

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

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 BB69)	≥ 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 ¹³ 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 ***

UNDERSTANDING YOUR TRACER WIRE SELECTION

AWG SIZE	MEASUREMENTS			COPPER WIRE		PROTRACE HF-CCS		PROTRACE HS-CCS		PROTRACE HDD-CCS		STAINLESS STEEL	
	O.D.	CROSS SECTION		TENSILE	BREAKLOAD	TENSILE	BREAKLOAD	TENSILE	BREAKLOAD	TENSILE	BREAKLOAD	TENSILE	BREAKLOAD
	in	cmils	in ²	psi	lbs	psi	lbs	psi	lbs	psi	lbs	psi	lbs
18 AWG	0.0403	1,624	0.001280	38,500	49	55,000	70	87,500	111	-----	-----	-----	-----
16 AWG	0.0508	2,581	0.002030	38,500	78	55,000	111	87,500	177	-----	-----	-----	-----
14 AWG	0.0641	4,109	0.003230	38,500	124	55,000	177	87,500	282	225,000	725	-----	-----
12 AWG	0.0808	6,529	0.005130	38,500	197	55,000	282	87,500	452	260,000	1,330	179,300	920
10 AWG	0.1019	10,384	0.008155	38,500	313	55,000	448	84,000	685	238,000	1,940	154,500	1,260
8 AWG	0.1285	16,512	0.012970	37,000	479	55,000	713	75,000	972	215,000	2,785	131,100	1,700
6 AWG	0.1620	26,244	0.020610	37,000	762	-----	-----	-----	-----	252,000	4,705	116,450	2,400
PRODUCT STATUS				↑ ACTIVE ↑		↑ ACTIVE ↑		↑ ACTIVE ↑		↑ ACTIVE ↑		↑ ACTIVE ↑	

TRACER WIRE TYPE →	COPPER WIRE	PROTRACE HF-CCS (HIGH-FLEX)	PROTRACE HS-CCS (HIGH-STRENGTH)	PROTRACE HDD-CCS (EXTRA HIGH-STRENGTH)	STAINLESS STEEL (Type 304)
APPLICATIONS	OPEN TRENCH DIRECTIONAL BORING	OPEN TRENCH DIRECTIONAL BORING	OPEN TRENCH DIRECTIONAL BORING	PIPE BURSTING DIRECTIONAL BORING	PIPE BURSTING DIRECTIONAL BORING
ADVANTAGES	<ul style="list-style-type: none"> *Excellent signal strength *Corrosion resistant *Flexible 	<ul style="list-style-type: none"> *43% stronger than Copper *Equal signal strength *Rated for direct burial *Corrosion resistant *Considerably cheaper *Stable Pricing *No theft value *Flexible like solid copper *Virtually no spring release 	<ul style="list-style-type: none"> *227% stronger than Copper *Equal signal strength *Rated for direct burial *Corrosion resistant *Considerably cheaper *Stable Pricing *No theft value 	<ul style="list-style-type: none"> *700% stronger than Copper *Equal signal strength *Rated for direct burial *Corrosion resistant *Considerably cheaper *Stable Pricing *No theft value *Only 1 wire needed *Eliminates re-boring *The strongest wire period 	<ul style="list-style-type: none"> *400% stronger than Copper *Very Flexible *Rated for direct burial *Corrosion resistant *Stable Pricing *Only 1 wire needed *Eliminates re-boring
DISADVANTAGES	<ul style="list-style-type: none"> *Extremely high in cost *Multiple wires for boring *Copper is extremely volatile *Copper breaks often *High theft value *THHN is not direct burial 	<ul style="list-style-type: none"> *Multiple wires for boring 	<ul style="list-style-type: none"> *High spring release *Multiple wires for boring 	<ul style="list-style-type: none"> *High spring release 	<ul style="list-style-type: none"> *Poor signal strength *Extremely high in cost

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