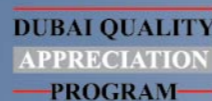


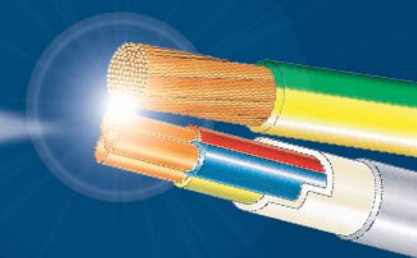
NATIONAL CABLES INDUSTRY **NCI** الوطنية لصناعة الكابلات

*Committed Quality for our Customers*



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**INNOVATIVE**  
 PROCESSES AND  
 TECHNOLOGY STRATEGIES



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## **INTRODUCTION**

Power is the driving force of industries and the focus of advanced communities and aspiring Governments.

The unlimited ambitions, adopted by the **UAE** Government were behind the establishment of National Cables Industry, contributing to power distribution and transmission in the region.

As a leading manufacturer of wires and cables and with a mission of “POWER THE NATION” **NCI** manufactures cables based on strong technological base, continual improvement and maintains high Quality standards. **NCI** has devoted itself to development and continues to make steady strides towards a brighter future in **U.A.E.** and abroad by supplying Quality products in time.

**NCI** specializes in manufacturing of electrical wires, low medium and high voltage cables, fire retardant cables, low smoke and halogen free cables and overhead conductors for power transmission and distribution networks in compliance with British and other International Standards such as **IEC, DIN, ASTM, ICEA, AEIC, AS, NZS,** and **NFC** etc.

**Quality:** Effective Quality Management System is maintained at **NCI** as a key to long term operational reliability. Stringent quality control measures are implemented during procurement, during all stages of production and during final testing. Under professional control, **NCI** has demonstrated competence by obtaining Quality Management System **ISO-9001:2008** from **BASEC**, Product Certification Requirements from **BASEC** for “Enhanced Quality Management System for Product Related Functions”, Occupational Health and Safety Management System **OHSAS 18001:2007** from **SGS**, Emirates Mark of Conformity from **Emirates Authority for Standardization and Metrology (ESMA)**.

**BASEC** is a government-nominated independent non-profit making organization and a leader in product certification for more than 30 years and seeks to ensure National, European and International Manufacturers and their products in cable industry reach relevant standard.

**NCI**, understands customers needs and requirements that apply to their specific projects, offering an unparalleled after-sales services. Our professional dedicated staff is always ready to promptly respond to clients, wherever they are.





Building wires are generally used to carry electrical current in almost every industrial, residential, commercial building. National Cables Industry (NCI) is a leading manufacturer of electrical building wire and cables in the UAE. NCI supplies both residential wire for electrical wiring in homes, apartments and manufactures wires for commercial and industrial buildings.

This catalogue lists wires, cables and cords rated 300/300V, 300/500V and 450/750V used for electric power, lighting, internal wiring , electric power, domestic, office and similar environments as specified in IEC 60227, BS EN 50525-2-31 (BS 6004), BS EN 50525-2-11 (BS 6500), BS 6231 and BS EN 50525-3-41 (BS 7211).

In addition to the above, National Cables Industry manufactures variety of cables and conductors to National and International Standards to meet specific customer needs and specifications.



# C U/PVC WIRES 450/750 VOLTS (ROUND SOLID)

Copper Conductor PVC insulation, BS EN 50525-2-31 (BS 6004) and IEC 60227

H07V-U as per BS EN 50525-2-31 (BS 6004) Type IEC 01 as per IEC 60227  
 Conductor: Round Solid (Class 1)  
 Insulation: PVC – Type TI 1 as per BS EN 50525-2-31 (BS 6004), Type C as per IEC 60227  
 Based on special request, PVC insulation rated 85°C and 90°C (105°C for reduced duration) can also be provided.



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 V DC to earth.

| Nominal Cross Section | Conductor (Solid)            |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable (Approx) | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|------------------------------|-------------------------------|---------------------------------|--------------------------|-----------------------------------|---|-------------------------|
|                       | Number of Wires in Conductor | Approx. Diameter of Conductor |                                 |                          |                                   |   |                         |
| mm <sup>2</sup>       |                              | mm                            | mm                              | mm                       | Kg / Km                           | Ohm / Km                                |                         |
| 1 x 1.5               | 1                            | 1.38                          | 0.7                             | 2.8                      | 20                                | 12.1                                    | 100 Yards               |
| 1 x 2.5               | 1                            | 1.78                          | 0.8                             | 3.4                      | 32                                | 7.41                                    | 100 Yards               |
| 1 x 4                 | 1                            | 2.25                          | 0.8                             | 3.9                      | 47                                | 4.61                                    | 100 Yards               |
| 1 x 6                 | 1                            | 2.76                          | 0.8                             | 4.4                      | 65                                | 3.08                                    | 100 Yards               |
| 1 x 10                | 1                            | 3.57                          | 1.0                             | 5.6                      | 110                               | 1.83                                    | 100 Yards               |

Color: green/yellow blue black green red yellow brown grey orange white

Packing: 100 Yards in Coils or Spools

Based on specific requirement, wires can also be supplied in km lengths in wooden or steel drums.



# C U/PVC WIRES 450/750 VOLTS (ROUND STRANDED)

Copper Conductor, PVC insulation, BS EN 50525-2-31 (BS 6004) and IEC 60227

H07V-R as per BS EN 50525-2-31 (BS 6004), Type IEC 01 as per IEC 60227

Conductor: Round Stranded (Class 2)

Insulation: PVC – Type TI 1 as per BS EN 50525-2-31 (BS 6004), Type C as per IEC 60227

Based on special request, PVC insulation rated 85°C and 90°C (105°C for reduced duration) can also be provided.



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 V DC to earth.

| Nominal Cross Section | Conductor (Stranded)         |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable (Approx) | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|------------------------------|-------------------------------|---------------------------------|--------------------------|-----------------------------------|---|-------------------------|
|                       | Number of Wires in Conductor | Approx. Diameter of Conductor |                                 |                          |                                   |   |                         |
| mm <sup>2</sup>       |                              | mm                            | mm                              | mm                       | Kg / Km                           | Ohm / Km                                |                         |
| 1 x 1.5               | 7                            | 1.56                          | 0.7                             | 3.0                      | 21                                | 12.1                                    | 100 Yards               |
| 1 x 2.5               | 7                            | 1.98                          | 0.8                             | 3.6                      | 33                                | 7.41                                    | 100 Yards               |
| 1 x 4                 | 7                            | 2.52                          | 0.8                             | 4.1                      | 48                                | 4.61                                    | 100 Yards               |
| 1 x 6                 | 7                            | 3.12                          | 0.8                             | 4.7                      | 68                                | 3.08                                    | 100 Yards               |
| 1 x 10                | 7                            | 4.01                          | 1.0                             | 6.0                      | 113                               | 1.83                                    | 100 Yards               |
| 1 x 16                | 7                            | 5.03                          | 1.0                             | 7.0                      | 170                               | 1.15                                    | 100 Yards               |
| 1 x 25                | 7                            | 6.30                          | 1.2                             | 8.7                      | 265                               | 0.727                                   | 100 Yards               |
| 1 x 35                | 7                            | 7.44                          | 1.2                             | 9.8                      | 361                               | 0.524                                   | 100 Yards               |
| 1 x 50                | 19                           | 8.10                          | 1.4                             | 10.9                     | 470                               | 0.387                                   | 3000 Drum               |
| 1 x 70                | 19                           | 9.70                          | 1.4                             | 12.5                     | 660                               | 0.268                                   | 3000 Drum               |
| 1 x 95                | 19                           | 11.40                         | 1.6                             | 14.6                     | 920                               | 0.193                                   | 3000 Drum               |
| 1 x 120               | 37                           | 12.90                         | 1.6                             | 16.1                     | 1140                              | 0.153                                   | 2000 Drum               |
| 1 x 150               | 37                           | 14.30                         | 1.8                             | 17.9                     | 1410                              | 0.124                                   | 2000 Drum               |
| 1 x 185               | 37                           | 16.00                         | 2.0                             | 20.0                     | 1770                              | 0.0991                                  | 2000 Drum               |
| 1 x 240               | 61                           | 18.40                         | 2.2                             | 22.8                     | 2320                              | 0.0754                                  | 1000 Drum               |
| 1 x 300               | 61                           | 20.40                         | 2.4                             | 25.2                     | 2900                              | 0.0601                                  | 1000 Drum               |
| 1 x 400               | 61                           | 23.20                         | 2.6                             | 28.4                     | 3700                              | 0.0470                                  | 500 Drum                |
| 1 x 500               | 61                           | 26.70                         | 2.8                             | 32.3                     | 4730                              | 0.0366                                  | 500 Drum                |
| 1 x 630               | 61                           | 30.40                         | 2.8                             | 36.0                     | 6050                              | 0.0283                                  | 500 Drum                |

Color: green/yellow blue black green red yellow brown grey orange white

Based on specific requirement, wires can also be supplied in km lengths in wooden or steel drums.



# C U/PVC WIRES 450/750 VOLTS (ROUND FLEXIBLE)

Copper Conductor PVC insulation, BS EN 50525-2-31 (BS 6004) and IEC 60227

H07V-K as per BS EN 50525-2-31 (BS 6004) Type IEC 02 as per IEC 60227

Conductor: Flexible (Class 5)

Insulation: PVC – Type TI 1 as per BS EN 50525-2-31 (BS 6004), Type C as per IEC 60227

Based on special request, PVC insulation rated 85°C and 90°C (105°C for reduced duration) can also be provided.



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 V DC to earth.

| Nominal Cross Section | Conductor (Round Flexible)    |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|-------------------------------|-------------------------------|---------------------------------|--------------------------|----------------------------------|---|-------------------------|
|                       | Numbers of Wires in Conductor | Diameter of Conductor Approx. |                                 |                          |                                  |   |                         |
| mm <sup>2</sup>       | No x mm                       | mm                            | mm                              | mm                       | Kg / Km                          | Ohm / Km                                |                         |
| 1 x 1.5               | 27 x 0.25                     | 1.55                          | 0.7                             | 3.0                      | 20                               | 13.3                                    | 100 C                   |
| 1 x 2.5               | 45 x 0.25                     | 2.00                          | 0.8                             | 3.6                      | 30                               | 7.98                                    | 100 C                   |
| 1 x 4                 | 50 x 0.30                     | 2.51                          | 0.8                             | 4.2                      | 45                               | 4.95                                    | 100 C                   |
| 1 x 6                 | 76 x 0.30                     | 3.09                          | 0.8                             | 4.7                      | 65                               | 3.30                                    | 100 C                   |
| 1 x 10                | 74 x 0.40                     | 4.07                          | 1.0                             | 6.1                      | 110                              | 1.91                                    | 100 C                   |
| 1 x 16                | 118 x 0.40                    | 5.08                          | 1.0                             | 7.1                      | 165                              | 1.21                                    | 100 C                   |
| 1 x 25                | 182 x 0.40                    | 6.35                          | 1.2                             | 9.0                      | 255                              | 0.780                                   | 100 C                   |
| 1 x 35                | 257 x 0.40                    | 7.50                          | 1.2                             | 10.0                     | 345                              | 0.554                                   | 100 C                   |
| 1 x 50                | 371 x 0.40                    | 8.95                          | 1.4                             | 12.0                     | 495                              | 0.386                                   | 1000 D                  |
| 1 x 70                | 336 x 0.50                    | 10.70                         | 1.4                             | 14.0                     | 690                              | 0.272                                   | 1000 D                  |
| 1 x 95                | 444 x 0.50                    | 12.30                         | 1.6                             | 16.0                     | 910                              | 0.206                                   | 1000 D                  |
| 1 x 120               | 568 x 0.50                    | 14.00                         | 1.6                             | 17.2                     | 1150                             | 0.161                                   | 1000 D                  |
| 1 x 150               | 708 x 0.50                    | 15.60                         | 1.8                             | 19.2                     | 1435                             | 0.129                                   | 1000 D                  |
| 1 x 185               | 864 x 0.50                    | 17.20                         | 2.0                             | 21.2                     | 1745                             | 0.106                                   | 1000 D                  |
| 1 x 240               | 1134 x 0.50                   | 20.00                         | 2.2                             | 24.4                     | 2265                             | 0.0801                                  | 1000 D                  |
| 1 x 300               | 1414 x 0.50                   | 22.00                         | 2.4                             | 27.0                     | 2815                             | 0.0641                                  | 1000 D                  |

Color: green/yellow blue black green red yellow brown grey orange white



# C U/PVC WIRES 600/1000 VOLTS

Copper Conductor PVC insulation, BS 6231, Type CK

Conductor: Flexible Stranded (Class 5)

Insulation: PVC – Type TI 3 rated for 90°C (105°C for reduced duration) as per BS 6231 and Type E as per IEC 60227.

These wires are high temperature heat resistant wires, intended for use in the wiring of switch control, metering, relay and instrument panels of power switchgears and for internal connections in rectifier equipment and its motor starters and controllers. They are intended for use at alternating voltages not exceeding 600V to earth and direct voltage not exceeding 1000V to earth.



| Nominal Cross Section | Conductor (Flexible)          |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|-------------------------------|-------------------------------|---------------------------------|--------------------------|----------------------------------|---|-------------------------|
|                       | Numbers of Wires in Conductor | Diameter of Conductor Approx. |                                 |                          |                                  |   |                         |
| mm <sup>2</sup>       | No x mm                       | mm                            | mm                              | mm                       | Kg / Km                          | Ohm / Km                                |                         |
| 1 x 1.5               | 27 x 0.25                     | 1.55                          | 0.8                             | 3.0                      | 20                               | 13.3                                    | 100 C                   |
| 1 x 2.5               | 45 x 0.25                     | 2.0                           | 0.8                             | 3.6                      | 30                               | 7.98                                    | 100 C                   |
| 1 x 4                 | 50 x 0.30                     | 2.5                           | 0.8                             | 4.11                     | 45                               | 4.95                                    | 100 C                   |
| 1 x 6                 | 76 x 0.30                     | 3.09                          | 0.8                             | 4.7                      | 65                               | 3.30                                    | 100 C                   |
| 1 x 10                | 74 x 0.40                     | 4.07                          | 1.0                             | 6.1                      | 110                              | 1.91                                    | 100 C                   |
| 1 x 16                | 118 x 0.40                    | 5.08                          | 1.0                             | 8.0                      | 165                              | 1.21                                    | 100 C                   |
| 1 x 25                | 182 x 0.40                    | 6.4                           | 1.2                             | 9.0                      | 255                              | 0.780                                   | 100 C                   |
| 1 x 35                | 257 x 0.40                    | 7.5                           | 1.2                             | 10.0                     | 345                              | 0.554                                   | 100 C                   |
| 1 x 50                | 371 x 0.40                    | 8.95                          | 1.4                             | 12.0                     | 495                              | 0.386                                   | 1000 D                  |
| 1 x 70                | 336 x 0.50                    | 10.7                          | 1.4                             | 13.5                     | 690                              | 0.272                                   | 1000 D                  |
| 1 x 95                | 444 x 0.50                    | 12.3                          | 1.6                             | 15.5                     | 910                              | 0.206                                   | 1000 D                  |
| 1 x 120               | 568 x 0.50                    | 14.0                          | 1.6                             | 17.2                     | 1150                             | 0.161                                   | 1000 D                  |
| 1 x 150               | 708 x 0.50                    | 15.6                          | 1.8                             | 19.2                     | 1435                             | 0.129                                   | 1000 D                  |
| 1 x 185               | 864 x 0.50                    | 17.2                          | 2.0                             | 21.2                     | 1745                             | 0.106                                   | 1000 D                  |
| 1 x 240               | 1134 x 0.50                   | 20.0                          | 2.2                             | 24.4                     | 2265                             | 0.0801                                  | 1000 D                  |

Color: green/yellow blue black green red yellow brown grey orange white





Fire is a complex and emotive subject, the consequences of fire can be catastrophic. The nature of organic material used in the manufacture of cables and possible installation conditions in areas of the fire risk can lead to a situation where cables may contribute to the spread of fire, emission of smoke and release of combustion products injurious to equipment and human health.

