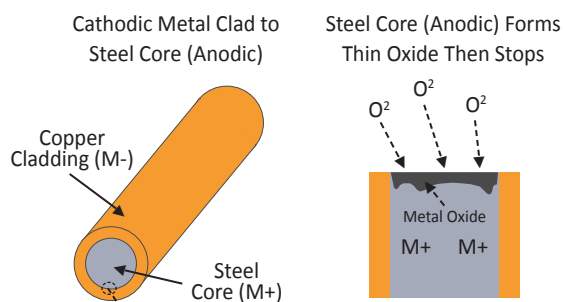
Corrosion Test Information

- Five year corrosion study was initiated using destructive and non-destructive test along with microscopic analysis to evaluate.
- Samples were buried in various soil conditions with monitoring systems to check soil PH, moisture, conductivity and temperature.

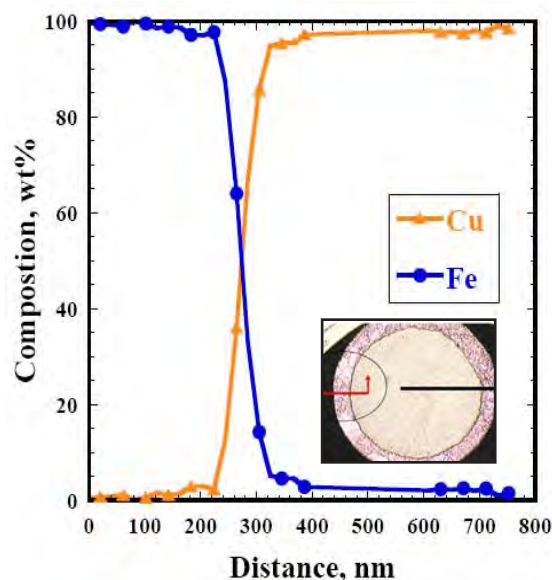


Corrosion Tests Support Our Claims

- PRO-TRACE® HF-CCS & HD-CCS are corrosion resistant tracer wires.
- Exposing the steel core does not compromise tracer wire performance.
- Depth of Corrosion = 0.056" at which point rust scabs formed sealing out moisture and effectively ceasing the corrosion process.



METALLURGICAL BOND OF CCS



STEM-HAADF-XEDS with drift correction

As tested by University of Alabama
Tuscaloosa, Alabama



Specification Updated: 10.30.2010 10:25:44 CST

PRO-LINE SAFETY PRODUCTS COMPANY
1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424



SD-CU PE30

(SOFT-DRAWN COPPER)

Copper Tracer Wire • Oxygen Free Copper • Dead Soft Annealed Copper Conductor • Corrosion Resistant
High-Density, High Molecular Weight Polyethylene (HDPE) Insulation • Moisture, Chemical, and Oil Resistant
Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Made in the USA



Applications and Information

- **SD-CU PE30** conductors are used for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **SD-CU PE30** utilizes a 30 mil, High-Density, HMWPE insulation specifically formulated to provide excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. It provides superior long term aging performance while providing excellent environmental and thermal stress-cracking resistance.
- **SD-CU PE30** is suitable for use direct burial applications not locations at temperatures not to exceed 75°C.
- **SD-CU PE30** is RoHS Compliant and manufactured in the USA.

Standards and References

SD-CU PE30 tracer wire meets or exceeds all applicable ASTM standards and requirements of the National Electrical Code.

- ASTM B-3: Standard Specification for Soft or Annealed Copper Wire.
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper.
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.
- ASTM D1238: Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.

Construction

SD-CU PE30 copper conductors are annealed copper (soft-drawn), insulated with a high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provide excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. It provides superior long term aging performance and excellent environmental and thermal stress-cracking resistance. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil and other conditions.

Specification Example

Tracer wire shall be a 12 AWG solid, SD-CU PE30. Tracer wire shall consist of a soft-drawn, oxygen free copper conductor with a minimum break load of 197 lbf (38,500 psi). Conductor shall be extruded with a 30 mil, high density polyethylene insulation, and blue in color to meet the APWA color code of the buried utility line. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be 12 AWG SOLID SD-CU PE30 as manufactured by Pro-Line Safety Products and made in the USA. If tracer wire connectors are necessary, contractor shall use a PRO-TRACE® TW Connector (Part No: 73901) rated for direct burial use filled with silicone sealant to prevent corrosion at connection points.

Specification Updated: 11.1.2010 18:15:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|------------------------|------------|------------|------------|------------|
| Conductor Type | Copper | Copper | Copper | Copper |
| Conductor Temper | Soft-Drawn | Soft-Drawn | Soft-Drawn | Soft-Drawn |
| Rated Break Load | 124 lbs | 197 lbs | 313 lbs | 479 lbs |
| Rated Tensile Strength | 38,500 psi | 38,500 psi | 38,500 psi | 37,000 psi |
| Elongation | 3.0% | 5.0% | 5.0% | 5.0% |
| Nominal DC Resistance | 2.525 ohms | 1.588 ohms | 0.999 ohms | 0.628 ohms |

TABLE 2: INSULATION (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|------------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D792 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.8 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature / Failures | ASTM D746 | 0 failures @ -76° C |
| Melting Point | ASTM D3418 | 130°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity Test @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

| PRODUCT PART NO. | CONDUCTOR | | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|-------------------------------------|-----------|----------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | AWG SIZE | STRANDS | | | | | COPPER WEIGHT | FINISHED WEIGHT | |
| WEIGHTS, MEASUREMENTS AND PACKAGING | | | | | | | | | |
| 74003XXXX | 14 AWG | SOLID | 124 lbs | 38,500 psi | 0.030" | 0.124" | 12.437 | 16.00 | 500 / 2500 |
| 74004XXXX | 12 AWG | SOLID | 197 lbs | 38,500 psi | 0.030" | 0.141" | 19.763 | 24.00 | 500 / 2500 |
| 74005XXXX | 10 AWG | SOLID | 313 lbs | 38,500 psi | 0.030" | 0.162" | 35.949 | 37.00 | 500 / 2500 |
| 74006XXXX | 8 AWG | SOLID | 479 lbs | 37,000 psi | 0.030" | 0.189" | 49.975 | 62.00 | CALL for INFO |
| 74008XXXX | 14 AWG | STRANDED | 124 lbs | 38,500 psi | 0.030" | 0.133" | 12.671 | 17.00 | CALL for INFO |
| 74010XXXX | 12 AWG | STRANDED | 197 lbs | 38,500 psi | 0.030" | 0.152" | 20.180 | 25.00 | CALL for INFO |
| 74012XXXX | 10 AWG | STRANDED | 313 lbs | 38,500 psi | 0.030" | 0.176" | 32.030 | 39.00 | CALL for INFO |
| 74014XXXX | 8 AWG | STRANDED | 479 lbs | 37,000 psi | 0.030" | 0.206" | 50.984 | 64.00 | CALL for INFO |

| INSULATION COLOR & REEL SIZE | | | | REEL & PACKAGING INFORMATION | | | | | | |
|--|-----------|------------|------------|------------------------------|--------|--------|----------|----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL | SIZE | LENGTH | FLANGE | TRAVERSE | MATERIAL | CARTON QTY | PALLET QTY |
| BLACK | 0132 | 0141 | 0147 | 14 AWG | 500 | 6.5" | 5.0" | PLASTIC | BULK | 90,000 F |
| BLUE | 0232 | 0241 | 0247 | | 2500 | 12.0" | 10.0" | PLASTIC | BULK | 90,000 F |
| GREEN | 0532 | 0541 | 0547 | 12 AWG | 500 | 6.5" | 5.0" | PLASTIC | BULK | 90,000 F |
| ORANGE | 0632 | 0641 | 0647 | | 2500 | 12.0" | 10.0" | PLASTIC | BULK | 90,000 F |
| PURPLE | 0832 | 0841 | 0847 | 10 AWG | 500 | 10.5" | 6.0" | PLASTIC | BULK | 30,000 F |
| RED | 0932 | 0941 | 0947 | | 2500 | 14.0" | 11.0" | PLASTIC | BULK | 45,000 F |
| WHITE | 1132 | 1141 | 1147 | 8 AWG | 500 | | | | | |
| YELLOW | 1232 | 1241 | 1247 | | 1000 | | | | | |
| ***SOME COLORS AND SIZES MAY BE SUBJECT TO MINS*** | | | | | 2500 | | | | | |



