

LOW-VOLTAGE PVC CABLE DATA

ELECTRICAL AND PHYSICAL PROPERTIES OF SINGLE CORE PVC INSULATED CABLES WITH STRANDED COPPER CONDUCTORS, UNARMoured, PVC SHEATHED 600/1000V MANUFACTURED TO SABS 1507:1990

(1) D1 is a diameter over the conductor
(2) D2 is the diameter over the PVC sheath

| RATED AREA | NOMINAL DIAMETER | | NOMINAL MASS | Impedance | Cables A.C. or D.C. | | | Cables in Trefoil Formation. | | | Voltage drop per amp per meter |
|-----------------|------------------|-------|--------------|-----------|---------------------|------|--------------------------------|------------------------------|------|-----|--------------------------------|
| | | | | | Current Rating | | Voltage drop per amp per meter | Current Rating | | | |
| | | | | | Ground | Air | | Ground | Duct | Air | |
| mm ² | D1 | D2 | kg/km | (Ω/km) | Ground | Air | mV | Ground | Duct | Air | mV |
| 25 | 5.95 | 11.55 | 366 | 0.8767 | 129 | 139 | 1.75 | 127 | 121 | 109 | 1.52 |
| 35 | 7.00 | 12.60 | 469 | 0.6356 | 171 | 169 | 1.27 | 153 | 132 | 133 | 1.10 |
| 50 | 8.15 | 14.55 | 632 | 0.4745 | 204 | 207 | 0.95 | 180 | 155 | 164 | 0.82 |
| 70 | 9.79 | 16.19 | 880 | 0.3356 | 254 | 262 | 0.67 | 221 | 190 | 207 | 0.58 |
| 95 | 11.54 | 18.34 | 1160 | 0.2500 | 308 | 325 | 0.50 | 265 | 226 | 256 | 0.43 |
| 120 | 12.96 | 19.76 | 1413 | 0.2054 | 353 | 379 | 0.41 | 301 | 256 | 298 | 0.36 |
| 150 | 14.39 | 22.29 | 1734 | 0.1734 | 402 | 435 | 0.35 | 338 | 287 | 341 | 0.30 |
| 185 | 16.10 | 24.10 | 2145 | 0.1499 | 461 | 504 | 0.30 | 381 | 323 | 396 | 0.26 |
| 240 | 18.71 | 27.11 | 2725 | 0.1268 | 545 | 602 | 0.25 | 442 | 372 | 473 | 0.22 |
| 300 | 21.45 | 30.25 | 3375 | 0.1131 | 627 | 697 | 0.23 | 499 | 419 | 550 | 0.20 |
| 400 | 24.30 | 33.50 | 4395 | 0.1028 | 735 | 815 | 0.21 | 565 | 472 | 640 | 0.18 |
| 500 | 26.51 | 36.51 | 5299 | 0.0963 | 856 | 948 | 0.19 | 634 | 532 | 732 | 0.17 |
| 630 | 33.15 | 43.15 | 6965 | 0.0890 | 996 | 1108 | 0.16 | 718 | 603 | 867 | 0.15 |

SUSTAINED CURRENT RATING FACTORS FOR NON-STANDARD CONDITIONS

| Maximum Conductor temperature (°C) | Ground Temperature (°C) | | | | Maximum Conductor temperature (°C) | Ground Temperature (°C) | | | | Depth of Laying (mm) | Direct in Ground |
|------------------------------------|-------------------------|------|------|------|------------------------------------|-------------------------|------|------|------|----------------------|------------------|
| | 25 | 30 | 35 | 40 | | 30 | 35 | 40 | 45 | | |
| 70°C | 1.00 | 0.95 | 0.90 | 0.85 | 70°C | 1.00 | 0.94 | 0.87 | 0.79 | 500 | 1.00 |
| | | | | | | | | | | 800 | 0.97 |
| | | | | | | | | | | 1000 | 0.95 |
| | | | | | | | | | | 1250 | 0.94 |
| | | | | | | | | | | 1500 | 0.93 |
| | | | | | | | | | | 2000 | 0.92 |

MECHANICAL PROPERTIES

| Nominal Area mm ² | 3 CORE | | 4 CORE | |
|------------------------------|---|---------------|---|---------------|
| | Maximum Pulling Force During Installation | | Maximum Pulling Force During Installation | |
| | Sock kN | Conductors kN | Sock kN | Conductors kN |
| 1.5 | 0.04 | 0.22 | 0.05 | 0.29 |
| 2.5 | 0.05 | 0.37 | 0.06 | 0.49 |
| 4 | 0.08 | 0.59 | 0.11 | 0.78 |
| 6 | 0.11 | 0.88 | 0.14 | 1.18 |
| 10 | 0.16 | 1.47 | 0.22 | 1.96 |
| 16 | 0.24 | 2.35 | 0.42 | 3.14 |
| 25 | 0.46 | 3.68 | 0.61 | 4.90 |
| 35 | 0.57 | 5.15 | 0.89 | 6.86 |
| 50 | 0.92 | 7.35 | 1.68 | 9.80 |
| 70 | 1.49 | 10.29 | 2.43 | 13.72 |
| 95 | 2.40 | 13.97 | 3.73 | 18.62 |
| 120 | 2.96 | 17.64 | 4.75 | 23.52 |
| 150 | 4.20 | 22.05 | 7.22 | 29.40 |
| 185 | 6.42 | 27.20 | 10.24 | 36.26 |
| 240 | 10.01 | 35.28 | 15.93 | 47.04 |
| 300 | 14.07 | 44.10 | 22.74 | 58.80 |