In power stations, hospitals, theatres, hotels and other large public buildings, the loss of visibility caused by smoke evolved from burning cable materials can cause panic and create serious problems when evacuating personnel. Location of the fire source and fire fighting are also greatly hampered by smoke. Additionally the presence of corrosive gases in the smoke result in damage and failure of sensitive electrical equipment and may initiate long term deterioration of structures, as well as being injurious to the health of personnel even after short exposure.

Awareness of this situation has led to the development of new cable technologies and introduction by major cable users of cable types with low emission of smoke, corrosive and toxic fumes and reduced flame propagation properties.

In considering cable systems with improved fire performance characteristics it is useful to first consider the various aspects of the effect of fire on a cable.

- Propagation of fire along cable runs
- Evolution of smoke leading to obstruction of exits
- Evolution of acid gas leading to corrosion of equipment
- Evolution of toxic fumes leading to personal injury

LSZH wires and cables use special formulation based on non-halogenated polymers in order to restrict the generation of smoke as much as possible. Materials are carefully selected and the compounds carefully designed in order to ensure the best performance of the external sheaths, which are directly exposed to fire.

LSZH wires and cables manufactured by NCI have been designed to offer improved performance in areas where smoke and fume emission in the event of a fire would cause particular problems. Compound used in LSZH cables do not contain halogen hence, do not emit halogenated acids when burnt which help in minimizing the total cost of the damage caused by fire and generate little smoke when burned. Furthermore, the rate at which this low level of smoke is released, is very much slower than that of PVC or similar halogenated polymers.

LSZH wires and cables manufactured by NCI have controlled limits of smoke evolution, when assessed by burning samples of cables in a 3 meter cube smoke chamber as per IEC 61034. Generally these combine the properties of low corrosive gas emission and low toxic gas emission as they are essentially halogen free when assessed by IEC 60754-1 and IEC 60754-2.

LSZH wire and cables are designed and manufactured to pass the following tests as per relevant IEC/BS Standard.

- Vertical flame propagation tests
- Smoke density tests
- Acidity, pH and conductivity test



# C U/LSZH WIRES 450/750 VOLTS (ROUND SOLID)

Copper Conductor LSZH Insulation BS EN 50525-3-41 (BS 7211)

H07Z-U as per BS EN 50525-3-41 (BS 7211)

Conductor: Round Solid (Class 1)

Insulation: Low Smoke Thermosetting Insulation Type EI5 as per BS EN 50525-3-41 (BS 7211)



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 DC earth.

| Nominal Cross Section | Conductor (Solid)            |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable (Approx) | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|------------------------------|-------------------------------|---------------------------------|--------------------------|-----------------------------------|---|-------------------------|
|                       | Number of Wires in Conductor | Approx. Diameter of Conductor |                                 |                          |                                   |   |                         |
| mm <sup>2</sup>       |                              | mm                            | mm                              | mm                       | Kg / Km                           | Ohm / Km                                |                         |
| 1 x 1.5               | 1                            | 1.38                          | 0.7                             | 3.0                      | 20                                | 12.1                                    | 100 Yards               |
| 1 x 2.5               | 1                            | 1.78                          | 0.8                             | 3.5                      | 32                                | 7.41                                    | 100 Yards               |
| 1 x 4                 | 1                            | 2.25                          | 0.8                             | 4.0                      | 47                                | 4.61                                    | 100 Yards               |
| 1 x 6                 | 1                            | 2.76                          | 0.8                             | 5.0                      | 65                                | 3.08                                    | 100 Yards               |
| 1 x 10                | 1                            | 3.57                          | 1.0                             | 6.0                      | 110                               | 1.83                                    | 100 Yards               |

Color: green/yellow blue black green red yellow brown grey orange white



# C U/LSZH WIRES 450/750 VOLTS (ROUND STRANDED)

Copper Conductor LSZH Insulation BS EN 50525-3-41 (BS 7211)

H07Z-R as per BS EN 50525-3-41 (BS 7211)

Conductor: Round Solid (Class 2)

Insulation: Low Smoke Thermosetting Insulation Type EI5 as per BS EN 50525-3-41 (BS 7211)



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 V DC to earth.

| Nominal Cross Section | Conductor (Round Stranded)    |                                | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|-------------------------------|--------------------------------|---------------------------------|--------------------------|----------------------------------|---|-------------------------|
|                       | Numbers of Wires in Conductor | Approx. Diameter of Conductor. |                                 |                          |                                  |   |                         |
| mm <sup>2</sup>       | No                            | mm                             | mm                              | mm                       | Kg / Km                          | Ohm / Km                                | Yards                   |
| 1 x 1.5               | 7                             | 1.56                           | 0.7                             | 3.0                      | 21                               | 12.1                                    | 100 C                   |
| 1 x 2.5               | 7                             | 1.98                           | 0.8                             | 3.6                      | 33                               | 7.41                                    | 100 C                   |
| 1 x 4                 | 7                             | 2.52                           | 0.8                             | 4.1                      | 48                               | 4.61                                    | 100 C                   |
| 1 x 6                 | 7                             | 3.12                           | 0.8                             | 4.7                      | 68                               | 3.08                                    | 100 C                   |
| 1 x 10                | 7                             | 4.01                           | 1.0                             | 6.0                      | 113                              | 1.83                                    | 100 C                   |
| 1 x 16                | 7                             | 5.03                           | 1.0                             | 7.0                      | 170                              | 1.15                                    | 100 C                   |
| 1 x 25                | 7                             | 6.30                           | 1.2                             | 8.7                      | 265                              | 0.727                                   | 100 C                   |
| 1 x 35                | 7                             | 7.44                           | 1.2                             | 9.8                      | 360                              | 0.524                                   | 100 C                   |
| 1 x 50                | 19                            | 8.10                           | 1.4                             | 10.9                     | 470                              | 0.387                                   | 3000 D                  |
| 1 x 70                | 19                            | 9.70                           | 1.4                             | 12.5                     | 663                              | 0.268                                   | 3000 D                  |
| 1 x 95                | 19                            | 11.40                          | 1.6                             | 14.6                     | 920                              | 0.193                                   | 3000 D                  |
| 1 x 120               | 37                            | 12.90                          | 1.6                             | 16.1                     | 1140                             | 0.153                                   | 2000 D                  |
| 1 x 150               | 37                            | 14.30                          | 1.8                             | 17.9                     | 1410                             | 0.124                                   | 2000 D                  |
| 1 x 185               | 37                            | 16.00                          | 2.0                             | 20.0                     | 1770                             | 0.0991                                  | 2000 D                  |
| 1 x 240               | 61                            | 18.40                          | 2.2                             | 22.8                     | 2320                             | 0.0754                                  | 1000 D                  |
| 1 x 300               | 61                            | 20.40                          | 2.4                             | 25.2                     | 2900                             | 0.0601                                  | 1000 D                  |
| 1 x 400               | 61                            | 23.20                          | 2.6                             | 28.4                     | 3700                             | 0.0470                                  | 500 D                   |
| 1 x 500               | 61                            | 26.70                          | 2.8                             | 32.3                     | 4730                             | 0.0366                                  | 500 D                   |
| 1 x 630               | 61                            | 30.40                          | 2.8                             | 36.0                     | 6050                             | 0.0283                                  | 500 D                   |

Color: green/yellow    blue    black    green    red    yellow    brown    grey    orange    white



# **C**U/LSZH WIRES 450/750 VOLTS (ROUND FLEXIBLE) Copper Conductor LSZH Insulation BS EN 50525-3-41 (BS 7211)

H07Z-K as per BS EN 50525-3-41 (BS 7211)

Conductor: Round Flexible (Class5)

Insulation: Low Smoke Thermosetting Insulation Type EI5 as per BS EN 50525-3-41 (BS 7211)



For internal wiring of equipment rated voltage up to 1000 V AC and up to 750 V DC to earth.

| Nominal Cross Section | Conductor (Round Flexible)    |                               | Nominal Thickness of Insulation | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|-------------------------------|-------------------------------|---------------------------------|--------------------------|----------------------------------|---|-------------------------|
|                       | Numbers of Wires in Conductor | Approx. Diameter of Conductor |                                 |                          |                                  |   |                         |
| mm <sup>2</sup>       | No x mm                       | mm                            | mm                              | mm                       | Kg / Km                          | Ohm / Km                                | M ± 5%                  |
| 1 x 1.5               | 27 x 0.25                     | 1.55                          | 0.7                             | 3.0                      | 20                               | 13.3                                    | 100 C                   |
| 1 x 2.5               | 45 x 0.25                     | 2.00                          | 0.8                             | 3.6                      | 30                               | 7.98                                    | 100 C                   |
| 1 x 4                 | 50 x 0.30                     | 2.51                          | 0.8                             | 4.1                      | 45                               | 4.95                                    | 100 C                   |
| 1 x 6                 | 76 x 0.30                     | 3.09                          | 0.8                             | 4.7                      | 65                               | 3.30                                    | 100 C                   |
| 1 x 10                | 74 x 0.40                     | 4.07                          | 1.0                             | 6.1                      | 110                              | 1.91                                    | 100 C                   |
| 1 x 16                | 118 x 0.40                    | 5.08                          | 1.0                             | 7.1                      | 165                              | 1.21                                    | 100 C                   |
| 1 x 25                | 182 x 0.40                    | 6.35                          | 1.2                             | 9.0                      | 255                              | 0.780                                   | 100 C                   |
| 1 x 35                | 257 x 0.40                    | 7.50                          | 1.2                             | 10.0                     | 345                              | 0.554                                   | 100 C                   |
| 1 x 50                | 371 x 0.40                    | 8.95                          | 1.4                             | 12.0                     | 495                              | 0.386                                   | 1000 D                  |
| 1 x 70                | 336 x 0.50                    | 10.70                         | 1.4                             | 14.0                     | 690                              | 0.272                                   | 1000 D                  |
| 1 x 95                | 444 x 0.50                    | 12.30                         | 1.6                             | 16.0                     | 910                              | 0.206                                   | 1000 D                  |
| 1 x 120               | 568 x 0.50                    | 14.00                         | 1.6                             | 17.2                     | 1150                             | 0.161                                   | 1000 D                  |
| 1 x 150               | 708 x 0.50                    | 15.60                         | 1.8                             | 19.2                     | 1435                             | 0.129                                   | 1000 D                  |
| 1 x 185               | 864 x 0.50                    | 17.20                         | 2.0                             | 21.2                     | 1745                             | 0.106                                   | 1000 D                  |
| 1 x 240               | 1134 x 0.50                   | 20.0                          | 2.2                             | 24.4                     | 2265                             | 0.0801                                  | 1000 D                  |
| 1 x 300               | 1414 x 0.50                   | 22.0                          | 2.4                             | 27.0                     | 2815                             | 0.0641                                  | 1000 D                  |

Color: green / yellow blue black green red yellow brown grey orange white





# C U/PVC/PVC CABLES 300/500 VOLTS (ROUND SOLID)

Copper Conductor PVC insulated and PVC Sheathed - IEC 60227

H05VV-U, IEC 60227  
TYPE 60227 IEC 10



| Nominal Cross Section | Numbers of Wires in Conductor | Approx. Diameter of Conductor | Nominal Thickness of Insulation | Nominal Thickness of Sheath | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|-------------------------------|-------------------------------|---------------------------------|-----------------------------|--------------------------|----------------------------------|---|-------------------------|
| mm <sup>2</sup>       |                               | mm                            | mm                              | mm                          | mm                       | Kg / Km                          | Ohm / Km                                | M ± 5%                  |
| 2 x 1.5               | 1                             | 1.38                          | 0.7                             | 1.2                         | 8.0                      | 94                               | 12.1                                    | 100 C                   |
| 2 x 2.5               | 1                             | 1.78                          | 0.8                             | 1.2                         | 9.2                      | 133                              | 7.41                                    | 100 C                   |
| 2 x 4                 | 1                             | 2.25                          | 0.8                             | 1.2                         | 10.1                     | 176                              | 4.61                                    | 100 C                   |
| 2 x 6                 | 1                             | 2.76                          | 0.8                             | 1.2                         | 11.1                     | 227                              | 3.08                                    | 100 C                   |
| 2 x 10                | 1                             | 3.57                          | 1.0                             | 1.4                         | 13.9                     | 367                              | 1.83                                    | 1000/2000               |
| 3 x 1.5               | 1                             | 1.38                          | 0.7                             | 1.2                         | 8.4                      | 113                              | 12.1                                    | 100 C                   |
| 3 x 2.5               | 1                             | 1.78                          | 0.8                             | 1.2                         | 10.0                     | 163                              | 7.41                                    | 100 C                   |
| 3 x 4                 | 1                             | 2.25                          | 0.8                             | 1.2                         | 10.7                     | 219                              | 4.61                                    | 100 C                   |
| 3 x 6                 | 1                             | 2.76                          | 0.8                             | 1.4                         | 12.2                     | 298                              | 3.08                                    | 100 C                   |
| 3 x 10                | 1                             | 3.57                          | 1.0                             | 1.4                         | 15.0                     | 467                              | 1.83                                    | 1000/2000               |
| 4 x 1.5               | 1                             | 1.38                          | 0.7                             | 1.2                         | 9.1                      | 138                              | 12.1                                    | 100 C                   |
| 4 x 2.5               | 1                             | 1.78                          | 0.8                             | 1.2                         | 10.6                     | 201                              | 7.41                                    | 100 C                   |
| 4 x 4                 | 1                             | 2.25                          | 0.8                             | 1.4                         | 12.1                     | 284                              | 4.61                                    | 100 C                   |
| 4 x 6                 | 1                             | 2.76                          | 0.8                             | 1.4                         | 13.3                     | 372                              | 3.08                                    | 1000/2000               |
| 4 x 10                | 1                             | 3.57                          | 1.0                             | 1.4                         | 16.3                     | 594                              | 1.83                                    | 1000/2000               |
| 5 x 1.5               | 1                             | 1.38                          | 0.7                             | 1.2                         | 10.0                     | 165                              | 12.1                                    | 100 C                   |
| 5 x 2.5               | 1                             | 1.78                          | 0.8                             | 1.2                         | 11.5                     | 242                              | 7.41                                    | 100 C                   |
| 5 x 4                 | 1                             | 2.25                          | 0.8                             | 1.4                         | 13.2                     | 343                              | 4.61                                    | 100 C                   |
| 5 x 6                 | 1                             | 2.76                          | 0.8                             | 1.4                         | 15.0                     | 452                              | 3.08                                    | 1000/2000               |
| 5 x 10                | 1                             | 3.57                          | 1.0                             | 1.4                         | 17.8                     | 734                              | 1.83                                    | 1000/2000               |

**Colour of Insulation:**

- 2 cores: Red, Black
- 3 cores: Red, Yellow and Blue
- 4 cores: Red, Yellow, Blue and Black
- 5 cores: Red, Yellow, Blue, Black and Green

Colour of Outer sheath – Grey.

