## Table 15 Continued

| Size of conductor | | Insulation other than composite layers (see Annex G for required or optional overall covering and Table 22 for jacket thickness) | | Composite insulation construction Types RHH, RHW, RHW-2, R90, RW75 and RW90 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inner layer EP, XL, Silicone, or EPCV | | | Outer layer CP, CPE, EPCV, or XL | | |
| | | mm | | | | | | | |
| $mm^2$ | AWG or kcmil | Minimum average thickness | Minimum thickness at any point[a] | Minimum average thickness | Minimum thickness at any point[a] | | Minimum average thickness | Minimum thickness at any point[a] | |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 95 | 86 | 65 | 58 | 65 | 65 | 58 | 52 |
| Larger than 253 – 507 | Larger than 500 – 1000 | 110 | 99 | 80 | 72 | 78 | 65 | 58 | 52 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 125 | 112 | 100 | 90 | 99 | 95 | 85 | 76 |

[a] The minimum thickness at any point shall not be less than indicated in Column A or B under inner layer with the minimum thickness at any point not less than indicated in the corresponding Column A or B under outer layer. The thickness in Column B under inner layer plus the thickness in Column B under outer layer equals 90 percent of the sum of the average thickness indicated under inner layer and outer layer.

[b] Applies to the United States only.

## Table 16
## Thicknesses of insulation on 1000 V Types RW75, R90, and RW90

(See 4.2.3 and Annex B)

| Size of conductor | | Non-composite construction | | Composite insulation construction | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inner layer: EP, XL, Silicone, or EPCV | | | Outer layer: CP, CPE, EPCV, or XL | | |
| $mm^2$ | AWG or kcmil | Minimum average thickness | Minimum thickness at any point[a] | Minimum average thickness | Minimum thickness at any point[a] | | Minimum average thickness | Minimum thickness at any point[a] | |
| – | – | – | – | – | A | B | – | A | B |
| 2.08 –5.26 | 14 – 10 AWG | 1.14 | 1.01 | 0.87 | 0.78 | 0.82 | 0.38 | 0.36 | 0.3 |
| 8.37 | 8 | 1.14 | 1.01 | 1.21 | 1.09 | 1.15 | 0.76 | 0.69 | 0.61 |
| 13.3 – 33.6 | 6 – 2 | 1.52 | 1.37 | 1.27 | 1.14 | 1.22 | 0.76 | 0.69 | 0.61 |
| 42.4 –107 | 1 – 4/0 | 2.03 | 1.82 | 1.52 | 1.37 | 1.47 | 1.14 | 1.02 | 0.91 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 2.28 | 2.05 | 1.78 | 1.60 | 1.75 | 1.65 | 1.47 | 1.32 |
| Larger than 253 – 507 | Larger than 500 – 1000 | 2.28 | 2.05 | 2.16 | 1.94 | 2.10 | 1.65 | 1.47 | 1.32 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 2.79 | 2.51 | 2.67 | 2.40 | 2.64 | 2.41 | 2.16 | 1.93 |
| – | – | mils | | | | | | | |
| – | – | – | – | – | A | B | – | A | B |
| 2.08 – 5.26 | 14 – 10 AWG | 45 | 40 | 30 | 27 | 28 | 15 | 14 | 12 |
| 8.37 | 8 | 45 | 40 | 30 | 43 | 45 | 30 | 27 | 24 |

Table 16 Continued on Next Page

## Table 16 Continued

| Size of conductor | | Non-composite construction | | Composite insulation construction | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inner layer: EP, XL, Silicone, or EPCV | | | Outer layer: CP, CPE, EPCV, or XL | | |
| mm² | AWG or kcmil | Minimum average thickness | Minimum thickness at any point[a] | Minimum average thickness | Minimum thickness at any point[a] | | Minimum average thickness | Minimum thickness at any point[a] | |
| 13.3 – 33.6 | 6 – 2 | 60 | 54 | 50 | 45 | 48 | 30 | 27 | 24 |
| 42.4 – 107 | 1 – 4/0 | 80 | 72 | 60 | 54 | 58 | 45 | 40 | 36 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 90 | 81 | 70 | 63 | 69 | 65 | 58 | 52 |
| Larger than 253 – 507 | Larger than 500 – 1000 | 90 | 81 | 85 | 76 | 83 | 65 | 58 | 52 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 110 | 99 | 105 | 94 | 104 | 95 | 85 | 76 |

[a] The minimum thickness at any point shall not be less than as indicated in Column A or B under inner layer with the minimum thickness at any point not less than as indicated in the corresponding Column A or B under outer layer. The thickness in Column B under inner layer plus the thickness in Column B under outer layer equals 90 percent of the sum of the average thickness indicated under inner layer and outer layer.

