

### BENEFITS & FEATURES

- ✓ The corrosion resistance and conductivity of solid copper and the strength of fully annealed high-carbon steel
- ✓ Higher breaking strength than copper
- ✓ 11% lighter than solid copper
- ✓ 558 lb. break load
- ✓ 30, 45 or 60 mil HMWPE insulation
- ✓ Bonded metals will not corrode or separate
- ✓ 'Theft-resistant' (now aftermarket value) and stable price history compared to solid copper
- ✓ Rated for direct bury
- ✓ Color-coded in accordance with the American Public Works (APWA) standards for utility identification
- ✓ Exclusively manufactured by Kris-Tech Wire

### APPLICATION

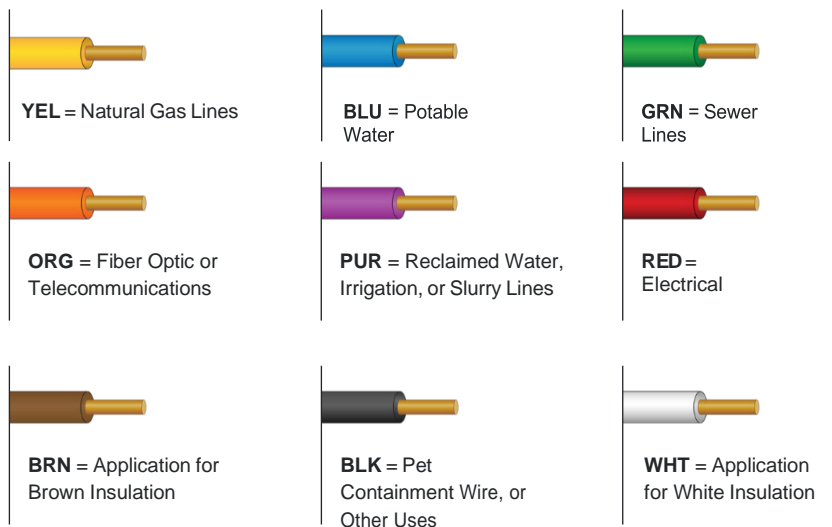
Kris-Tech copper-clad steel (CCS) tracer wire is installed on all non-metallic and metallic underground utilities and wires to enable infrastructure location. CCS tracer wire is ideal for trenching, open cut, and plowing applications when there are no above-ground buildings, roadways, or other obstructions.

### PRODUCT DESCRIPTION

#12 AWG (0.0808" diameter), fully annealed low carbon steel with a high-strength solid copper-clad steel conductor. Insulated with a high molecular weight polyethylene (HMWPE) insulation rated for direct burial use at 30, 600 or 1000 volts.

### COLOR OPTIONS

Our tracer wire is manufactured in a range of colors, in conformance with the American Public Works Administration Uniform Color Code. Non-standard colors based on unique customer requirements are also available.



## PART# AND TERMS

### HMWPE\*\*0012011-HS-\*-\*

- ✓ 12 AWG-Solid CCS Tracer Wire
- ✓ 30 Mil HMWPE 30 Volt
- ✓ 45 Mil HMWPE 600 Volt
- ✓ 60 Mil HMWPE 1000 Volt
- ✓ Direct Burial

\*\* INSULATION THICKNESS

### \* INSULATION COLOR

YEL=Yellow, BLU=Blue,  
GRN=Green, ORG=Orange,  
PUR=Purple, RED=Red,  
BRN=Brown, BLK=Black,  
WHT=White

\*\*\* SPOOL SIZE IN FEET

### SPOOL LABEL

Wound wire on a compact spool made of plastic or wood.

### CONDUCTOR

Kris-Tech Wire copper-clad steel wire is composed of a steel core with a uniform and continuous copper cladding completely bonded to the steel throughout. Wire conforms to ASTM B1010.

### SURFACE CONDITION

Wire surface shall be defect-free, including flakes, pits, voids, and grooves. Wire surface shall be smooth, with no excessive copper dust and residual drawing lubricants.

