

INCH-POUND

A-A-59544

July 10, 2000

## COMMERCIAL ITEM DESCRIPTION

### CABLE AND WIRE, ELECTRICAL (POWER, FIXED INSTALLATION)

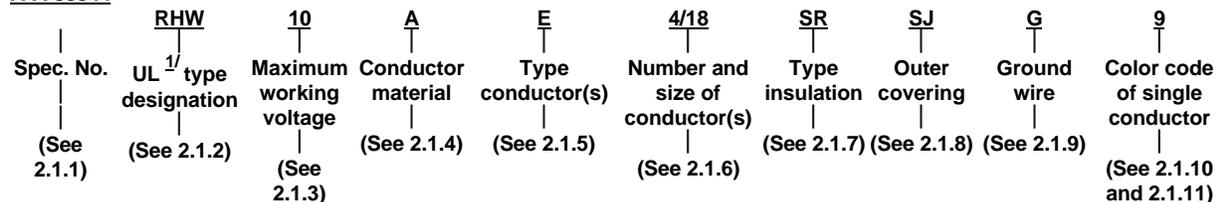
The General Services Administration has authorized the use of this commercial item description by all federal agencies.

1. SCOPE. This commercial item description (CID) covers single and multiple conductor cables and wires employing soft-annealed copper, copper-clad aluminum, 1350 aluminum, and 8000-series aluminum alloy conductors, insulated with synthetic rubber, thermoplastic, cross-linked-polyethylene, ethylene propylene, or chlorosulphonated polyethylene. These cables and wires are intended to be used for transmission of power in fixed type installations, and also for special purpose applications (e.g., control).

2. CLASSIFICATION. The fixed installation electrical power cable and wire shall conform to the types specified in table I.

2.1 Type designation. Cables and wires covered by this specification shall be identified by a type designation, constructed as illustrated below. This type designation is intended for cataloging and ordering purposes, and not for surface printing on the wire or cable.

**A-A-59544**



**1/ UL (Underwriters Laboratories, Inc.)**

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any other data that may improve this document should be sent to: Defense Logistics Agency, Defense Supply Center, Columbus (DSCC-VAI), P.O. Box 3990, Columbus, OH 43216-5000 .

TABLE I. Cable and wire types.

UL type	UL standard	Description	Maximum working voltage	Temp °C.
ACHH	4	Heat resistant armored	600	90
ACHHL	4	Heat resistant armored, lead sheath	600	90
ACTH	4	Heat resistant, armored	600	75
ACTHH	4	Heat resistant, armored	600	90
ACT	4	Dry locations, armored	600	60
ACL	4	Armored, lead sheath	600	75
ACHL	4	Heat resistant, armored, lead sheath	600	75
RHW	44	Heat and moisture resistant	600 or 2,000	75 wet
RHH	44	Heat resistant	600 or 2,000	90 dry
SA	44	Silicone, heat resistant	600	90
RH or RHW <sup>1/</sup>	44	Heat and moisture resistant	600	90
XHHW	44	Heat and moisture resistant (cross linked polyethylene, thin wall)	600	75 wet, 90 dry
TW	83	Moisture resistant	600	60
THWN	83	Heat and moisture resistant	600	75
THW	83	Heat and moisture resistant	600	75 wet
THHN	83	Heat resistant, for use in dry locations	600	90 dry
THHN or THWN <sup>1/</sup>	83	Heat and moisture resistant	600	90
UF	493	For direct burial in earth	600	60
UF-B	493	For direct burial in earth	600	60 or 75 wet
NM-B	719	For use in dry locations	600	60
NMC-B	719	For use in dry and moist and mildly corrosive locations	600	60
SE	854	Flame and moisture retardant, no mechanical protection	600	75
USE	854	Moisture resistant, no mechanical protection, for underground use	600	75
MV	1072	Medium voltage	5-35 kV	75 or 90
MC	1569	Metal-clad	600-35,000	75, 85, or 90

<sup>1/</sup> For dual marking, see paragraph 3.4.