Specification Updated: 11.1.2010 18:15:00 CST

PRO-LINE
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PRO-LINE SAFETY PRODUCTS COMPANY
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TOLL FREE: 800.554.3424



SD-CU PE45

(SOFT-DRAWN COPPER)

Copper Tracer Wire • Oxygen Free Copper • Dead Soft Annealed Copper Conductor • Corrosion Resistant High-Density, High Molecular Weight Polyethylene (HDPE) Insulation • Moisture, Chemical, and Oil Resistant Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 600 Volts • Made in the USA
UL Listed



Applications and Information

- **SD-CU PE45** conductors are used for tracer wire applications not exceeding 30 Volts. Tracer wire is used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets. Wire can be used in 600 Volts applications.
- **SD-CU PE45** utilizes a 45 mil, High-Density, HMWPE insulation specifically formulated to provide excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. It provides superior long term aging performance while providing excellent environmental and thermal stress-cracking resistance.
- **SD-CU PE45** is suitable for use direct burial applications not locations at temperatures not to exceed 75°C.
- **SD-CU PE45** is RoHS Compliant and manufactured in the USA.

Standards and References

SD-CU PE45 tracer wire meets or exceeds all applicable ASTM standards and requirements of the National Electrical Code.

- ASTM B-3: Standard Specification for Soft or Annealed Copper Wire.
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper.
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.
- ASTM D1238: Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.

Construction

SD-CU PE45 copper conductors are annealed copper (soft-drawn), insulated with a high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provide excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. It provides superior long term aging performance and excellent environmental and thermal stress-cracking resistance. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil and other conditions.

Specification Example

Tracer wire shall be a 12 AWG solid, SD-CU PE45. Tracer wire shall consist of a soft-drawn, oxygen free copper conductor with a minimum break load of 197 lbf (38,500 psi). Conductor shall be extruded with a 45 mil, high density polyethylene insulation, and blue in color to meet the APWA color code of the buried utility line. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be 12 AWG SOLID SD-CU PE45 as manufactured by Pro-Line Safety Products and made in the USA. If tracer wire connectors are necessary, contractor shall use a PRO-TRACE® TW Connector (Part No: 73901) rated for direct burial use filled with silicone sealant to prevent corrosion at connection points.

Specification Updated: 12.6.2016 09:57:00 CST

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 14 AWG | 12 AWG | 10 AWG | 8 AWG |
|------------------------|------------|------------|------------|------------|
| Conductor Type | Copper | Copper | Copper | Copper |
| Conductor Temper | Soft-Drawn | Soft-Drawn | Soft-Drawn | Soft-Drawn |
| Rated Break Load | 124 lbs | 197 lbs | 313 lbs | 479 lbs |
| Rated Tensile Strength | 38,500 psi | 38,500 psi | 38,500 psi | 37,000 psi |
| Elongation | 3.0% | 5.0% | 5.0% | 5.0% |
| Nominal DC Resistance | 2.525 ohms | 1.588 ohms | 0.999 ohms | 0.628 ohms |

TABLE 2: INSULATION (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|------------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D792 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.8 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature / Failures | ASTM D746 | 0 failures @ -76° C |
| Melting Point | ASTM D3418 | 130°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity Test @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

| PRODUCT PART NO. | CONDUCTOR | | RATED BREAK LOAD | RATED TENSILE STRENGTH | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|-------------------------------------|-----------|----------|------------------------|------------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | AWG SIZE | STRANDS | | | | | COPPER WEIGHT | FINISHED WEIGHT | |
| WEIGHTS, MEASUREMENTS AND PACKAGING | | | | | | | | | |
| 74103XXXX | 14 AWG | SOLID | 124 lbs | 38,500 psi | 0.045" | 0.124" | 12.437 | 19.00 | 500 / 2500 |
| 74104XXXX | 12 AWG | SOLID | 197 lbs | 38,500 psi | 0.045" | 0.141" | 19.763 | 27.00 | 500 / 2500 |
| 74105XXXX | 10 AWG | SOLID | 313 lbs | 38,500 psi | 0.045" | 0.162" | 35.949 | 40.00 | 500 / 2500 |
| 74106XXXX | 8 AWG | SOLID | 479 lbs | 37,000 psi | 0.045" | 0.189" | 49.975 | 62.00 | CALL for INFO |
| 74108XXXX | 14 AWG | STRANDED | 124 lbs | 38,500 psi | 0.045" | 0.133" | 12.671 | 17.00 | CALL for INFO |
| 74110XXXX | 12 AWG | STRANDED | 197 lbs | 38,500 psi | 0.045" | 0.152" | 20.180 | 25.00 | CALL for INFO |
| 74112XXXX | 10 AWG | STRANDED | 313 lbs | 38,500 psi | 0.045" | 0.176" | 32.030 | 39.00 | CALL for INFO |
| 74114XXXX | 8 AWG | STRANDED | 479 lbs | 37,000 psi | 0.045" | 0.206" | 50.984 | 64.00 | CALL for INFO |

| INSULATION COLOR & REEL SIZE | | | | REEL & PACKAGING INFORMATION | | | | | | |
|--|-----------|------------|------------|------------------------------|--------|--------|----------|----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL | SIZE | LENGTH | FLANGE | TRAVERSE | MATERIAL | CARTON QTY | PALLET QTY |
| BLACK | 0132 | 0141 | 0147 | 14 AWG | 500 | 6.5" | 5.0" | PLASTIC | BULK | 90,000 F |
| BLUE | 0232 | 0241 | 0247 | | 2500 | 12.0" | 10.0" | PLASTIC | BULK | 90,000 F |
| GREEN | 0532 | 0541 | 0547 | 12 AWG | 500 | 6.5" | 5.0" | PLASTIC | BULK | 90,000 F |
| ORANGE | 0632 | 0641 | 0647 | | 2500 | 12.0" | 10.0" | PLASTIC | BULK | 90,000 F |
| PURPLE | 0832 | 0841 | 0847 | 10 AWG | 500 | 10.5" | 6.0" | PLASTIC | BULK | 30,000 F |
| RED | 0932 | 0941 | 0947 | | 2500 | 14.0" | 11.0" | PLASTIC | BULK | 45,000 F |
| WHITE | 1132 | 1141 | 1147 | 8 AWG | 500 | | | | | |
| YELLOW | 1232 | 1241 | 1247 | | 1000 | | | | | |
| ***SOME COLORS AND SIZES MAY BE SUBJECT TO MINS*** | | | | | 2500 | | | | | |



Specification Updated: 12.6.2016 09:57:00 CST


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PRO-LINE SAFETY PRODUCTS COMPANY
 1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424

SSAC-T304 PE45

(STAINLESS STEEL)

Tracer Wire • Stainless Steel Aircraft Cable Type 304 Conductor • Directional Boring Applications • Corrosion Resistant High-Density, High Molecular Weight Polyethylene (HDPE) Insulation • Moisture, Chemical, and Oil Resistant Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Made in the USA

Applications and Information

- **SSAC-T304 PE45** conductors are used for tracer wire applications not exceeding 30 Volts. Tracer wire is designed for directional boring applications and used to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **SSAC-T304 PE45** has great flexibility, memory, and much higher break load than copper, minimizing damage during installation and while in service. This product is best suited for directional boring when high strength is needed.
- **SSAC-T304 PE45** is corrosion resistant with good price stability.
- **SSAC-T304 PE45** is RoHS Compliant, made in the USA.

Standards and References

SSAC-T304 PE45 tracer wire meets or exceeds all applicable ASTM specifications, requirements of the National Electrical Code, and Federal Specifications.

- RR-W-410E: Federal Specification for Wire Rope and Stranding.
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable

Construction

SSAC-T304 PE45 is a 7x7 stranded, stainless steel aircraft cable, type 304 conductor. Conductors is corrosion resistant is suitable for tracer wire applications only. The inherently high break load of stainless steel makes this a viable alternative to copper in directional boring applications when 1 conductor is used.