## Table 17
## Thickness of insulation on 2000 V Types R90, RW75, RW90, RHH, RHW, and RHW-2

(See 4.2.3, Table 36, Table 37, and Table 47, and Annex B)

| Size of conductor | | EP, XL, Silicone, or EPCV: Types R90, RW75, RW90, RHH, RHW, and RHW-2 | | CP, CPE, or SBR/IIR/NR Types RHH, RHW, RHW-2 | | Composite insulation construction Types RHH, RHW, RHW-2, R90, RW75, and RW90 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Inner layer EP, XL, Silicone, or EPCV | | | Outer layer CP, CPE, EPCV, or XL | |
| mm² | AWG or kcmil | Min. avg. thickness | Min. at any point | Min. avg. thickness | Min. at any point | Min. avg. thickness | Min. thickness at any point[a] | | Min. avg. thickness | Min. thickness at any point[a] |
| | | mm | | | | | | | | |
| | | | | | | | A | B | | A | B |
| 2.08 – 5.26 | 14 – 10 AWG | 1.52 | 1.37 | 2.03 | 1.83 | 1.14 | 1.02 | 1.07 | 0.38 | 0.36 | 0.30 |
| 8.37 | 8 | 1.78 | 1.60 | 2.03 | 1.83 | 1.40 | 1.27 | 1.32 | 0.76 | 0.69 | 0.61 |
| 13.3 – 33.6 | 6 – 2 | 1.78 | 1.60 | 2.41 | 2.18 | 1.40 | 1.27 | 1.32 | 0.76 | 0.69 | 0.61 |
| 42.4 – 107 | 1 – 4/0 | 2.29 | 2.06 | 2.79 | 2.51 | 1.65 | 1.47 | 1.60 | 1.14 | 1.02 | 0.91 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 2.67 | 2.39 | 3.18 | 2.84 | 1.90 | 1.73 | 1.88 | 1.65 | 1.47 | 1.32 |
| Larger than 253 – 507 | Larger than 500 – 1000 | 3.05 | 2.74 | 3.56 | 3.20 | 2.29 | 2.06 | 2.24 | 1.65 | 1.47 | 1.32 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 3.56 | 3.20 | 3.56 | 3.20 | 2.92 | 2.64 | 2.87 | 2.41 | 2.16 | 1.93 |
| | | mils | | | | | | | | | |
| | | | | | | | A | B | | A | B |

Table 17 Continued on Next Page

## Table 17 Continued

| Size of conductor | | EP, XL, Silicone, or EPCV: Types R90, RW75, RW90, RHH, RHW, and RHW-2 | | CP, CPE, or SBR/IIR/NR Types RHH, RHW, RHW-2 | | Composite insulation construction Types RHH, RHW, RHW-2, R90, RW75, and RW90 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Inner layer EP, XL, Silicone, or EPCV | | | Outer layer CP, CPE, EPCV, or XL | | |
| $mm^2$ | AWG or kcmil | Min. avg. thickness | Min. at any point | Min. avg. thickness | Min. at any point | Min. avg. thickness | Min. thickness at any point[a] | | Min. avg. thickness | Min. thickness at any point[a] | |
| 2.08 – 5.26 | 14 – 10 AWG | 60 | 54 | 80 | 72 | 45 | 40 | 42 | 15 | 14 | 12 |
| 8.37 | 8 | 70 | 63 | 80 | 72 | 55 | 50 | 52 | 30 | 27 | 24 |
| 13.3 – 33.6 | 6 – 2 | 70 | 63 | 95 | 86 | 55 | 50 | 52 | 30 | 27 | 24 |
| 42.4 – 107 | 1 – 4/0 | 90 | 81 | 110 | 99 | 65 | 58 | 63 | 45 | 40 | 36 |
| | | mils | | | | | | | | | |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 105 | 94 | 125 | 112 | 75 | 68 | 74 | 65 | 58 | 52 |
| | | | | | | | A | B | | A | B |
| Larger than 253 – 507 | Larger than 500 – 1000 | 120 | 108 | 140 | 126 | 90 | 81 | 88 | 65 | 58 | 52 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 140 | 126 | 140 | 126 | 115 | 104 | 113 | 95 | 85 | 76 |

[a] The minimum thickness at any point shall not be less than as indicated in Column A or B under inner layer with the minimum thickness at any point not less than as indicated in the corresponding Column A or B under outer layer. The thickness in Column B under inner layer plus the thickness in Column B under outer layer equals 90 percent of the sum of the average thickness indicated under inner layer and outer layer.