**Note:** Colour code as per BS Standards shall only be provided based on specific request which is as follows:

- 2 cores: brown and blue
- 3 cores: green/yellow, blue, brown
- 4 cores: green/yellow, blue, brown, black
- 5 cores: green/yellow, blue, brown, black and grey



# C U/PVC/PVC CABLES 300/500 VOLTS (ROUND STRANDED)

Copper Conductor PVC insulated and PVC Sheathed and IEC 60227

H05VV-R, IEC 60227  
TYPE 60227 IEC 10



| Cross Section   | Numbers of Wires in Conductor | Approx. Diameter of Conductor | Nominal Thickness of Insulation | Nominal Thickness of Sheath | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------|-------------------------------|-------------------------------|---------------------------------|-----------------------------|--------------------------|----------------------------------|---|-------------------------|
| mm <sup>2</sup> |                               | mm                            | mm                              | mm                          | mm                       | Kg / Km                          | Ohm / Km                                | M ± 5%                  |
| 2 x 1.5         | 7                             | 1.56                          | 0.7                             | 1.2                         | 8.3                      | 100                              | 12.1                                    | 100 C                   |
| 2 x 2.5         | 7                             | 1.98                          | 0.8                             | 1.2                         | 9.6                      | 140                              | 7.41                                    | 100 C                   |
| 2 x 4           | 7                             | 2.52                          | 0.8                             | 1.2                         | 10.7                     | 190                              | 4.61                                    | 100 C                   |
| 2 x 6           | 7                             | 3.12                          | 0.8                             | 1.2                         | 11.8                     | 246                              | 3.08                                    | 100 C                   |
| 2 x 10          | 7                             | 4.01                          | 1.0                             | 1.4                         | 14.8                     | 396                              | 1.83                                    | 1000/2000               |
| 2 x 16          | 7                             | 5.03                          | 1.0                             | 1.4                         | 16.9                     | 555                              | 1.15                                    | 1000/2000               |
| 2 x 25          | 7                             | 6.30                          | 1.2                             | 1.4                         | 20.0                     | 830                              | 0.727                                   | 1000                    |
| 2 x 35          | 7                             | 7.44                          | 1.2                             | 1.6                         | 23.0                     | 1210                             | 0.524                                   | 1000                    |
| 3 x 1.5         | 7                             | 1.56                          | 0.7                             | 1.2                         | 8.8                      | 121                              | 12.1                                    | 100 C                   |
| 3 x 2.5         | 7                             | 1.98                          | 0.8                             | 1.2                         | 10.2                     | 170                              | 7.41                                    | 100 C                   |
| 3 x 4           | 7                             | 2.52                          | 0.8                             | 1.2                         | 11.4                     | 235                              | 4.61                                    | 100 C                   |
| 3 x 6           | 7                             | 3.12                          | 0.8                             | 1.4                         | 13.0                     | 320                              | 3.08                                    | 100 C                   |
| 3 x 10          | 7                             | 4.01                          | 1.0                             | 1.4                         | 16.0                     | 500                              | 1.83                                    | 1000/2000               |
| 3 x 16          | 7                             | 5.03                          | 1.0                             | 1.4                         | 18.0                     | 714                              | 1.15                                    | 1000/2000               |
| 3 x 25          | 7                             | 6.30                          | 1.2                             | 1.6                         | 22.0                     | 1100                             | 0.727                                   | 1000                    |
| 3 x 35          | 7                             | 7.44                          | 1.2                             | 1.6                         | 24.0                     | 1440                             | 0.524                                   | 1000                    |
| 4 x 1.5         | 7                             | 1.56                          | 0.7                             | 1.2                         | 9.6                      | 148                              | 12.1                                    | 100 C                   |
| 4 x 2.5         | 7                             | 1.98                          | 0.8                             | 1.2                         | 11.1                     | 215                              | 7.41                                    | 100 C                   |
| 4 x 4           | 7                             | 2.52                          | 0.8                             | 1.4                         | 12.8                     | 304                              | 4.61                                    | 100 C                   |
| 4 x 6           | 7                             | 3.12                          | 0.8                             | 1.4                         | 14.2                     | 399                              | 3.08                                    | 1000/2000               |
| 4 x 10          | 7                             | 4.01                          | 1.0                             | 1.4                         | 17.3                     | 635                              | 1.83                                    | 1000/2000               |
| 4 x 16          | 7                             | 5.03                          | 1.0                             | 1.4                         | 19.8                     | 912                              | 1.15                                    | 1000/2000               |
| 4 x 25          | 7                             | 6.30                          | 1.2                             | 1.6                         | 24.0                     | 1400                             | 0.727                                   | 1000                    |
| 4 x 35          | 7                             | 7.44                          | 1.2                             | 1.6                         | 27.0                     | 1980                             | 0.524                                   | 1000                    |
| 5 x 1.5         | 7                             | 1.56                          | 0.7                             | 1.2                         | 10.4                     | 176                              | 12.1                                    | 100 C                   |
| 5 x 2.5         | 7                             | 1.98                          | 0.8                             | 1.2                         | 12.2                     | 250                              | 7.41                                    | 100 C                   |
| 5 x 4           | 7                             | 2.52                          | 0.8                             | 1.4                         | 14.0                     | 360                              | 4.61                                    | 100 C                   |
| 5 x 6           | 7                             | 3.12                          | 0.8                             | 1.4                         | 15.5                     | 484                              | 3.08                                    | 1000/2000               |
| 5 x 10          | 7                             | 4.01                          | 1.0                             | 1.4                         | 19.0                     | 786                              | 1.83                                    | 1000/2000               |
| 5 x 16          | 7                             | 5.03                          | 1.0                             | 1.6                         | 22.2                     | 1153                             | 1.15                                    | 1000/2000               |
| 5 x 25          | 7                             | 6.30                          | 1.2                             | 1.6                         | 27.0                     | 1740                             | 0.727                                   | 1000                    |
| 5 x 35          | 7                             | 7.44                          | 1.2                             | 1.6                         | 30.0                     | 2310                             | 0.524                                   | 1000                    |

**Colour of Insulation:**

- 2 cores: Red, Black
- 3 cores: Red, Yellow and Blue
- 4 cores: Red, Yellow, Blue and Black
- 5 cores: Red, Yellow, Blue, Black and Green

Colour of Outer sheath – Grey.

**Note:** Colour code as per BS Standards shall only be provided based on specific request which is as follows:

- 2 cores: brown and blue
- 3 cores: green/yellow, blue, brown
- 4 cores: green/yellow, blue, brown, black
- 5 cores: green/yellow, blue, brown, black and grey



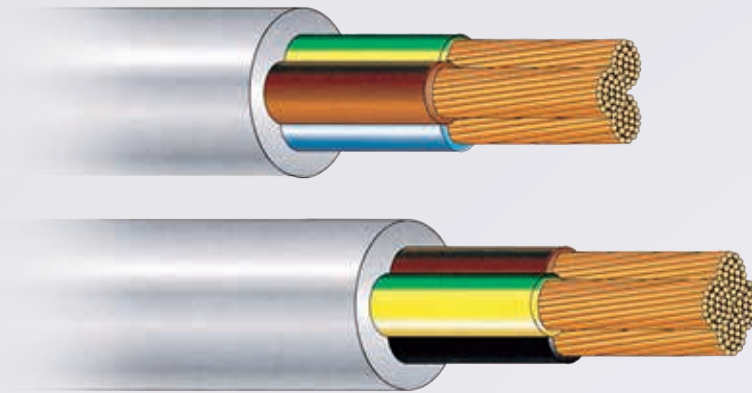
# C U/PVC/PVC CABLES 300/500 VOLTS

Flexible Copper Conductor PVC insulated and Sheathed, BS EN 50525-2-11 (BS 6500) and IEC 60227

H05VV-F, IEC 60227 & BS EN 50525-2-11 (BS 6500)

TYPE 60227 IEC 53

H05V2V2-F Heat Resistant Cables can be made on special request.



| Nominal Cross Section | Numbers & diameter of Wires in Conductor | Approx. Diameter of Conductor | Nominal Thickness of Insulation | Nominal Thickness of Sheath | Approx. Overall Diameter | Weight of Finished Cable Approx. | Maximum Conductor DC Resistance at 20°C | Standard Packing Length |
|-----------------------|--|-------------------------------|---------------------------------|-----------------------------|--------------------------|----------------------------------|---|-------------------------|
| mm <sup>2</sup>       | no x mm                                  | mm                            | mm                              | mm                          | mm                       | Kg / Km                          | Ohm / Km                                | M ± 5%                  |
| 2 x 0.75              | 22 x 0.20                                | 1.20                          | 0.6                             | 0.8                         | 6.4                      | 56                               | 26.0                                    | 100                     |
| 2 x 1                 | 29 x 0.20                                | 1.30                          | 0.6                             | 0.8                         | 6.6                      | 63                               | 19.5                                    | 100                     |
| 2 x 1.5               | 27 x 0.25                                | 1.55                          | 0.7                             | 0.8                         | 7.5                      | 83                               | 13.3                                    | 100                     |
| 2 x 2.5               | 45 x 0.25                                | 2.00                          | 0.8                             | 1.0                         | 9.2                      | 128                              | 7.98                                    | 100                     |
| 2 x 4                 | 50 x 0.3                                 | 2.51                          | 0.8                             | 1.1                         | 10.4                     | 175                              | 4.95                                    | 100                     |
| 3 x 0.75              | 22 x 0.20                                | 1.20                          | 0.6                             | 0.8                         | 6.78                     | 67                               | 26.0                                    | 100                     |
| 3 x 1                 | 29 x 0.20                                | 1.30                          | 0.6                             | 0.8                         | 7.0                      | 75                               | 19.5                                    | 100                     |
| 3 x 1.5               | 27 x 0.25                                | 1.55                          | 0.7                             | 0.9                         | 8.2                      | 105                              | 13.3                                    | 100                     |
| 3 x 2.5               | 45 x 0.25                                | 2.00                          | 0.8                             | 1.1                         | 9.8                      | 160                              | 7.98                                    | 100                     |
| 3 x 4                 | 50 x 0.3                                 | 2.51                          | 0.8                             | 1.2                         | 11.3                     | 225                              | 4.95                                    | 100                     |
| 4 x 0.75              | 22 x 0.20                                | 1.20                          | 0.6                             | 0.8                         | 7.4                      | 81                               | 26.0                                    | 100                     |
| 4 x 1                 | 29 x 0.20                                | 1.30                          | 0.6                             | 0.9                         | 7.8                      | 95                               | 19.5                                    | 100                     |
| 4 x 1.5               | 27 x 0.25                                | 1.55                          | 0.7                             | 1.0                         | 9.1                      | 132                              | 13.3                                    | 100                     |
| 4 x 2.5               | 45 x 0.25                                | 2.00                          | 0.8                             | 1.1                         | 11.0                     | 197                              | 7.98                                    | 100                     |
| 4 x 4                 | 50 x 0.3                                 | 2.51                          | 0.8                             | 1.2                         | 12.4                     | 275                              | 4.95                                    | 100                     |
| 5 x 0.75              | 22 x 0.20                                | 1.20                          | 0.6                             | 0.9                         | 8.3                      | 101                              | 26.0                                    | 100                     |
| 5 x 1                 | 29 x 0.20                                | 1.30                          | 0.6                             | 0.9                         | 8.5                      | 114                              | 19.5                                    | 100                     |
| 5 x 1.5               | 27 x 0.25                                | 1.55                          | 0.7                             | 1.1                         | 10.2                     | 163                              | 13.3                                    | 100                     |
| 5 x 2.5               | 45 x 0.25                                | 2.00                          | 0.8                             | 1.2                         | 12.1                     | 243                              | 7.98                                    | 100                     |
| 5 x 4                 | 50 x 0.3                                 | 2.51                          | 0.8                             | 1.4                         | 13.9                     | 345                              | 4.95                                    | 100                     |

#### Colour of Insulation:

2 cores: blue, brown.

3 cores: green/yellow, blue, brown.

4 cores: green/yellow, blue, brown black.

5 cores: green/yellow, blue, brown, black, grey.

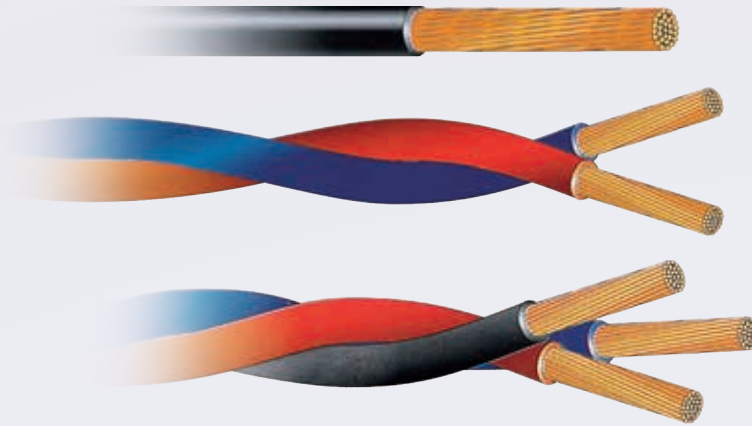
Colour of Outer sheath – White.