SSAC-T304 PE45 uses a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation. HDPE provides an excellent balance of surface smoothness, processing ease and electrical consistency. HDPE provides superior strength against underground elements that help prevent accidental breaks caused by rocks in shifting soil conditions.



Specification Example

Tracer wire for directional boring applications shall be a 12 AWG stranded 7x7, SSAC-T304 PE45. Tracer wire shall consist of a stainless steel aircraft cable, type 304 conductor. Conductor shall have a minimum break load of 920 lbs to ensure strength. Conductor shall be extruded with a 45 mil, high density polyethylene insulation, and blue in color to meet the APWA color code of the buried utility line. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be SSAC-T304 PE45 as manufactured by **Pro-Line Safety Products** and made in the USA.

TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

| PROPERTY | 3/32" | 7/64" | 1/8" | 5/32" | 3/16" | 7/32" | 1/4" |
|------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Conductor Type | SSAC | SSAC | SSAC | SSAC | SSAC | SSAC | SSAC |
| Conductor Temper | Type 304 | Type 304 | Type 304 | Type 304 | Type 304 | Type 304 | Type 304 |
| Rated Break Load | 920 lbs | 1,260 lbs | 1,700 lbs | 2,400 lbs | 3,700 lbs | 5,000 lbs | 6,400 lbs |
| Elongation | 1.0% | 1.0% | 1.0 % | 1.0% | 1.0% | 1.0% | 1.0% |

TABLE 2: INSULATION (Physical, Mechanical and Electrical Properties)

| TEST DESCRIPTION | ASTM STANDARD | TYPICAL VALUES |
|-------------------------------|---------------|-------------------------------|
| Density @ 23°C | ASTM D1505 | 0.945 g/cm ³ |
| Melt Flow Rate | ASTM D1238 | 0.70 g/10 min |
| Tensile Strength | ASTM D638 | 3,400 psi |
| Tensile Strength Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Tensile Elongation | ASTM D638 | 500% |
| Tensile Elongation Retention | ASTM D638 | 90% after 48 hours @ 100°C |
| Environmental Stress Cracking | ASTM D1693 | 0 failures @ 48 hours |
| Thermal Stress Cracking | ASTM D2951 | 0 failures @ 96 hours |
| Brittleness Temperature | ASTM D746 | -76°C |
| Melting Temperature | ASTM D3418 | 260°C |
| Oxidative Induction Time | ASTM D3895 | 170 min @ 200°C |
| Dielectric Constant | ASTM D1531 | 2.32 @ 1 MHz |
| Dissipation Factor | ASTM D1531 | 0.00006 @ 1 MHz |
| DC Volume Resistivity @ 23°C | ASTM D257 | > 1 x 10 ¹⁵ ohm-cm |

| PRODUCT PART NO. | CONDUCTOR | | RATED BREAK LOAD | HDPE INSULATION THICKNESS | NOMINAL O.D. | APPROX. WEIGHT PER 1,000 FT | | STANDARD PACKAGES |
|-------------------------------------|----------------|-----------|------------------------|---------------------------------|-----------------|--------------------------------|--------------------|----------------------|
| | AWG SIZE | STRANDING | | | | STEEL WEIGHT | FINISHED WEIGHT | |
| WEIGHTS, MEASUREMENTS AND PACKAGING | | | | | | | | |
| 69102XXXX | 3/32" (12 AWG) | 7 x 7 | 920 lbs | 0.045" | 0.188" | 16.00 | 28.00 | 500/1000/2500 |
| 69103XXXX | 3/32" (10 AWG) | 7 x 7 | 920 lbs | 0.045" | 0.188" | 16.00 | 28.00 | 500/1000/2500 |
| 6910ZXXXX | 7/64" (CUSTOM) | 7 x 7 | 1,260 lbs | 0.045" | 0.203" | 22.00 | 36.00 | SPECIAL ORDER |
| 69104XXXX | 1/8" (8 AWG) | 7 x 7 | 1,700 lbs | 0.045" | 0.219" | 28.50 | 47.50 | 500/1000/2500 |
| 69105XXXX | 5/32" (6 AWG) | 7 x 7 | 2,400 lbs | 0.045" | 0.250" | 43.00 | 62.00 | 500/1000/2500 |
| 69106XXXX | 3/16" (5 AWG) | 7 x 7 | 3,700 lbs | 0.045" | 0.282" | 62.00 | 77.00 | 500/1000/2500 |
| 69107XXXX | 7/32" (4 AWG) | 7 x 7 | 5,000 lbs | 0.045" | 0.313" | 83.00 | 110.00 | 500/1000/2500 |
| 69108XXXX | 1/4" (2 AWG) | 7 x 7 | 6,400 lbs | 0.045" | 0.344" | 106.00 | 124.00 | 500/1000/2500 |

| INSULATION COLOR & REEL SIZE | | | |
|--|-----------|------------|------------|
| COLOR | 500' REEL | 1000' REEL | 2500' REEL |
| BLACK | 0132 | 0141 | 0147 |
| BLUE | 0232 | 0241 | 0247 |
| GREEN | 0532 | 0541 | 0547 |
| ORANGE | 0632 | 0641 | 0647 |
| PURPLE | 0832 | 0841 | 0847 |
| RED | 0932 | 0941 | 0947 |
| WHITE | 1132 | 1141 | 1147 |
| YELLOW | 1232 | 1241 | 1247 |
| ***SOME PART NUMBERS MAY BE SUBJECT TO MINS*** | | | |



Specification Dated: 2.22.2010 13:19:40 CST

PRO-LINE SAFETY PRODUCTS COMPANY
1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424



PRO-TRACE® DB CONNECTOR

(PATENT #7335050)

Silicone Filled Tracer Wire Connector • Made from Polycarbonate • Impact and Crush Resistant • Water and Corrosion Proof
Moisture, Chemical, and Oil Resistant • Connector for use in Damp, Wet and Submersible Locations
300 Volts Max • RoHS Compliant • Direct Burial Rated

“PRO-TRACE® DB CONNECTOR -- CONFIDENCE & RELIABILITY -- IT'S FOOL PROOF INSTALLATION”



Applications and Information

- **PRO-TRACE® DB Connector** is used for underground splices or connections for tracer wire and other applications not exceeding 300 Volts. The silicone filled connector is used to splice or branch-off multiple tracer wires to maintain continuity and provides corrosion proof protection from the underground elements.
- **PRO-TRACE® DB Connector** is superior to twist-on connectors, providing better strain relief and performance along with easier installation. They are fool proof, minimizing damage and error during installation and while in service.
- **PRO-TRACE® DB Connector** is a patented technology that uses applied hand pressure to close and lock in the connections with ease and is superior to wire nuts (twist-on). With wire nuts, wires are inserted and torqued until tight. If too much torque is applied the threading inside can become “stripped”. If too little torque is applied the wires may become loose.
- **PRO-TRACE® DB Connector** is the best connector in the market specifically designed for tracer wire with a strain relief considerably stronger than DryConn or 3M Connectors.
- **PRO-TRACE® DB Connector** is designed to work with copper, copper-clad steel (CCS), and stainless steel. See table 4 for wire combinations.

Standards and References

PRO-TRACE® DB Connector meets or exceeds all applicable UL standards, and requirements of the National Electrical Code.

- Sealed Wire Connection System for use in Damp, Wet, Raintight, Watertight, Submersible and Direct Bury Locations

Construction

PRO-TRACE® DB Connector is injection molded from polycarbonate that has outstanding temperature and high-impact resistance. It is superior to breaking and cracking. The outer housing is clear in color and provides visual confidence with each installation. The rotating handle is color coded to meet the APWA color code. The inner housing features a locking mechanism made from zinc and uses applied hand pressure that securely closes and locks the wire inside with ease. A corrosion proof silicone sealant fills the inner housing and provides longevity for each installation.

