# Conduit Fill Chart and Calculator

## Quick reference: THHN/THWN-2 wires in EMT

Most conductors of one size at 40% fill, trade sizes 1/2 to 2 inch.

The usual fill rule limits the wires to 53% of the conduit's internal area for one conductor, 31% for two and 40% for three or more. This page works out the area of the conduit and of each wire from the manufacturer dimensions below, then counts how many wires fit under the limit.

### Most THHN/THWN-2 conductors of one size that fit in EMT at the 40% fill limit

| Wire size | OD used (in) | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 2" |
|---|---|---|---|---|---|---|---|
| **14 AWG** | 0.120 | 10 | 18 | 30 | 52 | 72 | 118 |
| **12 AWG** | 0.140 | 7 | 13 | 22 | 38 | 52 | 87 |
| **10 AWG** | 0.170 | 5 | 9 | 15 | 26 | 35 | 59 |
| **8 AWG** | 0.230 | 2 | 5 | 8 | 14 | 19 | 32 |
| **6 AWG** | 0.254 | 2 | 4 | 6 | 11 | 16 | 26 |
| **4 AWG** | 0.330 | 1 | 2 | 4 | 6 | 9 | 15 |
| **3 AWG** | 0.360 | 1 | 2 | 3 | 5 | 8 | 13 |
| **2 AWG** | 0.390 | 1 | 1 | 2 | 5 | 6 | 11 |

## Quick reference: THHN/THWN-2 wires in PVC Schedule 40

Same limit and wire sizes, using the minimum inside diameter that PVC makers publish.

### Most THHN/THWN-2 conductors of one size that fit in PVC Schedule 40 at the 40% fill limit

| Wire size | OD used (in) | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 2" |
|---|---|---|---|---|---|---|---|
| **14 AWG** | 0.120 | 9 | 16 | 28 | 49 | 67 | 113 |
| **12 AWG** | 0.140 | 6 | 12 | 20 | 36 | 49 | 83 |
| **10 AWG** | 0.170 | 4 | 8 | 13 | 24 | 33 | 56 |
| **8 AWG** | 0.230 | 2 | 4 | 7 | 13 | 18 | 30 |
| **6 AWG** | 0.254 | 2 | 3 | 6 | 11 | 15 | 25 |
| **4 AWG** | 0.330 | 1 | 2 | 3 | 6 | 8 | 15 |
| **3 AWG** | 0.360 | 1 | 1 | 3 | 5 | 7 | 12 |
| **2 AWG** | 0.390 | 0 | 1 | 2 | 4 | 6 | 10 |

## Conduit dimensions used

| Conduit type | Trade size | Inside diameter used (in) | ID basis | Internal area (in²) | One wire, 53% (in²) | Two wires, 31% (in²) | Three or more, 40% (in²) |
|---|---|---|---|---|---|---|---|
| **EMT** | 1/2" | 0.622 | nominal ID | 0.304 | 0.161 | 0.094 | 0.122 |
| **EMT** | 3/4" | 0.824 | nominal ID | 0.533 | 0.283 | 0.165 | 0.213 |
| **EMT** | 1" | 1.049 | nominal ID | 0.864 | 0.458 | 0.268 | 0.346 |
| **EMT** | 1-1/4" | 1.380 | nominal ID | 1.496 | 0.793 | 0.464 | 0.598 |
| **EMT** | 1-1/2" | 1.610 | nominal ID | 2.036 | 1.079 | 0.631 | 0.814 |
| **EMT** | 2" | 2.067 | nominal ID | 3.356 | 1.778 | 1.040 | 1.342 |
| **PVC Schedule 40** | 1/2" | 0.578 | minimum ID | 0.262 | 0.139 | 0.081 | 0.105 |
| **PVC Schedule 40** | 3/4" | 0.780 | minimum ID | 0.478 | 0.253 | 0.148 | 0.191 |
| **PVC Schedule 40** | 1" | 1.004 | minimum ID | 0.792 | 0.420 | 0.245 | 0.317 |
| **PVC Schedule 40** | 1-1/4" | 1.335 | minimum ID | 1.400 | 0.742 | 0.434 | 0.560 |
| **PVC Schedule 40** | 1-1/2" | 1.564 | minimum ID | 1.921 | 1.018 | 0.596 | 0.768 |
| **PVC Schedule 40** | 2" | 2.021 | minimum ID | 3.208 | 1.700 | 0.994 | 1.283 |