# PVC INSULATION, NON-SHEATHED CORDS FOR INTERNAL WIRING

## Single Core and Twisted Twin

COPPER CONDUCTOR: BS EN 50525-2-11 (BS 6500) and IEC 60227, 300 / 500 VOLTS H05V-K, TYPE 60227 IEC 06



| CONDUCTOR                 |                         | Radial Thickness of insulation | Mean overall diameter (upper limit) single | Maximum Conductor DC Resistance at 20°C | Approximate Weight |         |
|---------------------------|-------------------------|--------------------------------|--|---|--------------------|---------|
| Nom. cross sectional area | Nom. diameter of strand |                                |  |   | Single             | Twin    |
| mm <sup>2</sup>           | mm                      | mm                             | mm   | Ω / Km                                  | Kg / Km            | Kg / Km |
| 0.5                       | 0.20                    | 0.6                            | 2.4  | 39.0                                    | 9                  | 19      |
| 0.75                      | 0.20                    | 0.6                            | 2.6  | 26.0                                    | 12                 | 24      |
| 1.0                       | 0.20                    | 0.6                            | 2.8  | 19.5                                    | 15                 | 29      |

### Construction:

- Annealed Copper conductor as per BS EN 60228 (BS 6360) or IEC 60228, Class 5 ( Class 1 and Class 2 conductors can be provided based on special request)
- PVC Insulation Type T1 1

380 V NYFAF – PVC INSULATION, NON-SHEATHED FLEXIBLE CORDS FOR INTERNAL WIRING  
Single, Three and Four

| Nominal Cross Section | CONDUCTOR                          |                               | Nominal Thickness of Insulation | Overall Dimension max | Maximum Conductor DC Resistance at 20°C | Approx. Weight of Finished Cable |
|-----------------------|------------------------------------|-------------------------------|---------------------------------|-----------------------|---|----------------------------------|
|                       | Max. Diameter of Wire in Conductor | Approx. Diameter of Conductor |                                 |                       |   |                                  |
| mm <sup>2</sup>       | mm                                 | mm                            | mm                              | mm                    | Ω / Km                                  | Kg / Km                          |
| 1 x 0.50              | 0.21                               | 0.9                           | 0.6                             | 2.4                   | 37.1                                    | 9                                |
| 1 x 0.75              | 0.21                               | 1.1                           | 0.6                             | 2.6                   | 24.7                                    | 12                               |
| 3 x 0.50              | 0.21                               | 0.9                           | 0.6                             | 5.2                   | 39.0                                    | 27                               |
| 3 x 0.75              | 0.21                               | 1.1                           | 0.6                             | 5.6                   | 26.0                                    | 36                               |
| 4 x 0.50              | 0.21                               | 0.9                           | 0.6                             | 5.8                   | 39.0                                    | 36                               |
| 4 x 0.75              | 0.21                               | 1.1                           | 0.6                             | 6.2                   | 26.0                                    | 48                               |

### Construction:

Annealed copper conductor  
PVC Insulation.





**P**VC INSULATION, NON-SHEATHED FLEXIBLE CORDS FOR INTERNAL WIRING – PARALLEL TWIN  
 COPPER CONDUCTOR  
 H03VH-H 300/300 VOLTS - IEC 60227



| CONDUCTOR                 |                          | Radial Thickness of Insulation | Mean overall dimensions |             | Maximum Conductor DC Resistance at 20°C | Approx. Weight of Finished Cable |
|---------------------------|--------------------------|--------------------------------|-------------------------|-------------|---|----------------------------------|
| Nom. Cross Sectional area | Maximum diameter of Wire |                                | Lower Limit             | Upper Limit |   |                                  |
| mm <sup>2</sup>           | mm                       | mm                             | mm                      | mm          | Ω / Km                                  | Kg / Km                          |
| 2 x 0.50                  | 0.16                     | 0.8                            | 2.4 x 4.9               | 3.0 x 5.9   | 39.0                                    | 22                               |
| 2 x 0.75                  | 0.16                     | 0.8                            | 2.6 x 5.2               | 3.1 x 6.3   | 26.0                                    | 28                               |

**Construction:**

- Annealed Copper conductor as per BS EN 60228 (BS 6360) or IEC 60228 Class 6.
- The conductors shall be laid parallel and covered with PVC insulation.
- The insulation shall be provided with a groove on each side between the conductors to facilitate separation of the cores.



# 380 V NYIFY PVC INSULATION, PVC SHEATHED

## Cables, Flat Twin, Three – Core: Four core and Five core



| Nominal Cross Section | CONDUCTOR                    |                               | Nominal Thickness of Insulation | Approx. Thickness of Sheath | Overall Dimension max | Maximum Conductor DC Resistance at 20°C | Approx. Weight of Finished Cable. |
|-----------------------|------------------------------|-------------------------------|---------------------------------|-----------------------------|-----------------------|---|-----------------------------------|
|                       | Number of Wires in Conductor | Approx. Diameter of Conductor |                                 |                             |                       |   |                                   |
| mm <sup>2</sup>       | mm                           | mm                            | mm                              | mm                          | mm                    | Ω / Km                                  | Kg / Km                           |
| 2 x 1.5               | 1                            | 1.38                          | 0.4                             | 0.8                         | 4.4 x 12.0            | 11.9                                    | 60                                |
| 2 x 2.5               | 1                            | 1.78                          | 0.5                             | 0.9                         | 5.2 x 13.5            | 7.14                                    | 92                                |
| 2 x 4                 | 1                            | 2.25                          | 0.6                             | 0.9                         | 6.0 x 15.5            | 4.47                                    | 130                               |
| 3 x 1.5               | 1                            | 1.38                          | 0.4                             | 0.8                         | 4.4 x 19.0            | 11.90                                   | 90                                |
| 3 x 2.5               | 1                            | 1.78                          | 0.5                             | 0.9                         | 5.2 x 21.5            | 7.14                                    | 145                               |
| 3 x 4                 | 1                            | 2.25                          | 0.6                             | 0.9                         | 6.0 x 25.0            | 4.47                                    | 200                               |
| 4 x 1.5               | 1                            | 1.38                          | 0.4                             | 0.8                         | 4.4 x 26.0            | 11.9                                    | 130                               |
| 4 x 2.5               | 1                            | 1.78                          | 0.5                             | 0.9                         | 5.2 x 29.5            | 7.14                                    | 195                               |
| 5 x 1.5               | 1                            | 1.38                          | 0.4                             | 0.8                         | 4.4 x 33.0            | 11.9                                    | 165                               |
| 5 x 2.5               | 1                            | 1.78                          | 0.5                             | 0.9                         | 5.2 x 37.0            | 7.14                                    | 240                               |

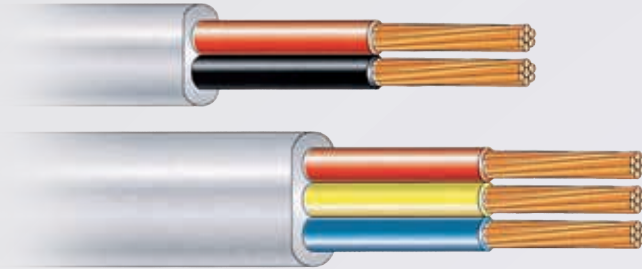
### Construction:

Plain annealed copper conductor, PVC Insulated.

The insulated conductor shall be laid in parallel and covered with PVC sheath. The sheath shall be closely fitting but shall not adhere to the cores. The sheath shall be provided with a groove on each side between the cores to facilitate separation of the cores.



**P**VC INSULATED, PVC SHEATHED CABLES SINGLE CORE, FLAT TWIN AND FLAT THREE CORES WITHOUT EARTH CONTINUITY CONDUCTOR  
COPPER CONDUCTOR – STANDARD: BS EN 50525-2-31 (BS 6004) – 300 / 500 VOLTS



| No. & Cross Sectional area of conductor | Number of Wires in Conductor | Radial Thickness of insulation | Radial Thickness of Sheath | Mean overall dimensions |             | Maximum Conductor DC Resistance at 20°C | Approx. Weight of Finished Cable |
|---|------------------------------|--------------------------------|----------------------------|-------------------------|-------------|---|----------------------------------|
|   |                              |                                |                            | Lower Limit             | Upper Limit |   |                                  |
| mm <sup>2</sup>                         | mm                           | mm                             | mm                         | mm                      | mm          | Ω / Km                                  | Kg / Km                          |
| 1 x 1.0                                 | 1                            | 0.6                            | 0.8                        | 3.8                     | 4.5         | 18.1                                    | 27                               |
| 1 x 1.5                                 | 1                            | 0.7                            | 0.8                        | 4.2                     | 4.9         | 12.1                                    | 34                               |
| 1 x 2.5                                 | 1                            | 0.8                            | 0.8                        | 4.8                     | 5.8         | 7.41                                    | 48                               |
| 1 x 4                                   | 7                            | 0.8                            | 0.9                        | 5.4                     | 6.8         | 4.61                                    | 70                               |
| 1 x 6                                   | 7                            | 0.8                            | 0.9                        | 6.0                     | 7.4         | 3.08                                    | 91                               |
| 1 x 10                                  | 7                            | 1.0                            | 0.9                        | 7.2                     | 8.8         | 1.83                                    | 142                              |
| 1 x 16                                  | 7                            | 1.0                            | 1.0                        | 8.4                     | 10.5        | 1.15                                    | 209                              |
| 1 x 25                                  | 7                            | 1.2                            | 1.1                        | 10.0                    | 12.5        | 0.727                                   | 318                              |
| 1 x 35                                  | 7                            | 1.2                            | 1.1                        | 11.0                    | 13.5        | 0.524                                   | 418                              |
|   |                              |                                |                            |                         |             |   |                                  |
| 2 x 1.0                                 | 1                            | 0.6                            | 0.9                        | 4.0 x 6.2               | 4.7 x 7.4   | 18.1                                    | 50                               |
| 2 x 1.5                                 | 1                            | 0.7                            | 0.9                        | 4.4 x 7.0               | 5.4 x 8.4   | 12.1                                    | 67                               |
| 2 x 2.5                                 | 1                            | 0.8                            | 1.0                        | 5.2 x 8.4               | 6.2 x 9.8   | 7.41                                    | 101                              |
| 2 x 4                                   | 7                            | 0.8                            | 1.0                        | 5.6 x 9.6               | 7.2 x 11.5  | 4.61                                    | 142                              |
| 2 x 6                                   | 7                            | 0.8                            | 1.1                        | 6.4 x 10.5              | 8.0 x 13.0  | 3.08                                    | 190                              |
| 2 x 10                                  | 7                            | 1.0                            | 1.2                        | 7.8 x 13.0              | 9.6 x 16.0  | 1.83                                    | 304                              |
| 2 x 16                                  | 7                            | 1.0                            | 1.3                        | 9.0 x 15.5              | 11.0 x 18.5 | 1.15                                    | 437                              |
|   |                              |                                |                            |                         |             |   |                                  |
| 3 x 1.0                                 | 1                            | 0.6                            | 0.9                        | 4.0 x 8.4               | 4.7 x 9.8   | 18.1                                    | 72                               |
| 3 x 1.5                                 | 1                            | 0.7                            | 0.9                        | 4.4 x 9.8               | 5.4 x 11.5  | 12.1                                    | 101                              |
| 3 x 2.5                                 | 1                            | 0.8                            | 1.0                        | 5.2 x 11.5              | 6.2 x 13.5  | 7.41                                    | 152                              |
| 3 x 4                                   | 7                            | 0.8                            | 1.1                        | 5.8 x 13.5              | 7.4 x 16.5  | 4.61                                    | 218                              |
| 3 x 6                                   | 7                            | 0.8                            | 1.1                        | 6.4 x 15.0              | 8.0 x 18.0  | 3.08                                    | 285                              |
| 3 x 10                                  | 7                            | 1.0                            | 1.2                        | 7.8 x 19.0              | 9.6 x 22.5  | 1.83                                    | 451                              |
| 3 x 16                                  | 7                            | 1.0                            | 1.3                        | 9.0 x 22.0              | 11.0 x 26.5 | 1.15                                    | 655                              |

**Construction:**

Plain annealed copper conductor Class 1 or Class 2 as per BS EN 60228 (BS 6360).

- PVC Insulation Type TI 1
- PVC Sheath Type 6
- The sheath shall be closely fitting but shall not adhere to the cores and in the case of twin and three-core, the cores shall be laid parallel.

**Colour of Insulation as per BS EN 50525-2-31 (BS 6004):**

Single : Brown or Blue  
Twin : Brown and Blue  
Three-core: Brown, Black (center), Grey

**Colour of Insulation General**

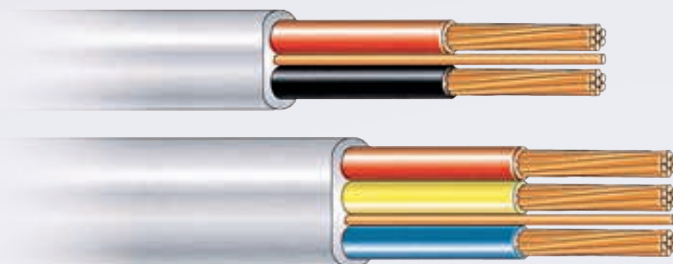
Single : Black  
Twin : Red, Black  
Three-core: Red, Yellow, Blue

**Color of Sheath:** Grey



# PVC INSULATION, PVC SHEATHED CABLES,

With Earth Continuity Conductor, Flat Twin and Flat Three Cores



| No. & Cross Sectional area of conductor | Number of Wires in Conductor | Radial Thickness of insulation | Radial Thickness of Sheath | Mean overall dimensions |             | Earth continuity conductor cross section | Maximum Conductor DC Resistance at 20°C | Approx. Weight of Finished Cable |
|---|------------------------------|--------------------------------|----------------------------|-------------------------|-------------|--|---|----------------------------------|
|   |                              |                                |                            | Lower Limit             | Upper Limit |  |   |                                  |
| mm <sup>2</sup>                         | mm                           | mm                             | mm                         | mm                      | mm          | mm <sup>2</sup>                          | Ω / Km                                  | Kg / Km                          |
| 2 x 1.0                                 | 1                            | 0.6                            | 0.9                        | 4.0 x 7.2               | 4.7 x 8.6   | 1.0                                      | 18.1                                    | 65                               |
| 2 x 1.5                                 | 1                            | 0.7                            | 0.9                        | 4.4 x 8.2               | 5.4 x 9.6   | 1.0                                      | 12.1                                    | 83                               |
| 2 x 2.5                                 | 1                            | 0.8                            | 1.0                        | 5.2 x 9.8               | 6.2 x 11.5  | 1.5                                      | 7.41                                    | 128                              |
| 2 x 4                                   | 7                            | 0.8                            | 1.0                        | 5.6 x 10.5              | 7.2 x 13.0  | 1.5                                      | 4.61                                    | 161                              |
| 2 x 6                                   | 7                            | 0.8                            | 1.1                        | 6.4 x 12.5              | 8.0 x 15.0  | 2.5                                      | 3.08                                    | 228                              |
| 2 x 10                                  | 7                            | 1.0                            | 1.2                        | 7.8 x 15.5              | 9.6 x 19.0  | 4  | 1.83                                    | 361                              |
| 2 x 16                                  | 7                            | 1.0                            | 1.3                        | 9.0 x 18.0              | 11.0 x 22.5 | 6  | 1.15                                    | 522                              |
| 3 x 1.0                                 | 1                            | 0.6                            | 0.9                        | 4.0 x 9.6               | 4.7 x 11.0  | 1.0                                      | 18.1                                    | 85                               |
| 3 x 1.5                                 | 1                            | 0.7                            | 0.9                        | 4.4 x 10.5              | 5.4 x 12.5  | 1.0                                      | 12.1                                    | 114                              |
| 3 x 2.5                                 | 1                            | 0.8                            | 1.0                        | 5.2 x 12.5              | 6.2 x 14.5  | 1.0                                      | 7.41                                    | 171                              |
| 3 x 4                                   | 7                            | 0.8                            | 1.1                        | 5.8 x 14.5              | 7.4 x 18.0  | 1.5                                      | 4.61                                    | 237                              |
| 3 x 6                                   | 7                            | 0.8                            | 1.1                        | 6.4 x 16.5              | 8.0 x 20.0  | 2.5                                      | 3.08                                    | 313                              |
| 3 x 10                                  | 7                            | 1.0                            | 1.2                        | 7.8 x 21.0              | 9.6 x 25.5  | 4  | 1.83                                    | 513                              |
| 3 x 16                                  | 7                            | 1.0                            | 1.3                        | 9.0 x 24.5              | 11.0 x 29.5 | 6  | 1.15                                    | 731                              |

### Construction:

Plain annealed copper conductor Class 1 or Class 2 as per BS EN 60228 (BS 6360).