## FULL PRODUCT DESCRIPTION

- ✓ Tracer wire shall be a #12 AWG (0.0808" diameter) fully annealed, low carbon steel, high strength solid copper-clad steel conductor (HS-CCS) rated at 30, 600 or 1000 volts
- ✓ Insulated with 30, 45 or 60 mil, high-density, high molecular weight polyethylene (HMWPE) insulation rated for direct-burial use
- ✓ HS-CCS conductor must meet or exceed 21% conductivity for locate purposes
- ✓ Break load of 558 lbs.
- ✓ HMWPE insulation is RoHS compliant and utilizes virgin-grade materials
- ✓ Insulation colors meet the APWA color code standard for buried utility identification

## PRINT LINE

- ✓ Permanent physical markings: surface print legend on insulation will repeat at a minimum interval of every two linear feet
- ✓ Ink colors include Black ink for Yellow, Blue, Red, Orange, Purple, Brown, White, and Green insulation, and White ink for Black insulation
- ✓ Kris-Tech wire #12 AWG HS-CCS tracer wire — 30, 45 or 60 mil HMWPE voltage direct burial only

## CLADDING

The steel and copper interface has a metallurgical bond achieved through a high heat and pressure bonding process — the established process for porosity-free material

- **Steel** is high strength, with 0.54 carbon or greater, and verified to meet all required mechanical properties.
- **Copper** is UNS-C10200, OF Copper as per ASTM B-170 (latest revision). High conductivity, oxygen-free copper is used to provide optimal signal performance

# SPECIFICATIONS

## INSULATION

The following is a description of the properties of the materials used in Kris-Tech high strength tracer wire insulation

## MATERIAL DESCRIPTION

- ✓ Insulation is made up of a copolymer high molecular weight polyethylene (HMWPE) designed explicitly for insulating highspeed copper wire
- ✓ It contains the obligatory levels and types of primary antioxidant and metal deactivator additives to meet most Wire and Cable industry requirements
- ✓ HMWPE material is produced with an excellent balance of surface smoothness, tensile and elongation properties, processing ease, abrasion toughness, environmental stress crack, thermal stress crack resistance, and electrical consistency
- ✓ Insulation conforms to ASTM D1248

## QUALITY ASSURANCE

Every Kris-Tech product is manufactured to exact specifications using our rigorous quality control system that ensures products are defect-free and meet or exceed all performance requirements.

## PHYSICAL, MECHANICAL, & ELECTRICAL PROPERTIES

The wire shall conform to the properties listed in Table 1 & Table 2.

Table 1: Physical, Mechanical, and Electrical Properties	
#12 AWG CCS Low Carbon Steel	21% HS CCS Conductor
<b>1. General Specifications</b>	
Wire Hardness	High Strength(HS)
Base Alloy Material	Low carbon steel
<b>2. Dimensions</b>	
Diameter, nominal	2.0523 mm / 0.0808 in
Diameter, minimum	2.0318 mm / 0.0800 in
Cross section Area, nominal	3.3 mm <sup>2</sup> / 6,528.6 cmil
Net Weight	26.42 Kg/Km / 17.75 lb/Kft
Copper Thickness, minimum	0.0308 mm / 0.0012 in
Density, typical	7.9900 g/cm <sup>3</sup> / 0.2884 lb/in <sup>3</sup>
<b>3. Electrical Specifications</b>	
Electrical Conductivity (IACS), nominal	21%
DC Resistance, maximum	27.98640 Ω/Km, 8.52983 Ω/Kft
<b>4. Mechanical Specifications</b>	
Breaking Load, minimum	2,481 N / 558 lb <sub>f</sub>
Tensile Strength, maximum	900 N/mm <sup>2</sup> / 130,534 psi
Tensile Strength, minimum	750N/mm <sup>2</sup> / 108,779 psi
Wire Elongation, minimum	1% (actual 1.5%)

\*Diameter tolerances: ±1%

Table 2: Physical, Mechanical, and Electrical Properties	
High Molecular Weight Polyethylene Insulator	Value
<b>1. Physical Specifications</b>	
Density (ASTM D1505)	0.920 g/cm <sup>3</sup>
Melt Mass-Flow Rate (ASTM D1238)	0.70 g/10min
Brittleness Temperature (ASTM D746)	< -76.1°C
<b>2. Mechanical Specifications</b>	
Tensile-Yield (ASTM D638)	12.0 Mpa
Tensile-Break (ASTM D638)	15.2 Mpa
Tensile-Elongation (Break) (ASTM D638)	650%
<b>3. Electrical Specifications</b>	
Volume Resistivity (ASTM D257)	>10E+15 Ω*cm
Dielectric Constant (ASTM D150)	2.29
Dissipation Factor (ASTM D150)	6.0E-05