

# ELECTRICAL CONDUIT SELECTION GUIDE



**Conduit helps protect cable and electrical wire from damage.** Various types of conduit are suited for specific conditions and applications, each having its own advantages. Understanding the differences can help you choose the right conduit for the job. The uses covered here are based on the National Electric Code. Local building codes vary by location; not all conduit meets code in all areas. Check your local codes before starting a project.

## METALLIC CONDUIT

■ **RIGID METAL CONDUIT, or type RMC, is most commonly known as “rigid.”** It has long been the standard for providing superior protection from severe physical and environmental damage. Galvanized steel RMC is factory-threaded at both ends and has a coupler applied on one end.

**Advantages and uses:** May be used for exposed or concealed applications, indoors or outdoors, in wet or dry conditions, and may be buried directly in earth or in concrete. Also permitted as an equipment grounding conductor.

**Limitations:** Heavy and usually more expensive than alternatives. The fittings also tend to be more expensive. Bending rigid conduit is difficult, requiring special equipment for sizes larger than 3/4". It may need to be rethreaded if cut, unless compression fittings are used.

■ **ELECTRICAL METALLIC TUBING, or type EMT, is the most commonly used conduit.** (Note: Technically, EMT is not classified as conduit; it's tubing.) Commonly known as “thinwall” because the wall is much thinner than RMC. As a result, it's not suitable for use where it's likely to be subject to severe physical damage (for example, on a wall next to a driveway). Like steel RMC, EMT is galvanized to provide excellent rust and corrosion resistance.

**Advantages and uses:** Lightweight and easy to bend. Fittings are commonly available and inexpensive. May be used for exposed or concealed applications, indoors or outdoors, in wet or dry conditions, and may be buried directly in earth or in concrete. Also permitted as an equipment grounding conductor.

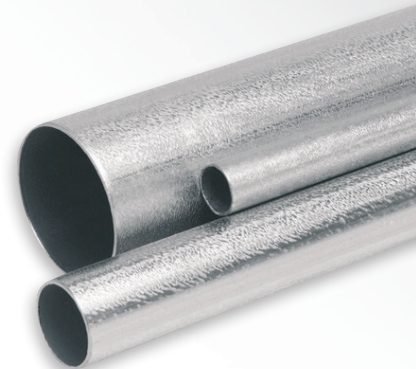
**Limitations:** Not suitable for use where subject to severe physical damage.

■ **FLEXIBLE METALLIC CONDUIT, or type FMC, is more commonly known as “flex” or “Greenfield.”** Manufactured from an interlocking, spirally wound metal strip. Although the length of installation is not limited, it's used most commonly for the last several feet of a more conventional conduit system that would be difficult to terminate (for example, to connect light fixtures in a suspended grid ceiling). Also used for equipment that is subject to movement or vibration, such as pumps or manufacturing equipment.

**Advantages and uses:** Easy to install with no special equipment needed; however, use of a cutting tool is recommended to help save time and yield the best results. May be used for exposed or concealed applications in dry locations only. Where flexibility is not required after installation, it is permitted as an equipment grounding conductor. (Note: Installations that are subject to vibration or that require a high degree of flexibility require a separate equipment grounding conductor.)

**Limitations:** May not be used in wet locations, in corrosive environments or where subject to severe physical damage.

■ **LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT, or type LFMC, is commonly known as “liquidtight” or “sealtight.”** Like FMC, LFMC is made with an interlocking, spirally wound metal strip; however, it has an overall outer covering of liquidtight, sunlight-resistant, non-metallic material. Also like FMC, length of installation is not limited. Used most commonly for the last several feet of a more conventional conduit system that would be difficult to terminate, and for equipment prone to movement or vibration. An excellent choice for environments with dust, vapor or moisture.



**Advantages and uses:** Easy to install with no special equipment needed; however, use of a cutting tool is recommended to help save time and yield the best results. May be used for exposed or concealed applications, indoors or outdoors, in wet or dry conditions, and may be buried directly in earth. Where flexibility is not required after installation, it is permitted as an equipment grounding conductor. *(Note: Installations that are subject to vibration or that require a high degree of flexibility require a separate equipment grounding conductor.)*

**Limitations:** Not for use where subject to severe physical damage.

## NONMETALLIC CONDUIT

■ **RIGID POLYVINYL CHLORIDE CONDUIT, or type PVC, is most commonly available with one end belled to facilitate joining sections together without the need for a separate coupler.**

The conduit and pre-formed elbows are available in both schedule 40 and schedule 80. Schedule 40 has a thinner wall than schedule 80, and is not permitted for use where subject to physical damage. The outside diameters of schedule 40 and schedule 80 conduit are identical; therefore, the same fittings are employed for both. Conduit and fittings are joined by solvent welding with primer and cement. Because PVC is prone to thermal expansion and contraction, use of expansion couplings is necessary where the total run length will change by ¼" or more.

**Advantages and uses:** Nonconductive, flame retardant and sunlight resistant. Inexpensive and easy to install; no special equipment needed. May be used indoors and outdoors, for concealed or exposed work, and in dry, damp or wet conditions. Also suitable for corrosive conditions, for direct burial and encasement in concrete. As previously noted, schedule 80 is suitable for use where subject to physical damage.

**Limitations:** Not suitable for hazardous locations or where ambient temperature exceeds 122°F (50°C). Because it's nonconductive, it may not be used as an equipment grounding conductor. Where equipment grounding is required, a separate equipment grounding conductor must be installed within the conduit.

