

Cathodic Protection Cable HMW-PE

HIGH MOLECULAR WEIGHT POLYETHYLENE (HMW-PE) INSULATED CABLE

Farwest Corrosion Control Company provides a full line of copper cable with insulation specifically designed for the cathodic protection industry. The most common and popular cable insulation used in cathodic protection is High Molecular Weight Polyethylene (HMW-PE). Extruded over the copper cable, HMW-PE insulation is designed for direct burial applications where flexibility and durability are required. Additionally, HMW-PE provides strong electrical isolation properties and is rated to 600 volts.

STANDARDS:

- *Stranded copper conductor conforms to ASTM specification B-8*
- *Insulation is high molecular weight polyethylene conforming to ASTM D-1248, type 1, class A category 5, grades E4 & E5. Tensile strengths J1, J3 Available with high density polyethylene (type II, III, IV) class B and C (all colors)*

APPLICATION:

- *A direct burial DC feeder cable for use in cathodic protection systems for storage tanks, pipelines, vessels and metallic structures either buried or submerged.*

CONSTRUCTION:

- *Annealed, uncoated, stranded copper conductor, HMW-PE polyethylene insulation*
- *Surface printed*
- *Custom printing available*
- *Custom colors available*

FARWEST CORROSION CONTROL HMWPE CP CABLE

SIZE	NO. OF STRANDS	FARWEST NO.	CIRC. MILS	SIZE AWG DIAMETER INCHES	INSULATION THICKNESS INCHES	NOMINAL DIAMETER INCHES	APPROX NET WT. LB/1000	MAX. D.C. RESISTANCE @ 20C. OHMS/MFT
#14	7	06-10000	4,110	.0726	.110	.293	38	2.57
#12	7	06-10010	6,530	.0195	.110	.311	48	1.62
#10	7	06-10020	10,380	.116	.110	.340	62	1.02
#8	7	06-10030	16,510	.146	.110	.370	87	.640
#6	7	06-10040	26,240	.184	.110	.408	122	.403
#4	7	06-10050	41,740	.232	.110	.456	175	.254
#2	7	06-10060	66,360	.283	.110	.510	260	.159
#1	19	06-10070	83,690	.322	.125	.580	330	.129
#1/O	19	06-10080	105,600	.362	.125	.620	401	.102
#2/O	19	06-10090	133,100	.406	.125	.660	492	.081
#4/O	19	06-10110	211,600	.512	.125	.770	750	.051



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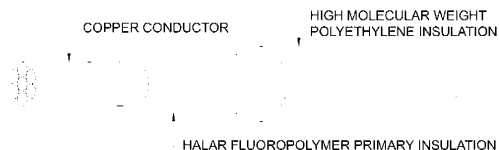


Cathodic Protection Cable HALAR*

DUAL JACKETED HALAR*/HMW-PE INSULATED CABLE

Where improved chemical resistance is required, as in many deep well anode applications, dual jacketed Halar/HMW-PE cable is recommended. Historically, anode cable is the most common cause of failures in deep well anode systems. As cathodic protection anodes discharge current, high levels of chlorine gas can be generated. Chlorine gas is detrimental to the HMW-PE insulation and the deterioration of the insulation will lead to the failure of the copper cable and the loss of the anode in the cathodic protection circuit.

With the dual insulated cable, the outer insulation jacket consists of standard HMW-PE, which provides excellent physical properties such as abrasion resistance. The inner insulation jacket consists of a homogeneous wall of natural ECTFE fluoropolymer (Halar*), which provides excellent resistance to chlorine attack. Halar is also resistant to many other detrimental chemicals such as hydrochloric and sulfuric acid as well as petroleum hydrocarbons.



STANDARDS:

- Stranded bare copper conductor conforms to ASTM specifications B-8
- Insulation - a homogeneous wall of natural ECTFE fluoropolymer *(HALAR) is extruded over the conductor
- Jacket - high molecular weight polyethylene conforming to ASTM D-1248, type 1, class A category 5, grades E4 and E5. Tensile strengths J1, J3. Available with high density polyethylene (type II, III, IV) class B and C (all colors). Surface printed. Custom printing available.

