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ELECTRICAL WIRING AND COLOUR CODING OF WIRING

Electrical wiring

Electrical wiring is an electrical installation of cabling and associated devices such as switches, distribution boards, sockets and light fittings in a structure. Wiring is subject to safety standards for design and installation. Allowable wire and cable types and sizes are specified according to the circuit operating voltage and electric current capability, with further restrictions on the environmental

conditions, such as ambient temperature range, moisture levels, and exposure to sunlight and chemicals.

Associated circuit protection, control and distribution devices within a building's wiring system are subject to voltage, current and functional specification. Wiring safety codes vary by locality, country or region. The International Electrotechnical Commission (IEC) is attempting to harmonise wiring standards amongst member countries, but significant variations in design and installation requirements still exist.

Colour coding of wiring by region

In a typical electrical code, some colour-coding of wires is mandatory. Many local rules and exceptions exist per country, state or region. Older installations vary in colour codes, and colours may fade with insulation exposure to heat, light and ageing.

As of March 2011, the European Committee for Electrotechnical Standardization (CENELEC) requires the use of green/yellow colour cables as protective conductors, blue as neutral conductors and brown as single-phase conductors.

The United States National Electrical Code requires a bare copper, or green or green/yellow insulated protective conductor, a white or grey neutral, with any other colour used for single phase. The NEC also requires the "high leg" conductor of a High-leg delta or "bastard-leg" system to have orange insulation. In the United States, colour-coding of three-phase system conductors follows a de facto standard, wherein black, red, and blue are used for three-phase 120/208-volt systems, and brown, orange, and yellow are used in 277/480-volt systems. In buildings with multiple voltage systems, the grounded conductors (neutrals) of both systems are required to be identified and made distinguishable to avoid cross-system connections. Most often, 120/208-volt systems use white insulation, while 277/480-volt systems use grey insulation, although this particular colour code is not currently an explicit requirement of the NEC.

The United Kingdom requires the use of wire covered with green/yellow striped insulation, for safety earthing (grounding) connections. This growing international standard was adopted for its distinctive appearance, to reduce the likelihood of dangerous confusion of safety earthing (grounding) wires with other electrical functions, especially by persons affected by red-green colour blindness.

In the UK, phases could be identified as being live by using coloured indicator lights: red, yellow and blue. The new cable colours of brown, black and grey do not lend themselves to coloured indicators. For this reason, three-phase control panels will often use indicator lights of the old colours.

In conclusion, the colour of the wiring in different countries is not just a whim of the wire manufacturer. It is done in order not to confuse them during

installation, because for solving various problems you need wires of different colours.