

# IMC Reference Guide

A Decision Maker's Guide to Applicable  
Codes, Standards and Technical Data



**Atkore**<sup>™</sup>  
Allied Tube  
& Conduit

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## Overview of IMC

### Physical Protection

Allied IMC is precision manufactured for economical protection and long lasting value for the electrical raceway system. IMC is manufactured from premium, work hardened steel combining electrical and mechanical performance with ductility. Allied IMC is resistant to impact and is easy to cut, bend and join for smooth, continuous raceways. Allied IMC has a typical yield strength of 50,000 psi and an average ultimate tensile strength of 60,000 psi. It is as strong, lighter in weight, and less expensive than Rigid. In fact, it can save you as much as 30% in overall costs. Allied IMC is available in trade sizes ½(16) thru 4(103) and True Color™ IMC is available through special order.

### Corrosive Environments

Allied IMC is hot galvanized using Allied's inline Flo-Coat® process. This process combines zinc, a conversion coating, and a clear organic polymer topcoat to form a triple layer of protection against corrosion and abrasion. The interior of Allied IMC is coated with a highly corrosion-resistant lubricating finish for easier wire-pulling. No need to worry about damage to the conduit system even when pulling through multiple 90° bends. (See Chart 1, Applicable Codes & Standards. "Corrosive Environments").

### Exceptional Equipment Grounding Conductor

IMC, covered by Article 342 in the National Electrical Code (NEC), is recognized as an equipment grounding conductor in Article 250. In 1994 the Steel Conduit/EMT Section of the National Electrical Manufacturer's Association (NEMA) contracted with the Georgia Institute of Technology School of Electrical and Computer Engineering to determine the performance of steel conduit/EMT as equipment grounding conductors. The full report can be found at: <http://steeltubeinstitute.org/steel-conduit/resources/gemi-analysis-research/>. The results of the study show that IMC, EMT, and GRC will allow the flow of higher fault currents than the wire type equipment grounding conductors listed in NEC table 250-102 (C) (1) The study also computed the maximum run lengths of steel conduit/EMT to install in order to comply with Article 250.

### Excellent Shield of EMI

Georgia Tech also conducted studies to determine the performance of steel conduit/EMT as a shield against electromagnetic fields. The study proved that IMC is very effective in reducing the effects of electromagnetic fields on encased power distribution circuits, shielding computers and other sensitive electronic equipment from the effects of electromagnetic interference (EMI).

\* Software to determine the maximum allowable run lengths of steel conduit as well as performance as a shield against EMI can be downloaded from: <http://steeltubeinstitute.org/steel-conduit/resources/gemi-analysis-research/>. The software, developed by the Georgia Institute of Technology, is called GEMI, Grounding and Electromagnetic Interference.

Building Information Modeling Systems (BIM)

Free BIM Models for IMC, Kwik-Couple® IMC, as well as elbows and nipples are available for download from the Allied Tube & Conduit website at: <http://www.alliedeg.us/bim-models/>

## Uses Permitted Quick Code Reference

Uses Permitted	Code Reference
Cinder Fill	NEC 342.10(C)
Corrosive Environments	NEC 342.10(B) UL White Book Category DYBY
Damp Locations	NEC 342.10(A)
Direct Burial	NEC 300.5 NEC 300.50 NEC 342.10(B) UL White Book Category DYBY
Encased in Concrete	NEC 342.10(B) UL White Book Category DYBY
Exposed Applications	NEC 342.10(A)
Hazardous Locations	Class I Locations NEC 501.10(A)(1)(a) Class II Locations NEC 502.10(A)(1)(1) Class III Locations NEC 503.10(A)(1)(1)
Health Care Facilities	NEC 517.12 NEC 517.30(C)(3)(1)
Outdoor Use	NEC 342.10(A)
Used as Equipment Grounding Conductor	NEC 250.118(3) NEC 342.60
Wet Locations	NEC 342.10(D)
Where Subject to Physical Damage	NEC 342.10(A)