Specification Example

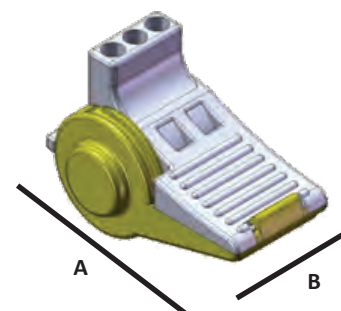
Tracer wire shall be a 12 AWG solid, PRO-TRACE® HF-CCS PE30. Tracer wire shall consist of a dead soft annealed, 21% IACS conductivity, copper clad steel conductor with a minimum break load of 282 lbf (55,000 psi) to ensure flexibility and strength. Conductor shall be extruded with a 30 mil, high density polyethylene insulation, and blue in color to meet the APWA color code of the buried utility line. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be PRO-TRACE® HF-CCS PE30 as manufactured by Pro-Line Safety Products and made in the USA. If tracer wire connectors are necessary, contractor shall use a PRO-TRACE® DB Connector (Part No: 73901) rated for direct burial use filled with silicone sealant to prevent corrosion at connection points.

TABLE 1: WIRE COMBINATIONS (Conductor and Insulation Type Compatibility)

| CONDUCTOR TYPES | | | | | | | INSULATION TYPES | | |
|-----------------|---------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|------------------|---------------------|------------------------------|
| SIZE | COPPER SD/MHD/HD | HF-CCS PRO-TRACE® | HS-CCS PRO-TRACE® | HD-CCS PRO-TRACE® | HDD-CCS PRO-TRACE® | STAINLESS TYPE 304 | PVC/NYLON | PVC | LDPE, HDPE, XLPE |
| 14 AWG | 1-3 WIRES | 1-3 WIRES | 1-3 WIRES | ----- | ----- | ----- | THHN or THWN | TW, UF, THW, TWU | PE30, PE45, XHHW-2, USE-2 |
| 12 AWG | 1-3 WIRES | 1-3 WIRES | 1-3 WIRES | <u>NO</u> | <u>NO</u> | 1-3 WIRES | THHN or THWN | TW, UF, THW, TWU | PE30, PE45, XHHW-2, USE-2 |
| 10 AWG | 1-3 WIRES | <u>NO</u> | <u>NO</u> | <u>NO</u> | <u>NO</u> | 1-3 WIRES | THHN or THWN | TW, UF, THW, TWU | PE30, PE45, XHHW-2, USE-2 |

TABLE 2: CONNECTOR (Physical and Electrical Properties)

| MEASUREMENTS | TYPICAL VALUES |
|------------------------------|---------------------------------|
| Connector Size | 2.375" (A) x 1.375" (B) |
| Maximum Voltage | 300 Volts |
| Wire Range | Min #14 / Max #10 (See Table 1) |
| Temperature Rating | 105°C (221°F) |
| Silicone Sealant Temperature | -40°F to 400°F |



| PRODUCT PART NO. | PRODUCT DESCRIPTION | PACKAGING | | APPROX WEIGHT PER 100 | STOCK |
|---|--|-----------------|------------------|-----------------------------|-------|
| | | INNER CARTON | MASTER CARTON | | |
| WEIGHTS, MEASUREMENTS AND PACKAGING | | | | | |
| 739010250 | PRO-TRACE DB CONNECTOR MIN #14 MAX #10 300V BLUE | 100/Inner | 600/Master | 9.862 lbs | YES |
| 739011250 | PRO-TRACE DB CONNECTOR MIN #14 MAX #10 300V YELLOW | 100/Inner | 600/Master | 9.862 lbs | YES |
| ***** ADDITIONAL COLORS AVAILABLE WITH MIN RUN CALL FOR DETAILS ***** | | | | | |

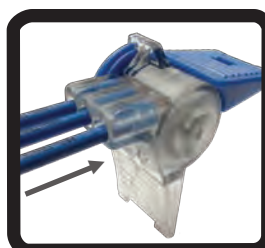
Installation Instructions

STEP #1


Open wings (handles) to 90 degrees position

STEP #2


Strip wires to 5/8". Use the strip guide molded into the connector for reference.

STEP #3


Insert striped wires into connector. The striped ends of the wires should be visible through the clear housing on the back.

STEP #4


Hold wires in place while squeezing wings (handles) together until the latch snaps shut.



Specification Dated: 10.21.2010 09:20:40 CST

PRO-LINE
SAFETY PRODUCTS
A DIVISION OF PRO-PAK IND. INC.

PRO-LINE SAFETY PRODUCTS COMPANY
1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424

PATENT #7335050

PRO-TRACE® DB CONNECTOR

DRYCONN®

WATERPROOF CONNECTORS

For Use with Utility Tracer Lines



Installation Instructions

For use on Solid Conductor Only

1. Strip main and tap conductor to 5/8" (width of lug).
2. Place one stripped conductor (one conductor per side) into side A or B.*
3. Using a screwdriver, tighten set screw until it comes in contact with the solid conductor. Note location of screwdriver and continue tightening the set screw as indicated below:
3/4 Turn #14-#10 Solid Copper
1/4 Turn #14-#10 Steel Core Tracer
4. Repeat steps 1 through 3 for adjacent side.
5. Remove sealant cover and discard.
6. Close housing, aligning conductors until housing lid is fully latched.
7. Do not reuse.

*Use side A for uncut main or tap conductor (Figure 1).



Figure 1

DryConn® Direct Bury Lug Aqua

| Catalog # | Selling Unit |
|-----------|--------------|
| 90220 | Bag of 5 |

Product Specifications and Measurements

Max. Voltage: 50V

Connector Size: 1.138" x 1.285"

Wire Range: #14-10 Solid Copper;

#14-10 Steel Core Tracer Wire

Silicone Sealant Temperature Rating: -45°F to 400°F

Construction

Lug: Tin plated high conductivity aluminum

Screws: Zinc plated steel

Housing: High impact polypropylene

Sealant: Non-hardening viscous dielectric silicone

Weight

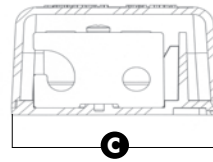
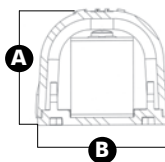
One connector: 61.5g (2.169 oz)

One bag of five: 308.5g (10.881 oz)

Measurements (Inches)

A - 1.138" B - 1.285" C - 1.929"

A - 28.9mm B - 32.6mm C - 49.0mm



C

DryConn® Direct Bury Lug Aqua

Features and Benefits

- Waterproof and corrosion proof
- Pre-filled with dielectric silicone sealant that never hardens
- One piece for easy installation
- Install service line without cutting the main line
- Installs in one minute or less
- User friendly design prevents cuts and handling discomfort
- Manufacturer approved for direct bury
- Wire Range: # 14 - #10 AWG
- Silicone sealant Temperature rating: -45°F to 400°F
- Designed for low voltage tracer splices and cathodic applications up to 50V



Weights and Measures

| Shelfpack Qty. | Part # | Wt. | W | H | L | Cube | Master Qty. | Wt. | W | H | L | Cube | UPC 7-19362 |
|----------------|--------|-----|------|------|---|--------|-------------|------|--------|-------|-----|------|-------------|
| 1 bag | 90220 | 0.7 | 8.25 | 9.25 | 2 | 0.0883 | 10 | 7.44 | 12.125 | 10.13 | 5.5 | 0.39 | 90220-3 |

In the chart above, width, height, and length are represented in inches. Weight is represented as pounds.

DETECTABLE TAPE (5.0 MIL)

Solid Aluminum Foil Core • Virgin Clear Polypropylene Film Laminated Top Structure
Virgin Clear Polyethylene Film Laminated Base Structure • Reverse Printed Polypropylene Structure
Acid, Alkali, Chemical, and Oil Resistant • Direct Burial Rated • Made in the USA



Applications and Information

- **Pro-Line's Detectable Marking Tape** is used for detecting, locating, identifying, and protecting buried utility lines for gas, water, sewer, telecommunication, and electrical markets. The width of tape used, is determined by the size of, and depth at which the underground utility line is buried. The depth at which detectable tape is buried, is determined by the width of the tape used.
- **DETECT:** Aluminum core is detected through means of inductive locating.
- **LOCATE:** Line is located and marked after inductive locating is performed.
- **IDENTIFY:** Utility type is identified by both the APWA color-code and utility legend printed on the marking tape.
- **PROTECT:** Detectable tape works 24 hours a day and year round, even if tape is not inductively located during excavation, the tape provides a "stop-sign" effect that is highly visible.

Standards and References

Pro-Line's Detectable Marking Tape meets or exceeds all applicable ASTM specifications.

