

Electrical metallic tubing (EMT) fittings

Specifications

Ref. CEC Rule 12-000 not exceeding 750 volts

Electrical metallic tubing (EMT) is similar to rigid steel conduit but is much lighter, weighing approximately 40 percent as much as rigid steel conduit of the same nominal size. EMT can be used, reference CEC Rule 12-1402, for both exposed or concealed work provided that, during installation or afterwards, it is not subjected to severe physical damage. Galvanized steel EMT installed in concrete, on grade or above, generally requires no supplementary corrosion protection. However, when installed in concrete below grade level and in contact with soil or cinders, supplementary corrosion protection consisting of a protective coating of bitumastic or asphalt base paint or plastic is generally applied. EMT run in or under permanently moist cinder fill must be encased in at least two inches of cinder-free concrete unless the conduit is at least 18 inches below the fill.

Aluminum EMT cannot be directly embedded in concrete containing soluble chlorides such as calcium chloride, unwashed beach sand, sea water or coral-bearing aggregates. When adequately treated with a protective coating of bitumastic or asphalt base paint or plastic coating, the raceway can be installed in concrete containing chlorides.

In wet locations where walls are frequently washed or where there are surfaces of absorbent material, the entire wiring system, including boxes, fittings, conduit and cables, must be supported such that there is at least ¼ inch air space between it and the supporting surface.

Fittings and couplings are required to be of concrete-tight type when embedded in masonry or concrete or in dry locations and of the raintight type when installed in wet locations (CEC Rule 12-1410).

Where No. 4 or larger underground conductors enter or leave a conduit, an insulating bushing with a smooth well-rounded insulating surface must be provided to protect conductors unless the terminating fitting is equipped with an insulated throat, firmly secured in place providing equivalent protection. The insulating bushing or insulating material must have a temperature rating of not less than the insulation temperature rating of installed conductors.

CEC Rule 12-3022 requires that the raceways be metallically joined together into a continuous electric conductor and must be mechanically connected to all boxes, fittings and cabinets as to provide effective electrical continuity.

EMT is not permitted to be threaded. Cut ends of tubing are required to be reamed. Code requires that EMT be adequately supported and restricts bends in one run to the equivalent of four quarters or 360 degrees total.

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For further details and complete information please refer to the following:

1. NEC Article 358 – Electrical metallic tubing
2. ANSI C80.3 – Electrical metallic tubing, zinc coated
3. UL797 – Standards for safety, electrical metallic tubing
4. ANSI C80.4 – Fittings for rigid metal conduit and electrical metallic tubing
5. UL 514A and 514B – Standards for safety, outlet boxes and fittings
6. WW-C-563 – Conduit, metal, rigid, and bend and elbow, electrical conduit, thinwall type (EMT)
7. W-F-408 – Fittings for conduit, metal, rigid, (thickwall and thinwall (EMT) Type)
8. NEMA FB-1 – Standards publication, fittings and supports for conduit and cable assemblies
9. CEC Section 12-1400 – Electrical metallic tubing
10. CSA C22.2 No. 83 – Safety standards for electrical metallic tubing
11. CSA C22.2 No. 18.1 and 18.3 – Safety standards for outlet boxes, conduit boxes and fittings

Please note

The excerpts and other material herein, whether relating to the Canadian Electrical Code 2012 Part I, the Underwriters Laboratories, Inc. listing, to industry practice or otherwise, are not intended to provide all relevant information required for use and installation. Reference to original or primary source material and data is mandatory before any application or use is made of the product.

Electrical metallic tubing (EMT) fittings

Specifications

—
01 Series 5123
insulated EMT
fitting (raintight)
(compression type)

—
02 Series 5120
EMT coupling (raintight)
(compression type)

—
03 Series 1350
pipe spacers

—
04 Series 106
bonding locknut

—
05 Series 4176
pipe straps

- Ferrous electrical metallic tubing (EMT) shall be of the hot-dipped galvanized type conforming to applicable specifications WW-563/ANSI 80.3/UL 797/CSA C22.2 No. 83. EMT protected solely by enamel shall not be used.
- Where lengths of EMT are coupled together or connected to boxes or enclosures or where EMT is coupled to threaded rigid metal conduit or IMC, fittings approved for intended applications shall be used, and:
 - (1) Shall be of rugged steel/malleable iron construction electro-zinc plated inside/outside including threads. Fitting throat shall be bushed with a nylon insulator.
 - (2) Shall be of raintight type for installations exposed to weather or wet locations such as series 5123, 5120 and 530.

