T&B' Fittings

Armored Cable and Flexible Metal Conduit Fittings

Armored Cable (Type AC) – Ref. NEC Article 333

National Electric Code defines type AC armored cable as, "A fabricated assembly of insulated conductors in a flexible metallic enclosure."

ACT indicates an armored cable employing conductors having thermoplastic (Type T) insulation.

AC indicates an armored cable employing conductors having rubber insulation of code grade.

ACH indicates an armored cable employing conductors having rubber insulation of the heat resistant (75°C) grade.

ACHH indicates an armored cable employing conductors having rubber insulation of the heat resistant (90°C) grade.

ACU indicates an armored cable employing conductors having rubber insulation of latex grade.

'L' used as a suffix indicates that a lead covering has been applied over the conductor assembly.

All above cables may employ copper or aluminum or copperclad aluminum conductors with the following sizes and are rated for 600 volts or less:

No. 14 AWG to No. 1 AWG Copper No. 12 AWG to No. 1 AWG Aluminum or Copperclad Aluminum

Type AC cables except ACL carry an internal bonding strip of copper or aluminum in intimate contact with the armor for its entire length. Armored cable can be used for both exposed or concealed locations. With lead covered conductors (Type ACL) the cable can be embedded in masonry or concrete and can be used in damp locations or where exposed to oil.

Armored cable is not permitted in locations where it will be subjected to physical damage or corrosive fumes. Armored cable cannot be used for direct burial in earth.

With minor exceptions armored cable is also not permitted to be used in hoists or elevators, storage battery rooms, any hazardous locations, in commercial garages and in theaters or similar locations.

Codes require that cable shall be supported with straps or staples without damaging conductors and also limit the minimum bend radius to 5 times the diameter of type AC cable. Certain precautions are prescribed in code where cable is installed through joist rafters or similar wood members.

According to NEC 333-9 where armored cable is terminated, a fitting is required to protect conductors from abrasion. In addition a bushing is required between the conductors and armor. Design of fitting has to be such that the insulating bushing is visible for inspection. Bushing is not required with lead covered cables when properly installed.

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Please refer to the following for further details and complete information:
1. NEC Article 333…Armored Cable (Type AC Cable)
2. U.L. 4, ANSI C33.9…Safety Standards for Armored Cable
5. NEMA FB-1…Standards Publication. Fittings & Supports for Conduit and Cable Assemblies
6. CEC Section 12-700…Wiring Methods (Armored Cable)
7. CSA C22.2 No. 51…Safety Standards for Armored Cables
8. CSA C22.2 No. 18…Safety Standards for Outlet Boxes, Conduit Boxes and Fittings

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Flexible metal conduit can be used for exposed or concealed work in dry locations. It can be used for wet locations provided conductors within are lead covered or other approved type.

Flexible metal conduit cannot be used underground or embedded in poured concrete or aggregate. With rubber covered conductors the conduit cannot be exposed to oil, gasoline or other materials having a deteriorating effect on rubber.

With minor exceptions use of flexible metal conduit is not permitted in hoists, in storage battery rooms and in any hazardous locations. Use of flexible metal conduit is restricted to systems under 600 volts.

According to NEC Article 350-5, flexible metal conduit no longer than six feet and containing circuit conductors protected by overcurrent device rated for 20 amps or less is suitable as a grounding means provided the conduit and the fitting are approved for the purpose. To date there is no flexible metal conduit approved for the purpose by the Underwriters Laboratories.

In Class I & II, Division 2 hazardous areas, the conduit itself cannot be used as the grounding means. A bonding jumper must be installed in accordance with NEC Section 250-79(e).

Flexible metal conduit is available with steel or aluminum armor in trade size 

Flexible metal conduit longer than six feet is permitted to be used as a grounding means provided the conduit and the fitting are approved for the purpose. Bends in concealed work are restricted to 360 degrees total. No angle connectors are permitted in concealed raceway installations.

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Please refer to the following for further details and complete information:
1. NEC Article 350…Flexible Metal Conduit
2. U.L. 1, ANSI C33.92…Safety Standards for Flexible Metal Conduit
5. WW-C-566…Federal Specification. Conduit, Metal, Flexible
6. NEMA FB1…Standards Publication. Fittings and Supports for Conduit and Cable Assemblies
7. CEC 12-1100…Wiring Method (Rigid & Flexible Conduit)
8. CSA C22.2 No. 56…Safety Standards for Flexible Metallic Conduit and Liquid-Tight Flexible Metal Conduit
9. CSA C22.2 No. 18…Safety Standards for Outlet Boxes, Conduit Boxes and Fittings
Suggested Specifications for Armored Cable and Flexible Metal Conduit Fittings

- Armored cable (metal clad cable type AC) and flexible metal conduit shall conform to provisions of following applicable standards:
  - Armored Cable...U.L. 4/ANSI C33.9/CSA 22.2 No. 51
  - Flexible Metal Conduit...U.L. 1/ANSI C33.92/WW-C-566/CSA 22.2 No. 56

  Type of cable used and conductors within flexible metal conduit shall be suitable for conditions of use and location.

- Where armored cable or flexible metal conduit terminates into a threadless or threaded opening, it shall be assembled with approved fittings; fittings shall be of malleable iron/steel construction, electro zinc plated inside outside, equipped with nylon insulated throat and shall be of angled saddle type as manufactured by Thomas & Betts, series 3110.

  Direct bearing screw type fittings shall not be used.

  Suitable bushing as manufactured by Thomas & Betts, series 422 or 390, shall be provided between the conductors and armor.

- Where approved armored cable or flexible metal conduit is used as an equipment grounding conductor terminating fitting used shall be of the grounding type as manufactured by Thomas & Betts, series 3110.