## Wire dimensions used

Insulated wire diameters differ between manufacturers. The calculator and the tables use the largest published value, which gives the lower conductor count.

| Wire size | Cerrowire - THHN/THWN-2 spec sheet | Prysmian - THHN/THWN-2 High Speed SPEC 5290 | Encore Wire - SuperSlick Elite THHN spec sheet | Southwire - product pages THHN/THWN 14/12/10 AWG stranded | Priority Wire & Cable - Copper THHN/THWN-2 spec | Southw SIM THHN/TH 2 SPEC 10 | Wire size | Cerrowire - THHN/THWN-2 spec sheet | Prysmian - THHN/THWN-2 High Speed SPEC 5290 | Encore Wire - SuperSlick Elite THHN spec sheet | Southwire - product pages THHN/THWN 14/12/10 AWG stranded | Priority Wire & Cable - Copper THHN/THWN-2 spec | South SI THHN/TI 2 SPEC 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **14 AWG** | 0.111 | 0.109 | 0.109 | 0.113 | 0.120 | | **3/0 AWG** | 0.584 | 0.557 | 0.568 | — | 0.600 | |
| **12 AWG** | 0.130 | 0.130 | 0.128 | 0.132 | 0.140 | | **4/0 AWG** | 0.642 | 0.612 | 0.624 | — | 0.660 | |
| **10 AWG** | 0.164 | 0.161 | 0.161 | 0.165 | 0.170 | | **250 kcmil** | 0.711 | 0.694 | — | — | 0.720 | |
| **8 AWG** | 0.216 | 0.212 | 0.213 | — | 0.230 | | **300 kcmil** | 0.766 | 0.747 | — | — | 0.766 | |
| **6 AWG** | 0.254 | 0.248 | 0.249 | — | 0.250 | | **350 kcmil** | 0.817 | 0.797 | — | — | 0.830 | |
| **4 AWG** | 0.324 | 0.317 | 0.318 | — | 0.330 | | **400 kcmil** | 0.864 | 0.842 | — | — | 0.864 | |
| **3 AWG** | 0.352 | — | 0.346 | — | 0.360 | | **500 kcmil** | 0.949 | 0.925 | — | — | 0.960 | |
| **2 AWG** | 0.384 | 0.375 | 0.378 | — | 0.390 | | **600 kcmil** | 1.051 | 1.024 | — | — | 1.051 | |

| Wire size | Cerrowire - THHN/THWN-2 spec sheet | Prysmian - THHN/THWN-2 High Speed SPEC 5290 | Encore Wire - SuperSlick Elite THHN spec sheet | Southwire - product pages THHN/THWN 14/12/10 AWG stranded | Priority Wire & Cable - Copper THHN/THWN-2 spec | Southw SIM THHN/TH 2 SPEC 10 | Wire size | Cerrowire - THHN/THWN-2 spec sheet | Prysmian - THHN/THWN-2 High Speed SPEC 5290 | Encore Wire - SuperSlick Elite THHN spec sheet | Southwire - product pages THHN/THWN 14/12/10 AWG stranded | Priority Wire & Cable - Copper THHN/THWN-2 spec | South SI THHN/T 2 SPEC 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 AWG** | 0.446 | 0.427 | 0.435 | — | 0.450 | 0 | **750 kcmil** | 1.156 | 1.126 | — | — | 1.170 | |
| **1/0 AWG** | 0.486 | 0.466 | 0.474 | — | 0.500 | 0 | **1000 kcmil** | 1.310 | 1.275 | — | — | 1.320 | |
| **2/0 AWG** | 0.532 | 0.509 | 0.518 | — | 0.540 | 0.524 | **0.540** | | | | | | |

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