Raintight type fittings may be substituted for concrete tight application.

- Where electrical metallic tubing and associated fittings are used as part of equipment grounding system:

- (1) A bonding type locknut such as series 106 shall be installed where hub-type fitting terminates into a threadless opening.
 - (2) Compression ring type fittings such as series 5123 and 5120 shall be used for terminating and coupling.
- EMT shall be securely fastened in place at intervals as specified by the code using straps, hangers and other supporting assemblies as indicated on plans, and as manufactured by ABB, series 4176 straps. In wet locations or where supporting surfaces are of absorbent materials vertical and horizontal runs of conduit shall be firmly supported such that there is at least $\frac{1}{4}$ in. air space between conduit and supporting surface.
 - Spacers and supporting straps shall be of rugged malleable iron or steel construction, hot-dipped galvanized, and conforming to requirements of Canadian Standards Association Standard C22.2 No. 18.3 as manufactured by ABB, series 4176 straps and series 1350 spacers.



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Electrical metallic tubing (EMT) fittings

Specifications – Fittings compression type, raintight

—
01 5123 series
—
02 5120 series
4230 series – 90° fittings

Application

- To connect and effectively bond electrical metallic tubing to a box or an enclosure
- To provide a raintight connection between tubing and the fitting
- To couple ends of tubing

Features

- Rugged all-steel construction
- Rings designed to positively bond conduit to fitting; unique locknut design provides effective bond between fitting and box or enclosure; ground continuity is assured
- Nylon insulator firmly secured in place – protects conductors, reduces wire pulling effort and prevents thread damage in handling
- Locknuts are designed with extended reach to lock fitting onto a thin box or an enclosure
- Locknuts tighten without deformation; will not vibrate loose

Standard material

- All steel except insulator
- Insulator: Thermoplastic, UL rated 105 °C

Standard finish

- All steel parts: electro zinc plated and chromate coated
- Insulator: As molded

Range

- Conduit size: ½ in. through 2 in.
- Hub size: ½ in. through 2 in. NPS
- Hubs provided with straight pipe threads NPS

Conformity

- UL 514B
- CSA 22.2 No. 18.3
- NFPA 70-2008 (ANSI)
- NEMA FB-1
- Federal Specification W-F-408
- Federal Standard H-28 (Threads)



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01



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02

Electrical metallic tubing (EMT) fittings

Fittings and couplings



EMT fittings – Nylon insulated



Diagram	Cat. no.	Size (in.)	Dimensions (in.)	
			A	B
<p>Across corners</p>	5123	1/2	1 3/64	1 21/32
	5223	3/4	1 21/64	1 27/32
	5323	1	1 11/16	1 7/8
	5423	1 1/4	2 1/16	2 11/32
	5523	1 1/2	2 5/16	2 23/32
	5623	2	2 25/32	2 13/16

UL Listed and CSA Certified concrete-tight



EMT couplings



Diagram	Cat. no.	Size (in.)	Dimensions (in.)	
			A	B
<p>Across corners</p>	5120	1/2	1 1/16	1 27/32
	5220	3/4	1 5/16	2 1/8
	5320	1	1 11/16	2 1/8
	5420	1 1/4	2 1/16	2 29/32
	5520	1 1/2	2 5/16	3 1/16
	5620	2	2 3/4	3 7/32

UL Listed and CSA Certified concrete-tight



EMT fittings



Diagram	Cat. no.	Size (in.)	Dimensions (in.)	
			A	B
<p>Across corners</p>	5121-TB	1/2	1 1/16	1 9/16
	5221	3/4	1 5/16	1 21/32
	5321	1	1 11/16	1 3/4
	5421	1 1/4	2 1/16	1 11/32
	5521-TB	1 1/2	2 5/16	2 9/16
	5621	2	2 3/4	2 3/4

