



Determining Tubing/Conduit Core Size

How to use the tables on this page:

A

It is possible for a wire bundle to contain wires of all the same size diameter, or a variety of mixed diameters. The gauge indicates only the diameter of the conductor, and this information alone is not sufficient to determine required tubing size. Referring to the appropriate wire specification is necessary to establish the overall diameter including the insulation and/or braided shielding.

Step	All Wires Same Diameter	Two Different Wire Diameters
1. A bundle containing 30 wires	30 wires @ .045 dia	15 wires @ .045 dia 15 wires @ .135 dia
2. Determine average wire diameter	$30 \times .045 = 1.35$ $1.35 \div 30 = .045$ average wire diameter	$15 \times .045 = .68$ $15 \times .135 = \underline{2.03}$ 2.71 $2.71 \div 30 = .090$ average wire diameter
3. Using Table I, find factor for 30 wires (6.7) and multiply by average wire diameter	$.045 \times 6.7 = .3015$ wire bundle diameter	$.090 \times 6.7 = .603$ wire bundle diameter
4. Tubing size is determined on Table II. 70% fill is recommended	Size 12 (.305 dia = 70% fill)	Size 24 (.607 dia = 70% fill)

Table I

Number of Wires	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	28	32
Factor	1.0	2.0	2.2	2.4	2.7	2.9	3.0	3.3	3.8	4.0	4.3	4.6	5.0	5.3	5.6	6.0	6.5	6.9
Number of Wires	36	40	45	50	55	60	65	70	75	80	90	100	125	150	175	200	250	300
Factor	7.4	7.7	8.1	8.5	8.9	9.3	9.7	10.1	10.5	10.9	11.6	12.2	13.7	15.0	16.1	17.2	19.3	21.0

Table II

Dash No.	I.D.	Cross-sectional Area	FILL				
			50%	60%	70%	80%	90%
06	3/16 (0.188)	0.027	0.132	0.145	0.156	0.167	0.177
08	1/4 (0.250)	0.049	0.177	0.194	0.209	0.224	0.237
09	9/32 (0.281)	0.062	0.199	0.218	0.235	0.251	0.267
10	5/16 (0.313)	0.076	0.221	0.242	0.261	0.279	0.296
12	3/8 (0.375)	0.110	0.265	0.290	0.314	0.335	0.356
14	7/16 (0.438)	0.150	0.309	0.338	0.366	0.391	0.415
16	1/2 (0.500)	0.196	0.354	0.387	0.418	0.447	0.474
20	5/8 (0.625)	0.307	0.442	0.484	0.523	0.559	0.593
24	3/4 (0.750)	0.442	0.530	0.581	0.627	0.671	0.712
28	7/8 (0.875)	0.601	0.619	0.678	0.732	0.783	0.830
32	1 (1.000)	0.785	0.707	0.775	0.837	0.894	0.949
40	1 1/4 (1.250)	1.227	0.884	0.968	1.046	1.118	1.186
48	1 1/2 (1.500)	1.767	1.061	1.162	1.255	1.342	1.423
56	1 3/4 (1.750)	2.405	1.237	1.356	1.464	1.565	1.660
64	2 (2.000)	3.142	1.414	1.549	1.673	1.789	1.897
80	2 1/2 (2.500)	4.909	1.768	1.936	2.092	2.236	2.372
96	3 (3.000)	7.069	2.121	2.324	2.510	2.683	2.846