- PVC Insulation Type TI 1
- PVC Sheath Type 6
- The sheath shall be closely fitting but shall not adhere to the cores which shall be laid parallel with un-insulated earth continuity conductor.

### Colour of Insulation as per BS EN 50525-2-31 (BS 6004):

Single : Brown or Blue  
 Twin : Brown and Blue  
 Three-core: Brown, Black (center), Grey

### Colour of Insulation General

Single : Black  
 Twin : Red, Black  
 Three-core: Red, Yellow, Blue

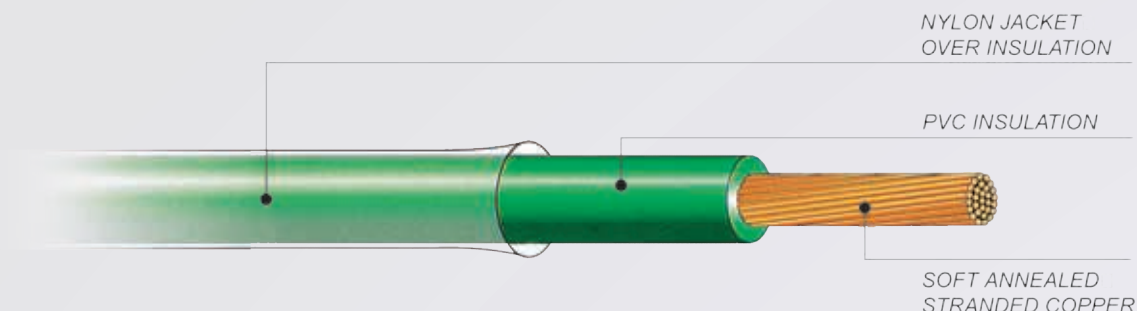
Color of Sheath: Grey





# THHN, THWN, TFFN, WIRES

UL 83, UL 158



## Construction:

- Conductor** - Soft drawn annealed copper conductors as per UL 83. Available in solid or stranded type for sizes 14, 12 and 10 AWG. Sizes 8 AWG and larger available in stranded only.
- Insulation** - Extruded Polyvinyl Chloride (PVC) compound rated 75 and 90°C.
- Jacket** - Tough, smooth, heat and light stabilized, low moisture absorption nylon conforming to UL requirements for type THHN or THWN. This jacket offers a great degree of protection to the PVC insulation from abrasion and cut through which may be encountered in pulling wire through conduits. Nylon has long been recognized as one of the toughest jacketing material used in wire and cable manufacturing.

## Feature:

1. Meet UL "VW - 1' Flame Test requirements.
2. Wet or dry locations - Rated 90C dry, and 75°C wet.
3. Resistant to gas and oil exposure - Rated gasoline and oil resistant II per UL.
4. Versatile - Can be used as follows:
  - a) THHN - 90°C dry building wire
  - b) THWN - 75°C wet and dry building wire
  - c) MTW - 90°C machine tool wire
5. Pulls easier - tough, smooth nylon jacket over PVC insulation.
6. Small diameter - more conductors per conduit.

## Applications:

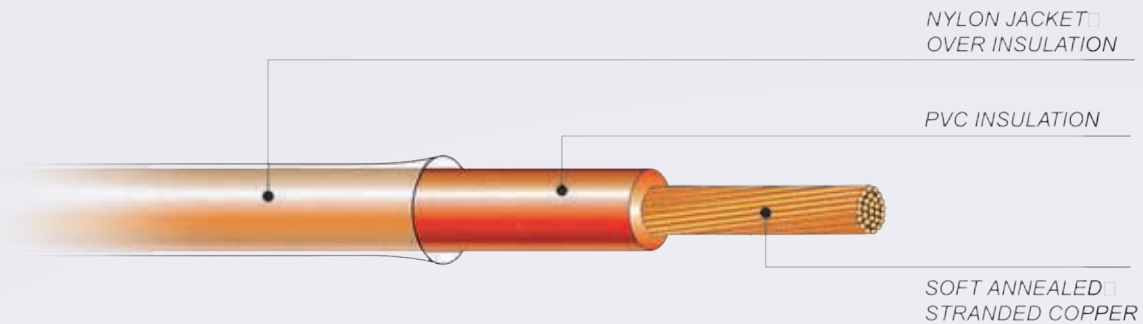
Type THHN - THWN building wires are intended for general purpose applications and may be installed in conduit, duct or other recognized raceways in wet or dry locations. Type THHN - THWN wires are designed to operate at conductor temperatures of 75°C for 600 volts service in wet and dry location. Applicable for both new work and rewiring installations where the smaller wire diameter permits additional circuits or larger conductors to be installed in the conduit without exceeding fill limitations.

Type THHN - THWN wires are also recommended for industrial installation where exceptional resistance to heat and corrosive atmospheres are needed, such as chemical plants, oil refineries, paper mills, etc.



# THHN, THWN, TFFN, WIRES

UL 83, UL 158



### Markings:

The wire is surface marked as follows:

National Cables Industry, Year of manufacture, Typed THHN or THWN or TFFN Gasoline and Oil Resistant II, 600 Volts, VW – 1

### Standards:

- UL 83 - Underwriters Laboratories, Thermoplastic Insulated wires and Cables.
- UL 1063 - Underwriters Laboratories, Machine Tool Wires and Cables.
- UL 1581 - Underwriters Laboratories, Reference standard for Electrical wires, Cables and Flexible Cords.

### 600 Volts

Copper Conductor PVC Insulated Nylon Jacketed THHN/THWN Wires UL 83, 1581

| AWG | Equivalent      | CONDUCTORS            |                               | Nominal Thickness of Insulation | Approx. Thickness of Nylon Jacket | Approx. Overall Diameter | Approx. Weight of Conductor | Standard DC Resistance at 20°C | Standard Packing Length |
|-----|-----------------|-----------------------|-------------------------------|---------------------------------|-----------------------------------|--------------------------|-----------------------------|--------------------------------|-------------------------|
|     |                 | No. of Stranding Wire | Approx. Diameter of Conductor |                                 |                                   |                          |                             |                                |                         |
|     | mm <sup>2</sup> | No. x mm              | mm                            | mm                              | mm                                | mm                       | Kg/Km                       | ohm/Km                         | M ± 5%                  |
| 18* | 0.82            | 16 x 0.254            | 1.19                          | 0.38                            | 0.10                              | 2.3                      | 12                          | 18.23                          | 152 C                   |
| 16* | 1.31            | 19 x 0.296            | 1.48                          | 0.38                            | 0.10                              | 2.5                      | 17                          | 13.42                          | 152 C                   |
| 14  | 2.08            | 19 x 0.373            | 1.86                          | 0.38                            | 0.10                              | 2.9                      | 25                          | 8.62                           | 152 C                   |
| 12  | 3.31            | 19 x 0.47             | 2.35                          | 0.38                            | 0.10                              | 3.4                      | 37                          | 5.43                           | 152 C                   |
| 10  | 5.26            | 19 x 0.594            | 2.97                          | 0.51                            | 0.10                              | 4.3                      | 59                          | 3.409                          | 152 C                   |
| 8   | 8.37            | 19 x 0.749            | 3.75                          | 0.76                            | 0.13                              | 5.6                      | 96                          | 2.144                          | 152 C                   |
| 6   | 13.30           | 19 x 0.945            | 4.72                          | 0.76                            | 0.13                              | 6.6                      | 146                         | 1.348                          | 152 C                   |
| 4   | 21.15           | 19 x 1.19             | 5.95                          | 1.02                            | 0.15                              | 8.4                      | 233                         | 0.8481                         | 1000C                   |
| 2   | 33.63           | 19 x 1.50             | 7.50                          | 1.02                            | 0.15                              | 9.9                      | 356                         | 0.5335                         | 1000C                   |
| 1/0 | 53.48           | 37 x 1.36             | 9.52                          | 1.27                            | 0.18                              | 12.5                     | 567                         | 0.3354                         | 1000C                   |
| 2/0 | 67.43           | 37 x 1.52             | 10.64                         | 1.27                            | 0.18                              | 13.6                     | 697                         | 0.266                          | 1000C                   |

\*Listed as TFFN

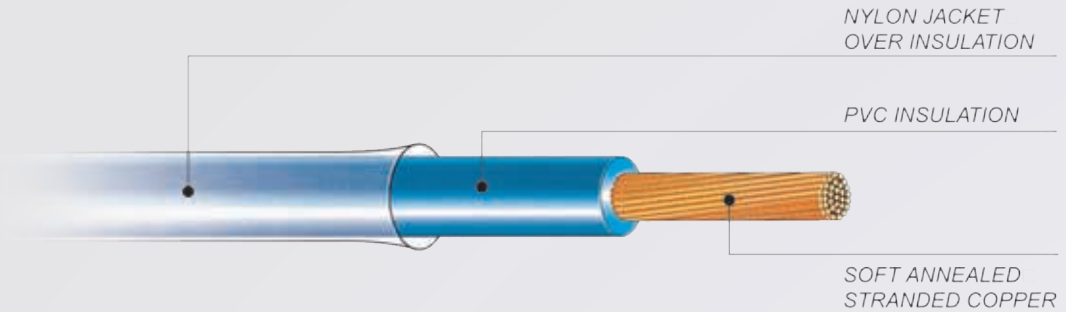
Colour : Black, White, Red, Blue, Green, Yellow, Orange, Brown, etc.

Cutting Length: 152 M (500FT) in Coils 1000 M (3280 FT) in Drum



# THHN, THWN, TFFN, WIRES

UL 83, UL 158



**TABLE FOR THHN WIRE**  
**TABLE 5**

| Size<br>AWG | THWN<br>AMPS | THHN<br>AMPS |
|-------------|--------------|--------------|
| 18          |              | 14           |
| 16          |              | 18           |
| 14          | 20           | 25           |
| 12          | 25           | 30           |
| 10          | 35           | 40           |
| 8           | 50           | 55           |
| 6           | 65           | 75           |
| 4           | 85           | 95           |
| 2           | 115          | 130          |
| 1/0         | 150          | 170          |
| 2/0         | 175          | 195          |

Current carrying capacities of THWN and THHN insulated Copper Conductors rated 600 V not more than three conductors in raceway or cable or earth (Direct Buried) base on ambient tempt. of 30° C.

**TABLE 6**

| SIZE<br>AWG | THWN<br>AMPS | THHN<br>AMPS |
|-------------|--------------|--------------|
| 18          |              | 18           |
| 16          |              | 24           |
| 14          | 30           | 35           |
| 12          | 35           | 40           |
| 10          | 50           | 55           |
| 8           | 70           | 80           |
| 6           | 95           | 105          |
| 4           | 125          | 140          |
| 2           | 170          | 190          |
| 1/0         | 230          | 260          |
| 2/0         | 265          | 300          |

Current carrying capacities of THWN and THHN single insulated Copper Conductors rated 600 V in free air based on ambient air temperature of 30°C.

**TABLE 7 –CORRECTION FACTORS**

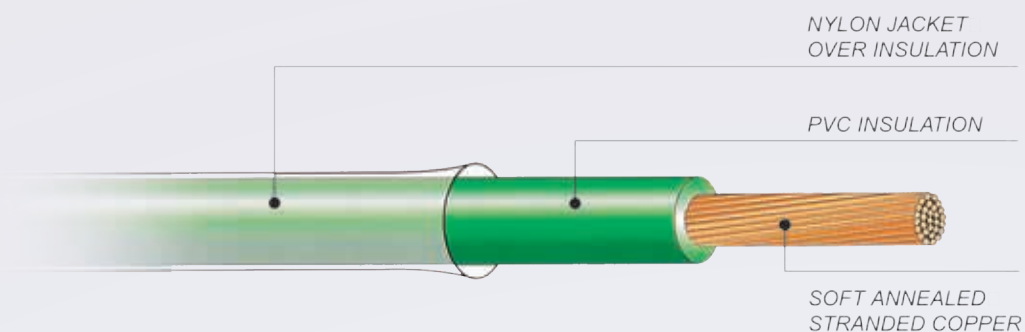
| Ambient Temp. °C | THWN (75°C) | THHN (90°C) |
|------------------|-------------|-------------|
| 21 - 25          | 1.05        | 1.04        |
| 26 - 30          | 1.00        | 1.00        |
| 31 - 35          | 0.94        | 0.96        |
| 36 - 40          | 0.88        | 0.91        |
| 41 - 45          | 0.82        | 0.87        |
| 46 - 50          | 0.75        | 0.82        |
| 51 -55           | 0.67        | 0.76        |
| 56 - 60          | 0.58        | 0.71        |
| 61 - 70          | 0.33        | 0.58        |
| 71 - 80          |             | 0.41        |

For ambient temperature other than 30°C multiply the ampacities given in table 5 & 6 by the appropriate factor given in Table 7.



