

**PRO-TRACE® HF-CCS PE30/PE45****TRACER-WIRE**

Tracer Wire • High-Flex Copper Clad Steel (HF-CCS) • 21% IACS Conductivity • Corrosion Resistant • 30 or 600 Volts High-Density, High Molecular Weight Polyethylene (HMWPE-HDPE) Insulation • Moisture, Chemical, and Oil Resistant Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • Buy American / AIS Compliant

“PRO-TRACE® HF-CCS -- FLEXIBILITY & STRENGTH -- THE STANDARD FOR OPEN-TRENCH”



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## Applications and Information

- **PRO-TRACE® HF-CCS** is used for tracer wire applications to conductively locate buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- **PRO-TRACE® HF-CCS** is designed to embody the flexibility, memory, and feel of copper. It also has a 50% higher break-load, minimizing damage during installation and while in service. Equal to copper in signal tracing performance.
- For installation in open-trench, plow-in, or inside conduit using 1 wire.
- Available in 30 mil (30v) and 45 mil (600v) insulation for desired level of protection.
- Equal to copper in signal performance, lower in cost, and great price stability.
- RoHS Compliant and works with connectors you already use.

## Standards and References

**PRO-TRACE® HF-CCS** meets or exceeds all applicable UL Standards, 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
- UL 2989 [not listed]: in accordance with USPSHTC Section 307.8.1, 18 AWG tracer wire for water service lines.

## Construction

**PRO-TRACE® HF-CCS** 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** uses a 30 mil or 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. All insulation spark tested @5000 VAC (30 mil) and @7500 VAC (45 mil).

## 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 rated break load of 302 lbs (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: 4.14.2020 (HF-CCS Tracer Wire)

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

[www.prolinesafety.com](http://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
Break Strength	70 lbs	111 lbs	177 lbs	282 lbs	448 lbs	713 lbs
Elongation (ASTM B869)	≥ 15.0%	≥ 15.0%	≥ 15.0%	≥ 15.0%	≥ 15.0%	≥ 15.0%
Copper Thickness (% of Diameter)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
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)**

PRO-TRACE® -- 12 AWG SOLID HF-CCS -- 30 MIL HDPE -- 30V -- DIRECT BURIAL TRACER WIRE -- OPEN TRENCH -- CAUTION GAS LINE BELOW *DATE & TRACE* SEQ FT	
Density @ 23°C	ASTM D1505 0.945 g/cm <sup>3</sup>
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 <sup>15</sup> 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
<b>PRO-TRACE® HF-CCS PE30 TRACER WIRE (30 mil/30V) -- OPEN TRENCH, PLOW IN, INSIDE CONDUIT</b>							
74418.XXXX	18 AWG SOLID HF-CCS PE30	70 lbs	0.0403"	0.101"	0.030"	7.0	500', 1000', 2500', 5000'
74416.XXXX	16 AWG SOLID HF-CCS PE30	111 lbs	0.0508"	0.111"	0.030"	10.0	500', 1000', 2500', 5000'
74411.XXXX	14 AWG SOLID HF-CCS PE30	177 lbs	0.0641"	0.124"	0.030"	15.0	500', 1000', 2500', 5000'
74412.XXXX	12 AWG SOLID HF-CCS PE30	282 lbs	0.0808"	0.141"	0.030"	22.5	500', 1000', 2500', 5000'
74413.XXXX	10 AWG SOLID HF-CCS PE30	448 lbs	0.1019"	0.162"	0.030"	34.0	500', 1000', 2500', 5000'
74414.XXXX	8 AWG SOLID HF-CCS PE30	713 lbs	0.1285"	0.189"	0.030"	52.0	500', 1000', 2500', 5000'
<b>PRO-TRACE® HF-CCS PE45 TRACER WIRE (45 mil/600V) -- OPEN TRENCH, PLOW IN, INSIDE CONDUIT</b>							
74448.XXXX	18 AWG SOLID HF-CCS PE45	70 lbs	0.0403"	0.131"	0.045"	9.5	500', 1000', 2500', 5000'
74446.XXXX	16 AWG SOLID HF-CCS PE45	111 lbs	0.0508"	0.141"	0.045"	12.5	500', 1000', 2500', 5000'
74441.XXXX	14 AWG SOLID HF-CCS PE45	177 lbs	0.0641"	0.154"	0.045"	17.5	500', 1000', 2500', 5000'
74442.XXXX	12 AWG SOLID HF-CCS PE45	282 lbs	0.0808"	0.171"	0.045"	26.0	500', 1000', 2500', 5000'
74443.XXXX	10 AWG SOLID HF-CCS PE45	448 lbs	0.1019"	0.192"	0.045"	37.0	500', 1000', 2500', 5000'
74444.XXXX	8 AWG SOLID HF-CCS PE45	713 lbs	0.1285"	0.219"	0.045"	55.0	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



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**PRO-LINE**  
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