

MANAGING THE CHANGE OF CABLE COLOUR CODE IN HONG KONG

Ir Dr KM LEUNG

Chief Electrical and Mechanical Engineer
Electricity Legislation Division
Electrical and Mechanical Services Department
HKSAR Government

Ir. WY HO

Electrical and Mechanical Engineer
Electricity Legislation Division
Electrical and Mechanical Services Department
HKSAR Government

ABSTRACT

With effect from 1 July 2007, cable colour for fixed electrical installations in Hong Kong will be changed from the current red/yellow/blue/black colour to new brown/black/grey/blue colour so as to align with the latest international standard. The change will ensure a steady cable supply into Hong Kong and prevent possible cable price fluctuation. The new colour code will involve the change of black cored cable from neutral to phase and the blue cored cable from phase to neutral, and hence the change may induce a risk of wrong cable connection. This paper will discuss the collaboration between the Government, the trade and the industry in managing the cable colour change with a view to ensuring the safety of trade workers as well as the general public in Hong Kong.

	Phase conductors			Neutral	Earth	
	L1	L2	L3			
Old Colour Code	red	yellow	blue	black	green	yellow
New Colour Code	brown	black	grey	blue	green	yellow

Figure 1 – Old and new cable colour code

Background

2. Since 2002, the majority of European countries including France, Germany and the UK have gradually adopted a set of new cable colour code [Ref.1] for fixed electrical installations^{note1} (i.e. brown/black/grey/blue) as specified by the European Committee for Electrotechnical Standardisation. The existing cable colour code for fixed electrical installations in Hong Kong (i.e. red/yellow/blue/black) is originated from the UK. The change means that our existing system will no longer be in line with the relevant international standards, namely the International Electrotechnical Commission (IEC) standards [Ref. 2] and the new British Standards [Ref. 3].

Formation of Working Group with the Trade

3. With the endorsement of the Electrical Safety Advisory Committee (ESAC)^{note2}, a “Working Group on the Review of Cable Color Code in Hong Kong” (Working Group) was set up in 2003 to study the impacts of the change in cable colour code for fixed electrical installations and to make recommendations on the way forward regarding the cable colour code in Hong Kong. Members of the Working Group include representatives from the utility companies, electrical trade unions, electrical contractor and consultant associations, academic institutions, cable supplier, professional institutions, public bodies, government departments and the Electrical and Mechanical Services Department (EMSD).

Findings of the Working Group

Benefits of the Change

4. It has been the practice of Hong Kong, as an international city, to adopt standards of fixed electrical installations that are in line with the international and national standards. Currently, most electric cables used for fixed electrical installations in Hong Kong are imported from European countries where the new cable colour code has been implemented. Adoption of the new cable colour code for fixed electrical installations in Hong Kong could therefore ensure a stable supply of electric cables, prevent possible cable price fluctuations, and avoid longer delivery time of electric cables likely to be caused by the continued use of less commonly used cables. Such advantages will benefit the electrical trade and the community of Hong Kong.

Consultation with stakeholders

5. After detailed study, the Working Group recommended to ESAC at its meeting on 14 September 2004 that the new cable colour code should be adopted for fixed electrical installations in Hong Kong. The ESAC endorsed the recommendation and a consultation exercise was subsequently carried out in mid-2005 among the electrical trade, construction industry, academics, professional institutions, utility companies, as well as relevant government bureaux/departments and public bodies. All stakeholders support the proposed change to the new cable colour code.

Mitigation of Risk associated with the Change

6. Since the adoption of new cable colour code will involve the change of black cored cable from neutral to phase and the blue cored cable from phase to neutral, wrong connection of these cables may lead to possible short-circuitry and eventually electrical accidents, in particular for a new extension of electrical installation using the new colour system connecting to an existing installation using the old colour system. To overcome the risk associated with the change, the Working Group has conducted a detailed study and prepared installation guidelines for the trade and industry to follow.

Impact to existing Installations

7. The general public will not need to change the existing cables of their fixed electrical installations to the new colour code. Cables of the new colour code will only be used when there is addition or alteration work being carried out on the existing electrical installations. The change therefore will not entail any additional cost implication to the general public. In addition, the change will only affect fixed electrical installations and will exclude any household appliances or electrical equipment that obtains electricity from a socket outlet via a plug.

Implementation Plan

Implementation Schedule

8. The implementation plan of the new cable colour code for fixed electrical installations drawn up by the Working Group was endorsed at the ESAC meeting on 28 September 2005. With effect from 1 July 2007, the new cable colour code will be used for new fixed electrical installations in Hong Kong. To ensure a smooth transition to the new cable colour code, a two-year grace period (from 1 July 2007 to 30 June 2009) will be allowed, during which electric cables of either the new or the "old" colour code can be used for fixed electrical installations. For installations with on-site works commencing on or after 1 July 2009, only cables of the new colour code can be used [Ref. 4].