2.1.1 Cable and wire specification number: A-A-59544.

2.1.2 UL type designation. The UL type designation shall consist of the types specified in table I.

2.1.3 Maximum working voltage. The maximum working voltage shall be designated as follows:

03	-	300
06	-	600
10	-	1,000
20	-	2,000
30	-	3,000
40	-	4,000
50	-	5,000
100	-	10,000
350	-	35,000

2.1.4 Conductor material. The conductor material shall be designated as follows:

A	-	1350 aluminum
C	-	Copper
CA	-	Copper clad aluminum (M 83)
AA	-	Aluminum alloy, 8000 series (UL 83, 44, 493, 854)

2.1.5 Type of conductor(s). The type of conductor(s) shall be designated as follows:

- E - Solid conductor (AWG 20 to AWG 8 only).
- F - Concentric-lay-stranded conductor(s) of standard flexibility, conforming to type C, class B of QQ-W-343 or class B of American Society for Testing and Materials Document ASTM-B231, as applicable.
- G - Concentric-lay-stranded conductor(s) where greater flexibility is desired, conforming to type C, class C of QQ-W-343 or class C of ASTM-B231 as applicable.
- H - Rope-lay-stranded conductor(s) where extreme flexibility is desired, conforming to type RC, class G of QQ-W-343.
- J - Rope-lay-stranded conductor (s) where extreme flexibility is desired, conforming to type RC, class H of QQ-W-343.
- K - Bunch-stranded conductor(s) where extreme flexibility in the smaller AWG sizes is desired, conforming to type B, class K of QQ-W-343.
- L - Compact stranded conductors(s) where greater flexibility is desired, conforming to Class B of ASTM B400.

Note: AWG – American Wire Gauge

2.1.6 Number and size of conductors. The number of individual conductors of the same wire size shall be designated by that number followed by a slant line and followed by a number indicating the conductor AWG size. When cables comprise different wire sizes, each different wire size with the number of conductors shall be individually represented with a dash separating each different wire size. A conductor larger than number 0000 AWG shall be designated by its cross-sectional area in circular mils.

2.1.7 Type of insulation. The type of insulation shall be designated as follows:

SR	-	Synthetic rubber
T	-	Thermoplastic
XP	-	Cross-linked polyethylene
CP	-	Chlorosulphonated polyethylene
EP	-	Ethylene propylene

2.1.8 Outer covering. The outer covering shall be designated as follows:

- AL - Aluminum sheath
- AR - Armored
- CB - Cotton braid
- CRE - Chlorinated polyethylene
- FC - Fibrous covering
- GB - Glass braid
- LS - Lead sheath
- PJ - Polyamide jacket
- RJ - Rubber jacket
- SJ - Synthetic rubber jacket
- TJ - Thermoplastic jacket
- UJ - Unjacketed
- W - Neoprene jacket
- XP - Cross-linked polyethylene jacket

2.1.9 Ground wire. When a ground wire is part of a cable configuration, the ground wire shall be designated by the letter G.

2.1.10 Color code. The color code for single conductor cables and wires shall be designated by the appropriate identifying number as shown in table II (see 3.3.1.).

TABLE II. Color-code identification for single conductor cables and wires.

Number designator	Color	Number designator	Color
0	Black	5	Green
1	Brown	6	Blue
2	Red	7	Violet (purple)
3	Orange	8	Gray (slate)
4	Yellow	9	White

NOTE: This table is not intended to signify a color sequence but only a number-color identification reference.

2.1.11 Color code for multi-conductor cables. For 2-, 3-, and 4-conductor cables, designation of color-coding will not be necessary in the type designation (see 2.1). These multi-conductor cables have a definite color-coding arrangement (see 3.3.2); consequently, the number of multi-conductors in the type designation (see 2.1.6) automatically signifies the color-code.

### 3. SALIENT CHARACTERISTICS.

3.1 Requirements. Cable and wire covered by this CID shall conform to the requirements of the applicable UL standards for the types specified in table I.

