

NEC 2024 Conduit Fill Sizing Chart

Professional Engineering Reference Pack v4.0

This chart provides the internal diameter and fill capacity for common electrical conduit types according to **NEC 2024 Chapter 9, Table 4**.

1. Electrical Metallic Tubing (EMT)

NEC Article 358 Reference

Trade Size	ID (inches)	Total Area (in ²)	40% Fill (in ²)	31% Fill (in ²)	53% Fill (in ²)
1/2"	0.622	0.304	0.122	0.094	0.161
3/4"	0.824	0.533	0.213	0.165	0.282
1"	1.049	0.864	0.346	0.268	0.458
1-1/4"	1.380	1.496	0.598	0.464	0.793
1-1/2"	1.610	2.036	0.814	0.631	1.079
2"	2.067	3.356	1.342	1.040	1.779
2-1/2"	2.731	5.858	2.343	1.816	3.105
3"	3.356	8.846	3.538	2.742	4.688

2. Rigid PVC Conduit (Schedule 40)

NEC Article 352 Reference

Trade Size	ID (inches)	Total Area (in ²)	40% Fill (in ²)	31% Fill (in ²)	53% Fill (in ²)
1/2"	0.602	0.285	0.114	0.088	0.151
3/4"	0.804	0.508	0.203	0.157	0.269
1"	1.029	0.832	0.333	0.258	0.441
1-1/4"	1.360	1.453	0.581	0.450	0.770
1-1/2"	1.590	1.986	0.794	0.616	1.053
2"	2.047	3.291	1.316	1.020	1.744
2-1/2"	2.445	4.695	1.878	1.455	2.488
3"	3.042	7.268	2.907	2.253	3.852

3. Conductor Properties (THHN/THWN-2)

NEC Chapter 9, Table 5 Reference

AWG Size	Diameter (inches)	Total Area (in ²)	Max Amps (Copper)
14 AWG	0.111	0.0097	15A
12 AWG	0.130	0.0133	20A
10 AWG	0.164	0.0211	30A
8 AWG	0.216	0.0366	40A
6 AWG	0.254	0.0507	55A
4 AWG	0.324	0.0824	70A
2 AWG	0.384	0.1158	95A
1/0 AWG	0.491	0.1894	125A

4. Engineering Guidelines

- **Table 1:** Fill ratio for >2 wires is **40%**.
- **Jam Probability:** Occurs when the ratio of conduit ID to cable OD is between **2.8** and **3.2**.
- **Adjustment Factors:** Remember to apply ambient temperature and bundling derating factors for current carrying capacity.

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For custom BIM calculations or site validation, visit conduit-fill-calculator.com