

Cables shall be permitted to be installed where such use is not prohibited by the respective cable articles. The number of cables shall not exceed the allowable percentage fill specified in Table 1, Chapter 9.

Table 4 of Chapter 9 provides the usable area within the selected conduit or tubing, and Table 5 provides the required area for each conductor. Examples using these tables to calculate a conduit or tubing size are provided in the commentary following Chapter 9, Notes to Tables, Note 6.

To select the proper trade size of RMC, see the appropriate sub-table for Article 344, Rigid Metal Conduit (RMC), in Table 4 of Chapter 9. If the conductors are of the same wire size and insulation type, Tables C.9 and C.9(A) for RMC in Informative Annex C can be used instead of performing the calculations.

Δ 344.24 Bends.

(A) How Made. Bends of RMC shall be so made that the conduit will not be damaged and so that the internal diameter of the conduit will not be effectively reduced. The radius of the curve of any field bend to the centerline of the conduit shall not be less than indicated in Table 2, Chapter 9.

(B) Number in One Run. The total degrees of bends in a conduit run shall not exceed 360 degrees between pull points.

Limiting the number of bends in a conduit run reduces pulling tension on conductors. It also helps ensure easy insertion or removal of conductors during later phases of construction when the conduit may be permanently enclosed by the finish of the building.

344.28 Reaming and Threading. All cut ends shall be reamed or otherwise finished to remove rough edges. Where conduit is threaded in the field, a standard cutting die with a 1 in 16 taper ($\frac{3}{4}$ in. taper per foot) shall be used. PVC-coated RMC shall be threaded in accordance with manufacturer's instructions to prevent damage to the exterior coating.

Informational Note No. 1: See ANSI/ASME B1.20.1-2013, *Standard for Pipe Threads, General Purpose (Inch)*.

Informational Note No. 2: See NECA 101-2013, *Standard for Installing Steel Conduits (RMC, IMC, EMT)*, for information on threading and clamping methods for RMC and PVC-coated RMC.

Conduit is cut using a saw or a roll cutter (pipe cutter). Crooked threads result from a die not started on the pipe squarely. After the cut is made, the conduit must be reamed. Proper reaming removes burrs from the interior of the cut conduit so that as wires and cables are pulled through the conduit, chafing of the insulation or cable jacket does not occur. Finally, the conduit is threaded. The number of threads is important. When determining the correct number of threads for a conduit end, the same number of threads should be cut on the conduit as are present on the factory (threaded) end of the conduit. Where excessive threads are cut on the conduit and threaded couplings are installed, the conduits within the coupling will butt, resulting in a weak mechanical joint and poor grounding continuity.

To avoid damage to the exterior coating on PVC-coated conduits, proper threading and clamping tools specifically designed for PVC-coated conduit must be used. Standard threading and clamping tools, which have not been modified, can cause damage to the coatings, therefore exposing the conduit to unintended corrosion and potential unsafe conditions. Manufacturer's instructions for threading and bending should also be followed, in order to prevent any additional damage.

344.30 Securing and Supporting. RMC shall be installed as a complete system in accordance with 300.18 and shall be securely fastened in place and supported in accordance with 344.30(A) and (B).

(A) Securely Fastened. RMC shall be secured in accordance with one of the following:

- (1) RMC shall be securely fastened within 900 mm (3 ft) of each outlet box, junction box, device box, cabinet, conduit body, or other conduit termination.
- (2) Fastening shall be permitted to be increased to a distance of 1.5 m (5 ft) where structural members do not readily permit fastening within 900 mm (3 ft).
- (3) Where approved, conduit shall not be required to be securely fastened within 900 mm (3 ft) of the service head for above-the-roof termination of a mast.

Exception: For concealed work in finished buildings or pre-finished wall panels where such securing is impracticable, unbroken lengths (without coupling) of RMC shall be permitted to be fished.

As illustrated in Exhibit 344.1, RMC is required to be securely fastened within 3 feet of outlet boxes, junction boxes, cabinets, conduit bodies, or other conduit terminations. Couplings are not considered conduit terminations. However, where structural support members do not permit fastening within 3 feet, secure fastening can be located up to 5 feet away. In addition, RMC is required to be supported at least every 10 feet unless permitted otherwise by 344.30(B).

Δ (B) Supports. RMC shall be supported in accordance with one of the following:

- (1) Conduit shall be supported at intervals not exceeding 3 m (10 ft).
- (2) The distance between supports for straight runs of conduit shall be permitted in accordance with Table 344.30(B), provided the conduit is made up with threaded couplings and supports that prevent transmission of stresses to termination where conduit is deflected between supports.
- (3) Exposed vertical risers from industrial machinery or fixed equipment shall be permitted to be supported at intervals not exceeding 6 m (20 ft) if the conduit is made up with threaded couplings, the conduit is supported and securely fastened at the top and bottom of the riser, and no other means of intermediate support is readily available.