# Most Common National Electrical Code References

Section	Section Subject	Description
250.118	Types of Equipment Grounding Conductors	(3) Intermediate Metal Conduit
Article 342	TYPE : IMC	Article 342 of the NEC <sup>®</sup> describes the guidelines for the use, installation, and construction of IMC
342.6	Listing Requirements	IMC Elbows, couplings, and fittings are required to be listed
342.10	Uses Permitted	Lists Uses Permitted for IMC
342.10(A)	All Atmospheric Conditions	This section allows the use of IMC in all atmospheric conditions and occupancies
342.10(B)	Corrosive Environments	This section allows the installation of IMC in concrete, direct contact with earth, and in areas subject to severe corrosive influence where the corrosion protection is judged suitable for the location
342.10(C)	Cinder Fill	IMC shall be permitted to be installed in cinder fill. (See the NEC <sup>®</sup> for specific details)
342.10(D)	Wet Locations	Allows the use of IMC in wet locations. All supports, bolts, straps, screws, and so forth shall be of corrosion resistant material or protected against corrosion by corrosion resistant material
342.14	Dissimilar Metals	Dissimilar Metals should be avoided where practicable to eliminate the possibility of galvanic action. Aluminum fittings and enclosures shall be permitted to be used with IMC
342.22	Number of Conductors	Refer to Table 1 Chapter 9 of NEC

## Most Common National Electrical Code References

Section	Section Subject	Description
342.22	Bends-How Made	Bends to IMC shall be made so that the conduit will not be damaged and the internal diameter of the conduit will not be effectively reduced. Refer to Table 2 Chapter 9 of NEC for curve of field bends
342.26	Bends-Number in One Run	Maximum of 4 bends (360 degrees) between pull points
342.28	Reaming and Threading	This section states that all ends should be finished in a way that removes all rough and sharp edges. When threading in the field use a standard cutting die with a $\frac{3}{4}$ inch taper per foot or 1 in 16
342.60	Equipment Grounding	IMC shall be permitted as an equipment grounding conductor
500	Hazardous Locations	This article covers requirements for electrical equipment and wiring for Hazardous Locations
501.10(A)(1)	Class I Division 1 Wiring Methods	(a) Allows IMC as a wiring method Class I Div. I
501.10(B)(1)	Class I Division 2 Wiring Methods	(1) Allows use of all wiring methods in 501.10(A)(1)(a)
502.10(A)(1)	Class II Division 1 Wiring Methods	(1) Allows the use of IMC
502.10(B)(1)	Class II Division 2 Wiring Methods	(1) Allows the use of IMC
503.10(A)(1)	Class III Division 1 Wiring Methods	(1) Allows use of IMC
503.10(B)	Class III Division 2 Wiring Methods	States wiring methods shall comply with 503.10(A)
517.12	Wiring Methods--Healthcare	This section of the code allows IMC to be used in Healthcare facilities
680.21(A)	Wiring Methods--Permanently Installed Pools	1) Allows the use of IMC as a wiring method for branch circuits associated with pool motors
695.6(D)	Fire Pump---Pump Wiring	Allows the use of IMC
708.10(C)(1)	COPS Feeder Wiring Requirements --Protection Against Physical Damage	(1) Allows the use of IMC





# Overview Safety Standard UL 1242- Electrical Metal Conduit-Steel

Chapter	Description
6	All listed IMC must have the O/D protected with a zinc or an alternate corrosion resistant material. Interiors shall be protected by organic or zinc coating
7	Threading and chamfering requirements including dimension of threads, protection of threads, and taper of the thread
9	Manufacturing requirements for straight conduit
14	Bending Test - This test section states that the interior coating shall not crack or flake when IMC is bent into a semi-circle following the guideline of 14.1.1 and as described in table 11.1 of UL 1242
19	Beam-Strength Test - This test is done to check the average force at which specimens of finished IMC will buckle. Table 19.1 gives the minimum values the conduit must meet
20	Threaded Conduit Pullout - This test is done to test the integrity of the IMC threads. During the test, pieces of IMC are assembled using a threaded coupling. The assembly is put into a testing machine that grips the opposite ends of the assembly and pulls at a rate of .50+/- 0.05 inch/minute until it meets the level indicated in 20.1
21	Chapter 21 lists all marking requirements for listed IMC

## UL White Book 2014 Category (DYBY) Intermediate Ferrous Metal Conduit

In addition, the product standard UL also provides the UL Whitebook which is a compilation of general guide information for all product categories including use and installation. Below is a list of statements under the use and installation section of the DYBY category.

- Galvanized intermediate steel conduit installed in concrete does not require supplementary corrosion protection
- Galvanized IMC installed in contact with soil does not generally require supplementary corrosion protection.

