

# ECET 4520

Industrial Distribution Systems, Illumination, and the NEC

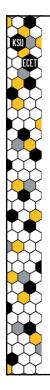
Conduit Fill

## **Electric Distribution System Design**

<u>Conduit Fill</u> is the percent of the area inside a conduit taken up by the conductor(s) or cable(s) that are contained by the conduit.

Maintaining an adequate amount of empty space within a conduit is important for both heat-dissipation and ease of installation.

If the conductors that are being pulled through the conduit take up too much of the available space, jamming may occur, especially in long conduit runs or those with a large number of bends.



### **Article 358 – Electrical Metallic Tubing**

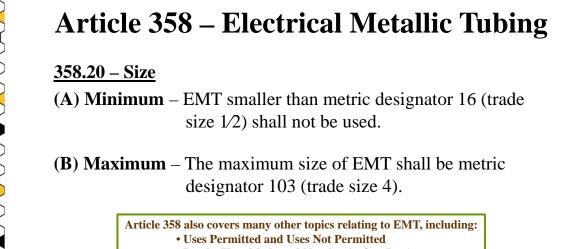
#### <u>358.1 – Scope</u>

This article covers the use, installation, and construction specifications for electrical metallic tubing (EMT) and associated fittings.

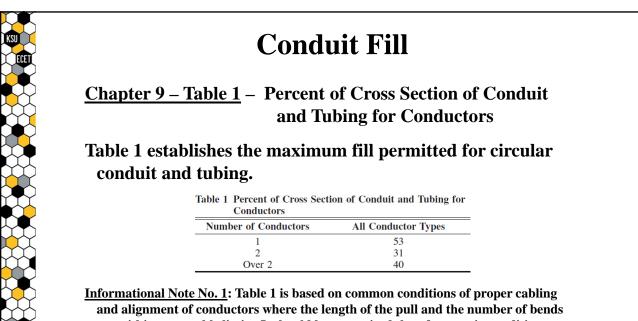
#### <u>358.22 – Number of Conductors</u>

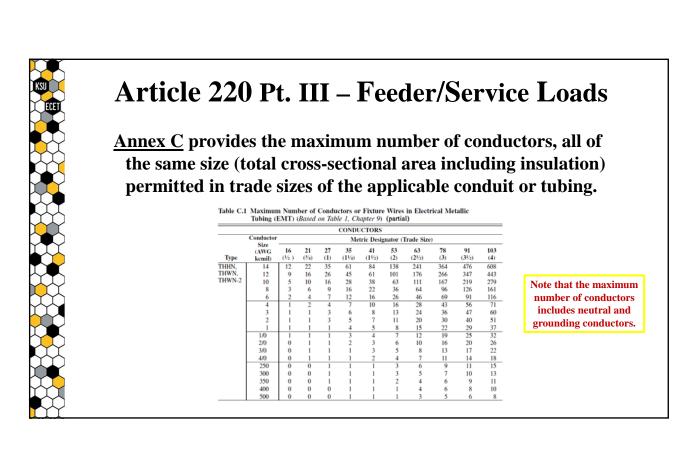
The number of conductors shall not exceed that permitted by the percent fill specified in Table 1, Chapter 9. Electrical Metallic Tubing (EMT) An unthreaded thin-wall raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed utilizing appropriate fittings. EMT is generally made of steel (ferrous) with protective coatings or

(ferrous) with protective coatings of aluminum (nonferrous).



- Bends (How Made and Number in One Run)
- Securing and Supporting
- Couplings and Connectors
- Grounding.





and alignment of conductors where the length of the pull and the number of bends are within reasonable limits. It should be recognized that, for certain conditions, a larger size conduit or a lesser conduit fill should be considered.

### Article 220 Pt. III – Feeder/Service Loads

#### <u>For Example</u> – Determine the minimum standard-sized conduit that is needed for a run containing 5 - #4 THHN conductors.

CONDUCTORS											
	Conductor	Metric Designator (Trade Size)									
Type	Size (AWG kcmil)	16 (½)	21 (¾)	27 (1)	35 (1¼)	41 (1½)	53 (2)	63 (2½)	78 (3)	91 (3½)	103 (4)
THHN,	14	12	22	35	61	84	138	241	364	476	608
THWN, THWN-2	12	9	16	26	45	61	101	176	266	347	443
	10	5	10	16	28	38	63	111	167	219	279
	8	3	6	9	16	22	36	64	96	126	161
	6	2	4	7	12	16	26	46	69	91	116
	4	1	2	4	7	10	16	28	43	56	71
	3	1	1	3	6	8	13	24	36	47	60
	2	1	1	3	5	7	11	20	30	40	51
	1	1	1	1	4	5	8	15	22	29	37
	1/0	1	1	1	3	4	7	12	19	25	32
	2/0	0	1	1	2	3	6	10	16	20	26
	3/0	0	1	1	1	3	5	8	13	17	22
	4/0	0	1	1	1	2	4	7	11	14	18
	250	0	0	1	1	1	3	6	9	11	15
	300	0	0	1	1	1	3	5	7	10	13
	350	0	0	1	1	1	2	4	6	9	11
	400	0	0	0	1	1	1	4	6	8	10
	500	0	0	0	1	1	1	3	5	6	8