## Table 18
## Insulation thicknesses on 1000 V Types RWU75 and RWU90

(See 4.2.3 and Annex B)

| Conductor size | | Insulation thickness | | | |
|---|---|---|---|---|---|
| | | mm | | mils | |
| $mm^2$ | AWG or kcmil | Minimum average thickness | Minimum thickness at any point | Minimum average thickness | Minimum thickness at any point |
| 2.08 – 5.26 | 14 – 10 AWG | 1.52 | 1.37 | 60 | 54 |
| 8.37 | 8 | 2.03 | 1.83 | 80 | 72 |
| 13.3 – 33.6 | 6 – 2 | 2.03 | 1.83 | 80 | 72 |
| 42.4 – 107 | 1 – 4/0 | 2.41 | 2.18 | 95 | 86 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 2.79 | 2.51 | 110 | 99 |
| Larger than 253 – 507 | Larger than 500 – 1000 kcmil | 3.18 | 2.84 | 125 | 112 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 kcmil | 3.56 | 3.20 | 140 | 126 |

## Table 19
## Thickness of composite insulations on 1000 V Types RWU75 and RWU90

(See 4.2.3)

| Size of conductor | | Composite construction | | | | Composite construction | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Inner Layer: XL | | Outer Layer: CP, CPE, EPCV, or XL | | Inner Layer: EP, EPCV | | Outer Layer: CP, CPE, EPCV, or XL | |
| $mm^2$ | AWG or kcmil | Minimum average thickness | Minimum at any point | Minimum average thickness | Minimum at any point | Minimum average thickness | Mini-mum at any point | Minimum average thickness | Mini-mum at any point |
| | | mm | | | | | | | |
| 2.08 – 5.26 | 14 – 10 AWG | 1.16 | 1.04 | 0.38 | 0.30 | 1.16 | 1.04 | 1.14 | 0.91 |
| 8.37 | 8 | 1.35 | 1.22 | 0.76 | 0.60 | 1.35 | 1.22 | 1.14 | 0.91 |
| 13.3 –33.6 | 6 – 2 | 1.69 | 1.52 | 0.76 | 0.60 | 1.69 | 1.52 | 1.65 | 1.32 |
| 42.4 –107 | 1 – 4/0 | 2.02 | 1.82 | 1.14 | 0.91 | 2.02 | 1.82 | 1.65 | 1.32 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 2.36 | 2.12 | 1.65 | 1.32 | 2.36 | 2.12 | 2.41 | 1.93 |
| Larger than 253 – 507 | Larger than 500 – 1000 | 2.87 | 2.58 | 1.65 | 1.32 | 2.87 | 2.58 | 2.41 | 1.93 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 3.55 | 3.20 | 2.41 | 1.93 | 3.55 | 3.20 | 3.17 | 2.54 |
| | | mils | | | | | | | |
| 2.08 – 5.26 | 14 – 10 AWG | 45 | 35 | 15 | 12 | 39 | 35 | 45 | 36 |
| 8.37 | 8 | 53 | 48 | 30 | 24 | 53 | 48 | 45 | 36 |
| 13.3 – 33.6 | 6 – 2 | 67 | 60 | 30 | 24 | 67 | 60 | 65 | 52 |
| 42.4 – 107 | 1 – 4/0 | 80 | 72 | 45 | 36 | 80 | 72 | 65 | 52 |
| Larger than 107 – 253 | Larger than 4/0 – 500 kcmil | 93 | 83 | 65 | 52 | 93 | 83 | 95 | 76 |
| Larger than 253 – 507 | Larger than 500 – 1000 kcmil | 113 | 102 | 65 | 52 | 113 | 102 | 95 | 76 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 140 | 126 | 95 | 76 | 140 | 126 | 125 | 100 |