3.2 Fire and casualty hazards. Each contractor shall maintain evidence that the cable or wire to be supplied under this specification conforms to the requirements of the applicable UL Standard. The UL label, or listing with re-examination, of the UL may be accepted as evidence that the cable or wire conforms to the requirements. In lieu of the UL label, or listing with re-examination, the contractor shall maintain evidence that the cable or wire conforms to the applicable requirements of the published standards including methods of tests of the applicable UL standard.

### 3.3 Color code.

3.3.1 Single conductor. The color of a single conductor cable or wire is usually arbitrarily selected for purposes of differentiating between circuits when a number of single conductor cables or wires are to be used. Consequently, the number designated in the type designation signifies the color of a single conductor cable or wire (see 2.1.10).

3.3.2 Multi-conductor. Multi-conductor cables shall be color-coded as follows:

2-conductor - black, white <sup>1/</sup>.

3-conductor - black, white, red <sup>1/</sup>.

4-conductor - black, white, red, blue.

Note 1/: For type SE cable, the color white is omitted for the uninsulated neutral conductor.

### 3.4 Dual markings.

3.4.1 THHN or THWN wire. Any types of THHN wire that comply with the requirements in UL Standard 83 for Type THWN wire as well as those for Type THHN may be dual marked THHN or THWN.

3.4.2 RHH or RHW wire. A wire or a cable which complies with the requirements in UL Standard 44 for Type RHH wire and all the requirements for Type RHW wire may be dual marked RHH or RHW.

3.4.3 RHW or USE cable. If a rubber insulated wire or cable also qualifies completely for use as a cable in a different classification (such as Type USE service-entrance cable), the product may carry an amplified marking including the word or to indicate the additional classification and the optional use - for example, RHW or USE.

## 4. REGULATORY REQUIREMENTS.

4.1 Recovered materials. Recovered materials will be used to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

4.2 Toxic chemicals, hazardous substances, and ozone depleting chemicals (ODCs). The use of toxic chemicals, hazardous substances, or ODCs shall be avoided whenever feasible.

## 5. PRODUCT CONFORMANCE PROVISIONS.

5.1 Product conformance. The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market. The Government reserves the right to require proof of such conformance.

5.2 Market acceptability. The item must have been sold in the commercial market or to the Government within the past 3 years.

## 6. PACKAGING.

6.1 Preservation, packing, and marking shall be as specified in the contract or order.

## 7. NOTES.

7.1 Requirements for tests. If laboratory tests by the government are required, purchasing officers should order cable or wire for test purposes, in addition to the number of feet required for installation.  
7.2 Source of documents.

7.2.1 Source of government documents. Military and Federal documents are available from:

Standardization Documents Order Desk  
Bldg. 4D  
700 Robbins Avenue  
Philadelphia, PA 19111-5094

7.2.2 The Code of Federal Regulations (CFR) and the Federal Acquisition Regulation may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

7.2.3 Other Publications. Applicable documents are available from the following:

American National Standards Institute (ANSI)  
11 West 42<sup>nd</sup> Street, 13<sup>th</sup> Floor  
New York, NY 10036

American Society for Testing and Materials (ASTM)  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959

Underwriter's Laboratories, Inc.  
333 Pfingsten Road  
Northbrook, IL 60062 USA

7.3 Ordering data. The contract or order should specify the following:

- a. Title, number, and date of this CID.
- b. Wire types, material, number and size of conductors, color (see 2.1 through 2.1.11).
- c. Packaging requirements (see 6.1).

7.4 Key words.

Armored  
Heat-resistant  
Metal-clad  
Thermoplastic

MILITARY INTERESTS:

Preparing Activity:  
DLA-CC

Custodians:

(Project 6145-2284)

Army - CR  
Navy - AS  
Air Force - 11  
DLA - CC

Review Activities:

Army - AR, CR4, EA, MI  
Navy - MC  
Air Force - 99