

## Cable construction

Cables are constructed of various components. To name cables a universal, harmonized set of codes is defined. It classifies the construction of the cable by allocating codes (letters or numbers) to represent the cable voltage, insulation material, structural elements, sheath, special features and conductor type.

### Designation Codes

#### Identification of Designation

- A authorised national standard
- H harmonised standard

#### Nominal Voltage

- 01 100 V
- 03 300/300 V
- 05 300/500 V
- 07 450/750 V

#### Insulation & Sheath Materials

- B Ethylene-propylene rubber (EDR) +90°C
- B2 Ethylene-propylene rubber (EDR), hardened
- B3 Butyl rubber
- E Polyethylene
- E2 Polyethylene, high density
- E4 Poly-tetrafluorethylene
- E5 Ethylene propylene rubber
- E6 Ethylene tetrafluorethylene
- E7 Polypropylene
- G Ethylene-vinylacetate (EVA)
- J Glass fibre braiding
- J2 Glass fibre wrapping
- M Mineral insulation
- N Chloroprene rubber (CR)
- N2 Chloroprene-rubber (CR), welding cable
- N4 Chlorinated polyethylene
- N5 Nitril-rubber
- N6 Fluorinated rubber
- N7 PVC nitril rubber compound
- N8 Polychloroprene rubber, water resistant
- P Impregnated paper insulation
- Q Polyurethane (PUR)
- Q2 Polyethyleneterephthalate
- Q3 Polystyrole
- Q4 Polyamide
- Q5 Polyamide
- Q6 Polyvinylidene fluoride
- R (NR, SR) natural or synthetic rubber
- S (SIR) silicone rubber
- T Textile braiding
- T2 Textile braiding with flame retardant

- T3 Textile conductor wrapping or tape
- T4 Textile conductor wrapping or tape, flame retardant
- T5 Corrosion protection
- T6 Textile braiding over individual conductor or cable
- V PVC
- V2 PVC soft, resistant to increased temperature, +90°C
- V3 PVC soft, for low temperatures
- V4 PVC soft, cross-linked
- V5 PVC soft, oil resistant
- X Cross-linked polyethylene
- Z Cross-linked compound, LSZH
- Z1 Thermoplastic compound, LSZH

### **Structural Elements**

- Concentric Conductors
  - A Concentric aluminium conductor
  - A6 Concentric aluminium conductor, meander-shaped
  - C Concentric copper-conductor
  - C6 Concentric copper-conductor, meander-shaped
  - C9 Divided concentric copper conductor
- Screen
  - A7 Aluminium screen
  - A8 Aluminium screen, individual conductors
  - C4 Copper braid screen
  - C5 Copper braid screen, individual conductors
  - C7 Copper tape screen
  - C8 Copper tape screen, individual conductors
  - D Screen of one or more thin steel tapes
- Armouring
  - Z2 Armouring of round steel wires
  - Z3 Armouring of flat steel wires
  - Z4 Armouring of steel tape
  - Z5 Braiding of steel wires
  - Z6 Supporting braid of steel wires
  - Z7 Armouring of sectional steel wires
  - Y2 Armouring of round aluminium wires
  - Y3 Armouring of flat aluminium wires
  - Y5 Armouring of special materials
  - Y6 Armouring of steel wires and/or tape and copper wires

### **Conductor Material**

- w/o designation Copper
- A Aluminium
- Z Special material and/or special shape

### **Special Design Features**

- Supporting Structures
  - D2 Textile or steel wires over cable conductor
  - D3 Textile elements stranded in conductor cable
  - D4 Self-supporting cables and wires
  - D5 Central conductor element

- Special Versions

w/o designation round cable construction

- H Flat type as separable cables with or without jacket
- H2 Flat type of cables not separable
- H3 Building Cable, flat webbed
- H4 Multi conductor flat cable with one plain conductor
- H5 Two or more single conductor stranded, non-jacket
- H6 Flat cables with 3 or more conductors
- H7 Cable with two-jacket extruded insulation
- H8 Coiled conductor