| No. of Cables in group | Direct in ground | | | | |
|------------------------|--------------------|------|------|------|------|
| | Axial spacing (mm) | | | | |
| | Touching | 150 | 300 | 450 | 600 |
| 2 | 0.81 | 0.87 | 0.91 | 0.93 | 0.94 |
| 3 | 0.70 | 0.78 | 0.84 | 0.87 | 0.90 |
| 4 | 0.63 | 0.74 | 0.81 | 0.86 | 0.89 |
| 5 | 0.59 | 0.70 | 0.78 | 0.83 | 0.87 |
| 6 | 0.56 | 0.67 | 0.76 | 0.82 | 0.86 |

CURRENT RATING FACTORS FOR GROUPING OF MULTICORE CABLES INSTALLED HORIZONTALLY AIR

| No. of Cables | 1 | 2 | 3 | 6 | 9 |
|-----------------------------|------------------|------|------|------|------|
| Condition | DEPARTING FACTOR | | | | |
| Cables touching | 1 | 0.9 | 0.84 | 0.8 | 0.75 |
| Clearance D* between cables | 1 | 0.95 | 0.9 | 0.88 | 0.85 |

D* is overall diameter of one cable

LOW-VOLTAGE PVC CABLE DATA

ELECTRICAL AND PHYSICAL PROPERTIES OF 3 AND 4 CORE PVC INSULATED PVC BEDDED SWA PVC SHEATHED 600/1000V CABLES MANUFACTURED TO SABS 1507:1990

D1 = Diameter over the bedding sheath
d = Diameter of armour wire
D2 = Diameter over outer sheath

COPPER CONDUCTORS

| Cable size | ELECTRICAL PROPERTIES | | | | | | PHYSICAL PROPERTIES | | | | | | | |
|--------------------|-----------------------|-------|-----|-----------|-----------|----------------------------|---------------------|-------|------|------|--------------|-------|---------|---------|
| | Current ratings | | | Impedance | Volt drop | 1 sec short circuit rating | Nominal Diameters | | | | Approx. Mass | | | |
| | Ground | Ducts | Air | | | | D1 | | d | | D2 | | | |
| | (A) | (A) | (A) | (Ω/km) | (mV/A/m) | (kA) | 3c | 4c | 3c | 4c | 3c | 4c | | |
| (mm ²) | (A) | (A) | (A) | (Ω/km) | (mV/A/m) | (kA) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (kg/km) | (kg/km) |
| 1.5 | 23 | 18 | 18 | 14.48 | 25.080 | 0.17 | 8.51 | 9.33 | 1.25 | 1.25 | 14.13 | 14.95 | 448 | 501 |
| 2.5 | 30 | 24 | 24 | 8.87 | 15.363 | 0.28 | 9.61 | 10.56 | 1.25 | 1.25 | 15.23 | 16.18 | 522 | 597 |
| 4 | 38 | 31 | 32 | 5.52 | 9.561 | 0.46 | 11.40 | 12.57 | 1.25 | 1.25 | 17.02 | 18.39 | 667 | 762 |
| 6 | 48 | 39 | 40 | 3.69 | 6.391 | 0.69 | 12.58 | 13.90 | 1.25 | 1.25 | 18.4 | 19.72 | 790 | 910 |
| 10 | 64 | 52 | 54 | 2.19 | 3.793 | 1.15 | 14.59 | 16.14 | 1.25 | 1.25 | 20.41 | 21.96 | 996 | 1169 |
| 16 | 82 | 67 | 72 | 1.38 | 2.390 | 1.84 | 16.55 | 19.18 | 1.25 | 1.25 | 22.37 | 25.92 | 1295 | 1768 |
| 25 | 126 | 101 | 113 | 0.8749 | 1.515 | 2.87 | 19.46 | 21.34 | 1.60 | 1.60 | 26.46 | 28.34 | 1838 | 2196 |
| 35 | 147 | 120 | 136 | 0.6335 | 1.097 | 4.02 | 20.89 | 23.97 | 1.60 | 1.60 | 27.89 | 31.17 | 2215 | 2732 |
| 50 | 176 | 144 | 167 | 0.4718 | 0.817 | 5.75 | 24.26 | 28.14 | 1.60 | 1.60 | 31.46 | 36.54 | 2871 | 3893 |
| 70 | 215 | 175 | 207 | 0.3325 | 0.576 | 8.05 | 27.07 | 31.29 | 2.00 | 2.00 | 35.47 | 40.09 | 3617 | 4837 |
| 95 | 257 | 210 | 253 | 0.2460 | 0.427 | 10.92 | 31.19 | 35.82 | 2.00 | 2.00 | 39.99 | 44.62 | 4901 | 6115 |
| 120 | 292 | 239 | 293 | 0.2012 | 0.348 | 13.80 | 33.38 | 38.10 | 2.00 | 2.00 | 42.18 | 47.40 | 5720 | 7269 |
| 150 | 328 | 269 | 336 | 0.1698 | 0.294 | 17.25 | 36.68 | 42.05 | 2.00 | 2.00 | 45.98 | 52.65 | 6908 | 9250 |
| 185 | 369 | 303 | 384 | 0.1445 | 0.250 | 21.27 | 40.82 | 46.75 | 2.50 | 2.50 | 51.12 | 57.45 | 8690 | 11039 |
| 240 | 422 | 348 | 447 | 0.1220 | 0.211 | 27.60 | 46.43 | 53.06 | 2.50 | 2.50 | 57.13 | 64.16 | 10767 | 13726 |
| 300 | 472 | 397 | 509 | 0.1090 | 0.189 | 34.50 | 51.10 | 58.53 | 2.50 | 2.50 | 62.20 | 70.13 | 12950 | 16544 |