# THHN, THWN, TFFN, WIRES

UL 83, UL 158



**THHN/THWN BUILDING WIRE 90°C 600 VOLTS**  
**TABLE 8 – Conduit Fill**

| Size AWG | Conduit Trade Size (inches) |     |    |       |       |     |       |     |       |     |     |     |
|----------|-----------------------------|-----|----|-------|-------|-----|-------|-----|-------|-----|-----|-----|
|          | 1/2                         | 3/4 | 1  | 1-1/4 | 1-1/2 | 2   | 2-1/2 | 3   | 3-1/2 | 4   | 5   | 6   |
| 18*      | 19                          | 34  | 55 | 97    | 132   | 216 | -     | -   | -     | -   | -   | -   |
| 16*      | 15                          | 26  | 43 | 76    | 104   | 169 | -     | -   | -     | -   | -   | -   |
| 14       | 13                          | 24  | 39 | 69    | 94    | 154 | -     | -   | -     | -   | -   | -   |
| 12       | 10                          | 18  | 29 | 51    | 70    | 114 | 164   | -   | -     | -   | -   | -   |
| 10       | 6                           | 11  | 18 | 32    | 44    | 73  | 104   | 160 | -     | -   | -   | -   |
| 8        | 3                           | 5   | 9  | 16    | 22    | 36  | 51    | 79  | 106   | 136 | -   | -   |
| 6        | 1                           | 4   | 6  | 11    | 15    | 26  | 37    | 57  | 76    | 98  | 154 | -   |
| 4        | 1                           | 2   | 4  | 7     | 9     | 16  | 22    | 35  | 47    | 60  | 94  | 137 |
| 3        | 1                           | 1   | 3  | 6     | 8     | 13  | 19    | 29  | 39    | 51  | 80  | 116 |
| 2        | 1                           | 1   | 3  | 5     | 7     | 11  | 16    | 25  | 33    | 43  | 67  | 97  |
| 1        | -                           | 1   | 1  | 3     | 5     | 8   | 12    | 18  | 25    | 32  | 50  | 72  |
| 1/0      | -                           | 1   | 1  | 3     | 4     | 7   | 10    | 15  | 21    | 27  | 42  | 61  |
| 2/0      | -                           | 1   | 1  | 2     | 3     | 6   | 8     | 13  | 17    | 22  | 35  | 51  |

Maximum number of THHN/THWN Conductors in conduit or tubing as per 1990 NEC

\*Listed as TFFN

For groups or combinations of conductors, the conduit or tubing shall be of such size that the sum of the cross sectional areas of the individual conductors will not be more than percentage of the internal cross sectional area of the conduit or tubing as shown below.

**TABLE 9 – Combination of Conductors**

| No. of Conductors | 1  | 2  | 3  | 4  | over 4 |
|-------------------|----|----|----|----|--------|
| Percentage        | 53 | 31 | 40 | 40 | 40     |



# Current Rating of CU/PVC Wires

**TABLE 1**

Current carrying capacity and associated voltage drop for single core PVC insulated cables, non-armoured, with or without sheath  
CU/PVC 450 / 750 V Wires - BS EN 50525-2-31 (BS 6004) & BS 6231

Conductor operating temperature: 70°C Ambient temperature: 30°C

| Conductor       |                           | Reference Method A<br>(enclosed in conduit in the thermally insulating wall etc.) |              |                                |                           | Reference Method B<br>(enclosed in conduit on a wall or in trunking etc.) |              |                                |                           | Reference method C<br>(clipped direct)               |              |   |                           | Reference Method F (in free air or on a perforated cable tray horizontal or vertical) |              |                       |                           |        |              |        |                           |        |              |  |
|-----------------|---------------------------|---|--------------|--------------------------------|---------------------------|---|--------------|--------------------------------|---------------------------|--|--------------|---|---------------------------|---|--------------|-----------------------|---------------------------|--------|--------------|--------|---------------------------|--------|--------------|--|
|                 |                           | 2 cables, single-phase a.c. or d.c.   |              | 3 or 4 cables three-phase a.c. |                           | 2 cables, single-phase a.c. or d.c.                                       |              | 3 or 4 cables three-phase a.c. |                           | 2 cables, single-phase a.c. or d.c flat and touching |              | 3 or 4 cables three-phase a.c. flat and touching or trefoil |                           | Touching  |              | Space by one diameter |                           |        |              |        |                           |        |              |  |
| C.S.A.          | Current carrying capacity |   | Voltage drop |                                | Current carrying capacity |   | Voltage drop |                                | Current carrying capacity |  | Voltage drop |   | Current carrying capacity |   | Voltage drop |                       | Current carrying capacity |        | Voltage drop |        | Current carrying capacity |        | Voltage drop |  |
|                 | 1                         | 2   | 3            | 4                              | 5                         | 6   | 7            | 8                              | 9                         | 10   | 11           | 12  | 13                        | 14  | 15           | 16                    | 17                        | 18     | 19           | 20     | 21                        | 22     | 23           |  |
| mm <sup>2</sup> | A                         | A/m   | A            | mV/A/m                         | A                         | mV/A/m  | A            | mV/A/m                         | A                         | mV/A/m   | A            | mV/A/m  | A                         | mV/A/m  | A            | mV/A/m                | A                         | mV/A/m | A            | mV/A/m | A                         | mV/A/m | mV/A/m       |  |
| 1.0             | 11                        | 44  | 10.5         | 38                             | 13.5                      | 44  | 12           | 38                             | 15.5                      | 44   | 14           | 38  | -                         | 44  | -            | 38                    | -                         | 38     | -            | -      | -                         | 44     | 38           |  |
| 1.5             | 14.5                      | 29  | 13.5         | 25                             | 17.5                      | 29  | 15.5         | 25                             | 20                        | 29   | 18           | 25  | -                         | 29  | -            | 25                    | -                         | 25     | -            | -      | -                         | 29     | 25           |  |
| 2.5             | 20                        | 18  | 18           | 15                             | 24                        | 18  | 21           | 15                             | 27                        | 18   | 25           | 15  | -                         | 18  | -            | 15                    | -                         | 15     | -            | -      | -                         | 18     | 15           |  |
| 4               | 26                        | 11  | 24           | 9.5                            | 32                        | 11  | 28           | 9.5                            | 37                        | 11   | 33           | 9.5   | -                         | 11  | -            | 9.5                   | -                         | 9.5    | -            | -      | -                         | 11     | 9.5          |  |
| 6               | 34                        | 7.3   | 31           | 6.4                            | 41                        | 7.3   | 36           | 6.4                            | 47                        | 7.3  | 43           | 6.4   | -                         | 7.3   | -            | 6.4                   | -                         | 6.4    | -            | -      | -                         | 7.3    | 6.4          |  |
| 10              | 46                        | 4.4   | 42           | 3.8                            | 57                        | 4.4   | 50           | 3.8                            | 65                        | 4.4  | 59           | 3.8   | -                         | 4.4   | -            | 3.8                   | -                         | 3.8    | -            | -      | -                         | 4.4    | 3.8          |  |
| 16              | 61                        | 2.8   | 56           | 2.4                            | 76                        | 2.8   | 68           | 2.4                            | 87                        | 2.8  | 79           | 2.4   | -                         | 2.8   | -            | 2.4                   | -                         | 2.4    | -            | -      | -                         | 2.8    | 2.4          |  |
| 25              | 80                        | 1.80a   | 73           | 1.55                           | 101                       | 1.80  | 89           | 1.55                           | 114                       | 1.75   | 104          | 1.55  | 131                       | 1.80  | 114          | 1.55                  | 110                       | 1.50   | 146          | 130    | 180                       | 1.80   | 1.55         |  |
| 35              | 99                        | 1.30a   | 89           | 1.10                           | 125                       | 1.30  | 110          | 1.10                           | 141                       | 1.25   | 129          | 1.10  | 162                       | 1.30  | 143          | 1.10                  | 137                       | 1.10   | 181          | 162    | 1.30                      | 1.15   |              |  |
| 50              | 119                       | 1.00a   | 108          | 0.85                           | 151                       | 1.00  | 134          | 0.85                           | 182                       | 0.95   | 167          | 0.84  | 196                       | 1.00  | 174          | 0.84                  | 167                       | 0.82   | 219          | 197    | 0.97                      | 0.86   |              |  |
| 70              | 151                       | 0.72a   | 136          | 0.61                           | 192                       | 0.72  | 171          | 0.61                           | 234                       | 0.66   | 214          | 0.60  | 251                       | 0.72  | 225          | 0.60                  | 216                       | 0.57   | 281          | 254    | 0.69                      | 0.63   |              |  |
| 95              | 182                       | 0.56 a  | 164          | 0.48                           | 232                       | 0.56  | 207          | 0.48                           | 284                       | 0.50   | 261          | 0.47  | 304                       | 0.56  | 275          | 0.47                  | 264                       | 0.43   | 341          | 311    | 0.54                      | 0.51   |              |  |
| 120             | 210                       | 0.47a   | 188          | 0.41                           | 269                       | 0.47  | 239          | 0.41                           | 330                       | 0.41   | 303          | 0.40  | 352                       | 0.47  | 321          | 0.40                  | 308                       | 0.36   | 396          | 362    | 0.45                      | 0.44   |              |  |
| 150             | 240                       | 0.41a   | 216          | 0.36                           | 300                       | 0.41  | 262          | 0.36                           | 381                       | 0.34   | 349          | 0.34  | 406                       | 0.41  | 372          | 0.34                  | 356                       | 0.30   | 456          | 419    | 0.39                      | 0.40   |              |  |
| 185             | 273                       | 0.37a   | 245          | 0.32                           | 341                       | 0.37  | 296          | 0.32                           | 436                       | 0.29   | 400          | 0.31  | 463                       | 0.37  | 427          | 0.31                  | 409                       | 0.26   | 521          | 480    | 0.35                      | 0.36   |              |  |
| 240             | 321                       | 0.33a   | 286          | 0.29                           | 400                       | 0.33  | 346          | 0.29                           | 515                       | 0.25   | 472          | 0.27  | 546                       | 0.33  | 507          | 0.27                  | 485                       | 0.22   | 615          | 569    | 0.31                      | 0.34   |              |  |
| 300             | 367                       | 0.31a   | 328          | 0.27                           | 458                       | 0.31  | 394          | 0.27                           | 594                       | 0.22   | 545          | 0.25  | 629                       | 0.31  | 587          | 0.25                  | 561                       | 0.190  | 709          | 659    | 0.29                      | 0.32   |              |  |
| 400             | -                         | 0.29a   | -            | 0.25                           | 546                       | 0.29  | 467          | 0.25                           | 694                       | 0.20   | 634          | 0.24  | 754                       | 0.29  | 689          | 0.24                  | 656                       | 0.175  | 852          | 795    | 0.27                      | 0.31   |              |  |
| 500             | -                         | 0.28a   | -            | 0.25                           | 626                       | 0.28  | 533          | 0.25                           | 792                       | 0.185  | 723          | 0.23  | 868                       | 0.28  | 789          | 0.23                  | 749                       | 0.160  | 982          | 920    | 0.26                      | 0.30   |              |  |
| 630             | -                         | 0.27a   | -            | 0.24                           | 720                       | 0.27  | 611          | 0.24                           | 904                       | 0.175  | 826          | 0.22  | 1005                      | 0.27  | 905          | 0.22                  | 855                       | 0.150  | 1138         | 1070   | 0.25                      | 0.29   |              |  |
| 800             | -                         | -   | -            | -                              | -                         | -   | -            | -                              | 1030                      | 0.165  | 943          | 0.22  | 1086                      | -   | 1020         | 0.22                  | 971                       | 0.145  | 1265         | 1188   | 0.25                      | 0.29   |              |  |
| 1000            | -                         | -   | -            | -                              | -                         | -   | -            | -                              | 1154                      | 0.160  | 1058         | 0.21  | 1216                      | -   | 1149         | 0.21                  | 1079                      | 0.140  | 1420         | 1337   | 0.24                      | 0.28/  |              |  |

Where more precise calculation requires the use of resistive and reactive components of cable impedance, reference should be made to Table 4D1A and 4D1B of BS 7671.

**Notes:**

- The current carrying capacities in columns 2 & 4 are also applicable to flexible cables to BS EN 50525-2-31 (BS 6004) (HO7V-K) where the cables are used in fixed installations.
- Spacing larger than one cable diameter will result in a larger voltage drop.
- Cables to BS 6231 when installed in conduit or trunking are rated for 70 °C

**Correction Factors**

**For Ambient Temperature**

Ambient Temperature 25°C 30°C 35°C 40°C 45°C 50°C 55°C 60°C  
Correction Factor 1.03 1.0 0.94 0.87 0.79 0.71 0.61 0.50





# Current Rating of CU/LSZH Wires

**TABLE 2**

Current carrying capacity and associated voltage drop for single core XLPE insulated cables, non-armoured, with or without sheath CU/LSZH 450 / 750 V Wires - BS EN 50525-3-41 (BS 7211)