## Table 20
## Insulations and protective coverings

(See 4.2.1.1, 4.3.1, 4.9.1.1, Table 37, Table 46, Table 47, G.1.1, G.1.3, and Annex B)

| Type designation | Insulation | Jacket or fibrous covering | |
|---|---|---|---|
| | | Over finished single conductor or single conductor core of a multiconductor cable | Over two or more parallel or twisted conductors |
| XHH, XHHW, and XHHW-2<br>SA or SF<br>2.08 – 8.37 $mm^2$ (14 – 8 AWG) | XL or EPCV<br>Silicone | None<br>One or more glass or aramid braid fibrous coverings | Jacket or fibrous covering[a]<br>Fibrous covering |

Table 20 Continued on Next Page

## Table 20 Continued

| Type designation | Insulation | Jacket or fibrous covering | |
|---|---|---|---|
| SA or SF 13.3 – 1010 mm$^2$ (6 AWG – 2000 kcmil) | Silicone | Two or more glass or aramid braid fibrous coverings | Fibrous covering |
| SIS | XL, EPCV, CP or CPE | None | Not applicable |
| RHH, RHW, RHW-2 [600 V or 1000 V[b], 2.08 – 8.37 mm$^2$ (14 – 8 AWG)] | EP, SBR/IIR, NR | Jacket or one or more fibrous coverings[a] | Jacket or fibrous covering[a] |
| RHH, RHW, RHW-2 [600 V or 1000 V[b], 13.3 – 1010 mm$^2$ (6 AWG – 2000 kcmil)] and all 2 kV | EP, SBR/IIR, NR | Jacket or two or more fibrous coverings[a] | Jacket or fibrous covering[a] |
| RHH, RHW, and RHW-2 | XL, EPCV, CP, CPE, Composite | Jacket or fibrous covering[a] (optional) | Jacket or fibrous covering[a] |
| R90, RW75, RW90 | EP | Jacket | Jacket |
| RWU75, RWU90 | EP or EPCV | Jacket | Jacket (optional) |
| R90, RW75, RW90 | XL or EPCV | Jacket (optional) | Jacket |
| RWU75, RWU90 | XL | Jacket (optional) | Jacket (optional) |
| R90, RW75, RW90 | Silicone | Jacket | Jacket |
| R90, RW75, RW90 | Composite | Jacket (optional) | Jacket |
| RHH, RHW, or RHW-2 (600 V, 1000 V[b] or 2000 V) | Silicone | Jacket or two or more fibrous coverings[a] | Jacket or fibrous covering[a] |

[a] In the United States, for Types other than SA, the use of a fibrous covering(s) in this table is an alternative to a jacket.

[b] Applies to the United States only.

In Mexico, for types other than SF, the use of fibrous coverings does not apply.

In Canada, the use of fibrous coverings does not apply.

## Table 21
## Physical properties of jackets

(See 4.3.1, 4.9.1.1, 4.10.1, 4.10.2, 5.20, 7.2.4, and Annex B)

| Condition | Test | | | Material and properties | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Neoprene, CP, CPE, NBR/PVC | | PVC | | XL |
| | | | | 75°C | 90°C | 75°C | 90°C | 90°C |
| Before aging | Elongation | Minimum | | 200 percent | 200 percent | 100 percent | 100 percent | 150 percent |
| | Tensile strength | Minimum | | 8.3 MPa (1200 lbf/in$^2$) | 8.3 MPa (1200 lbf/in$^2$) | 10.3 MPa (1500 lbf/in$^2$) | 10.3 MPa (1500 lbf/in$^2$) | 10.3 MPa (1500 lbf/in$^2$) |
| | Air-oven test | Temperature | | 100 ±1°C | 110 ±1°C | 100 ±1°C | 121 ±1°C | 110 ±1°C |
| | | Time | | 10 d | 10 d | 10 d | 7 d | 10 d |
| After accelerated aging | | Minimum percent of results obtained on | Elongation | 50 | 50 | 45 | 45 | 75 |
| | | | Tensile strength | 50 | 50 | 70 | 85 | 75 |

Table 21 Continued on Next Page

## Table 21 Continued

| Condition | Test | | | Material and properties | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Neoprene, CP, CPE, NBR/PVC | | PVC | | XL |
| | | | | 75°C | 90°C | 75°C | 90°C | 90°C |
| | unaged specimens | | | | | | | |
| | Oil-immersion test (IRM 902) | Temperature | | 121 ±1°C | 121 ±1°C | 70 ±1°C | 70 ±1°C | 121 ±1°C |
| | | Time | | 18 h | 18 h | 4h | 4h | 18 h |
| | | Minimum percent of results obtained on unaged specimens | Elongation | 60 | 60 | 75 | 75 | 60 |
| | | | Tensile strength | 60 | 60 | 75 | 75 | 40 |

