

PRO-TRACE® COPPER PE45

TRACER-WIRE

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 • UL Listed • Made in the USA



Applications and Information

- **PRO-TRACE® COPPER PE45** is used for tracer wire applications to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- 45 mil, High-Density, HMWPE insulation provides excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. Provides superior long term aging performance with excellent environmental and thermal stress-cracking resistance.
- Available in 30 mil (30v) and 45 mil (600v) insulation for desired level of protection, but we only recommended 45 mil version when boring for extra abrasion protection.
- Environmentally friendly and RoHS compliant
- **Recommended:** Tracer-Lock® Connector #TL-LUG-SS. Is performs Main-to-Main or Main-to-Service connections without cutting or stripping, saving time and labor costs.
- **Recommended:** Pro-Trace® Grounding Mag Rod #PTANODE12. It provides far-end grounding to utilize 512 Hz or 8 kHz with pin-point accuracy and corrosion protection.

Standards and References

PRO-TRACE® COPPER PE45 meets or exceeds all applicable UL Standards, ASTM specifications, 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.

Construction

PRO-TRACE® COPPER PE45 is made from oxygen free copper cathode formed into copper rod. Copper rod is pulled thru a series of drawing dies to achieve conductor diameter. Conductor then undergoes a heat treating process (annealing), resulting in soft annealed copper. The process above is what determines properties like break load and flexibility.

The next process is extrusion of the insulation, high-density, high molecular weight polyethylene (HMW-HDPE) spark test 7,500 VAC. HDPE is considered the best tracer wire insulation due to cost, smoothness, and abrasion protection. The final process is processing insulated wire onto reels.

Specification Example

Tracer wire shall be a **#12 AWG SOLID PRO-TRACE COPPER PE45**. Tracer wire shall consist of a soft-drawn, oxygen free copper conductor with a minimum break load of 197 lbs. 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 600 volts and RoHS compliant. Tracer wire shall be as manufactured by Pro-Line Safety Products or approved equal and made in the USA.

Tracer-Lock Connectors shall be used for connecting Main-to-Main or Main-to-Service (Part #: TL-LUG-SS) to ensure reliable installation, electrical continuity throughout the tracer wire system and protection from corrosion.

Specification Updated: 4.14.2020 (PRO-TRACE COPPER PE45-v1)

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

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

PRODUCT PART NO.	AWG SIZE / PRODUCT DESCRIPTION	BREAK STRENGTH (lbs)	CONDUCTOR O.D. (Nominal)	FINISHED O.D. (Nominal)	INSULATION THICKNESS (Nominal)	PRODUCT WEIGHT LBS/1000'	STANDARD LENGTHS
(SOLID) PRO-TRACE® COPPER PE45 TRACER WIRE (45 mil/600V)							
74103.XXXX	14 AWG SOLID COPPER PE45	124 lbs	0.0641"	0.155"	0.045"	19.0	500', 1000', 2500', 5000'
74104.XXXX	12 AWG SOLID COPPER PE45	197 lbs	0.0808"	0.171"	0.045"	27.0	500', 1000', 2500', 5000'
74105.XXXX	10 AWG SOLID COPPER PE45	313 lbs	0.1019"	0.192"	0.045"	40.0	500', 1000', 2500', 5000'
74106.XXXX	8 AWG SOLID COPPER PE45	479 lbs	0.1285"	0.219"	0.045"	66.0	500', 1000', 2500', 5000'
(STRANDED) PRO-TRACE® COPPER PE45 TRACER WIRE (45 mil/600V)							
74108.XXXX	14-7 AWG STR COPPER PE45	124 lbs	0.0726"	0.163"	0.045"	20.0	500', 1000', 2500', 5000'
74110.XXXX	12-7 AWG STR COPPER PE45	197 lbs	0.0915"	0.182"	0.045"	28.0	500', 1000', 2500', 5000'
74112.XXXX	10-7 AWG STR COPPER PE45	313 lbs	0.1155"	0.206"	0.045"	41.0	500', 1000', 2500', 5000'
74114.XXXX	8-7 AWG STR COPPER PE45	479 lbs	0.1458"	0.236"	0.045"	67.0	500', 1000', 2500', 5000'

(.XXXX) INSULATION COLOR AND REEL SIZE									
PART# (.XXXX)	BLACK	BLUE	BROWN	GREEN	ORANGE	PURPLE	RED	WHITE	YELLOW
500' REEL	0132	0232	0332	0532	0632	0832	0932	1132	1232
1000' REEL	0141	0241	0341	0541	0641	0841	0941	1141	1241
2500' REEL	0147	0247	0347	0547	0647	0847	0947	1147	1247
5000' REEL	0153	0253	0353	0553	0653	0853	0953	1153	1453

*Custom lengths are available upon request **Some sizes, colors, and lengths may be subject to mins

(APWA) UNIFORM COLOR CODE	
POTABLE WATER	
SEWER & DRAINAGE	
RECLAIMED WATER	
GAS & PETROLEUM	
COMMUNICATION	
ELECTRIC & POWER	



Specification Dated: 4.14.2020 (PRO-TRACE COPPER PE45-v1)

PRO-LINE SAFETY PRODUCTS

a PRESCO company

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