- ASTM D2103-08: Standard Specification for Polyethylene Films and Sheeting.
- ASTM D882-09: Standard Test Method for Tensile Properties and Elongation of Thin Plastic Sheeting.
- ASTM D2578-08: Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films.
- ASTM D792-08: Standard Test Methods for Density of Plastics by Displacement.
- ASTM D671-93: Standard Test Method for Flexural Fatigue of Plastics.

Construction

Pro-Line's Detectable Marking Tape consists of a minimum 5.0 mil overall thickness. Construction is 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 solid aluminum foil core and then laminated to a 3.75 mil clear virgin polyethylene film. Tape is printed with our APWA Color-Coded, patented "Diagonally Striped" design with big, bold, black lettering to identify a specific buried utility line.

Specifications

DETECTABLE UNDERGROUND MARKING TAPE

Underground marking tape shall be a (2", 3", 4", 6", or 12" width), detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a **0.35 mil solid aluminum foil core**, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape shall be printed using a diagonally striped design for maximum visibility, and meet the APWA Color-Code standard for identification of buried utilities. Detectable marking tape shall be **Pro-Line Safety Products** or approved equal and made in the USA.

TABLE 1: DETECTABLE TAPE CONSTRUCTION (Polypropylene, Aluminum Foil, and Polyethylene)

| PROPERTY | 2" WIDTH | 3" WIDTH | 4" WIDTH | 6" WIDTH | 12" WIDTH |
|---|------------------|------------------|------------------|------------------|------------------|
| Nominal Overall Thickness | 5.0 mil | 5.0 mil | 5.0 mil | 5.0 mil | 5.0 mil |
| Aluminum Foil Core Thickness | 0.35 mil | 0.35 mil | 0.35 mil | 0.35 mil | 0.35 mil |
| Polyethylene Film Thickness | 3.75 mil | 3.75 mil | 3.75 mil | 3.75 mil | 3.75 mil |
| Polypropylene Film Thickness | 0.80 mil | 0.80 mil | 0.80 mil | 0.80 mil | 0.80 mil |
| Polypropylene Print Method | Reverse Printed | Reverse Printed | Reverse Printed | Reverse Printed | Reverse Printed |
| Print Design #1 (Patented) | Diagonal Striped | Diagonal Striped | Diagonal Striped | Diagonal Striped | Diagonal Striped |
| Print Design #2 (Custom) | Solid Block | Solid Block | Solid Block | Solid Block | Solid Block |
| Print Design #3 (Custom) | Solid Flood | Solid Flood | Solid Flood | Solid Flood | Solid Flood |
| Print Design Color-Code | APWA Color-Code | APWA Color-Code | APWA Color-Code | APWA Color-Code | APWA Color-Code |
| <i>*Diagonal striped design is a PATENTED design of Pro-Line Safety Products that enhances tape visibility for superior protection.</i> | | | | | |
| <i>*Please note that there may be a nominal + or - 10% difference throughout the overall thickness.</i> | | | | | |

TABLE 2: TESTING SPECIFICATIONS (Physical and Mechanical Properties)

| TEST DESCRIPTION | STANDARD | 2" WIDTH | 3" WIDTH | 4" WIDTH | 6" WIDTH | 12" WIDTH |
|------------------------|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Aluminum Foil Core | MFG. SPECS | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade |
| Polyethylene Film | MFG. SPECS | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade |
| Polypropylene Film | MFG. SPECS | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade | Virgin Grade |
| Adhesive Type | MFG. SPECS | AV1257/CA100 | AV1257/CA100 | AV1257/CA100 | AV1257/CA100 | AV1257/CA100 |
| Adhesive Bond Strength | BOILING WATER | 5 hrs W/O Peel | 5 hrs W/O Peel | 5 hrs W/O Peel | 5 hrs W/O Peel | 5 hrs W/O Peel |
| Printed Inks | MFG. SPECS | Chromabond | Chromabond | Chromabond | Chromabond | Chromabond |
| Print Repeat | MFG. SPECS | Varies by Legend | Varies by Legend | Varies by Legend | Varies by Legend | Varies by Legend |
| Coefficient Friction | ASTM D4521-96 | 0.247 Static | 0.247 Static | 0.247 Static | 0.247 Static | 0.247 Static |
| Density | ASTM D792-66 | 1.09 g/cm ³ | 1.09 g/cm ³ | 1.09 g/cm ³ | 1.09 g/cm ³ | 1.09 g/cm ³ |
| Elongation (MD) | ASTM D882-80A | 139% | 139% | 139% | 139% | 139% |
| Elongation (TD) | ASTM D882-80A | 80% | 80% | 80% | 80% | 80% |
| Flexural Fatigue | ASTM D671-93 | Pliable Hand | Pliable Hand | Pliable Hand | Pliable Hand | Pliable Hand |
| Printability | ASTM D2578-08 | 45 Dynes | 45 Dynes | 45 Dynes | 45 Dynes | 45 Dynes |
| Tensile Strength | ASTM D882-09 | 15,000 psi | 15,000 psi | 15,000 psi | 15,000 psi | 15,000 psi |

WEIGHTS, MEASUREMENTS AND PACKAGING

| PRODUCT PART NO. | SIZE (WIDTH) | NOMINAL OVERALL THICKNESS | NOMINAL THICKNESS OF STRUCTURAL MATERIALS | | | RECOMMENDED BURIAL DEPTHS FOR DETECTION | PRODUCT WEIGHT PER ROLL | STANDARD PACKAGING |
|------------------|--------------|---------------------------|---|------------------------|-------------------------|---|-------------------------|--------------------|
| | | | ALUMINUM FOIL THICKNESS | POLYETHYLENE THICKNESS | POLYPROPYLENE THICKNESS | | | |
| 10311XXX3 | 2" x 1000' | 5.0 MIL | 0.35 MIL | 3.75 MIL | 0.80 MIL | 6-9 inches | 4.75 lbs | 9 / CARTON |
| 10312XXX3 | 3" x 1000' | 5.0 MIL | 0.35 MIL | 3.75 MIL | 0.80 MIL | 9-12 inches | 7.13 lbs | 6 / CARTON |
| 10313XXX3 | 4" x 1000' | 5.0 MIL | 0.35 MIL | 3.75 MIL | 0.80 MIL | 12-15 inches | 9.50 lbs | 4 / CARTON |
| 10314XXX3 | 6" x 1000' | 5.0 MIL | 0.35 MIL | 3.75 MIL | 0.80 MIL | 15-18 inches | 14.25 lbs | 3 / CARTON |
| 10316XXX3 | 12" x 1000' | 5.0 MIL | 0.35 MIL | 3.75 MIL | 0.80 MIL | 18-24 inches | 28.50 lbs | 1 / CARTON |

****FOR CUSTOM LEGENDS OR SIZES CALL 800.554.3424****

| PRINT LEGEND | PART # |
|--|--------|
| CAUTION BURIED CHILLED WATER LINE BELOW | 103 |
| CAUTION BURIED GEOTHERMAL LINE BELOW | 128 |
| CAUTION BURIED POTABLE WATER LINE BELOW | 115 |
| CAUTION BURIED WATER LINE BELOW | 125 |
| CAUTION BURIED FORCE MAIN BELOW | 208 |
| CAUTION BURIED FORCE MAIN BELOW | 308 |
| CAUTION BURIED SANITARY SEWER LINE BELOW | 318 |
| CAUTION BURIED SEWER LINE BELOW | 319 |
| CAUTION BURIED STORM DRAIN LINE BELOW | 321 |
| CAUTION BURIED STORM SEWER LINE BELOW | 322 |

| PRINT LEGEND | PART # |
|---|--------|
| CAUTION BURIED CATV LINE BELOW | 402 |
| CAUTION BURIED COMMUNICATION LINE BELOW | 404 |
| CAUTION BURIED FIBER OPTIC CABLE BELOW | 406 |
| CAUTION BURIED TELEPHONE LINE BELOW | 423 |
| CAUTION BURIED NON-POTABLE WATER LINE | 512 |
| CAUTION BURIED RECLAIMED WATER LINE BELOW | 517 |
| CAUTION BURIED ELECTRIC LINE BELOW | 605 |
| CAUTION BURIED HIGH VOLTAGE LINE BELOW | 610 |
| CAUTION BURIED GAS LINE BELOW | 809 |
| CAUTION BURIED PIPELINE BELOW | 814 |



PRO-LINE SAFETY PRODUCTS COMPANY
 1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424



NON-DETECTABLE MARKING TAPE

4.0 Mil Virgin Pigmented Polyethylene Film • Rated for Direct Burial for Marking Underground Utility Lines
APWA Color-Coded for Representation and Visibility of Buried Utility Line

DESCRIPTION

PRO-LINE® Non-Detectable Marking Tape is used primarily for marking and underground utility structures. **PRO-LINE®** Non-Detectable Marking Tape serves three simple functions: Locate, Identify, and Protect. Non-Detectable Tape is usually the last category of a utility structures design and installation...maintenance and immediate location and identification. **PRO-LINE®** Non-Detectable Marking Tape is APWA Color-Coded to identify the type of utility that is buried below. Non-Detectable Marking Tape is also printed to identify what type of utility is buried below.



