

### What's it all About?

Electrical conduits refer to an electrical system used to protect and provide route of electrical wiring. Electrical conduits are made of metal, plastic, or fiber and could be rigid or flexible. Conduits must be installed by following standard regulations, as those provided by the manufacturer and the National Electrical Code (NEC).

### Keys to Remember

- The 2017 NEC covers 12 types of conduits. Articles 342 through 362 specify use, installation, and construction specifications.
- Fill rates, or how many wires can be put in the conduit, is covered in the 2017 NEC Annex C.
- Sizing - Conduit tubing uses Outside Dimensions (OD); conduit piping uses Nominal Pipe Size (NPS). Sizes range from 3/8" to 6".
- With any wiring project, safety for people and property is most important. Any metallic conduit should be grounded/bonded to the electrical grounding system.

### For the Project

- Material List with Costs
- References
- Diagrams
- Planning and Research
- Dimensions
- Title and Labels
- Pictures (if exhibiting a report or poster)
- Record Sheet

## Nine Common Types of Electrical Conduit

### 1. Galvanized Rigid Conduit

A conduit made from galvanized steel tubing is commonly referred to as a rigid conduit. The thickness of a galvanized rigid (GR) conduit protects the electrical wiring from being hit and allows it to be threaded.

### 2. Electrical Metallic Tubing

An electrical metallic tubing (EMT) conduit is made of steel; in some cases aluminum is also used. EMT is cheaper than a galvanized rigid conduit and lighter than a GR conduit. EMT is also a very popular material because it can be bent to specific radius and directions.

### 3. Electrical Nonmetallic Tubing

A non-metallic conduit is thin-walled corrugated tubing, moisture-resistant and flame retardant. The non-metallic conduit can be bent by hand and can be easily installed due to its flexible properties. However, fittings used to connect non-metallic tubing are rigid and cannot be bent.

#### 4. Flexible Metallic Conduit

A flexible metallic conduit (MC) forms a hollow tube in which electrical wires are passed. It is highly recommended in dry areas. The flexible metallic conduit, also called Greenfield of flex, does not maintain permanent bend.

#### 5. Liquid-Tight Flexible Metal Conduit

A liquid-tight flexible metal conduit (LFMC) is covered by a plastic waterproof coating. Its interior is very similar with the flexible metallic conduit. It is recommended for use in general wiring, wet or damp locations.

#### 6. Rigid Metallic Conduit

A rigid metallic conduit is made commonly from coated stainless steel or aluminum. The rigid metallic conduit can be treated to prevent corrosion by applying different coating to the conduit. Rigid steel conduit is the heaviest- weight and thickest wall conduit. Rigid metal conduit is available in trade sizes 1/2 through 6.

#### 7. Liquid-Tight Flexible Nonmetallic Conduit

Liquid-tight flexible nonmetallic conduit (LNFC) is another term for a number of flame-resistant types of non-metallic tubing. This type of tubing is recommended as a raceway for the installation of approved conductors with a nominal rating of 600 volts or less for non-hazardous locations. The interiors of this conduit may be corrugated or smooth.

#### 8. Aluminum Conduits

An aluminum conduit is a rigid conduit commonly used in commercial and industrial applications. Aluminum conduits are used to prevent corrosion and are the preferred conduit used in areas where there are large amounts of water and in corrosion-prone areas. Aluminum cannot be directly embedded in concrete, since the metal reacts with the alkalis in cement. Aluminum conduits may be protected with additional coatings.

#### 9. PVC Conduits

PVC is the lightest conduit material and usually the lower cost conduit material. PVC conduits can vary in thickness depending on the uses and where the PVC will be installed. The PVC conduit resists moisture and corrosion but the tubing is non-conductive. An extra grounding conductor must be passed into each conduit. PVC conduit has a higher thermal coefficient of expansion allowing the conduit to expand and contract.