ALUMINIUM CONDUCTORS

| Cable size | ELECTRICAL PROPERTIES | | | | | | PHYSICAL PROPERTIES | | | | | | | |
|--------------------|-----------------------|-------|-----|-----------|-----------|----------------------------|---------------------|-------|------|------|--------------|-------|---------|---------|
| | Current ratings | | | Impedance | Volt drop | 1 sec short circuit rating | Nominal Diameters | | | | Approx. Mass | | | |
| | Ground | Ducts | Air | | | | D1 | | d | | D2 | | | |
| | (A) | (A) | (A) | (Ω/km) | (mV/A/m) | (kA) | 3c | 4c | 3c | 4c | 3c | 4c | | |
| (mm ²) | (A) | (A) | (A) | (Ω/km) | (mV/A/m) | (kA) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (kg/km) | (kg/km) |
| 25 | 98 | 79 | 88 | 1.4448 | 2.502 | 1.80 | 17.76 | 20.65 | 1.60 | 1.60 | 24.76 | 27.65 | 1301 | 1554 |
| 35 | 119 | 95 | 108 | 1.0465 | 1.813 | 2.52 | 19.33 | 21.93 | 1.60 | 1.60 | 26.33 | 29.13 | 1477 | 1757 |
| 50 | 142 | 113 | 132 | 0.7749 | 1.342 | 3.61 | 21.87 | 25.05 | 1.60 | 1.60 | 29.07 | 32.25 | 1782 | 2150 |
| 70 | 171 | 138 | 164 | 0.5388 | 0.933 | 5.05 | 24.76 | 29.27 | 1.60 | 1.60 | 31.96 | 37.67 | 2132 | 2930 |
| 95 | 204 | 165 | 201 | 0.3934 | 0.681 | 6.86 | 28.68 | 33.73 | 2.00 | 2.00 | 37.08 | 42.53 | 2908 | 3647 |
| 120 | 235 | 186 | 234 | 0.3148 | 0.545 | 8.66 | 31.09 | 35.44 | 2.00 | 2.00 | 39.89 | 44.24 | 3328 | 4023 |
| 150 | 263 | 213 | 270 | 0.2607 | 0.452 | 10.83 | 33.99 | 39.39 | 2.00 | 2.50 | 42.79 | 49.69 | 3837 | 5276 |
| 185 | 295 | 240 | 308 | 0.2133 | 0.369 | 13.35 | 37.80 | 44.51 | 2.00 | 2.50 | 47.10 | 54.81 | 4557 | 6231 |
| 240 | 340 | 278 | 362 | 0.1708 | 0.296 | 17.32 | 42.60 | 50.04 | 2.50 | 2.50 | 52.9 | 61.14 | 5977 | 7550 |

UNDER SHORT CIRCUIT CONDITIONS A MAXIMUM CONDUCTOR TEMPERATURE OF 160°C IS ALLOWED FOR A MAXIMUM OF 1 SECOND PVC CURRENT RATINGS ARE BASED ON THE FOLLOWING ENVIRONMENTAL PARAMETERS.

| Maximum sustained conductor temperature | Ground temperature | Ambient air temperature (Free air shared) | Ground Thermal Resistivity * | Depth of Laying to top of cable or dust |
|---|--------------------|---|------------------------------|---|
| 70°C | 25°C | 30°C | 1.2K.m/W | 500 mm |