"Helping to Protect Underground Investments and the General Public Since 1992!"

STANDARDS & REFERENCES

PRO-LINE® Detectable Marking Tape meets or exceeds all applicable ASTM specifications.

- ASTM D2103-05 (Standard Specification for Polyethylene Film and Sheeting)
- ASTM D882-02 (Standard Test Method for Tensile Properties of Thin Plastic Sheeting)
- ASTM D882-75B (Standard Test Method for Tensile Properties of Thin Plastic Sheeting for Elongation)
- ASTM D2578 (Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films)

CONSTRUCTION

- **PRO-LINE®** Non-Detectable Marking Tape consists of a minimum 4.0 mil overall thickness, manufactured with virgin polyethylene with color pigments added at point of film extrusion to identify underground utility structures based on the APWA Color-Code .
- **PRO-LINE®** Non-Detectable Marking Tape is printed with big, bold, black lettering to identify what type of utility line is buried below.

| TEST DATA | METHOD | VALUE |
|-------------------|------------------|------------------|
| Thickness | ASTM D2103-05 | 4.0 mil |
| Tensile Strength | ASTM D882-02 | 2,750 psi |
| Elongation | ASTM D882-75B | 500% |
| Film Pigmentation | APWA Color-Coded | APWA Color-Coded |
| Message Repeat | Mfg. Specs. | Varies by Legend |
| Printed Inks | Mfg. Specs. | Flexo 9605 |
| Printability | ASTM D2578 | 45 Dynes |

****THIS SPEC COVERS WIDTHS OF: 2", 3", 4", 6", 12" and 24" Non-Detectable Marking Tape**

NON-DETECTABLE MARKING TAPE (6 MIL)

6.0 Mil Virgin Pigmented Polyethylene Film • Rated for Direct Burial for Marking Underground Utility Lines
 APWA Color-Coded for Representation and Visibility of Buried Utility Line

DESCRIPTION

PRO-LINE® Non-Detectable Marking Tape is used primarily for marking and underground utility structures. **PRO-LINE®** Non-Detectable Marking Tape serves three simple functions: Locate, Identify, and Protect. Non-Detectable Tape is usually the last category of a utility structures design and installation...maintenance and immediate location and identification. **PRO-LINE®** Non-Detectable Marking Tape is APWA Color-Coded to identify the type of utility that is buried below. Non-Detectable Marking Tape is also printed to identify what type of utility is buried below.



“Helping to Protect Underground Investments and the General Public Since 1992!”

STANDARDS & REFERENCES

PRO-LINE® Detectable Marking Tape meets or exceeds all applicable ASTM specifications.

- ASTM D2103-05 (Standard Specification for Polyethylene Film and Sheeting)
- ASTM D882-02 (Standard Test Method for Tensile Properties of Thin Plastic Sheeting)
- ASTM D882-75B (Standard Test Method for Tensile Properties of Thin Plastic Sheeting for Elongation)
- ASTM D2578 (Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films)

CONSTRUCTION

- **PRO-LINE®** Non-Detectable Marking Tape consists of a minimum 6.0 mil overall thickness, manufactured with virgin polyethylene with color pigments added at point of film extrusion to identify underground utility structures based on the APWA Color-Code .
- **PRO-LINE®** Non-Detectable Marking Tape is printed with big, bold, black lettering to identify what type of utility line is buried below.


| TEST DATA | METHOD | VALUE |
|-------------------|------------------|------------------|
| Thickness | ASTM D2103-05 | 6.0 mil |
| Tensile Strength | ASTM D882-02 | 4,100 psi |
| Elongation | ASTM D882-75B | 700% |
| Film Pigmentation | APWA Color-Coded | APWA Color-Coded |
| Message Repeat | Mfg. Specs. | Varies by Legend |
| Printed Inks | Mfg. Specs. | Flexo 9605 |
| Printability | ASTM D2578 | 45 Dynes |

****THIS SPEC COVERS WIDTHS OF: 2", 3", 4", 6", 12" and 24" Non-Detectable Marking Tape**

Krylon Industrial Quick-Mark™ Inverted Marking Paint uses a special, high-solids formulation for bold, bright, visible markings on virtually any surface - gravel, asphalt, soil, grass, stone, concrete, and many more. This paint features one-coat coverage and a non-clogging spray tip for consistency and efficiency. The Spray-Thru™ cap allows for inverted spraying ease. Choose from a wide variety of water-based colors in 20 oz. cans (17 oz. net weight).



WATER-BASED APWA COLORS

-  Clear (S03500)
-  APWA Utility Yellow (S03801)
-  APWA Brilliant White (S03901)
-  APWA Blue (S03903)
-  APWA Green (S03904)
-  APWA Orange (S03905)
-  APWA Brilliant Red (S03911)

WATER-BASED FLUORESCENT COLORS








-  Fluorescent Safety Red (S03610)
-  Fluorescent Pink (S03612)
-  Fluorescent Caution Blue (S03620)
-  Fluorescent Safety Green (S03630)
-  Fluorescent Red/Orange (S03650)
-  Fluorescent Orange (S03700)
-  Fluorescent Purple (S03715)





Seymour Inverted Marking Paint is specially formulated for use in the inverted position to produce vivid lines that are safe on grass. Meets APWA Color-Code standards making it the ideal product to use for marking underground utility lines. Great for buried water, sewer, gas, electric and communication lines. Solvent-based formulations are available upon request. Choose from a wide variety of water-based colors in 20 oz. cans (17 oz. net weight).



WATER-BASED APWA COLORS

-  Clear (20-631)
-  Utility Yellow (20-678)
-  White (20-652)
-  Precaution Blue (20-653)
-  Safety Green (20-655)
-  Alert Orange (20-670)
-  Safety Red (20-671)

WATER-BASED FLUORESCENT COLORS

-  Red Fluorescent (20-654)
-  Pink Fluorescent (20-679)
-  Blue Fluorescent (20-669)
-  Green Fluorescent (20-668)
-  Red / Orange Fluorescent (20-658)
-  Orange Fluorescent (20-657)
-  Purple (20-680)



Eliminate the annoyance of marking paint on your hands by using either Krylon or Seymour Marking Wands. There are two styles available - the 12" spotter hand-held wand or the back-saving 34" wheeler hand-held wand. Both styles are constructed of durable, rugged plastic and lightweight steel with a comfortable pistol grip for easy handling and marking.

KRYLON INVERTED MARKING WANDS & GUNS

SEYMOUR INVERTED MARKING WANDS & GUNS



UTILITY MARKING FLAGS



Pro-Line's high-quality, plain and printed marking flags are ideal for above ground marking in a variety of industries. From utility construction to line locating, pet containment to forestry applications, landscaping to lawn care, these flags ensure constant communication and long lasting visibility for your project.

STANDARD PE MATERIAL COLORS



STANDARD GLOW PE MATERIAL COLORS



- APWA color-coded
- Bright Ink for high visibility
- Heat welded to wire staff
- Made from 3 mil polyethylene
- Available in both wire and plastic staffs
- Wind and tear resistant for performance
- Private labeling and packaging available

UTILITY MARKING POSTS



Reduce your exposure to accidental dig-ins and service interruptions. Flexible fiberglass reinforced composite markers from Pro-Line Safety protects your valuable underground investment by clearly and quickly identifying pipelines, valves and other underground utilities. Available in a variety of colors and sizes to meet your requirements. Custom or standard warning message, reflective sheeting or lettering and numbering are also available.

