

## Chapter E 347

## RIGID NON-METALLIC CONDUIT

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**E 347.01 Description.** The provisions of this chapter shall apply to a type of conduit and fittings of suitable non-metallic material which is resistant to moisture and chemical atmospheres. For use above ground, it shall also be flame retardant, resistant to impact and crushing, shall resist distortion due to heat under conditions likely to be encountered in service and shall be resistant to low temperature and sunlight effects. For use underground, the material shall be acceptably resistant to moisture and corrosive agents and shall be of sufficient strength to withstand abuse, such as by impact and crushing, in handling and during installation. Where intended for direct burial, without encasement in concrete, the material shall also be capable of withstanding continued loading which is likely to be encountered after installation.

*Note:* Materials which have been recognized as having suitable physical characteristics when properly formed and treated include fiber, asbestos cement, soapstone, rigid polyvinyl chloride, and high density polyethylene for underground use and rigid polyvinyl chloride for use above ground.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.02 Use permitted.** Rigid nonmetallic conduit and fittings approved for the purpose may be used under the following conditions and where the potential is 600 volts or less except as noted in Wis. Adm. Code section E 347.03.

- (1) Underground if encased in not less than 2 inches of concrete.
- (2) Direct earth burial if of a type approved for the purpose and if buried not less than 18 inches below the surface.
- (3) In concrete walls, floors and ceilings.
- (4) In locations subject to severe corrosive influences as set forth in section E 300.05 and where subject to chemicals for which the materials are specifically approved.
- (5) Cinder fill.
- (6) Wet Locations. In portions of dairies, laundries, canneries or other wet locations and in locations where walls are frequently washed, the entire conduit system including boxes and fittings used therewith shall be so installed and equipped as to prevent water from entering the conduit. All supports, bolts, straps, screws, etc., shall be of corrosion-resistant materials or protected against corrosion by approved corrosion-resistant materials.
- (7) In dry and damp locations not prohibited by section E 347.03.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.03 Use prohibited.** Rigid nonmetallic conduit shall not be used:

- (1) Less than 8 feet above ground outdoors unless protected against physical damage.
- (2) In hazardous locations except as covered in section E 514.08.
- (3) In the concealed spaces of combustible construction.
- (4) For the support of fixtures or other equipment.
- (5) Where subject to physical damage.
- (6) Where subject to ambient temperatures exceeding those for which the conduit had been tested.
- (7) For conductors whose insulation temperature limitations would exceed those for which the conduit had been tested.
- (8) For potentials exceeding 600 volts unless encased in not less than 2 inches of concrete.
- (9) In the sunlight unless approved for the purpose.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.04 Other chapters.** Installation of rigid non-metallic conduit shall comply with provisions of the applicable sections of chapter E 300.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

## A. INSTALLATIONS

**E 347.05 Trimming.** All cut ends shall be trimmed inside and outside to remove rough edges.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.06 Joints.** All joints between lengths of conduit and between conduit and couplings, fittings and boxes shall be made by a method specifically approved for the purpose.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.08 Supports.** See section E 300.11.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.09 Expansion joints.** Expansion joints for rigid non-metallic conduit shall be provided where required to compensate for thermal expansion and contraction.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.10 Minimum size.** No conduit smaller than ½ inch electrical trade size shall be used.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.11 Number of conductors.** The number of conductors permitted in a single conduit shall be as follows:

- (1) **NEW WORK:** (a) Where conductors are all of the same size, tables 1 and 2 of chapter E 900.
- (b) Where conductors are of various sizes to be used in combination, use tables 3 and 4 of Wis. Adm. Code chapter E 900 and the dimensions of conductors in column 3 of table 5 of chapter E 900.

Where bare conductors are permitted by other sections of this code, the dimensions for bare conductors in table 8 of chapter E 900 may be used.

(c) When equipment grounding is required by chapter E 250, a separate grounding conductor shall be installed in the conduit.

(2) **REWIRING EXISTING CONDUITS:** For rewiring existing conduits, the allowable fill may be determined from tables 3 and 4 of chapter E 900 using the dimensions from table 5 of chapter E 900.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.12 Bushings.** Where a conduit enters a box or other fitting, a bushing or adapter shall be provided to protect the wire from abrasion unless the design of the box or fitting is such as to provide equivalent protection. See section E 373.06 (2) for the protection of conductors at bushings.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.13 Bends, how made.** Bends of rigid non-metallic conduit shall be so made that the conduit will not be injured and that the internal diameter of the conduit will not be effectively reduced. Field bends shall be made only with bending equipment specifically approved for the purpose, and the radius of the curve of the inner edge of such bends shall be not less than shown in table E 346.10.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.14 Bends, number in one run.** A run of conduit between outlet and outlet, between fitting and fitting or between outlet and fitting shall not contain more than the equivalent of 4 quarter bends (360°) total including those bends located immediately at the outlet or fitting.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 347.15 Boxes and fittings.** See chapter E 370.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

## B. CONSTRUCTION SPECIFICATIONS

**E 347.16 General.** Rigid nonmetallic conduit shall conform to the following:

(1) Rigid nonmetallic polyvinyl chloride conduit as shipped shall be in standard lengths of 10 feet including couplings, one coupling to be furnished with each length. For specific applications or uses, lengths shorter or longer than 10 feet with or without couplings may be shipped.

(2) High density polyethylene conduit as shipped shall be in standard lengths of 10 feet. One threaded coupling shall be furnished with each threaded length of high density polyethylene conduit. For specific applications or uses, lengths shorter or longer than 10 feet with or without couplings may be shipped.

(3) Each length of nonmetallic conduit shall be clearly and durably marked at least every ten feet with the manufacturer's name, trade name, or trademark, nominal trade size, and type of material.

(4) For conduit recognized for use above ground these markings shall be permanent. For conduit limited to underground use only, these markings shall be sufficiently durable to remain legible until the material is installed.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.