Changes in UK Cable Identification Colours and Update on Deliberation of Adopting New Cable Colour Code in HK

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This paper is intended to inform members of the Hong Kong Electrical Contractors' Association Limited regarding development on changes of cable identification colours for fixed electrical installations in Europe (including the United Kingdom) and its possible implication in Hong Kong. The changes in colour identification of cable from existing cable colour to European Harmonized colour will be illustrated in the paper. Moreover, in view of the cable colour code changes in Europe, the Electrical and Mechanical Services Department (EMSD) of the Hong Kong Special Administration Region (HKSAR) Government has set up the Working Group on the Review of Cable Colour Code in November 2003 to study and assess the impact of changing the colour code in the HKSAR from the point of view of electrical safety, cable supply and international code standardization and to make recommendations on the way forward. [1]

INTRODUCTION

In year 1973, the European Committee for Electrotechnical Standardization (CENELEC) was set up for harmonizing electrical standards in European countries. These countries include Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

In year 2000, International Electrotechnical Commission (IEC) Standard IEC 60446 titled, "Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals" was adopted and transformed by CENELEC into a European Standard (EN 60446) without any modification.. In an effort to align the cable colour deviations among CENELEC members, CENELEC have selected 3 distinct colours (i.e. brown/black/grey) for identification of phase conductors in a 3-phase system. Moreover, brown colour was selected to identify live conductor in a single phase system. All CENELEC countries are in general obligated to follow the new colour identification in cable in year 2004.[2]

UNITED KINGDOM

The United Kingdom (UK) has begun to adopt the new cable colour in an effort to comply with CENELEC and its Harmonization Document HD 308 S2:2001 titled, "Identification of cores in cables and flexible cords" which agrees with EN 60446. Amendment No. 2:2004 to BS7671:

2001 titled, “Requirements for Electrical Installations”, issued on the 31st March 2004 was jointly agreed by the Institution of Electrical Engineers (IEE) and British Standards Institute (BSI) in the United Kingdom, which implements the cable core colours introduced in the revision of the above CENELEC document.[3]

The major changes were the single phase cable colour identification will be changed from Red to Brown and neutral from Black to Blue for fixed installation. The three-phase phase cable colour identification is changed from red, yellow and blue to brown, black and grey. Where a circuit includes a neutral or mid-point conductor, it will be identified by the colour of blue instead of black. In all installations the earth or protective conductor will remain green and yellow.

For installation after 31st March 2006 in UK, the CENELEC harmonized cable colour code shall be used. Before 31st March 2006 and after 31st March 2004, the electrical installers may use either the harmonized coloured cable or the old colour cable in any project, but not both.

The following tables show the changes in common cables used in building services in Hong Kong.

Table 1: Flexible Cables (BS6500 PVC insulated PVC sheathed 300/500V)

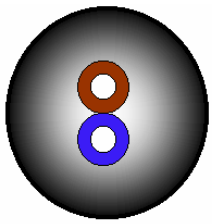
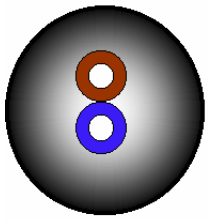
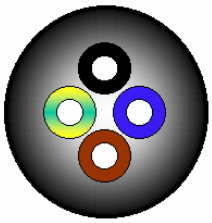
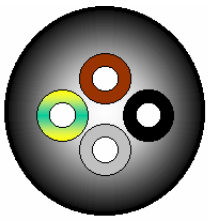
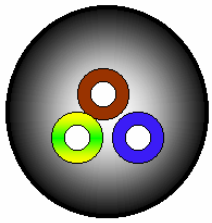
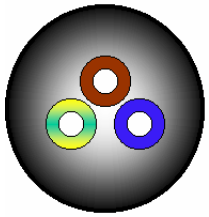
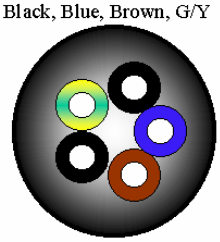
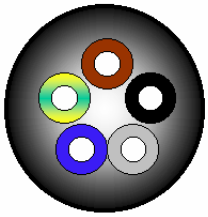
Colour before 31st March 2004 in UK	Colour after 1st April 2006 in UK
 Brown, Blue	 Brown, Blue
 Black, Blue, Brown, G/Y	 Brown,Black,Grey, G/Y
 Brown, Blue, G/Y	 Brown, Blue, G/Y
 Black, Blue, Brown, Black,G/Y	 Brown, Black, Grey, Blue,G/Y

Table 2: Building Services Cables (BS 6004 PVC insulated PVC sheathed 300/500V cables with bare circuit protection conductor (CPC))

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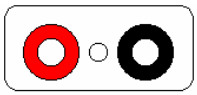
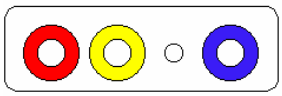
Colour before 31st March 2004 in UK	Colour after 1st April 2006 in UK
 Red, Black	 Brown, Blue
 Red, Yellow, Blue	 Brown, Black, Grey

Table 3: Multi-core Armoured Cables (BS5367, BS6346, BS6724, BS7846..etc)

