



**Copperhead® Tracerwire Specification for
7X7 Stranded Copper Clad Steel – Break Load 4700 lbs**

Part #s: PBX-50*-LLS

Part # description: 7 x 7 Stranded CCS, 50 (jacket mil), * (indicates jacket color: B=Blue, Y=Yellow, R=Red, K=Black, N=Orange, G=Green, P=Purple) Standard spool sizes 500, 1000 or 2500 (wire length in ft.)

Available in custom length spools.

Print Line:

COPPERHEAD * 7 x 7 STRANDED CCS * PIPE BURST AND EXTREME HORIZONTAL DIRECTIONAL DRILL TRACER WIRE * 50 MIL HDPE * 30 VOLT * DIRECT BURIAL ONLY

Spool Label: Wound wire on a compact spool made of metal, plastic, or wood.

COPPERHEAD® INDUSTRIES, LLC

PBX-50*-LLS (Production Trace Code)

7 x 7 Stranded CCS Pipe Burst and Extreme Horizontal Directional Drill Tracer Wire

50 Mil HDPE * 30 Volt

Direct Burial Only

www.copperheadwire.com

Recommended Purchasing Description:

Direct Burial 7 x 7 Stranded CCS (0.2023" outside diameter), 21% conductivity copper-clad hard drawn high carbon steel with copper cladding, pipe burst and extreme horizontal directional drill tracer wire, 4700 lb average tensile break load, 50 mil. high molecular weight-high density polyethylene jacket complying with ASTM-D-1248, 30 volt rating.

Recommended Engineering Specifications:

Conductor Specifications for Tracer Wire
7X7 Stranded Copper Clad Steel – Break Load 4700 lbs

Specification: This specification describes the properties of the conductor to be used in the fabrication of extra high strength tracer wire.

1. Material Description: Copperhead® Copper-clad steel wire as manufactured by Copperweld®. All single ends composed of a steel core with a uniform and continuous copper cladding thoroughly bonded to the steel throughout.

- a. **Cladding:** The steel and copper interface must have a metallurgical bond achieved through a high heat and pressure bonding process. Established process for porosity-free material.
- b. **Steel:** Extra High Strength with 0.54 carbon or greater. Verified to meet required mechanical properties.
- c. **Copper:** UNS-C10200; OF Copper according to ASTM B-170 (latest revision). High conductivity, oxygen free copper to achieve optimal signal performance.

2. Surface Condition: Wire surface shall be free of any defects, including flakes, grooves, pits, and voids. Wire surface shall be smooth, bright and shiny, and free of excessive copper dust and residual drawing lubricants.

3. Physical, Mechanical, and Electrical Properties

The wire shall conform to the properties listed in Table 1.

TABLE 1: Physical, Mechanical, and Electrical Properties

7x7 Stranded CCS 0.2023” 21% Conductivity	CCS Conductor
O.D. of stranded conductor	0.2023”
Conductor Type	Copper Clad Steel (CCS)
Temper	Hard Drawn (HD)
Average Break Load	4700 lbs.
Minimum Tensile Strength	230,000 psi
Minimum Elongation	1.0%
Copper Thickness (% of Diameter)	3.0%
Minimum Copper Weight	13%
DC Resistance at 20° C (ohms/1000 ft.)	2.010

**Diameter tolerances: ± 1%*

Insulating Jacket Specifications for Tracer Wire
7X7 Stranded Copper Clad Steel – Break Load 4700 lbs

Specification: This specification describes the properties of the insulation material to be used in the jacketing of extra high strength tracer wire.

1. Material Description: insulating jacket is comprised of a co-polymer high molecular weight natural high density polyethylene (HDPE) designed specifically for high-speed copper wire insulating. It contains the required levels and types of primary antioxidant and metal deactivator additives to satisfy most Wire and Cable industry requirements. HDPE material will be produced with an excellent balance of surface smoothness, processing ease, tensile and elongation properties, abrasion toughness, environmental stress crack, thermal stress crack resistance, and electrical consistency.

2. Physical, Mechanical, and Electrical Properties

The wire shall conform to the properties listed in Table 1.

TABLE 1: Physical, Mechanical, and Electrical Properties

High Density Polyethylene Insulator	Value
Density (ASTM D 792)	0.943 g/cc
Bulk Density (ASTM D 1895)	0.58 g/cc
Melt Index (ASTM D 1238/E)	0.70 dg/min
Tensile-Yield (ASTM D 638)	4300 psi
Tensile-Ultimate (ASTM D 638)	2900 psi
Tensile-Elongation (ASTM D 638)	850%
Flexural Modulus (ASTM D 790/1)	120,000 psi
Hardness (ASTM D 2240)	63 Shore D
Environmental Stress-Crack (ASTM D 1693/B)	F ₂₀ > 48 h
Thermal Stress-Crack (ASTM D2951)	F ₀ > 1000 h
Brittleness Temperature (ASTM D 746)	< -95° F
Melting Point (DSC) (ASTM D 3417)	262° F
Softening Point (Vicat) (ASTM D 1525)	250° F
Oxidative Induction Time (ASTM D 3895)	> 50 min. @ 200° C
Dielectric Constant (ASTM D 1531)	2.34 @ 1MHz
Dissipation Factor (ASTM D 1531)	0.00007 @ 1 MHz
Volume Resistivity (ASTM D 257)	5 x 10 ¹⁷ ohm-cm
Dielectric Strength (ASTM D 3755)	1000 volts @ 20 mils