**Conductor Type**

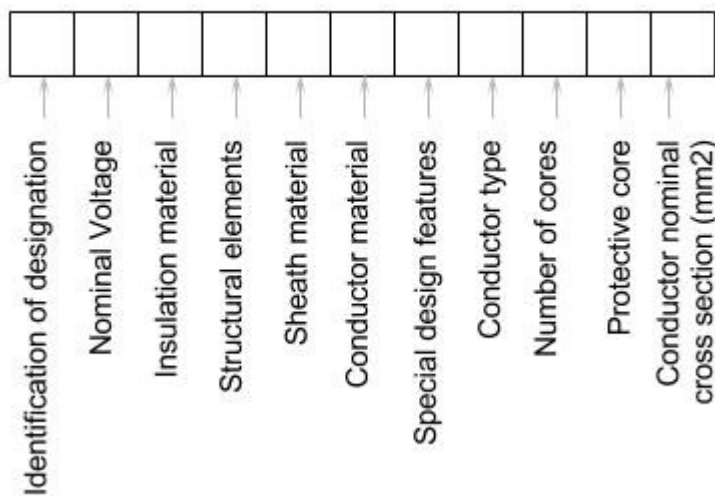
- D fine wire stranded for welding cables
- E extra fine wire stranded for welding cables
- F fine wire stranded for flexible cables
- H extra fine wire stranded for flexible cables
- K fine wire stranded conductor for fixed installation
- M Milliken conductor
- R conductor of multi stranded wires
- S sector-shaped conductor of multi stranded wires
- U round conductor of single wire
- W sector-shaped conductor of single wire
- Y tinsel conductor
- Z conductor of special material

**Protective Core**

- G with green/yellow earth conductor
- X without earth conductor

[Cable Code Examples](#)

A typical cable specification would take the form of:



- H05VV5-F 2G075 is 00/500 V, PVC insulated, PVC sheathed, stranded flexible conductor, 2 core 2.5 mm<sup>2</sup> with protective conductor

- H05V-K 1X1 is 300/500 V, PVC insulated, fine wire stranded, single core 1 mm<sup>2</sup> with no protective conductor
- S03VV-F 3G0.75 is national standard (VDE in this case), 300/300 V, PVC insulated, PVC sheathed, fine wire stranded flexible cable, 3 core 0.75 mm<sup>2</sup> with protective conductor
- H07RV-F 3X10 is 450/750 V, natural rubber insulation, PVC sheath, fine wire stranded, three core 10 mm<sup>2</sup> with no protective conductor
- H05Z-K 1X2.5 is 300/500 V, XLPE LSZH, fine wire stranded, single core 2.5 mm<sup>2</sup> without protective conductor

Source(<https://myelectrical.com/notes/entryid/228/harmonised-cable-codes-and-colours>)

## Wire colour definition

DIN Standard DIN 47100 regulated the color-coding for the identification of cores in telecommunication cables. The standard was withdrawn without a replacement in November 1998, but remains in widespread use by cable manufacturers.

The isolations of the several wires in a cable are either solidly colored in one color, or striped lengthwise in two colors. Use of the three-colored wires numbered 45 and up is rare.

Number	Colour	Short form	Number	Colour	Short form
1	white	WH	31	green-blue	GNBU
2	brown	BN	32	yellow-blue	YEBU
3	green	GN	33	green-red	GNRD
4	yellow	YE	34	yellow-red	YERD
5	grey	GY	35	green-black	GNBK
6	pink	PK	36	yellow-black	YEBK
7	blue	BU	37	grey-blue	GYBU
8	red	RD	38	pink-blue	PKBU
9	black	BK	39	grey-red	GYRD
10	violet	VT	40	pink-red	PKRD
11	grey-pink	GYPK	41	grey-black	GYBK
12	red-blue	RDBU	42	pink-black	PKBK
13	white-green	WHGN	43	blue-black	BUBK
14	brown-green	BNGN	44	red-black	RDBK
15	white-yellow	WHYE	45	white-brown-black	WHBNBK
16	yellow-brown	YEBN	46	yellow-green-black	YEGNBK
17	white-grey	WHGY	47	grey-pink-black	GYPKBK
18	grey-brown	GYBN	48	red-blue-black	RDBUBK
19	white-pink	WHPK	49	white-green-black	WHGNBK
20	pink-brown	PKBN	50	brown-green-black	BNGNBK
21	white-blue	WHBU	51	white-yellow-black	WHYEBK
22	brown-blue	BNBU	52	yellow-brown-black	YEBNBK
23	white-red	WHRD	53	white-grey-black	WHGYBK

<b>24</b>	brown-red	BNRD	54	grey-brown-black	GYBNBK
<b>25</b>	white-black	WHBK	55	white-pink-black	WHPKBK
<b>26</b>	brown-black	BNBK	56	pink-brown-black	PKBNBK
<b>27</b>	grey-green	GYGN	57	white-blue-black	WHBUBK
<b>28</b>	yellow-grey	YEGY	58	brown-blue-black	BNBUBK
<b>29</b>	pink-green	PKGK	59	white-red-black	WHRDBK
<b>30</b>	yellow-pink	YEPK	60	brown-red-black	BNRDBK