UL Listed and CSA Certified concrete-tight

EMT (thinwall) fittings comply with Federal Spec. WF408B

Electrical metallic tubing (EMT) fittings

Elbows and combination couplings



Short elbows – Insulated

Ideal for cramped locations or tight corners where large radius conduit elbows will not fit or would appear unworkmanlike. Shoulders on body of 1/2 in. size are hex-shaped to provide positive holding for

standard installation tools. Use insulated type for simple and safe installations. Malleable iron. CSA rated 105 °C.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)		
			A	B	C
	4240	1/2	1 7/8	1 1/8	1 1/16
	4241-TB	3/4	1 11/16	1 3/8	1/2
	4242	1	1 7/8	1 5/8	5/8
	4243-TB	1 1/4	2 3/4	2 5/16	1 1/16
	4244	1 1/2	3 1/16	2 5/8	1 1/16
	4245	2	3 3/8	3 7/32	3/4

UL Listed and CSA Certified raintight



Short elbows – Malleable iron

Ideal for cramped locations or tight corners where large radius conduit elbows will not fit or would appear unworkmanlike. Shoulders on body of 1/2 in. size are hex-shaped to provide positive holding for

standard installation tools.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)		
			A	B	C
	4230	1/2	1 7/16	1 9/32	7/16
	4231	3/4	1 11/16	1 19/32	1/2
	4232	1	1 7/8	1 27/32	5/8
	4233	1 1/4	2 3/4	2 15/32	1 1/16
	4234	1 1/2	3 1/16	2 3/4	1 1/16
	4235	2	3 3/8	3 5/16	1 1/16

UL Listed and CSA Certified raintight



Combination couplings – Steel

For connecting EMT to threaded rigid and intermediate metal conduit.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)	
			A	B
	530TB	1/2	1 3/8	1 1/16
	531	3/4	1 1/2	1 11/32
	532	1	1 19/32	1 21/32

UL Listed and CSA Certified raintight

Electrical metallic tubing (EMT) fittings

Pipe straps and spacers



Pipe straps – Steel

Elongated bolt hole makes alignment easy, even when holes in mounting surface are out of alignment. Snap-on features hold strap in place.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)		
			A	B	C (bolt hole)
	4159C	1/2	1 ²⁷ / ₃₂	3/4	1/4
	4160C	3/4	2 ¹ / ₃₂	3/4	1/4
	4161C	1	2 ¹¹ / ₃₂	3/4	1/4
	4162*	1 1/4	2 ⁷ / ₈	3/4	1/4
	4163*	1 1/2	3 ¹¹ / ₁₆	1 1/4	1 ¹ / ₃₂
	4164*	2	4 ¹ / ₁₆	1 1/8	1 ³ / ₃₂

Oval hole for screw size (C)

Not UL Listed. *Not CSA. Conform to CEC 12-1404.



Pipe straps – Malleable iron

Designed to fit each size of conduit snugly. High reinforcing ribs on each side increase strength, reduce weight. Hot-dipped galvanized finish.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)		
			A	B	C (bolt hole)
	4175-C	3/8	1 1/2	5/8	1 ⁷ / ₆₄
	4176	1/2	2 ⁵ / ₃₂	2 ¹ / ₃₂	1/4
	4177	3/4	2 ⁹ / ₁₆	1 ¹ / ₁₆	1/4
	4178	1	3	3/4	1/4
	4179	1 1/4	3 ³ / ₄	1 ³ / ₁₆	5 ¹ / ₁₆
	4180	1 1/2	4 ³ / ₁₆	1 ⁵ / ₁₆	3/8
	4181	2	5 ³ / ₁₆	1 1/8	7 ¹ / ₁₆
	1282*	2 1/2	5 ¹⁵ / ₁₆	1 1/2	1/2
	1283*	3	6 ¹¹ / ₁₆	1 ⁵ / ₈	1/2
	1284*	3 1/2	7 ¹⁹ / ₃₂	1 3/4	5/8
	1285*	4	8 ⁵ / ₁₆	1 ⁷ / ₈	5/8

Not UL Listed. *Not CSA. Conforms to CEC 12-1404.



Pipe spacers

Used with conduit straps to permit space between conduit and mounting surface. Eliminates need for costly offset-bending conduit and possible corrosive moisture traps when conduit is mounted directly to a surface. Malleable iron.

Hot-dipped galvanized finish, pre-mountable and stackable to eliminate offsetting.



Diagram	Cat. no.	Size (in.)	Dimensions (in.)	
			A	B
	1350	1/2, 3/4, 1	3	7/8
	1351	1 1/4, 1 1/2, 2	5	1 3/16
	1352	2 1/2, 3	9 ⁹ / ₁₆	1 3/4
	1353	3 1/2, 4	7 ⁷ / ₁₆	2

Conforms to CEC 12-012 (5).