- APWA color coded
- Bright pigmentation for easy identification
- Long lasting material colors
- Use for marking underground utilities
- Made from flexible fiberglass
- Post decals easily identify utility lines
- Custom decal messages are available
- Prevents dig-ins and service interruptions

PRECOILED PIPE MARKERS



These wrap around markers easily snap around the pipe, cable, duct or tubing. Pro-Line pipe markers are made of calendared vinyl with carbon pigment and treated with UV inhibitors. Wrap around precoiled pipe markers are user friendly because they do not need cable ties, adhesives, and require virtually no time to install. Custom printing and legends available to your specification.

| SIZE | CABLE DIAMETER |
|------|----------------|
| 2" | ¼" to ½" |
| 4" | ½" to 1" |
| 7" | 1" to 2" |

| SIZE | CABLE DIAMETER |
|------|----------------|
| 8" | 2" to 3" |
| 10" | 3" to 4" |

POLYESTER MESH VESTS

Pro-Line Safety's economy line of safety vests combine value with safety. Soft mesh with flexibility and ventilation is great for warmer weather and is not abrasive to the skin. These lightweight polyester mesh vests are available in a highly visible orange or lime color with or without 3M™ Scotchlite™ reflective stripes. All vests can be screen printed.

- Available in high visibility orange and lime
- Reflective stripes available: ¾", 1", 1½", and 2"
- Black cloth binding
- Elastic side straps are ¾" x 8"
- Front hook and loop closures are ¾" x 1½"
- 3M™ Scotchlite™ reflective material



PVC COATED POLYESTER MESH VESTS

Pro-Line Safety's vinyl coated knit mesh is a tougher and more durable material. It is heavy-duty yet flexible for maximum durability. These vinyl coated vests are available in highly visible orange and lime. Other colors available are blue, green, brown and black. Vests are available with or without 3M™ Scotchlite™ reflective stripes for any application.

- Available in high visibility orange and lime
- Reflective stripes available: ¾", 1", 1½", and 2"
- Black cloth binding
- Elastic side straps are ¾" x 8"
- Front hook and loop closures are ¾" x 1½"
- Screen printing available
- 3M™ Scotchlite™ reflective material



CUSTOM IMPRINTED VESTS

Pro-Line Safety's custom imprinted safety vests are available in our soft polyester mesh or vinyl coated polyester mesh material. These durable safety vests are screen printed with company names, logos, or any messages on 4" x 18" 3M™ Scotchlite™ reflective panels or directly on the vest itself. These custom vests are great for public safety, emergency services, traffic control markets, and for police and fire departments.

- Available in orange, lime, blue, brown, green, and black
- 6 oz. vinyl coated polyester mesh
- 1" vertical reflective stripes
- 4" x 18" reflective panels: lime or silver
- Panels silk-screened with black ink
- Black cloth binding
- Elastic side straps are ¾" x 8"
- Front hook and loop closures are ¾" x 1½"
- Poncho style vests available
- Bold black printed letters
- 3M™ Scotchlite™ reflective material



ANSI CLASS 2

Pro-line's ANSI / ISEA Class 2 safety vests provide superior visibility for wearers by the additional coverage of the torso. Class 2 vests can be customized with screen printing on 3M™ reflective panels or directly on the vests. Additional options include: pockets, adjustable side closures, reflective designs, tearaway styles, custom sizes, and more.

- High Visibility orange or lime
- 100% solid or mesh polyester
- 2" and 4½" wide reflective available
- Black, orange, or lime cloth binding
- Velcro or zipper front closure
- Available in sizes: M - 6XL
- 3M™ Scotchlite™ reflective material



ANSI / ISEA 107-2004 REQUIREMENTS

Pro-Line Safety Products ANSI apparel are all made of tested and certified materials which meet or exceed current specifications set forth by the ANSI / ISEA 107-2004 Standard. The American Standard for High Visibility Safety Apparel is published and distributed to all areas of federal, state and local governments as a guideline for high visibility safety apparel. ANSI / ISEA 107-2004 has been updated from the original standard set back in 1999 and will be reviewed and evaluated every five years. The standard represents what the industry views as necessary to adequately protect workers from the hazards associated with working conditions in low visibility environments.

| ANSI / ISEA | Performance Class 3 | Performance Class 2 | Performance Class 1 | Performance Class E | Headwear |
|--|--|---|---|---|--|
| Background Material | 0.80 m ² (1240 in ²) | 0.50 m ² (775 in ²) | 0.14 m ² (217 in ²) | 0.30 m ² (465 in ²) | 0.05 m ² (78 in ²) |
| Retroreflective or combined-performance material with background material | 0.20 m ² (310 in ²) | 0.13 m ² (201 in ²) | 0.10 m ² (155 in ²) | 0.07 m ² (108 in ²) | 0.0065 m ² (10 in ²) |
| Photometric Performance | Level 2 or Level 1 | Level 2 or Level 1 | Level 2 or Level 1 | Level 2 or Level 1 | Level 2 |
| Combined-Performance material used without background material | | | 0.20 m ² (310 in ²) | | 0.05 m ² (78 in ²) |
| Photometric Performance | | | Level 2 or Level 1 | | Level 2 or Level 1 |

ANSI CLASS 3

Pro-Line Safety's ANSI/ISEA Class 3 safety vests offer greater visibility to the wearer with increased background material utilized along with increased retroreflective or combined performance material. Additionally, visibility is enhanced beyond Class 2 vests by the addition of background and reflective material to the arms and legs. Regardless of the area of materials used, a sleeveless garment or vest alone shall not be considered Class 3.

- High visibility orange or lime
- 100% solid or mesh polyester
- 2" and wide reflective available
- Black, orange, and lime cloth binding
- Velcro or zipper front closure
- Available in sizes: M - 6XL
- 3M™ Scotchlite™ reflective material



TYPE THHN

600 Volts • Copper Conductor
Thermoplastic Insulation / Nylon Sheath
Heat, Moisture, Gasoline, and Oil Resistant
Sizes 14 Through 1 AWG Rated VW-1

APPLICATIONS

Pro-Line Safety's Type THHN or THWN-2 conductors are primarily used in conduit and cable trays for services, feeders, and branch circuits in commercial or industrial applications as specified in the National Electrical Code, as well as underground tracer wire to effectively locate and detect underground utility lines through means of conductive location. When used as Type THHN, conductor is suitable for use in dry locations at temperatures not to exceed 90°C. When used as Type THWN-2, conductor is suitable for use in wet or dry locations at temperatures not to exceed 90°C or not to exceed 75°C when exposed to oil or coolant. When used as Type MTW, conductor is suitable for use in wet locations or when exposed to oil or coolant at temperatures not to exceed 60°C or dry locations at temperatures not to exceed 90°C (with ampacity limited to that for 75°C conductor temperature per NFPA 79). Conductor temperatures not to exceed 105°C in dry locations when rated AWM and used as appliance wiring material. Voltage for all applications is 600 volts.

SPECIFICATIONS

Pro-Line Safety's Type THHN or THWN-2 or MTW meets or exceeds all applicable ASTM specifications, UL Standard 83, UL Standard 1063 (MTW), Federal Specification A-A-59544, and requirements of the National Electrical Code.

CONSTRUCTION

Pro-Line Safety's Type THHN or THWN-2 or MTW copper conductors are annealed (soft) copper, insulated with a tough heat and moisture resistant polyvinyl chloride (PVC), over which a nylon (polyamide) or UL-Listed equal jacket is applied. Available in black, white, red, blue, green, yellow, brown, orange, purple. Some colors standard, some subject to economic order quantity.

