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| **CMGT 235 – Electrical and Mechanical Systems** | | |
| **Discussion No. 26** | **Unit 3 - Electrical Systems** | **Fall 2022** |

**Sizing Electrical Raceway**

**Proper Sizing of Conduit and Raceways**

When selecting the conduit size, it’s important to consider the following variables:

1. Number of conductors
2. Size of the conductors
3. Type of conduit

NFPA 731 Section 4.6.3.12(2) requires raceways to be sized properly in accordance with the NEC.

**2017 Edition National Electric Code (NFPA 70)**

**Article 300**

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**Article 300.17**

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In the NEC, there are two main locations used when determining the maximum number of conductors in a conduit or tubing:

**NEC Annex C** is used for determining the maximum number of conductors permitted in conduit or tubing, when all conductors in the conduit are of the same size and insulation type.

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**NEC Chapter 9** is used for combinations of conductors of different sizes or insulation types installed in the same conduit or tubing.

**Chapter 9**

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**Example 1**

What is the minimum size Schedule 40 PVC raceway required for three 500 kcmil THHN conductors, one 250 kcmil THHN conductor, and one 3 THHN conductor?

**Example 2**

What size RMC nipple is required for three 3/0 THHN conductors, one 1 THHN conductor and one 6 THHN conductor?

**Example 3**

How many 8 THHN conductors can be installed in a trade size 3/4 EMT?

**Example 4**

How many 18 TFFN conductors can be installed in trade size ¾ LFMC?

**Example 5**

What’s the smallest trade size PVC Schedule 40 raceway that can be used for the installation of four 1/0 THHN conductors?

**Example 6**

A 200A feeder installed in Schedule 80 PVC has three 3/0 THHN conductors, one 2 THHN conductor, and one 6 THHN conductor. What size raceway is required?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| QTY | GAUGE | TYPE | Cross-Section Area | |  |
| 3 | 3/0 | THHN |  | |  |
| 1 | 2 | THHN |  | |  |
| 1 | 6 | THHN |  | | PVC Sched. 80 |
|  |  |  | Total Cross-Section Area |  |  |

**Example 7**

What size EMT raceway is required for 4 wires, with insulation type THHN, and gauge of 8 AWG and 2 wires, with insulation type THW, and gauge of 4 AWG.?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| QTY | GAUGE | TYPE | Cross-Section Area | |  |
|  |  |  |  | |  |
|  |  |  |  | | EMT |
|  |  |  | Total Cross-Section Area |  |  |