

# Rigid Nonmetallic Conduit

## Typical Properties of Conduit Raw Material Compound

### Thermal

	ASTM Test	Typical Values
Co-efficient of Thermal Expansion-inch/inch/°F (properties @ 73.4°F)	D696	3.38 x 10 <sup>-5</sup>
Heat Distortion °F at 264 psi	D648	160°F
Thermal Conductivity BTU (hr.) (ft.) (°F/in.)	N/A	1.3

### Electrical

	ASTM Test	Typical Values
Dielectrical Strength volts/mil	D149	1100
Dielectric Constant 60 CPS @ 30°C	D150	4.00
Power Factor 60 CPS @ 30°C	D150	1.93

### Mechanical

	ASTM Test	Typical Values
Specific Gravity	D792	1.43 - 1.6
Tensile Strength (psi) @ 73.4°F	D638	5,000-6,500
Izod Impact ft lbs./in. of notch	D256	0.65 - 1.5
Flexural Strength (psi)	D790	12,500
Compressive Strength (psi)	D695	9,000
Hardness (Durometer D)	D2240	85

### Impedance (Volts lost per ampere per 100 feet)

	3Ø 90% P.F.	80% P.F.	1Ø 90% P.F.	80% P.F.
Steel Conduit	.0118	.0123	.0136	.0142
Plus 40®	.0105	.0106	.0121	.0122

Using 250 KcMil Cu. conductor. comparable values for other conductor sizes.

## Wire Fill

Maximum number of conductors in Schedule 40 PVC conduit

Table 3A and Table 3B (Based on Table 1, Chapter 9 of the NEC)

Type Letters	Conductor Size AWG, MCM	Conduit Trade Size (inches)															
		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/4	5	6	8		
THWN	14	13	24	39	69	94	154										
	12	10	18	29	51	79	114	164									
	10	6	11	18	32	44	73	194	160								
	8	3	5	9	19	22	36	51	71	106	136						
THHN	6	1	4	6	11	15	26	37	57	76	98	125	154				
	4	1	2	4	7	9	16	22	35	47	60	75	94	137	236		
FEP (14 thru 2)	3	1	1	3	6	8	13	19	29	39	51	64	90	116	201		
	2	1	1	3	5	7	11	16	25	33	43	54	67	97	169		
FEPB (14 thru 8)	1	1	1	3	5	9	12	18	25	32	49	59	72	125			
	1/0	1	1	3	4	7	10	15	21	27	33	42	61	105			
PFA (14 thru 4/0)	2/0	1	1	2	3	6	8	13	17	22	28	35	51	88			
	3/0	1	1	1	3	5	7	11	14	18	23	29	42	73			
PFAH (14 thru 4/0)	4/0	1	1	1	2	4	6	9	12	15	19	24	35	61			
	250			1	1	1	3	4	7	10	12	16	20	28	49		
Z (14 thru 4/0)	300			1	1	1	3	4	6	8	11	13	17	24	42		
	350			1	1	1	2	3	5	7	9	12	15	21	37		
	400			1	1	1	3	5	6	8	10	13	19	33			
XHHW (4 thru 500MCM)	500			1	1	1	2	4	5	7	9	11	16	27			
	600			1	1	1	3	4	5	7	9	13	22				
	700			1	1	1	3	4	5	6	8	11	19				
	750			1	1	1	2	3	4	6	7	11	19				
XHHW	6	1	3	5	9	13	21	30	47	63	81	102	128	185	320		
	600			1	1	1	3	4	5	7	9	13	22				
	700			1	1	1	3	4	5	6	7	11	19				
	750			1	1	1	2	3	4	6	7	10	18				

Maximum number of conductors in Schedule 80 PVC conduit

(Based on Table 1, Chapter 9 of the NEC)

Conductor Size AWG, MCM		Conduit Trade Size (inches)									
		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5
# 14	THW	4	8	13	24	34	57	82	128		
	THHN	10	19	33	58	81	135	194	0		
12	THW	3	6	11	20	28	47	67	105	183	
	THHN	8	14	24	43	60	100	144	0		
10	THW	3	5	9	16	22	37	54	85	148	
	THHN	5	9	15	27	38	64	92	143		
8	THW	1	2	4	8	11	19	28	44	77	121
	THHN	1	4	7	13	18	31	45	70	123	195
6	THW	1	1	3	6	8	14	20	32	56	88
	THHN	1	3	5	9	13	22	32	50	88	140
4	THW	0	1	2	4	6	10	15	24	42	66
	THHN	1	1	3	6	8	13	20	31	54	86
3	THW	0	1	1	4	5	9	13	20	36	57
	THHN	1	1	2	5	7	11	17	26	46	73
2	THW	0	1	1	3	4	8	11	17	31	49
	THHN	1	1	1	4	5	9	14	22	38	61
1	THW	0	1	1	3	5	8	13	22	32	35
	THHN	0	1	1	3	4	7	10	16	28	45
0	THW	0	0	1	1	2	4	7	11	19	30
	THHN	0	1	1	2	3	6	8	13	24	38
00	THW	0	0	1	1	1	4	6	9	16	26
	THHN	0	1	1	1	3	5	7	11	20	32
000	THW	0	0	1	1	1	3	5	8	14	22
	THHN	0	0	1	1	2	4	6	9	16	26
0000	THW	0	0	1	1	1	3	4	6	11	18
	THHN	0	0	1	1	1	3	5	8	14	22
250	THW	0	0	0	1	1	3	5	9	14	
	THHN	0	0	0	1	1	2	4	6	11	18
300	THW	0	0	0	1	1	3	4	8	13	
	THHN	0	0	0	1	1	3	5	9	15	
350	THW	0	0	0	1	1	2	4	7	11	
	THHN	0	0	0	1	1	1	3	4	8	13
400	THW	0	0	0	0	1	1	1	3	6	10
	THHN	0	0	0	1	1	1	2	4	7	12
500	THW	0	0	0	0	1	1	1	3	5	8
	THHN	0	0	0	0	1	1	1	3	6	10
600	THW	0	0	0	0	0	1	1	1	4	7
	THHN	0	0	0	0	1	1	1	3	5	8
700	THW	0	0	0	0	0	1	1	1	3	6

## Weight Comparison

Carlson Plus 40® rigid nonmetallic conduit compared to other rigid conduit in pounds per 100 feet (approx.)

Nom. Size	Carlson Plus 40® Rigid Nonmetallic Conduit	Carlson Plus 80® Rigid Nonmetallic Conduit	Aluminum	Electrical Metallic Tubing (EMT)	Intermediate Metal Conduit (IMC)	Rigid Steel (GALV)
1/2	18	22	27	30	57	79
3/4	23	29	36	46	78	105
1	35	43	53	66	112	153
1 1/4	48	60	70	96	114	201
1 1/2	57	72	86	112	176	246
2	76	100	116	142	230	334
2 1/2	125	153	183	230	393	527
3	164	212	239	270	483	690
3 1/2	198		288	350	561	831
4	234	310	340	400	625	982
5	317	431	465	Not Made	Not Made	1344
6	412	592	612	Not Made	Not Made	1770