Figure 2 – Implementation Schedule

Installation Guidelines

9. The risk associated with the change has been carefully evaluated, and installation guidelines have been devised to prevent technical errors and mitigate the identified risks. Noting that so far there is no electrical incidents arising from cable colour change in the U.K. [Ref. 5], the Working Group has made references to their practices and guidelines [Ref. 6] in devising the local installation guidelines. Registered Electrical Workers (REW) and Registered Electrical Contractors (REC) will be provided with the installation guidelines and they are also required to attend relevant training courses. In addition, the Code of Practice for the Electricity (Wiring) Regulations published under the Electricity Ordinance will be amended to reflect the new requirement.



Figure 3 – Yellow warning notice in Installation Guidelines

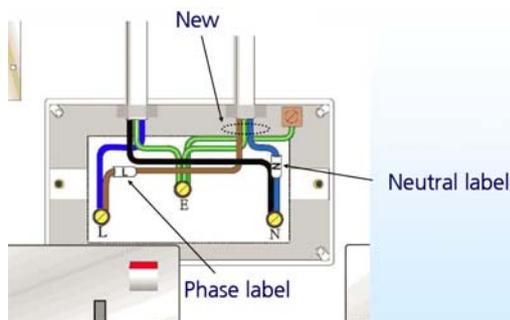


Figure 4 – Identification of a new colour coded single-phase circuit in an existing installation using blue / black colour coded cables

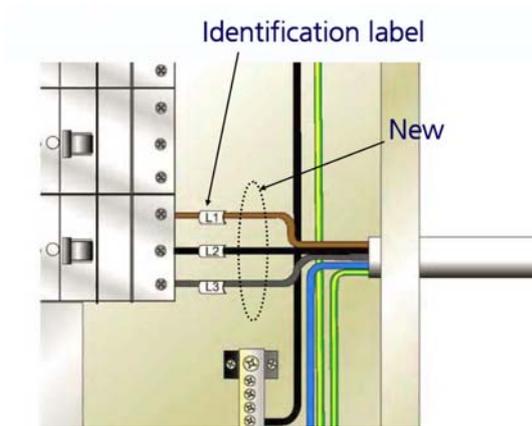


Figure 5 – Identification of a new colour coded 3-phase circuit in an existing distribution board

Training for Trade Workers

10. A training plan has been endorsed by the Working Group, and a series of training packages for REWs and trade workers is being arranged. Basically, there are four types of training, namely, web-based on-line self-learning training, mass scale training seminars, train-the-trainers workshops and distributed small-class training, scheduled for the trade in 2006 and 2007 prior to the implementation of the change.

11. Three mass-scale training sessions have been organized since November 2005. These training sessions provide an interactive platform for frontline electrical workers to discuss practical issues in relation to the change. Train-the-trainer workshops are also in progress. After the training, the participants can further train up their fellow colleagues of their respective companies/organizations. Besides electrical workers in the private sector, regular training sessions have also been arranged for the governmental staff. For the web-based on-line self-learning training, a web corner has been created under the EMSD's homepage (www.emsd.gov.hk). Self-learning training materials have been uploaded to the web-corner. REWs can study the training materials, answer some technical questions and enter their REW nos. for record on line anytime.



Figure 6 – Cable colour change web corner

Publicity

12. From mid 2006 onward, a series of publicity and promotional activities for the adoption of the new cable colour code will be launched. They will target at the trade as well as the general public. The publicity and promotional activities include a dedicated web corner in the EMSD's homepage to provide updated information on implementation of the change, and a holistic list of publicity and promotional materials such as articles in the Electricity News and E&M Safety Newsletters, posters, leaflets, pocket cards, and so on.

Way Forward

13. The implementation of the new cable colour code for fixed electrical installations in European countries and the situation of the supply of electric cables into Hong Kong will be closely monitored by the Working Group, the ESAC and EMSD. EMSD will also continue to collaborate with the electrical trade to implement and review the endorsed plans to ensure electrical safety and a smooth transition throughout the change.

Note:

- 1 A fixed electrical installation means a low or high voltage electrical installation that is fixed to premises but does not include any electrical equipment that obtains electricity from a socket outlet via a plug.
- 2 ESAC is a non-statutory body set up to advise the Government of HKSAR on matters relating to electrical safety.

References:

- [1] CENELEC Harmonization Document HD 308 S2: 2001 – Identification of cores in cables and flexible cords.
- [2] IEC 60446: Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals.
- [3] BS 7671 jointly published by British Standards Institution (BSI) and the Institution of Electrical Engineers (IEE) in the UK. (The IEE and Incorporated Engineers and Engineering Technicians (IIE) came together to form the Institution of Engineering and Technology (IET) in March 2006.)
- [4] Dr. K.M. LEUNG, "A New Challenge to Electrical Trade in Hong Kong – Implementation of Cable Colour Change".

- [5] Mike CLARK, "Experience of Cable Colour Change in United Kingdom".
- [6] New Fixed Wiring Colours – A practical guide, published by National Inspection Council for Electrical Installation Contracting (NICEIC) in the UK. (The NICEIC changed her name to the Electrical Safety Council (ESC) in April 2006.)