# Conduit fill chart

3/4 inch EMT holds up to 16 wires of 12 AWG THHN or 10 wires of 10 AWG, and 1/2 inch EMT holds 9 wires of 12 AWG, at the 40% fill limit for three or more conductors.

## Electrical metallic tubing (EMT): maximum THHN wires

Maximum number of THHN wires of each size in Electrical metallic tubing (EMT) by trade size, at 40% fill for three or more wires

| WIRE | 1/2″ | 3/4″ | 1″ | 1-1/4″ | 1-1/2″ | 2″ | 2-1/2″ | 3″ | 3-1/2″ | 4″ |
|---|---|---|---|---|---|---|---|---|---|---|
| **14 AWG** | 12 | 22 | 35 | 61 | 84 | 138 | 241 | 364 | 476 | 608 |
| **12 AWG** | 9 | 16 | 26 | 45 | 61 | 101 | 176 | 266 | 347 | 443 |
| **10 AWG** | 5 | 10 | 16 | 28 | 38 | 63 | 111 | 167 | 219 | 279 |
| **8 AWG** | 3 | 6 | 9 | 16 | 22 | 36 | 64 | 96 | 126 | 161 |
| **6 AWG** | 1 | 4 | 7 | 12 | 16 | 26 | 46 | 69 | 91 | 116 |
| **4 AWG** | 1 | 2 | 4 | 7 | 10 | 16 | 28 | 43 | 56 | 71 |
| **3 AWG** | 1 | 1 | 3 | 6 | 8 | 13 | 24 | 36 | 47 | 60 |
| **2 AWG** | 1 | 1 | 3 | 5 | 7 | 11 | 20 | 30 | 40 | 51 |
| **1 AWG** | 1 | 1 | 1 | 4 | 5 | 8 | 15 | 22 | 29 | 37 |
| **1/0 AWG** | — | 1 | 1 | 3 | 4 | 7 | 12 | 19 | 25 | 32 |
| **2/0 AWG** | — | 1 | 1 | 2 | 3 | 6 | 10 | 16 | 20 | 26 |
| **3/0 AWG** | — | 1 | 1 | 1 | 3 | 5 | 8 | 13 | 17 | 22 |
| **4/0 AWG** | — | — | 1 | 1 | 1 | 4 | 7 | 11 | 14 | 18 |

## Rigid PVC conduit, Schedule 40: maximum THHN wires

Maximum number of THHN wires of each size in Rigid PVC conduit, Schedule 40 by trade size, at 40% fill for three or more wires

| WIRE | 1/2″ | 3/4″ | 1″ | 1-1/4″ | 1-1/2″ | 2″ | 2-1/2″ | 3″ | 3-1/2″ | 4″ |
|---|---|---|---|---|---|---|---|---|---|---|
| **14 AWG** | 11 | 21 | 34 | 60 | 82 | 135 | 193 | 299 | 401 | 517 |
| **12 AWG** | 8 | 15 | 25 | 43 | 59 | 99 | 141 | 218 | 293 | 377 |
| **10 AWG** | 5 | 9 | 15 | 27 | 37 | 62 | 89 | 137 | 184 | 238 |

| WIRE | 1/2″ | 3/4″ | 1″ | 1-1/4″ | 1-1/2″ | 2″ | 2-1/2″ | 3″ | 3-1/2″ | 4″ |
|---|---|---|---|---|---|---|---|---|---|---|
| **8 AWG** | 3 | 5 | 9 | 16 | 21 | 36 | 51 | 79 | 106 | 137 |
| **6 AWG** | 1 | 4 | 6 | 11 | 15 | 26 | 37 | 57 | 77 | 99 |
| **4 AWG** | 1 | 1 | 4 | 7 | 9 | 16 | 22 | 35 | 47 | 61 |
| **3 AWG** | 1 | 1 | 3 | 6 | 8 | 13 | 19 | 30 | 40 | 51 |
| **2 AWG** | 1 | 1 | 3 | 5 | 7 | 11 | 16 | 25 | 33 | 43 |
| **1 AWG** | — | 1 | 1 | 3 | 5 | 8 | 12 | 18 | 25 | 32 |
| **1/0 AWG** | — | 1 | 1 | 3 | 4 | 7 | 10 | 15 | 21 | 27 |
| **2/0 AWG** | — | 1 | 1 | 2 | 3 | 6 | 8 | 13 | 17 | 22 |
| **3/0 AWG** | — | 1 | 1 | 1 | 3 | 5 | 7 | 11 | 14 | 18 |
| **4/0 AWG** | — | — | 1 | 1 | 1 | 4 | 6 | 9 | 12 | 15 |