SIZE	NO. OF STRANDS	FARWEST NO.	CIRC. MILS	SIZE AWG DIAMETER INCHES	HALAR THICKNESS INCHES	HMWPE THICKNESS INCHES	NOMINAL DIAMETER INCHES	APPROX NET WT. LB/1000	MAX. D.C. RESISTANCE @ 20C. OHMS/MFT
#8	7	06-12010	16,510	.146	.020	.065	.316	83	.640
#6	7	06-12020	26,240	.184	.020	.065	.354	120	.403
#4	7	06-12030	41,740	.232	.020	.065	.402	177	.254
#2	7	06-12040	66,360	.283	.020	.065	.462	260	.159

* Halar is a registered trademark of Ausimont USA, Inc.



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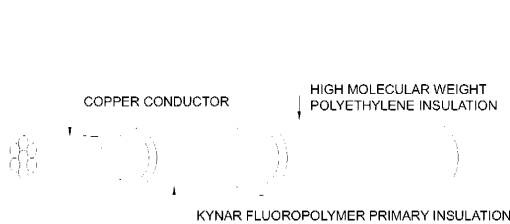
Cathodic Protection Cable

KYNAR*

DUAL JACKETED KYNAR*/HMW-PE INSULATED CABLE

Where improved chemical resistance is required, as in many deep well anode applications, dual jacketed Kynar/HMW-PE cable is recommended. Historically, anode cable is the most common cause of failures in deep well anode systems. As cathodic protection anodes discharge current, high levels of chlorine gas can be generated. Chlorine gas is detrimental to HMW-PE insulation and the deterioration of the insulation will lead to the failure of the copper cable and the loss of the anode in the cathodic protection circuit.

With the dual insulated cable, the outer insulation jacket consists of standard HMW-PE, which provides excellent physical properties such as abrasion resistance. The inner insulation jacket consists of a homogeneous wall of natural PVDF fluoropolymer (Kynar*), which provides excellent resistance to chlorine attack. Kynar* is also resistant to many other detrimental chemicals such as hydrochloric and sulfuric acid as well as petroleum hydrocarbons.



STANDARDS:

- Stranded bare copper conductor conforms to ASTM specifications B-8
- Insulation - a homogeneous wall of natural PVDF fluoropolymer *(KYNAR) shall be extruded over the conductor
- Jacket - high molecular weight polyethylene conforming to ASTM D-1248, type 1, class A category 5, grades E4 and E5. Tensile strengths J1, J3. Available with high density polyethylene (type II, III, IV) class B and C (all colors). Surface printed. Custom printing available.

SIZE	NO. OF STRANDS	FARWEST NO.	CIRC. MILS	SIZE AWG DIAMETER INCHES	KYNAR THICKNESS INCHES	HMWPE THICKNESS INCHES	NOMINAL DIAMETER INCHES	APPROX NET WT. LB/1000	MAX. D.C. RESISTANCE @ 20C. OHMS/MFT
#8	7	06-11010	16,510	.146	.020	.065	.316	83	.640
#6	7	06-11020	26,240	.184	.020	.065	.354	120	.403
#4	7	06-11030	41,740	.232	.020	.065	.402	177	.254
#2	7	06-11040	66,360	.283	.020	.065	.462	260	.159

*Kynar is a registered trademark of Elf Atochem



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Cathodic Protection Cable Miscellaneous & Bond

MISCELLANEOUS CABLE

Farwest offers a variety of common cable types and insulations. While not specifically designed for cathodic protection use, these cable insulations are used for cathodic protection purposes. These alternate insulation types are often used for test lead cables, bond cables and other applications. Before using these insulation types, we recommend that you check the application with the insulation type to determine if it is suitable for use.

THHN/THWN Insulated Copper Cable

Available with either a solid or stranded copper conductor, this insulated cable is a general purpose building cable that is PVC insulated with an outer jacket of nylon. Rated at 600 volts, THHN/THWN is suitable for use in dry locations at an operating temperature of 90° C. THHN/THWN is UL listed and is gasoline and oil resistant.

XLP USE-2 or RHH/RHW-2 Insulated Copper Cable

Available with either a solid or stranded copper conductor, this insulated cable is suitable for lighting and power applications in air, conduit or suitable raceways and is rated for direct burial. Rated at 600 volts, the insulation comprises of a single layer of polyethylene rated for operation at 90° C in dry locations and 75° C in wet locations.

XHHW-2 Insulated Copper Cable

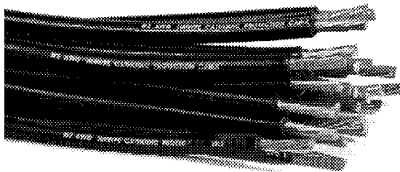
Available with either a solid or stranded copper conductor, this insulated cable is suitable for general wiring applications in dry or wet conditions as well as for direct burial. Rated at 600 volts, the insulation comprises of a single layer of cross-linked polyethylene rated for operation at 90° C in both dry and wet locations.