## Table 22
## Thicknesses of jacket on 600 V, 1000 V, and 2000 V single-conductor Types RW75, RW90, R90, RHW, RHW-2, and RHH

(See 4.3.1, Table 15, and Annex B)

| Conductor size | | 600 V and 1000 V | | | | 2000 V | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Minimum average jacket thickness | Minimum jacket thickness at any point | Minimum average jacket thickness | Minimum jacket thickness at any point | Minimum average jacket thickness | Minimum jacket thickness at any point | Minimum average jacket thickness | Minimum jacket thickness at any point |
| $mm^2$ | AWG or kcmil | mm | mm | mils | mils | mm | mm | mils | mils |
| 2.08 – 3.31 | 14 – 12 AWG | 0.38 | 0.30 | 15 | 12 | 0.38 | 0.30 | 15 | 12 |
| 5.26 | 10 | 0.38 | 0.30 | 15 | 12 | 0.76 | 0.61 | 30 | 24 |
| 8.37 – 26.7 | 8 – 3 | 0.76 | 0.61 | 30 | 24 | 0.76 | 0.61 | 30 | 24 |
| 33.6 | 2 | 0.76 | 0.61 | 30 | 24 | 1.14 | 0.91 | 45 | 36 |
| 42.4 – 85.0 | 1 – 3/0 | 1.14 | 0.91 | 45 | 36 | 1.14 | 0.91 | 45 | 36 |
| 107 | 4/0 | 1.14 | 0.91 | 45 | 36 | 1.65 | 1.32 | 65 | 52 |
| 127 – 507 | 250 – 1000 kcmil | 1.65 | 1.32 | 65 | 52 | 1.65 | 1.32 | 65 | 52 |
| Larger than 507 – 1010 | Larger than 1000 – 2000 | 2.41 | 1.93 | 95 | 76 | 2.41 | 1.93 | 95 | 76 |

## Table 23
## Thicknesses of jacket on 1000 V single-conductor Type RWU75 and RWU90

(See 4.3.1 and Annex B)

| Conductor size | | Thickness of jacket | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | XL insulated | | | | EP or EPCV insulated | | | |
| | | Minimum average | | Minimum at any point | | Minimum average | | Minimum at any point | |
| $mm^2$ | AWG or kcmil | mm | mils | mm | mils | mm | mils | mm | mils |
| 2.08 – 5.26 | 14 – 10 AWG | 0.38 | 15 | 0.30 | 12 | 1.14 | 45 | 0.91 | 36 |
| 8.37 | 8 | 0.76 | 30 | 0.60 | 24 | 1.14 | 45 | 0.91 | 36 |
| 13.3 – 26.7 | 6 – 3 | 0.76 | 30 | 0.60 | 24 | 1.65 | 65 | 1.32 | 52 |
| 33.6 – 85.0 | 2 – 3/0 | 1.14 | 45 | 0.91 | 36 | 1.65 | 65 | 1.32 | 52 |
| 107 | 4/0 | 1.65 | 65 | 1.32 | 52 | 1.65 | 65 | 1.32 | 52 |
| 127 – 507 | 250 – 1000 kcmil | 1.65 | 65 | 1.32 | 52 | 2.41 | 95 | 1.93 | 76 |
| 633 – 1010 | 1250 – 2000 | 2.41 | 95 | 1.93 | 76 | 3.17 | 125 | 2.54 | 100 |

## Table 24
## Thicknesses of optional jacket on each insulated conductor in 2-conductor flat parallel wire or cable, and on each insulated conductor in a multiple-conductor cable or assembly

(See 4.3.1 and Annex B)

| Calculated diameter of insulation under jacket | | Thicknesses of jacket[a] | | | |
|---|---|---|---|---|---|
| | | Average | | Minimum at any point | |
| mm | inch | mm | mils | mm | mils |
| 0 – 6.35 | 0 – 0.250 | 0.38 | 15 | 0.30 | 12 |
| 6.36 – 10.80 | 0.251 – 0.425 | 0.64 | 25 | 0.51 | 20 |
| 10.81 – 17.80 | 0.426 – 0.700 | 0.76 | 30 | 0.61 | 24 |
| 17.81 – 38.10 | 0.701 – 1.500 | 1.27 | 50 | 1.02 | 40 |
| 38.11 – 63.50 | 1.501 – 2.500 | 2.03 | 80 | 1.62 | 64 |

[a] Not applicable to a colored coating on an insulated conductor.