■ **LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT, or type LFNC-B, is commonly known as "liquidtight" or "sealtight."** Has a smooth, seamless inner surface with integral reinforcement within the conduit wall. Made of a liquidtight, sunlight-resistant, non-metallic material. Although the maximum length of

installation is not limited, it's used most commonly for the last several feet of a more conventional conduit system that would be difficult to terminate, and for equipment prone to movement or vibration. An excellent choice for environments with dust, vapor or moisture.

**Advantages and uses:** Nonconductive, flame retardant and sunlight resistant. Easy to install; no special equipment needed. May be used indoors and outdoors, for concealed or exposed work, and in dry, damp or wet conditions. Suitable for direct burial and encasement in concrete.

**Limitations:** Not suitable for hazardous locations, where subject to physical damage or where the operating voltage of the conductors is greater than 600 volts. Because it's nonconductive, it may not be used as an equipment grounding conductor. Where equipment grounding is required, a separate equipment grounding conductor must be installed within the conduit.

■ **ELECTRICAL NONMETALLIC TUBING, or type ENT, is a pliable, corrugated raceway of moisture-resistant, chemical-resistant, flame-retardant, non-metallic material.**

Commonly light blue in color, though not specified by code. There are fittings designed specifically for use with ENT; however, common PVC conduit fittings may be used with solvent welding.

**Advantages and uses:** Nonconductive and flame retardant. Easy to install; no special equipment needed. May be used indoors for concealed or exposed work, in dry, damp or wet conditions. May also be encased in concrete.

**Limitations:** Not suitable for outdoor use, direct burial, in hazardous locations, where subject to physical damage, where ambient temperature exceeds 122°F (50°C) or where the operating voltages of the conductors is greater than 600 volts. Because it's nonconductive, it may not be used as an equipment grounding conductor. Where equipment grounding is required, a separate equipment grounding conductor must be installed within the conduit.





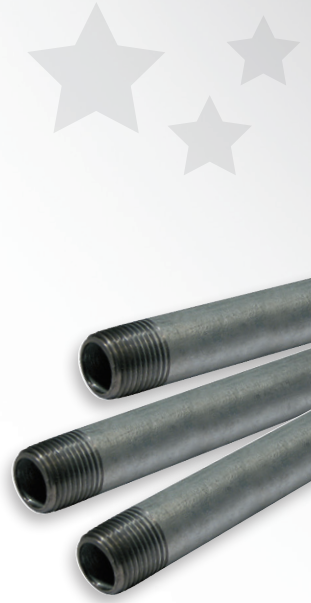
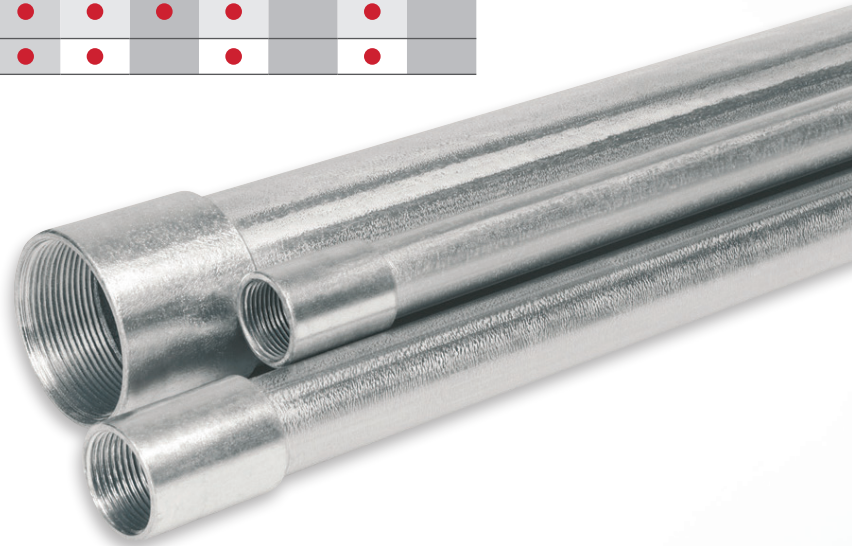
## QUICK REFERENCE GUIDE TO SELECTING ELECTRICAL CONDUIT

TYPE OF CONDUIT	Exposed Applications	Concealed Applications	For Use Where Subject to Physical Damage	Indoor Use	Outdoor Use	Wet Locations	Dry or Damp Locations	Suitable for Direct Burial	May Be Encased in Concrete	Galvanized	Non-Conductive	Used as Equipment Grounding Conductor
<b>METALLIC CONDUITS</b>												
Rigid Metal Conduit (RMC)	●	●	●	●	●	●	●	●	●	●		●
Electrical Metallic Tubing (EMT)	●	●		●	●	●	●	●	●	●		●
Flexible Metallic Conduit (FMC)	●	●		●			●			●		● <sup>1</sup>
Liquidtight Flexible Metallic Conduit (LFMC)	●	●		●	●	●	●	●				● <sup>1</sup>
<b>NONMETALLIC CONDUITS</b>												
Rigid Polyvinyl Chloride Conduit (PVC)	●	●	● <sup>2</sup>	●	●	●	●	●	●		●	
Liquidtight Flexible Nonmetallic Conduit (LFNC-B)	●	●		●	●	●	●	●	●		●	
Electrical Nonmetallic Tubing	●	●		●		●	●		●		●	

<sup>1</sup>Schedule 80 only

<sup>2</sup>Installations subject to vibration or requiring flexibility require a separate equipment grounding conductor

The product statements presented are intended for informational purposes only. Such product statements do not constitute a product recommendation or representation as to the appropriateness for a specific purpose. W.W. Grainger, Inc. does not guarantee the result of product operation or assume any liability for personal injury or property damage resulting from the user's reference to any product statements.



The Grainger Choice badge signals a broad selection of products that deliver quality and value, brought to you by Grainger.