All the above cables are available in a range of sizes from #14 AWG to 1000 MCM in a variety of insulation colors. Please contact your Farwest sales representative for more information.

CATHODIC PROTECTION BOND CABLES

Bond cables are short lengths of insulated copper cable generally used in the cathodic protection industry to electrically connect pipeline joints or multiple pipelines. These sections of cable are custom made to fit the requirements of the bonding project. Typically, HMW-PE insulation is utilized for this purpose as it is made for direct burial and has excellent physical properties for this use. However, other insulation types can be used for this purpose.

Bond cables are generally cut to length and the insulation is removed on each end of the cable for attachment to the pipeline. In some instances, copper sleeves are attached to the bare cable ends for the purpose of thermite welding the cable to the pipe.



WIRE SIZE	AVAILABLE LENGTHS
#10	12", 18", 24"
#8	12", 18", 24"
#6	12", 18", 24"
#4	12", 18", 24"
#2	12", 18", 24"

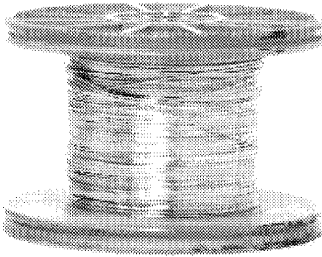
*Custom sizes and lengths are available



Resistance Wire

RESISTANCE WIRE

Available in a wide variety of wire gauges, resistance wire (commonly called Nichrome wire) is utilized in the cathodic protection field for adding electrical resistance to cathodic protection circuits. See the chart below to determine the wire gauge and linear resistance (at 20° F) of the most commonly used resistance wire.



Chemical Composition	61 Ni, 15 Cr, bal. Fe
Resistivity at 20 C (Ohms/CMF)	675
Specific Gravity	8.247
Pounds per cubic inch	.2979

SIZE (B&S)	DIA (INCHES)	NOMINAL OHMS PER LINEAR FOOT AT 20°C
12	.081	.1029
13	.072	.1302
14	.064	.1648
15	.057	.2078
16	.051	.2595
17	.045	.3333
18	.040	.4219
19	.036	.5208
20	.032	.7813
21	.0285	.831
22	.0253	1.055
23	.0226	1.322
24	.0201	1.671
25	.0179	2.107
26	.0159	2.670

SIZE (B&S)	DIA (INCHES)	NOMINAL OHMS PER LINEAR FOOT AT 20°C
27	.0142	3.348
28	.0126	4.251
29	.0113	5.286
30	.010	6.750
31	.0089	8.523
32	.008	10.55
33	.0071	13.39
34	.0063	17.00
35	.0056	21.52
36	.005	27.00
37	.0045	33.33
38	.004	42.19
39	.0035	55.10
40	.0031	70.24

Additional sizes available



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Marking Tape

MARKING TAPE

Used to alert construction personnel about the presence of underground utilities, marking tape is available in many standard and custom imprinted configurations. These products can be custom imprinted with your own message or insignia, or be purchased immediately from our warehouse with the following stock imprints (all printed in black):

CAUTION CATHODIC PROTECTION CABLE BURIED BELOW
CAUTION ELECTRIC LINE BURIED BELOW
CAUTION WATER LINE BURIED BELOW
CAUTION FIBER OPTIC LINE BURIED BELOW
CAUTION TELEPHONE LINE BURIED BELOW
CAUTION GAS LINE BURIED BELOW
CAUTION SEWER LINE BURIED BELOW



Special Orders

May be custom manufactured to your specifications. Please ask your salesperson about the options available to meet your specific needs.

Custom Sizes

Can be manufactured in 1" to 48" widths and up to 10,000' long rolls (depending on material selected). Minimum orders apply and vary by material selected. All rolls over 3000' are shipped on plastic cores, which may be requested on any order.

Custom Imprints

We can print logos in up to 4 different ink colors.

All marking tape products conform to APWA color code specifications for underground marking tape systems:

- *RED* for electrical power distribution and transmission lines.
- *YELLOW* for oil and gas distribution and transmission lines. Also for dangerous material, product lines and steam lines.
- *BLUE* for water systems.
- *GREEN* for sewer lines.
- *ORANGE* for telephone, telegraph and cable television systems. Also used for police and fire communication lines.

All standard marking tape products are available in 3" x 1000' and 6" x 1000' rolls.