WEIGHTS, MEASUREMENTS AND PACKAGING

| CONDUCTOR | | INSULATION THICKNESS (mils) | JACKET THICKNESS (mils) | NOMINAL O.D. (mils) | | APPROX. NET WEIGHT PER 1000 FT. (lbs) | | ALLOWABLE AMPACITIES † | | | STANDARD PACKAGING |
|--|-------------------|-----------------------------|-------------------------|---------------------|------|---------------------------------------|------|------------------------|------|------|--------------------|
| SIZE (AWG or kcmil) | NUMBER OF STRANDS | | | SOL. | STR. | SOL. | STR. | 60°C | 75°C | 90°C | |
| | | | | | | | | | | | |
| TYPE THHN or THWN-2 or MTW (also AWM) SPECIFICATIONS | | | | | | | | | | | |
| 14 AWG | 1 or 19 Str | 15 | 4 | 102 | 109 | 15 | 16 | 15 | 15 | 15 | 500S / 2500S |
| 12 AWG | 1 or 19 Str | 15 | 4 | 119 | 128 | 23 | 24 | 20 | 20 | 20 | 500S / 2500S |
| 10 AWG | 1 or 19 Str | 20 | 4 | 150 | 161 | 37 | 38 | 30 | 30 | 30 | 500S / 2500S |
| 8 AWG | 19 Str | 30 | 5 | -- | 213 | -- | 62 | 40 | 50 | 55 | 500S |
| 6 AWG | 19 Str | 30 | 5 | -- | 249 | -- | 95 | 55 | 65 | 75 | 500S / 1000S |
| 4 AWG | 19 Str | 40 | 6 | -- | 318 | -- | 152 | 70 | 85 | 95 | 500R |
| 3 AWG | 19 Str | 40 | 6 | -- | 346 | -- | 188 | 85 | 100 | 110 | 500R / 1000R |
| 2 AWG | 19 Str | 40 | 6 | -- | 378 | -- | 234 | 95 | 115 | 130 | 500R |
| 1 AWG | 19 Str | 50 | 7 | -- | 435 | -- | 299 | 110 | 130 | 150 | 500R / 1000R |
| 1/0 AWG | 19 Str | 50 | 7 | -- | 474 | -- | 371 | 125 | 150 | 170 | 500R / 1000R |
| 2/0 AWG | 19 Str | 50 | 7 | -- | 518 | -- | 461 | 145 | 175 | 195 | 500R / 1000R |
| 3/0 AWG | 19 Str | 50 | 7 | -- | 568 | -- | 574 | 165 | 200 | 225 | 500R / 1000R |
| 4/0 AWG | 19 Str | 50 | 7 | -- | 624 | -- | 717 | 195 | 230 | 260 | 500R / 1000R |
| 250 MCM | 37 Str | 60 | 8 | -- | 694 | -- | 850 | 215 | 255 | 290 | 500R / 1000R |
| 300 MCM | 37 Str | 60 | 8 | -- | 747 | -- | 1011 | 240 | 285 | 320 | 500R / 1000R |
| 350 MCM | 37 Str | 60 | 8 | -- | 797 | -- | 1173 | 260 | 310 | 350 | 500R / 1000R |
| 400 MCM | 37 Str | 60 | 8 | -- | 842 | -- | 1333 | 280 | 335 | 380 | 500R / 1000R |
| 500 MCM | 37 Str | 60 | 8 | -- | 926 | -- | 1653 | 320 | 380 | 430 | 500R / 1000R |
| 600 MCM | 61 Str | 70 | 9 | -- | 1024 | -- | 1985 | 355 | 420 | 475 | 500R |
| 750 MCM | 61 Str | 70 | 9 | -- | 1126 | -- | 2462 | 400 | 475 | 535 | 500R |
| 1000 MCM | 61 Str | 70 | 9 | -- | 1275 | -- | 3254 | 455 | 545 | 615 | 500R |
| S = Spool R = Reel | | | | | | | | | | | |

S = Spool R = Reel

APPLICATIONS

Pro-Line Safety's Type PE wire conductors are primarily used for irrigation wiring, cathodic protection cable, golf course sprinkler wire, and tracer wire applications. Type PE is insulated with low density, high molecular weight polyethylene (HMWPE). HMWPE is a rugged and durable material considered excellent for moisture and abrasion resistance. PE wire conductors are suitable for direct burial use in wet or dry locations at temperatures not to exceed 75°C. Voltage for all applications is 600 volt.

SPECIFICATIONS

Pro-Line Safety's Type PE wire meets or exceeds all applicable ASTM specifications, UL Standards, Federal Specifications, and requirements of the National Electrical Code.

CONSTRUCTION

Pro-Line Safety's Type PE copper conductors are annealed (soft) copper or hard-drawn, insulated with a excellent heat and moisture resistant high molecular weight polyethylene material. Available in black, white, red, blue, green, yellow, brown, orange, purple. Some colors standard, some subject to economic order quantity.

WEIGHTS, MEASUREMENTS AND PACKAGING

| CONDUCTOR | | INSULATION THICKNESS (mils) | | NOMINAL O.D. (mils) | | APPROX. NET WEIGHT PER 1000 FT. (lbs) | | ALLOWABLE AMPACITIES † | | | STANDARD PACKAGING |
|---|-------------------|-----------------------------|-------|---------------------|-------|---------------------------------------|-------|------------------------|------|------|----------------------|
| SIZE (AWG) | NUMBER OF STRANDS | | | | | | | | | | |
| | | PE 30 | PE 45 | PE 30 | PE 45 | PE 30 | PE 45 | 60°C | 75°C | 90°C | |
| TYPE SPRINKLER SYSTEM WIRE (PE30 or PE45) (also TRACER WIRE) SPECIFICATIONS | | | | | | | | | | | |
| 18 AWG | Solid | 30 | 45 | 102 | 132 | 8 | 11 | 6 | 6 | 6 | 500S / 2500S |
| 16 AWG | Solid | 30 | 45 | 112 | 142 | 11 | 15 | 8 | 8 | 8 | 500S / 2500S |
| 14 AWG | Solid | 30 | 45 | 126 | 156 | 17 | 20 | 15 | 15 | 15 | 500S / 2500S |
| 12 AWG | Solid | 30 | 45 | 142 | 172 | 24 | 28 | 20 | 20 | 20 | 500S / 2500S |
| 10 AWG | Solid | 30 | 45 | 164 | 194 | 37 | 41 | 30 | 30 | 30 | 500S / 2500S |
| 8 AWG | Solid | 30 | 45 | 206 | 236 | 57 | 60 | 40 | 50 | 55 | 500S |
| CATHODIC PROTECTION CABLE SPECIFICATIONS | | | | | | | | | | | |
| 14 AWG | 7 Str | 110 | | 294 | | 40 | | 15 | 15 | 15 | 500S / 2500S / 5000R |
| 12 AWG | 7 Str | 110 | | 309 | | 48 | | 20 | 20 | 20 | 500S / 2500S / 3000R |
| 10 AWG | 7 Str | 110 | | 333 | | 80 | | 30 | 30 | 30 | 500S / 2500R / 5000R |
| 8 AWG | 7 Str | 110 | | 362 | | 93 | | 40 | 50 | 55 | 500S / 1000R / 6000R |
| 6 AWG | 7 Str | 110 | | 398 | | 135 | | 55 | 65 | 75 | 500S / 1000R / 5000R |
| 4 AWG | 7 Str | 110 | | 445 | | 190 | | 70 | 85 | 95 | 500S / 2500R / 4500R |
| 2 AWG | 7 Str | 110 | | 503 | | 275 | | 95 | 115 | 130 | 500R / 2500R / 3500R |
| 1 AWG | 19 Str | 125 | | 572 | | 360 | | 110 | 130 | 150 | 500R / 2500R |
| 1/0 AWG | 19 Str | 125 | | 612 | | 435 | | 125 | 150 | 170 | 500R / 2250R |
| 2/0 AWG | 19 Str | 125 | | 655 | | 540 | | 145 | 175 | 195 | 500R / 2000R |
| 4/0 AWG | 19 Str | 125 | | 762 | | 800 | | 195 | 230 | 260 | 500R / 1500R |
| S = Spool R = Reel | | | | | | | | | | | |

S = Spool R = Reel

RECOMMENDED SAMPLE SPECIFICATIONS

When used as tracer wire or sprinkler wire, conductors shall be UL-listed Type THHN, UF, or PE wire, suitable for operation at 600 volts or less in wet or dry locations, including direct burial in earth. Conductors shall be annealed (soft) copper, with a polyethylene (PE) insulation or polyvinyl chloride insulation (that includes a nylon-polyamide jacket for Type THHN). Tracer wire or sprinkler wire to be Pro-Line Safety Products or equal.