Conductor operating temperature: 90°C Ambient temperature: 30°C

| Conductor | Reference Method A<br>(enclosed in conduit<br>in thermally insulating<br>wall etc.) |              |                                    |              | Reference Method B<br>(enclosed in conduit<br>on a wall or in trunking<br>etc.) |              |                                    |              | Reference Method C<br>(clipped direct)                      |              |  |              | Reference Method F (in free air or on<br>a perforated cable tray horizontal or<br>vertical) |              |  |              |                                       |              | Reference Method G (in<br>free air)  |                              |                              |              |              |
|-----------|---|--------------|------------------------------------|--------------|---|--------------|------------------------------------|--------------|---|--------------|--|--------------|---|--------------|--|--------------|---------------------------------------|--------------|--|------------------------------|------------------------------|--------------|--------------|
|           | 2 cables, single-phase<br>a.c. or d.c.  |              | 3 or 4 cables three-<br>phase a.c. |              | 2 cables, single-phase<br>a.c. or d.c.  |              | 3 or 4 cables three-<br>phase a.c. |              | 2 cables, single-phase<br>a.c. or d.c. flat and<br>touching |              | 3 or 4 cables three-<br>phase a.c. flat and<br>touching or trefoil |              | 2 cables, single-phase<br>a.c. or d.c. flat   |              | Touching<br>3 cables, three phase<br>a.c. flat |              | 3 cables, three phase<br>a.c. trefoil |              | Space by one diameter<br>2 cables, single phase<br>a.c. or d.c. or 3 cables<br>three phase a.c. flat |                              |                              |              |              |
|           | Current carrying<br>capacity  | Voltage drop | Current carrying<br>capacity       | Voltage drop | Current carrying<br>capacity  | Voltage drop | Current carrying<br>capacity       | Voltage drop | Current carrying<br>capacity                                | Voltage drop | Current carrying<br>capacity                                       | Voltage drop | Current carrying<br>capacity  | Voltage drop | Current carrying<br>capacity                   | Voltage drop | Current carrying<br>capacity          | Voltage drop | Current carrying<br>capacity   | Current carrying<br>capacity | Current carrying<br>capacity | Voltage drop | Voltage drop |
| C.S.A.    | mm <sup>2</sup>   | A            | mV/A/m                             | A            | mV/A/m  | A            | mV/A/m                             | A            | mV/A/m  | A            | mV/A/m   | A            | mV/A/m  | A            | mV/A/m   | A            | mV/A/m                                | A            | mV/A/m   | A                            | A                            | mV/A/m       | mV/A/m       |
| 1.0       | 14  | 46           | 13                                 | 40           | 17  | 46           | 15                                 | 40           | 19  | 46           | 17.5   | 40           | -   | 46           | -  | 40           | -                                     | 40           | -  | -                            | 46                           | 40           |              |
| 1.5       | 19  | 31           | 17                                 | 27           | 23  | 31           | 20                                 | 27           | 25  | 31           | 23   | 27           | -   | 31           | -  | 27           | -                                     | 27           | -  | -                            | 31                           | 27           |              |
| 2.5       | 26  | 19           | 23                                 | 16           | 31  | 19           | 28                                 | 16           | 34  | 19           | 31   | 16           | -   | 19           | -  | 16           | -                                     | 16           | -  | -                            | 19                           | 16           |              |
| 4         | 35  | 12           | 31                                 | 10           | 42  | 12           | 37                                 | 10           | 46  | 12           | 41   | 10           | -   | 12           | -  | 10           | -                                     | 10           | -  | -                            | 12                           | 10           |              |
| 6         | 45  | 7.9          | 40                                 | 6.8          | 54  | 7.9          | 48                                 | 6.8          | 59  | 7.9          | 54   | 6.8          | -   | 7.9          | -  | 6.8          | -                                     | 6.8          | -  | -                            | 7.9                          | 6.8          |              |
| 10        | 61  | 4.7          | 54                                 | 4.0          | 75  | 4.7          | 66                                 | 4.0          | 81  | 4.7          | 74   | 4.0          | -   | 4.7          | -  | 4.0          | -                                     | 4.0          | -  | -                            | 4.7                          | 4.0          |              |
| 16        | 81  | 2.9          | 73                                 | 2.5          | 100   | 2.9          | 88                                 | 2.5          | 109   | 2.9          | 99   | 2.5          | -   | 2.9          | -  | 2.5          | -                                     | 2.5          | -  | -                            | 2.9                          | 2.5          |              |
| 25        | 106   | 1.90         | 95                                 | 1.65         | 133   | 1.90         | 117                                | 1.65         | 143   | 1.85         | 130  | 1.60         | 135   | 1.85         | 141  | 1.60         | 135                                   | 1.60         | 182  | 161                          | 1.85                         | 1.65         |              |
| 35        | 131   | 1.35         | 117                                | 1.15         | 164   | 1.35         | 144                                | 1.15         | 176   | 1.35         | 161  | 1.15         | 169   | 1.35         | 176  | 1.15         | 169                                   | 1.15         | 226  | 201                          | 1.35                         | 1.20         |              |
| 50        | 158   | 1.05         | 141                                | 0.90         | 198   | 1.05         | 175                                | 0.90         | 228   | 1.00         | 209  | 0.87         | 207   | 1.00         | 216  | 0.87         | 207                                   | 0.87         | 275  | 246                          | 1.00                         | 0.89         |              |
| 70        | 200   | 0.75         | 179                                | 0.65         | 253   | 0.75         | 222                                | 0.65         | 293   | 0.71         | 268  | 0.61         | 246   | 0.71         | 279  | 0.62         | 268                                   | 0.61         | 353  | 318                          | 0.73                         | 0.65         |              |
| 95        | 241   | 0.58         | 216                                | 0.50         | 306   | 0.58         | 269                                | 0.50         | 355   | 0.52         | 326  | 0.45         | 328   | 0.52         | 342  | 0.46         | 328                                   | 0.45         | 430  | 389                          | 0.56                         | 0.49         |              |
| 120       | 278   | 0.48         | 249                                | 0.42         | 354   | 0.48         | 312                                | 0.42         | 413   | 0.43         | 379  | 0.37         | 383   | 0.43         | 400  | 0.38         | 383                                   | 0.37         | 500  | 454                          | 0.47                         | 0.42         |              |
| 150       | 318   | 0.43         | 285                                | 0.37         | 393   | 0.43         | 342                                | 0.37         | 476   | 0.36         | 436  | 0.31         | 444   | 0.36         | 464  | 0.32         | 444                                   | 0.31         | 577  | 527                          | 0.41                         | 0.37         |              |
| 185       | 362   | 0.37         | 324                                | 0.32         | 449   | 0.37         | 384                                | 0.32         | 545   | 0.30         | 500  | 0.26         | 510   | 0.30         | 533  | 0.28         | 510                                   | 0.26         | 661  | 605                          | 0.36                         | 0.33         |              |
| 240       | 424   | 0.33         | 380                                | 0.29         | 528   | 0.33         | 450                                | 0.29         | 644   | 0.25         | 590  | 0.22         | 607   | 0.25         | 634  | 0.24         | 607                                   | 0.22         | 781  | 719                          | 0.31                         | 0.29         |              |
| 300       | 486   | 0.31         | 435                                | 0.27         | 603   | 0.31         | 514                                | 0.27         | 743   | 0.22         | 681  | 0.195        | 703   | 0.22         | 736  | 0.21         | 703                                   | 0.195        | 902  | 833                          | 0.29                         | 0.27         |              |
| 400       | -   | 0.29         | -                                  | 0.25         | 683   | 0.29         | 584                                | 0.25         | 868   | 0.20         | 793  | 0.175        | 823   | 0.20         | 868  | 0.195        | 823                                   | 0.175        | 1085   | 1008                         | 0.27                         | 0.26         |              |
| 500       | -   | 0.28         | -                                  | 0.24         | 783   | 0.28         | 666                                | 0.24         | 990   | 0.185        | 904  | 0.160        | 946   | 0.185        | 998  | 0.180        | 946                                   | 0.160        | 1253   | 1169                         | 0.26                         | 0.25         |              |
| 630       | -   | 0.27         | -                                  | 0.23         | 900   | 0.27         | 764                                | 0.23         | 1130  | 0.175        | 1033   | 0.150        | 1088  | 0.175        | 1151   | 0.170        | 1088                                  | 0.150        | 1454   | 1362                         | 0.25                         | 0.24         |              |
| 800       | -   | -            | -                                  | -            | -   | -            | -                                  | -            | 1288  | 0.170        | 1179   | 0.145        | 1214  | 0.170        | 1275   | 0.165        | 1214                                  | 0.145        | 1581   | 1485                         | 0.25                         | 0.24         |              |
| 1000      | -   | -            | -                                  | -            | -   | -            | -                                  | -            | 1443  | 0.165        | 1323   | 0.140        | 1349  | 0.165        | 1436   | 0.165        | 1349                                  | 0.140        | 1775   | 1671                         | 0.24                         | 0.24         |              |

Where more precise calculation requires the use of resistive and reactive components of cable impedance, reference should be made to Table 4E1A and 4E1B of BS 7671.

Notes:

- Where the conductor is to be protected by a semi-enclosed fuse to BS 3036, see item 5.1 of the preface to Appendix 4 of BS 7671
- Spacing larger than those specified in Method C (Table 4A) will result in a larger voltage drop.

### Correction Factors For Ambient Temperature

|                     |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ambient Temperature | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C | 55°C | 60°C | 65°C | 70°C | 75°C | 80°C |
| Correction Factor   | 1.03 | 1.0  | 0.94 | 0.87 | 0.79 | 0.71 | 0.61 | 0.50 | 0.65 | 0.58 | 0.50 | 0.41 |



# Current Rating of CU/PVC/PVC 300/500 V Cables

**TABLE 3**

Current carrying capacity for Multicore PVC insulated, PVC sheathed, non-armoured cables as per BS EN 50525-2-31 (BS 6004)

Conductor operating temperature: 70°C Ambient temperature: 30°C For Installation required to comply with BS 7671

| Conductor       | Reference Method A (enclosed in conduit in the thermally insulating wall etc.) |              |   |              | Reference Method B (enclosed in conduit on a wall or in trunking etc.) |              |   |              | Reference method C (clipped direct)         |              |   |              | Reference method F (in free air or on a perforated cable tray etc, horizontal or vertical) |              |   |              |
|-----------------|--|--------------|---|--------------|--|--------------|---|--------------|---|--------------|---|--------------|--|--------------|---|--------------|
|                 | 1 two-core cable, single-phase a.c. or d.c.                                    |              | 1 three-core or 1 four-core cable, three-phase a.c. |              | 1 two-core cable, single-phase a.c. or d.c.                            |              | 1 three-core or 1 four-core cable, three-phase a.c. |              | 1 two-core cable, single-phase a.c. or d.c. |              | 1 three-core cable or 1 four-core cable, three-phase a.c. |              | 1 two-core cable, single-phase a.c. or d.c.  |              | 1 three-core cable or 1 four-core cable, three phase a.c. |              |
| C.S.A.          | Current carrying capacity  | Voltage drop | Current carrying capacity                           | Voltage drop | Current carrying capacity  | Voltage drop | Current carrying capacity                           | Voltage drop | Current carrying capacity                   | Voltage drop | Current carrying capacity                                 | Voltage drop | Current carrying capacity  | Voltage drop | Current carrying capacity                                 | Voltage drop |
| 1               | 2  | 3            | 4   | 5            | 6  | 7            | 8   | 9            | 10  | 11           | 12  | 13           | 14   | 15           | 16  | 17           |
| mm <sup>2</sup> | A  | mV/A/m       | A   | mV/A/m       | A  | mV/A/m       | A   | mV/A/m       | A   | mV/A/m       | A   | mV/A/m       | A  | mV/A/m       | A   | mV/A/m       |
| 1.0             | 11   | 44           | 10  | 38           | 13   | 44           | 11.5  | 38           | 15  | 44           | 13.5  | 38           | 17   | 44           | 14.5  | 38           |
| 1.5             | 14   | 29           | 13  | 25           | 16.5   | 29           | 15  | 25           | 19.5  | 29           | 17.5  | 25           | 22   | 29           | 18.5  | 25           |
| 2.5             | 18.5   | 18           | 17.5  | 15           | 23   | 18           | 20.   | 15           | 27  | 18           | 24  | 15           | 30   | 18           | 25  | 15           |
| 4               | 25   | 11           | 23  | 9.5          | 30   | 11           | 27  | 9.5          | 36  | 11           | 32  | 9.5          | 40   | 11           | 34  | 9.5          |
| 6               | 32   | 7.3          | 29  | 6.4          | 38   | 7.3          | 34  | 6.4          | 46  | 7.3          | 41  | 6.4          | 51   | 7.3          | 43  | 6.4          |
| 10              | 43   | 4.4          | 39  | 3.8          | 52   | 4.4          | 46  | 3.8          | 63  | 4.4          | 57  | 3.8          | 70   | 4.4          | 60  | 3.8          |
| 16              | 57   | 2.8          | 52  | 2.4          | 69   | 2.8          | 62  | 2.4          | 85  | 2.8          | 76  | 2.4          | 94   | 2.8          | 80  | 2.4          |
| 25              | 75   | 1.75         | 68  | 1.50         | 90   | 1.75         | 80  | 1.50         | 112   | 1.75         | 96  | 1.50         | 119  | 1.75         | 101   | 1.50         |
| 35              | 92   | 1.25         | 83  | 1.10         | 111  | 1.25         | 99  | 1.10         | 138   | 1.25         | 119   | 1.10         | 148  | 1.25         | 126   | 1.10         |
| 50              | 110  | 0.94         | 99  | 0.81         | 133  | 0.94         | 118   | 0.81         | 168   | 0.94         | 144   | 0.81         | 180  | 0.94         | 153   | 0.81         |
| 70              | 139  | 0.65         | 125   | 0.57         | 168  | 0.65         | 149   | 0.57         | 213   | 0.65         | 184   | 0.57         | 232  | 0.65         | 196   | 0.57         |
| 95              | 167  | 0.50         | 150   | 0.43         | 201  | 0.50         | 179   | 0.43         | 258   | 0.50         | 223   | 0.43         | 282  | 0.50         | 238   | 0.43         |
| 120             | 192  | 0.41         | 172   | 0.35         | 232  | 0.41         | 206   | 0.35         | 299   | 0.41         | 259   | 0.35         | 328  | 0.41         | 276   | 0.35         |
| 150             | 219  | 0.34         | 196   | 0.29         | 258  | 0.34         | 225   | 0.29         | 344   | 0.34         | 299   | 0.29         | 379  | 0.34         | 319   | 0.29         |
| 185             | 248  | 0.29         | 223   | 0.25         | 294  | 0.29         | 255   | 0.25         | 392   | 0.29         | 341   | 0.25         | 434  | 0.29         | 364   | 0.25         |
| 240             | 291  | 0.24         | 261   | 0.21         | 344  | 0.24         | 297   | 0.21         | 461   | 0.24         | 403   | 0.21         | 514  | 0.24         | 430   | 0.21         |
| 300             | 334  | 0.21         | 298   | 0.185        | 394  | 0.21         | 339   | 0.185        | 530   | 0.21         | 464   | 0.185        | 593  | 0.21         | 497   | 0.185        |
| 400             | -  | 0.185        | -   | 0.160        | 470  | 0.185        | 402   | 0.160        | 634   | 0.185        | 557   | 0.160        | 715  | 0.185        | 597   | 0.160        |

Where more precise calculation requires the use of resistive and reactive components of cable impedance, reference should be made to Table 4D2A and 4D2B of BS 7671.

**Correction Factors  
For Ambient Temperature**

Ambient Temperature 25°C 30°C 35°C 40°C 45°C 50°C 55°C 60°C  
 Correction Factor 1.03 1.0 0.94 0.87 0.79 0.71 0.61 0.50  
 For grouping refer to Table 4C1 of BS 7671



# Current Rating for Flat Cables

**TABLE 4**

Current carrying capacity and associated voltage drop for thermoplastic (PVC) insulated and Sheathed flat cable with protective earth continuity conductor for CU/PVC/PVC Cables

BS EN 50525-2-31 (BS 6004)

Conductor operating temperature: 70°C Ambient temperature: 30°C

For installation required to comply with BS 7671

| Conductor       | Reference method 100 (above a plasterboard ceiling covered by thermal insulation not exceeding 100mm in thickness) | Reference method 101 (above a plasterboard ceiling covered by thermal insulation not exceeding 100mm in thickness) | Reference method 102 (in a stud wall with thermal insulation with cable touching the inner surface wall) | Reference method 103 (in a stud wall with thermal insulation with cable not touching the inner surface wall) | Reference method C (slipped direct) | Reference method A (enclosed in conduit in an insulated wall) | Voltage drop |
|-----------------|--|--|--|--|-------------------------------------|---|--------------|
| 1               | 2  | 3  | 4  | 5  | 6                                   | 7   | 8            |
| mm <sup>2</sup> | A  | A  | A  | A  | A                                   | A   | mV/A/m       |
| 1               | 13   | 10.5   | 13   | 8  | 16                                  | 11.5  | 44           |
| 1.5             | 16   | 13   | 16   | 10   | 20                                  | 14.5  | 29           |
| 2.5             | 21   | 17   | 21   | 13.5   | 27                                  | 20  | 18           |
| 4               | 27   | 22   | 27   | 17.5   | 37                                  | 26  | 11           |
| 6               | 34   | 27   | 35   | 23.5   | 47                                  | 32  | 7.3          |
| 10              | 45   | 36   | 47   | 32   | 64                                  | 44  | 4.4          |
| 16              | 57   | 46   | 63   | 42.5   | 85                                  | 57  | 2.8          |

**Notes:**

Wherever practicable a cable is to be fixed in a position such that it will not be covered with thermal insulation, reference should be made to Table 4D5 of BS 7671

**Correction Factors**

**For Alternative Ambient Temperatures**

Ambient Temperature 25°C 30°C 35°C 40°C 45°C 50°C 55°C 60°C  
 Correction Factor 1.03 1.0 0.94 0.87 0.79 0.71 0.61 0.50



## ***Reference Methods as per BS 7671***

The Reference Methods are those methods of installation for which the current-carrying capacity has been determined by test or calculation.

