

Technical Advisory

Mohawk Premise Cable: 40% Conduit Fill

The National Electrical Code (NEC) limits the number of cables that can be placed in a conduit based on the type of cable. In the case of multi-conductor cables having 2 or more conductors, the conduit fill is limited to 40%. The NEC code is intended to limit the number of power carrying conductors in the conduit but the 40% Fill has become an installation practice in the LAN industry. Anyone using the information provided in the TA is advised to consult the local building codes to insure compliance with conduit fill regulations that may supercede the NEC.

Trade size of conduit, 1/2, 3/4, 1 1/4, etc, is commonly used as the dimension for calculating the area of the conduit. This will result in a slightly conservative number of cables because the actual inside diameter of the conduit is typically slightly larger than the Trade Size.

The formula is: $\frac{D^2}{d^2} \times 0.4$

Where d is the outside diameter of the cable in inches
 D is the Trade Size of the conduit in inches
.4 is the 40% conduit fill

The NEC allows rounding up to the next whole number of cables if the decimal portion of the calculation is .8 or larger.

For example: If the diameter of a cable is .200 inches and the Conduit is 1.5 inch Then the cable diameter squared is .040 sq in, the Conduit diameter squared is 2.25 sq in. The number of cables is then $2.25 / .04 \times .4 = 22.5$
The decimal portion (.5) is less than .8, so the number of cables should be rounded down to 22.

The following tables are based on the Trade Size of the conduit using .8 rounding rule.

For questions concerning a particular program, call the Technical Support Group of Mohawk at (800) 422-9961.

Twisted Pair LAN Cables

Mohawk Type	Description	Nominal Cable O.D	0.75	1	1.25	1.5	2	2.5	3	3.5	4
GigaLAN 10®	4 Pair UTP Non Plenum	0.295	2	4	7	10	18	28	41	56	73
	4 Pair UTP Plenum	0.295	2	4	7	10	18	28	41	56	73
GigaLAN®	4 Pair UTP Non Plenum	0.247	3	6	10	14	26	41	59	80	105
	4 Pair UTP Plenum	0.244	3	6	10	15	27	42	60	82	107
AdvanceNet®	4 Pair UTP Non Plenum	0.225	4	8	12	17	31	49	71	96	126
	4 Pair UTP Plenum	0.228	4	7	12	17	30	48	69	94	123
	4 Pair STP Non Plenum	0.265	3	5	9	13	22	35	51	69	91
	4 Pair STP Plenum	0.255	3	6	9	14	24	38	55	75	98
6 LAN™	4 Pair UTP Non Plenum	0.212	5	9	14	20	35	55	80	109	142
	4 Pair UTP Plenum	0.208	5	9	14	21	37	57	83	113	148
MegaLAN®	4 Pair UTP Non Plenum	0.190	6	11	17	25	44	69	99	135	177
	4 Pair UTP Plenum	0.190	6	11	17	25	44	69	99	135	177
	4 Pair ScTP Non Plenum	0.245	3	6	10	15	26	41	60	81	106
	4 Pair ScTP Plenum	0.224	4	8	12	18	32	50	71	97	127
5e LAN®	4 Pair UTP Non Plenum	0.190	6	11	17	25	44	69	99	135	177
	4 Pair UTP Plenum	0.180	7	12	19	27	49	77	111	151	197
	4 Pair STP Non Plenum	0.232	4	7	11	16	29	46	67	91	119
	4 Pair STP Plenum	0.218	4	8	13	19	33	52	75	103	134
	25 Pr UTP Non Plenum	0.470	1	2	3	4	7	11	16	22	29
	50 Pr UTP Non Plenum	0.750	0	0	1	1	3	4	6	8	11
	25 Pr STP Non Plenum	0.522	1	1	2	3	6	9	13	18	23
	25 Pr UTP Plenum	0.430	1	2	3	5	8	13	19	26	34
	25 Pr STP Plenum	0.472	1	1	3	4	7	11	16	22	28
	4 Pr UTP Plenum	0.170	7	14	21	31	55	86	124	169	221
Category 5	4 Pair UTP Non Plenum	0.190	6	11	17	25	44	69	99	135	177
	4 Pair UTP Plenum	0.180	7	12	19	27	49	77	111	151	197
	4 Pair ScTP Non Plenum	0.240	4	7	11	15	27	43	62	85	111
	4 Pair ScTP Plenum	0.230	4	7	12	17	30	47	68	92	121
	25 Pair UTP Non Plenum	0.470	1	2	3	4	7	11	16	22	29
	25 Pair ScTP Non Plenum	0.522	1	1	2	3	6	9	13	18	23
	50 Pair UTP Non Plenum	0.750	0	0	1	1	3	4	6	8	11
	4 Pair UTP Plenum	0.180	7	12	19	27	49	77	111	151	197
	25 Pair UTP Plenum	0.430	1	2	3	5	8	13	19	26	34
	25 Pair ScTP Plenum	0.472	1	1	2	4	7	11	16	22	28