## Table 25
## Maximum length of lay of multiple-conductor cables

(See 4.5.1.3)

| Number of conductors | Maximum length of lay |
|---|---|
| 2 | 30 times diameter of finished insulated conductor |
| 3 | 35 times diameter of finished insulated conductor |
| 4 | 40 times diameter of finished insulated conductor |
| 5 or more, or assemblies with more than one conductor size | 15 times the overall diameter of the assembly, except that in a multiple layer cable, the length of lay of the conductors in any inner layer shall be not more than 20 times the overall diameter of that layer |

## Table 26
## Minimum size of equipment-grounding conductor in multiple-conductor cable Types XHHW-2, XHHW, XHH, RHH, RHW, RHW-2, R90, RW75, RWU75, RWU90, SA, and SF

(See 4.5.2.1 and 7.2.2)

| Circuit conductor size | | Size of equipment-grounding conductor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 75°C (RHW, RW75, RWU75) | | | | 90°C (XHHW, XHHW-2, XHH, RHH, RHW-2, R90, RW90, RWU90, SA, SF) | | | |
| | | Copper | | Aluminum | | Copper | | Aluminum | |
| $mm^2$ | AWG or kcmil | $mm^2$ | AWG | $mm^2$ | AWG | $mm^2$ | AWG | $mm^2$ | AWG |
| **Copper** | | | | | | | | | |
| 2.08 | 14 AWG | 2.08 | 14 | – | – | 2.08 | 14 | – | – |
| 3.31 | 12 | 3.31 | 12 | | | 3.31 | 12 | | |
| 5.26 | 10 | 5.26 | 10 | – | – | 5.26 | 10 | – | – |
| 8.37 | 8 | 5.26 | 10 | 8.37 | 8 | 5.26 | 10 | 8.37 | 8 |
| 13.3, 21.2 | 6, 4 | 8.37 | 8 | 13.3 | 6 | 8.37 | 8 | 13.3 | 6 |
| 26.7 | 3 | 8.37 | 8 | 13.3 | 6 | 13.3 | 6 | 21.2 | 4 |
| 33.6 – 67.4 | 2 – 2/0 | 13.3 | 6 | 21.2 | 4 | 13.3 | 6 | 21.2 | 4 |
| 85.0 | 3/0 | 13.3 | 6 | 21.2 | 4 | 21.2 | 4 | 33.6 | 2 |
| 107 – 152 | 4/0 – 300 kcmil | 21.2 | 4 | 33.6 | 2 | 21.2 | 4 | 33.6 | 2 |
| 177 – 203 | 350 – 400 | 26.7 | 3 | 42.4 | 1 | 26.7 | 3 | 42.4 | 1 |
| 253 | 500 | 26.7 | 3 | 42.4 | 1 | 33.6 | 2 | 53.5 | 1/0 |
| 304 – 380 | 600 – 750 | 33.6 | 2 | 53.5 | 1/0 | 33.6 | 2 | 53.5 | 1/0 |
| 405 | 800 | 33.6 | 2 | 53.5 | 1/0 | 42.4 | 1 | 67.4 | 2/0 |
| 456 – 507 | 900 – 1000 | 42.4 | 1 | 67.4 | 2/0 | 42.4 | 1 | 67.4 | 2/0 |
| 633 | 1250 | 42.4 | 1 | 67.4 | 2/0 | 53.5 | 1/0 | 85.0 | 3/0 |
| 887 – 1010 | 1500 – 2000 | 53.5 | 1/0 | 85.0 | 3/0 | 53.5 | 1/0 | 85.0 | 3/0 |
| **Aluminum** | | | | | | | | | |
| 3.31 | 12 AWG | 2.08 | 14 | 3.31 | 12 | 2.08 | 14 | 3.31 | 12 |
| 5.26 | 10 | 3.31 | 12 | 5.26 | 10 | 3.31 | 12 | 5.26 | 10 |
| 8.37 | 8 | 5.26 | 10 | 8.37 | 8 | 5.26 | 10 | 8.37 | 8 |
| 13.3 | 6 | 5.26 | 10 | 8.37 | 8 | 5.26 | 10 | 8.37 | 8 |
| 221.2 – 33.6 | 4 – 2 | 8.37 | 8 | 13.3 | 6 | 8.37 | 8 | 13.3 | 6 |
| 42.4 | 1 | 8.37 | 8 | 13.3 | 6 | 13.3 | 6 | 21.2 | 4 |
| 53.5 – 85 | 1/0 – 3/0 | 13.3 | 6 | 21.2 | 4 | 13.3 | 6 | 21.2 | 4 |
| 107 | 4/0 | 13.3 | 6 | 21.2 | 4 | 21.2 | 4 | 33.5 | 2 |
| 126 – 177 | 250 – 350 kcmil | 21.2 | 4 | 33.6 | 2 | 21.2 | 4 | 33.6 | 2 |
| 202 | 400 | 21.2 | 4 | 33.6 | 2 | 26.7 | 3 | 42.4 | 1 |
| 253 – 354 | 500 – 700 | 26.7 | 3 | 42.4 | 1 | 26.7 | 3 | 42.4 | 1 |
| 380 – 405 | 750 – 800 | 26.7 | 3 | 42.4 | 1 | 33.6 | 2 | 53.5 | 1/0 |
| 456 – 507 | 900 – 1000 | 33.6 | 2 | 53.5 | 1/0 | 33.6 | 2 | 53.5 | 1/0 |
| 633 | 1250 | 33.6 | 2 | 53.5 | 1/0 | 42.4 | 1 | 67.4 | 2/0 |
| 760 | 1500 | 42.4 | 1 | 67.4 | 2/0 | 42.4 | 1 | 67.4 | 2/0 |
| 887 – 1010 | 1750 – 2000 | 42.4 | 1 | 67.4 | 2/0 | 53.5 | 1/0 | 85.0 | 3/0 |