**CERTIFICATE OF COMPLIANCE**

**Certificate Number** 20150519 – E58688  
**Report Reference** E58688 - 19741226  
**Issue Date** 2015-MAY-19

**Issued to:** ALLIED TUBE & CONDUIT CORP  
16100 LATHROP AVE  
HARVEY, IL 60426 USA

**This is to certify that  
representative samples of**

Intermediate Ferrous Metal Conduit  
Intermediate ferrous metal conduit, elbows, bends, nipples  
and couplings in the 1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-  
1/2 and 4 in. trade sizes.

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** ANSI/UL 1242, "Electrical Intermediate Metal Conduit -  
Steel."

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

*B. Mahrenholz*

Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

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contact a local UL Customer Service Representative at [www.ul.com/contactus](http://www.ul.com/contactus)





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# Allied Tube & Conduit

## Product Specification –MasterFormat

This product specification is written according to the Construction Specifications Institute MasterFormat, 2014 Update.

### **SECTION 26 05 33.13**

#### **CONDUIT FOR ELECTRICAL SYSTEMS – Intermediate Metal Conduit (IMC)**

##### PART 1 – GENERAL

###### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section.

###### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Steel IMC with coupling
- B. Related Sections
  - 1. Section 26 05 26 “Grounding and Bonding for Electrical Systems”
  - 2. Section 26 05 29 “Hangers and Supports for Electrical Systems”
  - 3. Section 26 05 33.16 “Boxes for Electrical Systems”
  - 4. Section 27 05 33 “Conduits and Back boxes for Communications Systems”
  - 5. Section 25 05 28.33 “Conduits and Back boxes for Integrated Automation”

###### 1.3 REFERENCES

- A. UL 1242 – Standard for Electrical Intermediate Metal Conduit –Steel
- B. ANSI C80.6 – American National Standard for Electrical Intermediate Metal Conduit (EIMC)
- C. UL 514B – Standard for Conduit, Tubing and Cable Fittings
- D. NFPA 70 – National Electrical Code® (NEC®)
- E. NECA NEIS 101 – National Electrical Installation Standard for Installing Steel Conduits.
- F. ANSI/ASME B 1.20.1 – Standard for Pipe Threads, General Purpose (Inch)

###### 1.4 SUBMITTALS

- A. Manufacturer’s Product Data
- B. Certifications to applicable standards
- C. Domestic certifications: When required to Buy American Act or Buy America Act, comply with the provisions of Section 01 33 13

#### 1.5 QUALITY ASSURANCE

- A. IMC shall be listed to UL 1242 and manufactured in accordance with ANSI C80.6.
- B. Electrical equipment and materials shall be new and comply with the latest codes and standards. No used, re-built, refurbished and/or re-manufactured electrical equipment and materials shall be furnished on this project.
- C. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

#### 1.6 STORAGE AND HANDLING

- A. Storage: Whenever possible, store the conduit indoors to prevent possible discoloration, the accumulation of dirt and to extend the life of the product. If conduit is stored outdoors, it shall be stored in such a way as to allow air circulation and water drain-off and shall not be directly covered with plastic.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Allied Tube & Conduit, 16100 S. Lathrop Ave, Harvey, IL 60426, [www.alliedeg.com](http://www.alliedeg.com)

#### 2.2 INTERMEDIATE METAL CONDUIT (IMC) A. IMC shall be available in trade sizes ½-4.

- B. IMC shall be listed to UL 1242 and manufactured in accordance with ANSI C80.6
- C. IMC shall be labeled or marked showing evidence of third-party listing to product standard.
- D. IMC shall be manufactured from premium, work-hardened steel.
- E. IMC shall be hot galvanized using a process that combines zinc, a conversion coating, and a clear organic polymer top-coat to form a triple layer of protection against corrosion and abrasion.
- F. IMC shall have an organic interior coating with a highly corrosion- resistant lubricating finish for easy wire-pulling.
- G. IMC shall be threaded on both ends. Taper of conduit threads shall be ¾” per foot (1 in 16) per ANSI/ASME B.1.20.1.
- H. Conduit threads shall be hot galvanized after factory cutting.

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## Allied Tube & Conduit Product Specification -MasterFormat

- I. IMC shall be supplied with a straight-tapped electro-galvanized steel coupling, manufactured in accordance with UL 1242, on one end.
- J. A color-coded thread protector shall be installed on the other end:  
Trade Sizes 1, 2, 3, 4, (orange); ½, 1 ½, 2 ½, 3 ½, (yellow); ¾, 1 ¼ (green).