## Rigid PVC conduit, Schedule 80: maximum THHN wires

Maximum number of THHN wires of each size in Rigid PVC conduit, Schedule 80 by trade size, at 40% fill for three or more wires

| WIRE | 1/2″ | 3/4″ | 1″ | 1-1/4″ | 1-1/2″ | 2″ | 2-1/2″ | 3″ | 3-1/2″ | 4″ |
|---|---|---|---|---|---|---|---|---|---|---|
| **14 AWG** | 9 | 17 | 28 | 51 | 70 | 118 | 170 | 265 | 358 | 464 |
| **12 AWG** | 6 | 12 | 20 | 37 | 51 | 86 | 124 | 193 | 261 | 338 |
| **10 AWG** | 4 | 7 | 13 | 23 | 32 | 54 | 78 | 122 | 164 | 213 |
| **8 AWG** | 1 | 4 | 7 | 13 | 18 | 31 | 45 | 70 | 95 | 123 |
| **6 AWG** | 1 | 3 | 5 | 9 | 13 | 22 | 32 | 51 | 68 | 89 |
| **4 AWG** | 1 | 1 | 3 | 6 | 8 | 14 | 20 | 31 | 42 | 54 |
| **3 AWG** | 1 | 1 | 3 | 5 | 7 | 12 | 17 | 26 | 35 | 46 |
| **2 AWG** | — | 1 | 1 | 4 | 6 | 10 | 14 | 22 | 30 | 39 |
| **1 AWG** | — | 1 | 1 | 3 | 4 | 7 | 10 | 16 | 22 | 29 |
| **1/0 AWG** | — | 1 | 1 | 2 | 3 | 6 | 9 | 14 | 18 | 24 |
| **2/0 AWG** | — | — | 1 | 1 | 3 | 5 | 7 | 11 | 15 | 20 |
| **3/0 AWG** | — | — | 1 | 1 | 1 | 4 | 6 | 9 | 13 | 17 |
| **4/0 AWG** | — | — | 1 | 1 | 1 | 3 | 5 | 8 | 10 | 14 |

## Rigid metal conduit (RMC): maximum THHN wires

Maximum number of THHN wires of each size in Rigid metal conduit (RMC) by trade size, at 40% fill for three or more wires

| WIRE | 1/2″ | 3/4″ | 1″ | 1-1/4″ | 1-1/2″ | 2″ | 2-1/2″ | 3″ | 3-1/2″ | 4″ |
|---|---|---|---|---|---|---|---|---|---|---|
| **14 AWG** | 13 | 22 | 36 | 63 | 85 | 140 | 200 | 309 | 412 | 531 |
| **12 AWG** | 9 | 16 | 26 | 46 | 62 | 102 | 146 | 225 | 301 | 387 |
| **10 AWG** | 6 | 10 | 17 | 29 | 39 | 64 | 92 | 142 | 189 | 244 |
| **8 AWG** | 3 | 6 | 9 | 16 | 22 | 37 | 53 | 82 | 109 | 140 |
| **6 AWG** | 1 | 4 | 7 | 12 | 16 | 27 | 38 | 59 | 79 | 101 |
| **4 AWG** | 1 | 2 | 4 | 7 | 10 | 16 | 23 | 36 | 48 | 62 |
| **3 AWG** | 1 | 1 | 3 | 6 | 8 | 14 | 20 | 31 | 41 | 53 |
| **2 AWG** | 1 | 1 | 3 | 5 | 7 | 11 | 17 | 26 | 34 | 44 |
| **1 AWG** | 1 | 1 | 1 | 4 | 5 | 8 | 12 | 19 | 25 | 33 |
| **1/0 AWG** | — | 1 | 1 | 3 | 4 | 7 | 10 | 16 | 21 | 27 |
| **2/0 AWG** | — | 1 | 1 | 2 | 3 | 6 | 8 | 13 | 18 | 23 |
| **3/0 AWG** | — | 1 | 1 | 1 | 3 | 5 | 7 | 11 | 15 | 19 |
| **4/0 AWG** | — | — | 1 | 1 | 1 | 4 | 6 | 9 | 12 | 16 |

## How the conduit fill chart is calculated

Each number is the inside area of the conduit times the fill limit, divided by the area of one THHN/THWN-2 wire. The limit is 40% for three or more wires, 31% for two and 53% for one. When all wires are one size, a result with a decimal of 0.8 or more is rounded up. Ground wires count toward the total.

The chart is about physical fill only. More than three current-carrying wires in one conduit must be derated, and a mix of sizes needs the conduit fill calculator.

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SOURCES


- NFPA 70, National Electrical Code (2023): Percent of cross section of conduit and tubing for conductors, Chapter 9 Table 1
- NFPA 70, National Electrical Code (2023): Dimensions and percent area of conduit and tubing, Chapter 9 Table 4
- NFPA 70, National Electrical Code (2023): Dimensions of insulated conductors, Chapter 9 Table 5


▶ Compared with 4 published documents, last on 2026-11-13

Calculated by Calculate.diy with the method of the National Electrical Code® (NEC®), 2023 edition; not the NEC text. Methodology. For planning only: check local code and use a licensed electrician.