Voice Grade Cables

Mohawk Type	Description	Nominal Cable O.D	0.75	1	1.25	1.5	2	2.5	3	3.5	4
Category 3	4 Pair UTP Non Plenum	0.161	8	15	24	34	61	96	139	189	247
	4 Pair ScTP Non Plenum	0.210	5	9	14	20	36	56	81	111	145
	25 Pair UTP Non Plenum	0.364	1	3	4	6	12	19	27	37	48
	50 Pair UTP Non Plenum	0.591	0	1	1	2	4	7	10	14	18
	100 Pair UTP Non Plenum	0.707	0	1	1	2	3	5	7	10	13
	200 Pair UTP Non Plenum	1.054	0	0	0	1	1	2	3	4	5
	300 Pair UTP Non Plenum	1.222	0	0	0	0	1	1	2	3	4
	400 Pair UTP Non Plenum	1.590	0	0	0	0	0	1	1	2	2
	25 Pair ScTP Non Plenum	0.394	1	2	4	5	10	16	23	31	41
	4 Pair UTP Plenum	0.161	8	15	24	34	61	96	139	189	247
	4 Pair ScTP Plenum	0.189	6	11	17	25	44	70	100	137	179
	25 Pair UTP Plenum	0.389	1	2	4	6	10	16	23	32	42
	25 Pair ScTP Plenum	0.346	2	3	5	7	13	21	30	41	53
	50 Pair UTP Plenum	0.550	0	1	2	3	5	8	12	16	21
	100 Pair UTP Plenum	0.786	0	0	1	1	2	4	6	8	10
	200 Pair UTP Plenum	1.088	0	0	0	0	1	2	3	4	5
	300 Pair UTP Plenum	1.334	0	0	0	0	1	1	2	2	3
400 Pair UTP Plenum	1.527	0	0	0	0	0	1	1	2	2	

Coaxial Cables

Mohawk Type	Description	Nominal Cable O.D	0.75	1	1.25	1.5	2	2.5	3	3.5	4
75 ohm	RG6/U Foil/Braid Non Plenum	0.269	3	5	8	12	22	34	49	67	88
	RG6/U Foil/Braid Plenum	0.235	4	7	11	16	29	45	65	88	116
	RG6 Quad Foil/Braid Non Plenum	0.307	2	4	6	9	17	26	38	52	68
	RG6 Quad Foil/Braid Plenum	0.268	3	5	8	12	22	35	50	68	89
	RG11/U Foil/Braid Non Plenum	0.405	1	2	4	5	9	15	22	30	39
	RG11/U Foil/Braid Plenum	0.346	2	3	5	7	13	21	30	41	53
	RG11 Quad Foil/Braid Non Plenum	0.424	1	2	3	5	9	14	20	27	35
	RG11 Quad Foil/Braid Plenum	0.372	1	3	4	6	11	18	26	35	46