### 2.3 FITTINGS

- A. Field-installed fittings shall be listed to UL 514B.

### 2.4 ELBOWS

- A. Elbows shall be listed to UL 6 and manufactured in accordance with ANSI C80.1.

### 2.5 NIPPLES

- A. Nipples shall be listed to UL 6 and manufactured in accordance with ANSI C80.1.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. IMC shall be allowed for use in all atmospheres and locations, as a substitute for rigid steel conduit, in accordance with the National Electrical Code® (NEC®).
- B. IMC shall be installed in compliance with the latest version of the National Electrical Code® (NEC®) and other applicable codes and standards as indicated elsewhere in these specifications.
- C. IMC shall be installed in accordance with NECA National Electrical Installation Standard (NEIS) 101, Standard for Installing Steel Conduit.

**ATC-IMC0614**

**END OF SECTION 26 05 33.13**

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## State Departments of Transportation Specifying IMC

- **Alaska** <http://www.dot.state.ak.us/stwddes/dcsspecs/assets/pdf/aptspecs/sections/lighting.pdf>
- **Arizona** <http://azdot.gov/docs/business/2008-standards-specifications-for-road-and-bridge-construction.pdf>
- **Connecticut** [http://www.ct.gov/dot/LIB/dot/Documents/dform815/M\\_15M.pdf](http://www.ct.gov/dot/LIB/dot/Documents/dform815/M_15M.pdf)
- **Florida** [http://www.dot.state.fl.us/programmanagement/Implemented/SpecBooks/July2015Files/715eBook\\_Revised.pdf](http://www.dot.state.fl.us/programmanagement/Implemented/SpecBooks/July2015Files/715eBook_Revised.pdf)
- **Illinois** <http://www.idot.illinois.gov/assets/uploads/files/doing-business/manuals-guides-&-handbooks/highways/construction/standard-specifications/12specbook.pdf>
- **Maryland** <http://sha.md.gov/index.aspx?pageid=44>
- **Minnesota** <http://www.dot.state.mn.us/pre-letting/spec/2014/2014-Std-Spec-for-Construction.pdf>
- **Missouri** [http://www.modot.org/business/standards\\_and\\_specs/documents/Master.pdf](http://www.modot.org/business/standards_and_specs/documents/Master.pdf)
- **Nebraska** <http://www.transportation.nebraska.gov/ref-man/specbook-2007.pdf>
- **New Mexico** [http://dot.state.nm.us/content/dam/nmdot/Plans\\_Specs\\_Estimates/2014\\_SpecsFor\\_Highway\\_And\\_Bridge\\_Construction.pdf](http://dot.state.nm.us/content/dam/nmdot/Plans_Specs_Estimates/2014_SpecsFor_Highway_And_Bridge_Construction.pdf)
- **New York** <https://www.dot.ny.gov/main/business-center/engineering/specifications/english-specrepository/espec-english-cd.pdf>
- **Wyoming** <https://www.dot.state.wy.us/files/live/sites/wydot/files/sharedConstruction/2010%2Standard%20Specifications/2010%2Standard%20Specifications.pdf>



- **GEMI Grounding Study:** <http://steeltubeinstitute.org/steel-conduit/resources/gemi-analysis-research/>
- **GEMI EMI Shielding Study:** <http://steeltubeinstitute.org/steel-conduit/wp-content/uploads/sites/4/2014/12/GEMIVOL1.pdf>
- **BIM Models Allied IMC:** <http://www.alliedeg.us/bim-models/>
- **SDS Sheets:** <http://www.alliedeg.us/literature/galvanized-steel-sds/>
- **Allied IMC Videos**
  - **Threading and Bending:** <http://www.alliedeg.us/videos/imc-vs-rigid-conduit-threading-bending/>
  - **Why Use IMC:** <http://www.alliedeg.us/videos/why-use-rigid-conduit-can-use-imc/>









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Unistrut Construction ▲ Cope ▲ US Tray ▲ Calbrite ▲ Calbond ▲ Kaf-Tech  
Columbia-MBF ▲ Eastern Wire + Conduit ▲ ACS/Uni-Fab ▲ Cii  
Power-Strut ▲ Calconduit ▲ Razor Ribbon ▲ Calpipe Security  
FRE Composites ▲ Vergokan ▲ Flexicon ▲ Marco

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the mindset, skill set and tool set for success?  
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