## Table 27
## Thickness of overall jacket on multiple-conductor cable

(See 4.9.2 and Annex B)

| Calculated diameter under jacket of round cable or calculated length of major axis under jacket of 2-conductor flat parallel | | Thickness of jacket | | | |
|---|---|---|---|---|---|
| mm | inch | Minimum average | | Minimum at any point | |
| | | mm | mils | mm | mils |
| 0 – 10.80 | 0 – 0.425 | 1.14 | 45 | 0.91 | 36 |
| 10.81 – 17.80 | 0.426 – 0.700 | 1.52 | 60 | 1.22 | 48 |
| 17.81 – 38.10 | 0.701 – 1.500 | 2.03 | 80 | 1.62 | 64 |
| 38.11 – 63.50 | 1.501 – 2.500 | 2.79 | 110 | 2.23 | 88 |
| Over 63.50 | Over 2.500 | 3.55 | 140 | 2.85 | 112 |

## Table 28
## Maximum direct-current resistance at 20°C of solid aluminum, bare copper, and coated-copper conductors

(See 5.2.1 and 5.2.2 and Annex B)

| Size of conductor | | Aluminum | | Bare copper | | Coated copper | |
|---|---|---|---|---|---|---|---|
| $mm^2$ | AWG | Ohms per km | Ohms per 1000 ft | Ohms per km | Ohms per 1000 ft | Ohms per km | Ohms per 1000 ft |
| 2.08 | 14 | – | – | 8.45 | 2.57 | 8.78 | 2.68 |
| 3.31 | 12 | 8.71 | 2.65 | 5.31 | 1.62 | 5.53 | 1.68 |
| 5.26 | 10 | 5.48 | 1.67 | 3.34 | 1.02 | 3.48 | 1.06 |
| 8.37 | 8 | 3.45 | 1.05 | 2.10 | 0.641 | 2.16 | 0.659 |
| 13.3 | 6 | 2.17 | 0.661 | 1.32 | 0.403 | 1.36 | 0.415 |
| 21.2 | 4 | 1.36 | 0.416 | 0.832 | 0.254 | 0.856 | 0.261 |
| 26.7 | 3 | 1.08 | 0.330 | 0.660 | 0.201 | 0.679 | 0.207 |
| 33.6 | 2 | 0.857 | 0.261 | 0.523 | 0.159 | 0.538 | 0.164 |
| 42.4 | 1 | 0.680 | 0.207 | 0.415 | 0.126 | 0.427 | 0.130 |
| 53.5 | 1/0 | 0.539 | 0.164 | 0.329 | 0.100 | 0.337 | 0.103 |
| 67.4 | 2/0 | 0.428 | 0.130 | 0.261 | 0.0795 | 0.267 | 0.0814 |
| 85.0 | 3/0 | 0.339 | 0.103 | 0.207 | 0.0631 | 0.212 | 0.0655 |
| 107 | 4/0 | 0.269 | 0.0820 | 0.164 | 0.0500 | 0.168 | 0.0512 |