Reference Method A, for example, Installation Methods 1 and 2 (non-sheathed cables and multicore cables in conduit in a thermally insulated wall).

The wall consists of an outer weatherproof skin, thermal insulation and an inner skin of wood or wood-like material having a thermal conductance of at least  $10 \text{ W/m}^2\text{K}$ . The conduit is fixed such that it is close to, but not necessarily touching, the inner skin. Heat from the cables is assumed to escape through the inner skin only. The conduit can be metal or plastic.

Reference Method B, for example, Installation Method 4 of Table 2 (non-sheathed cables in conduit mounted on a wooden or masonry wall) and installation Method 5 (multicore cable in conduit on a wooden or masonry wall).

The conduit is mounted on a wooden wall such that the gap between the conduit and the surface is less than 0.3 times the conduit diameter. The conduit can be metal or plastic. Where the conduit is fixed to a masonry wall the current-carrying capacity of the non-sheathed or sheathed cable may be higher.

Reference Method C (clipped direct), for example, Installation Method 20 (single-core or multicore cable on a wooden or masonry wall)

Cable mounted on a wooden wall so that the gap between the cable and surface is less than 0.3 times the cable diameter. Where the cable is fixed to or embedded in a masonry wall the current-carrying capacity may be higher.

**NOTE:** The term “masonry” is taken to include brickwork, concrete, plaster and similar (but excluding thermally insulating materials)

## ***Installation methods specifically for flat twin with earth continuity conductor cables in thermal insulation***

Method 100 – Installation methods for flat twin and earth cable clipped direct to a wooden joist above a plasterboard ceiling with a minimum U value of  $0.1 \text{ W/m}^2\text{K}$  and with thermal insulation no exceeding 100mm in thickness.

Method 101 - Installation methods for flat twin and earth cable clipped direct to a wooden joist above a plasterboard ceiling with a minimum U value of  $0.1 \text{ W/m}^2\text{K}$  and with thermal insulation exceeding 100mm in thickness.

Method 102 - Installation methods for flat twin and earth cable in a stud wall with thermal insulation with a minimum U value of  $0.1 \text{ W/m}^2\text{K}$  with the cable touching the inner wall surface.

Method 103 - Installation methods for flat twin and earth cable in a stud wall with thermal insulation with a minimum U value of  $0.1 \text{ W/m}^2\text{K}$  with the cable not touching the inner wall surface.

Wherever practicable, a cable is to be fixed in a position such that it will not be covered with thermal insulation. Regulation 523.7, BS 5803-5: Appendix C: Avoidance of overheating of electric cables, Building Regulations Approved document B and Thermal insulation: avoiding risk. BR 262, BRE, 2001 refer.

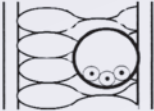
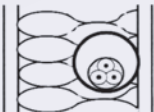

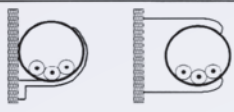
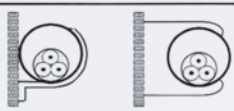







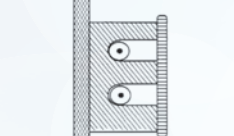




**Table 4A2 – Schedule of Installation Methods of cables (including Reference Methods) for determining current-carrying capacity**

**NOTE 1:** The illustrations are not intended to depict actual product or installation practices but are indicative of the method described.

**NOTE 2:** The installation and reference methods stated are in line with IEC. However, not all methods have a corresponding rating for all cable types..

| Number | Installation Method  |   | Reference Method to be used to determine current-carrying capacity |
|--------|--|---|--|
|        | Examples   | Description   |  |
| 1      |  Room   | Non-sheathed cables in conduit in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m <sup>2</sup> K | A  |
| 2      |   | Multicore cable in conduit in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m <sup>2</sup> K     | A  |
| 3      |  Room   | Multicore cable direct in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m <sup>2</sup> K         | A  |
| 4      |   | Non-sheathed cables in conduit on a wooden or masonry wall or spaced less than 0.3 × conduit diameter from it <sup>c</sup>                          | B  |
| 5      |   | Multicore cable in conduit on a wooden or masonry wall or spaced less than 0.3 × conduit diameter from it <sup>c</sup>                              | B  |
| 6<br>7 |  6<br> 7   | Non-sheathed cables in cable trunking on a wooden or masonry wall<br>6 - run horizontally <sup>b</sup><br>7 - run vertically <sup>b,c</sup>         | B  |
| 8<br>9 |  8<br> 9   | Multicore cable in cable trunking on a wooden or masonry wall<br>8 - run horizontally <sup>b</sup><br>9 - run vertically <sup>b,c</sup>             | B*   |
| 10     |   | Non-sheathed cables in suspended cable trunking <sup>b</sup>  | B  |
| 11     |  10<br> 11 | Multicore cable in suspended cable trunking <sup>b</sup>  | B  |
| 12     |   | Non-sheathed cables run in mouldings <sup>c,e</sup>   | A  |

<sup>b</sup> Values given for Installation Method B in Appendix 4 are for a single circuit. Where there is more than one circuit in the trunking the group rating factor given in Table 4C1 is applicable, irrespective of the presence of an internal barrier or partition.

<sup>c</sup> Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

<sup>e</sup> The thermal resistivity of the enclosure is assumed to be poor because of the material of construction and possible air spaces. Where the construction is thermally equivalent to Installation Methods 6 or 7, Reference Method B may be used.

\* Still under consideration in IEC.





Table 4A2 (continued)

| Number | Installation Method |  | Reference Method to be used to determine current-carrying capacity                                |
|--------|---------------------|--|---|
|        | Examples            | Description  |   |
| 13     |                     | Non-sheathed cables in skirting trunking   | B   |
| 14     |                     | Multicore cable in skirting trunking   | B   |
| 15     |                     | Non-sheathed cables in conduit or single-core or multicore cable in architrave <sup>c, f</sup>   | A   |
| 16     |                     | Non-sheathed cables in conduit or single-core or multicore cable in window frames <sup>c, f</sup>  | A   |
| 20     |                     | Single-core or multicore cables:<br>- fixed on (clipped direct), or spaced less than 0.3 x cable diameter from a wooden or masonry wall <sup>c</sup> | C   |
| 21     |                     | Single-core or multicore cables:<br>- fixed directly under a wooden or masonry ceiling   | B<br>(Higher than standard ambient temperatures may occur with this installation method)          |
| 22     |                     | Single-core or multicore cables:<br>- spaced from a ceiling  | E, F or G*<br>(Higher than standard ambient temperatures may occur with this installation method) |
| 23     |                     | Not used.  |   |
| 30     |                     | Single-core or multicore cables:<br>- on unperforated tray run horizontally or vertically <sup>c, h</sup>  | C with item 2 of Table 4C1  |
| 31     |                     | Single-core or multicore cables:<br>- on perforated tray run horizontally or vertically <sup>c, h</sup>  | E or F  |
| 32     |                     | Single-core or multicore cables:<br>- on brackets or on a wire mesh tray run horizontally or vertically <sup>c, h</sup>                              | E or F  |

<sup>c</sup> Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

<sup>f</sup> The thermal resistivity of the enclosure is assumed to be poor because of the material of construction and possible air spaces. Where the construction is thermally equivalent to Installation Methods 6, 7, 8, or 9, Reference Method B may be used.

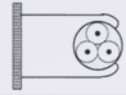

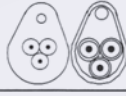

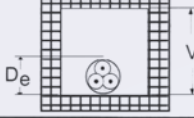
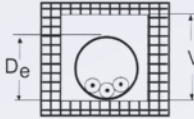
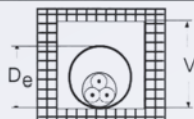
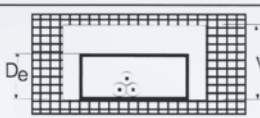
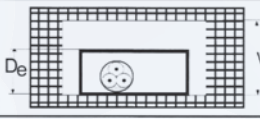
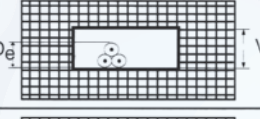
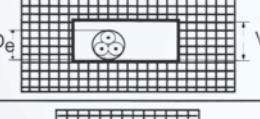
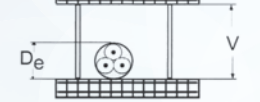
<sup>h</sup>  $D_e$  = the external diameter of a multicore cable:

- 2.2 x the cable diameter when three single-core cables are bound in trefoil, or
- 3 x the cable diameter when three single-core cables are laid in flat formation.

\* Still under consideration in IEC.



**Table 4A2 (continued)**

| Installation Method |   |  | Reference Method to be used to determine current-carrying capacity |
|---------------------|---|--|--|
| Number              | Examples  | Description  |  |
| 33                  |    | Single-core or multicore cables:<br>- spaced more than 0.3 times the cable diameter from a wall  | E, F or G <sup>g</sup>   |
| 34                  |    | Single-core or multicore cables:<br>- on a ladder <sup>c</sup>   | E or F   |
| 35                  |    | Single-core or multicore cable suspended from or incorporating a support wire or harness   | E or F   |
| 36                  |    | Bare or non-sheathed cables on insulators  | G  |
| 40                  |   | Single-core or multicore cable in a building void <sup>c,h,i</sup>   | Where $1.5 D_e \leq V < 20 D_e$ use B.                             |
| 41                  |  | Non-sheathed cables in conduit in a building void in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,i,j</sup>                  | Where $1.5 D_e \leq V$ use B.                                      |
| 42                  |  | Single-core or multicore cable in conduit in a building void in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,j</sup>         | Where $1.5 D_e \leq V$ use B.                                      |
| 43                  |  | Non-sheathed cables in cable ducting in a building void in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,i,j</sup>            | Where $1.5 D_e \leq V$ use B.                                      |
| 44                  |  | Single-core or multicore cable in cable ducting in a building void in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,i,j</sup> | Where $1.5 D_e \leq V$ use B.                                      |
| 45                  |  | Non-sheathed cables in cable ducting in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,h,i</sup>                               | Where $1.5 D_e \leq V < 50 D_e$ use B.                             |
| 46                  |  | Single-core or multicore cable in cable ducting in masonry having a thermal resistivity not greater than $2 \text{ K.m/W}$ <sup>c,h,i</sup>                    | Where $1.5 D_e \leq V < 50 D_e$ use B.                             |
| 47                  |  | Single-core or multicore cable:<br>- in a ceiling void <sup>h,i</sup><br>- in a suspended floor <sup>h,i</sup>   | Where $1.5 D_e \leq V < 50 D_e$ use B.                             |

<sup>c</sup> Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

<sup>g</sup> The factors in Table 4C1 may also be used.



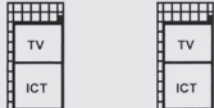
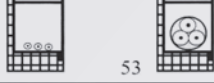

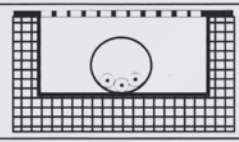
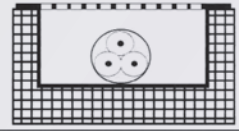
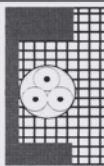
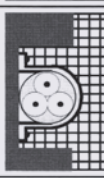
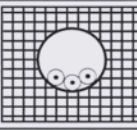
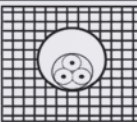
<sup>h</sup>  $D_e$  = the external diameter of a multicore cable:  
-  $2.2 \times$  the cable diameter when three single-core cables are bound in trefoil, or  
-  $3 \times$  the cable diameter when three single-core cables are laid in flat formation.

<sup>i</sup>  $V$  = the smaller dimension or diameter of a masonry duct or void, or the vertical depth of a rectangular duct, floor or ceiling void or channel.

<sup>j</sup>  $D_e$  = external diameter of conduit or vertical depth of cable ducting.



**Table 4A2 (continued)**

| Number | Installation Method   |  | Reference Method to be used to determine current-carrying capacity |
|--------|---|--|--|
|        | Examples  | Description  |  |
| 50     |    | Non-sheathed cables in flush cable trunking in the floor   | <b>B</b>   |
| 51     |    | Multicore cable in flush cable trunking in the floor   | <b>B</b>   |
| 52     |    | Non-sheathed cables in flush trunking <sup>c</sup>   | <b>B</b>   |
| 53     |    | Multicore cable in flush trunking <sup>c</sup>   | <b>B</b>   |
| 54     |    | Non-sheathed cables or single-core cables in conduit in an unventilated cable channel run horizontally or vertically <sup>c, i, k, m</sup>                               | Where $1.5 D_e \leq V$ use <b>B</b> .                              |
| 55     |   | Non-sheathed cables in conduit in an open or ventilated cable channel in the floor <sup>l, m</sup>   | <b>B</b>   |
| 56     |  | Sheathed single-core or multicore cable in an open or ventilated cable channel run horizontally or vertically <sup>m</sup>   | <b>B</b>   |
| 57     |  | Single-core or multicore cable direct in masonry having a thermal resistivity not greater than 2 K.m/W - without added mechanical protection <sup>n, o</sup>             | <b>C</b>   |
| 58     |  | Single-core or multicore cable direct in masonry having a thermal resistivity not greater than 2 K.m/W - with added mechanical protection <sup>n, o</sup> (e.g. capping) | <b>C</b>   |
| 59     |  | Non-sheathed cables or single-core cables in conduit in masonry having a thermal resistivity not greater than 2 K.m/W <sup>o</sup>                                       | <b>B</b>   |
| 60     |  | Multicore cables in conduit in masonry having a thermal resistivity not greater than 2 K.m/W <sup>o</sup>  | <b>B</b>   |

<sup>c</sup> Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

<sup>k</sup>  $D_e$  = external diameter of conduit

<sup>i</sup>  $V$  = the smaller dimension or diameter of a masonry duct or void, or the vertical depth of a rectangular duct, floor or ceiling void or channel. The depth of the channel is more important than the width.

<sup>l</sup> For multicore cable installed as Method 55, use current-carrying capacity for Reference Method B.

<sup>m</sup> It is recommended that these Installation Methods are used only in areas where access is restricted to authorized persons so that the reduction in current-carrying capacity and the fire hazard due to the accumulation of debris can be prevented.

<sup>n</sup> For cables having conductors not greater than 16 mm<sup>2</sup>, the current-carrying capacity may be higher.

<sup>o</sup> Thermal resistivity of masonry is not greater than 2 K.m/W. The term masonry is taken to include brickwork, concrete, plaster and the like (excludes thermally insulating materials).