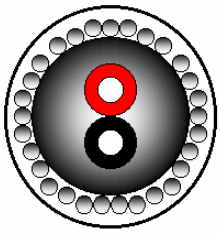
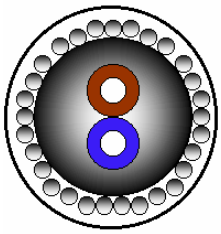
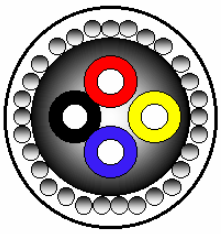
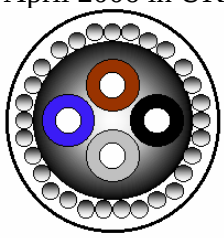
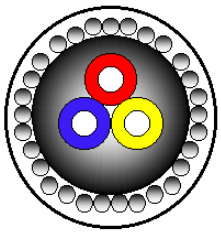
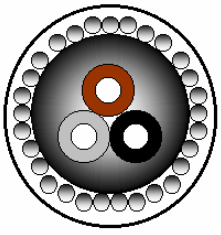
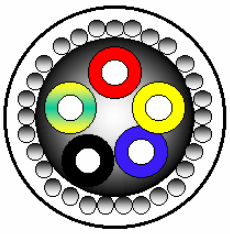
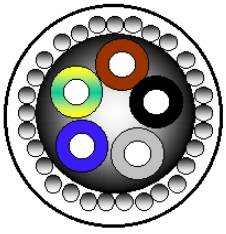
Colour before 31st March 2004 in UK	Colour after 1st April 2006 in UK
 Red & Black	 Brown & Blue
 Red,Yellow,Blue,Black	 Brown,Black,Grey,Blue
 Red,Yellow,Blue	 Brown,Black,Grey
 Red,Yellow,Blue,Black,G/Y	 Brown,Black,Grey,Blue, G/Y

Table 4, Example of conductor marking at the interface for additions and alterations to an a.c. installation identified with the old cable colours in UK

Function	Old Conductor		New Conductor	
	Colour	Marking	Marking	Colour
Single Phase	Red	L	L	Brown
Phase 1 of 3 phase	Red	L1	L1	Brown
Phase 2 of 3 phase	Yellow	L2	L2	Black
Phase 3 of 3 phase	Blue	L3	L3	Grey
Neutral	Black	N	N	Blue
Protective Conductor	Green & Yellow		Green & Yellow	

IMPLICATION IN HONG KONG

The cable colour code currently used for the fixed electrical installations in HKSAR originates from the British Standard, and the relevant requirements are specified in the Code of Practice for the Electricity (Wiring) Regulations published by EMSD. [1] Thus, with the endorsement of Electrical Safety Advisory Committee, EMSD of HKSAR has set up the Working Group on the Review of Cable Colour Code in November 2003 to study and address the concern on electrical safety, cable supply and international code standardization and to make recommendations on the way forward. Members of the Working Group come from trade unions, trade associations, power companies, cable supplier, professional institutions, university and government departments.

In one of the first round of papers presented by Electricity Legislation Division of EMSD in November 2003 [2], a survey on cable colours in other countries was conducted. After UK implemented the new cable colour scheme, Hong Kong and 5 other countries among the surveyed countries will remain using black colour to identify the neutral conductors. These 5 countries are Australia, Malaysia, New Zealand, Singapore and South Africa. One should note that Australia and New Zealand also have alternative standards that allow Neutral to be identified with light blue colour. China also uses light blue colour to identify its Neutral, which complies with IEC standard.

Since black and blue are currently used to identify neutral conductors and phase conductors respectively, the adoption of new Europe colour scheme for cable may cause confusion. Safety becomes the primary concern. In November 2004, the Working Group set up three task groups (i.e. Technical Support Task Group (TSTG), Training Task Group (TTG) and Publicity Task Group (PTG)) to work out a detailed plan to address the electrical workers' safety and to ensure that cable supply will remain stable.

WAY FORWARD

TSTG has held several meetings to evaluate the risk taken by the trade if new cable colour scheme was to be adopted and to study the issue of cable supply during the transitional period. TTG also held several meetings to follow up suggestion from TSTG and prepare the training material needed for the trade. If members have any opinion regarding the adoption of the new cable colour scheme, please feel free to contact the Hong Kong Electrical Contractors' Association (HKECA) secretariat. Your views and suggestions will be reviewed and reflected to the working group and task groups. Furthermore, HKECA will continue to report the progress on this issue in the forthcoming quarterly Newsletters.

ACKNOWLEDGMENTS

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REFERENCES:

[1] EMSD, "Electricity New", Issue 6, http://www.emsd.gov.hk/emsd/eng/pps/electricity_new_6/index.shtml, 2005.

[2] EMSD, "Electricity New" Issue 3, "Discussion paper"," Electric Cable Colours", http://www.emsd.gov.hk/emsd/eng/pps/electricity_new_3/index.shtml#bm3, 2003.

[3] IEE and BSI, BS7671:2001 Amendment No. 2:AMD14905, March 2004.