## Table 29
## Maximum direct-current resistance at 20°C of aluminum and bare copper conductors – concentric-stranded Classes B, C, and D; compact-stranded, compressed-stranded, and combination unilay[a]

(See 5.2.1, 5.2.2, and D.3 and Annex B)

| Size of conductor | | Conductor resistance | | | |
|---|---|---|---|---|---|
| | | Aluminum | | Bare copper | |
| $mm^2$ | AWG or kcmil | Ohms per km | Ohms per 1000 ft | Ohms per km | Ohms per 1000 ft |
| 2.08 | 14 AWG | – | – | 8.62 | 2.62 |
| 3.31 | 12 | 8.88 | 2.71 | 5.43 | 1.65 |
| 5.26 | 10 | 5.59 | 1.70 | 3.41 | 1.04 |
| 8.37 | 8 | 3.52 | 1.07 | 2.14 | 0.654 |
| 13.3 | 6 | 2.21 | 0.674 | 1.35 | 0.411 |
| 21.2 | 4 | 1.39 | 0.424 | 0.848 | 0.259 |
| 26.7 | 3 | 1.10 | 0.336 | 0.673 | 0.205 |
| 33.6 | 2 | 0.875 | 0.267 | 0.534 | 0.163 |
| 42.4 | 1 | 0.693 | 0.211 | 0.423 | 0.129 |
| 53.5 | 1/0 | 0.550 | 0.168 | 0.335 | 0.102 |
| 67.4 | 2/0 | 0.436 | 0.133 | 0.266 | 0.0811 |
| 85.0 | 3/0 | 0.346 | 0.106 | 0.211 | 0.0643 |
| 107 | 4/0 | 0.274 | 0.0836 | 0.167 | 0.0510 |
| 127 | 250 kcmil | 0.232 | 0.0708 | 0.142 | 0.0432 |
| 152 | 300 | 0.194 | 0.0590 | 0.118 | 0.0360 |
| 177 | 350 | 0.166 | 0.0505 | 0.101 | 0.0308 |
| 203 | 400 | 0.145 | 0.0442 | 0.0885 | 0.0270 |
| 228 | 450 | 0.129 | 0.0393 | 0.0787 | 0.0240 |
| 253 | 500 | 0.116 | 0.0354 | 0.0709 | 0.0216 |
| 279 | 550 | 0.106 | 0.0322 | 0.0644 | 0.0196 |
| 304 | 600 | 0.0967 | 0.0295 | 0.0590 | 0.0180 |
| 329 | 650 | 0.0893 | 0.0272 | 0.0545 | 0.0166 |
| 355 | 700 | 0.0829 | 0.0253 | 0.0506 | 0.0154 |
| 380 | 750 | 0.0774 | 0.0236 | 0.0472 | 0.0144 |
| 405 | 800 | 0.0725 | 0.0221 | 0.0443 | 0.0135 |
| 456 | 900 | 0.0645 | 0.0197 | 0.0393 | 0.0120 |
| 507 | 1000 | 0.0580 | 0.0177 | 0.0354 | 0.0108 |
| 557 | 1100 | 0.0528 | 0.0161 | 0.0322 | 0.00981 |
| 608 | 1200 | 0.0484 | 0.0147 | 0.0295 | 0.00899 |
| 633 | 1250 | 0.0464 | 0.0142 | 0.0283 | 0.00863 |
| 659 | 1300 | 0.0447 | 0.0136 | 0.0272 | 0.00823 |
| 709 | 1400 | 0.0415 | 0.0126 | 0.0253 | 0.00771 |
| 760 | 1500 | 0.0387 | 0.0118 | 0.0236 | 0.00719 |
| 811 | 1600 | 0.0363 | 0.0111 | 0.0221 | 0.00674 |

Table 29 Continued on Next Page