



BSI Standards Publication

Guidance on colour coding of optical fibre cables

National foreword

This Published Document is the UK implementation of IEC TR 63194:2019.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/1, Optical fibres and cables.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 539 01011 4

ICS 33.180.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 28 February 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------



TECHNICAL REPORT



Guidance on colour coding of optical fibre cables

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.10

ISBN 978-2-8322-6517-8

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

CONTENTS	2
FOREWORD	5
INTRODUCTION	7
0.1 General	7
0.2 Background in other documents	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	8
4 Rationale	
5 Fibre colour coding	9
5.1 Intent	9
5.2 Historic IEC 60794-2 colour code (for guidance)	9
5.3 Colour coding for fibres 13 through 16	10
5.4 Other coding schemes	10
6 Unit and group coding	10
6.1 Unit coding	10
6.2 Group coding	11
6.3 Coding of tubes in composite cables, IEC 60794-2	11
6.4 Other coding schemes	11
7 Jacket colour coding	11
7.1 General	11
7.2 IEC 60794-2 jacket colour code	12
7.2.1 Historic IEC jacket colour code	12
7.2.2 Current IEC jacket colour code	12
7.3 Jacket coding by striping	13
7.4 Other jacket colour code	13
8 Guidance on the measurement of colour	13
8.1 General	13
8.2 Preparation of specimens for colour measurement	13
8.3 Specification of colour	13
Annex A (informative) German colour code	14
A.1 Fibre colour coding	14
A.2 German counting code for tubes stranded in a layer	14
A.3 Jacket colour coding	15
Annex B (informative) North-American colour code	16
B.1 Fibre colour coding	16
B.2 Unit coding	19
B.3 Jacket colour coding	19
Annex C (informative) Swedish colour code S12	21
C.1 Fibre colour coding S12	21
C.2 Unit coding scheme S12	21
C.2.1 General	21
C.2.2 Sequence for individual fibres within a tube/fibre-unit/bundle and for individual tubes/fibre-units/yarns, etc.	21
C.2.3 Sequence for tubes stranded around a central part	21
C.3 Jacket colour coding	22

Annex D (informative) Swiss colour code	23
D.1 Fibre colour coding	23
D.2 Unit coding	24
D.3 Jacket colour coding	24
Annex E (informative) Chinese colour code	26
E.1 Fibre colour coding	26
E.2 Unit coding	27
E.3 Jacket colour coding	29
Annex F (informative) Japanese colour code	30
F.1 Fibre colour coding	30
F.2 Unit coding by identification strip	31
F.3 Jacket colour coding of multi-fibre indoor cable	32
Annex G (informative) Brazilian colour code	33
G.1 Fibre colour coding	33
G.2 Unit colour coding of buffer tubes	33
G.3 Jacket colour coding	33
Bibliography	34
Figure C.1 – Sequence of tubes by position	22
Figure D.1 – Example of an 18-way stranded loose tube cable	24
Figure D.2 – Example of an outdoor cable, black with orange stripes	25
Figure E.1 – Sequence of tubes by position	27
Figure E.2 – Example of a 24-tube stranded loose tube cable	28
Figure E.3 – Example of T Mark Colour Code	29
Figure F.1 – Colour coding scheme based on optical fibre ribbon	30
Figure F.2 – Identification strip to bundle several optical fibre ribbons	31
Figure F.3 – Overview of high-count indoor cable	32
Table 1 – Colour coding sequence for individual fibres or buffers	10
Table 2 – Colours for individual fibres, buffers, or other elements 13 through 16	10
Table 3 – Colour coding scheme for tubes in hybrid or composite cables	11
Table 4 – Colour coding of cable outer sheaths	12
Table 5 – Colour coding of cable outer sheaths by fibre type	12
Table 6 – Example of centroid values for base colours in Munsell and R*a*L systems	13
Table A.1 – Colour coding sequence for individual fibres	14
Table A.2 – Counting code and colours from the German specification	15
Table B.1 – Individual fibre, unit, and group identification for up to 12 elements in a set	16
Table B.2 – Individual fiber, unit, and group identification for up to 16 elements in a set	18
Table B.3 – Sample identification markings	19
Table B.4 – North American preferred coding scheme for indoor cable jackets	20
Table C.1 – Sequence for individual fibres within a tube/fibre-unit/bundle and for individual tubes/fibre-units/yarns, etc.	21
Table D.1 – Colour coding sequence for individual fibres or buffers in mini-breakout cables	23
Table D.2 – Colour coding for buffered fibres in simplex, duplex or breakout cables	24

Table D.3 – Colour coding and sequence for loose tubes stranded around a central part	24
Table D.4 – Colour coding for sub-cables and outer sheaths of indoor cables	25
Table D.5 – Colour for outer sheaths of outdoor cables	25
Table E.1 – Colour coding for individual fibres	26
Table E.2 – Colour coding for fibre counts up to 24	26
Table E.3 – Colour coding for loose tubes up to 12	27
Table E.4 – Colour coding for loose tubes up to 24	28
Table E.5 – Chinese colour coding scheme for indoor cable jackets	29
Table F.1 – Japanese colour coding for underground optical cable	30
Table F.2 – Japanese colour coding for aerial optical cable	31
Table F.3 – Colour coding of identification strip	31
Table F.4 – Jacket colour coding in high-count indoor cable	32
Table G.1 – Brazilian colour coding for fibre identification	33

Currently in preview, click buy full version

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDANCE ON COLOUR CODING OF OPTICAL FIBRE CABLES**FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance on this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the References cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 63194, which is a Technical Report, has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
86A/1870/DTR	86A/1891A/RVDTR

Full information on the voting for the approval of this Technical Report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

0.1 General

Colour coding of fibres is a useful method to uniquely identify fibres within a cable. For most fibre system architectures, such identification is considered essential.

A number of schemes for fibre identification have evolved in various regions. Attempts to unify the schemes have not yet been successful, as they are embedded in the system architecture.

Jacket colour coding is frequently used for a variety of reasons – most commonly in indoor cables.

Colour coding of both fibres and jackets has been addressed in IEC 60794-2 [5]¹ and in IEC 60794-3-11. The intent of this document is to collect that and other relevant information for application to all cable types defined by IEC 60794 (all parts).

0.2 Background in other documents

IEC 60304 [1] defines the 12 colours currently identified for fibre identification, but does not specify which colour is for which fibre number. IEC 60794-2:2002 [5] does define a colour code, but this has been determined to have been construed as not representing any existing major colour code; furthermore, it was never adopted by any region. Further discussion of both documents is included in the text that follows.

IEC 60794-1-1 [4] contains specific language on the intent of colour coding, and notes that it is "as agreed". This document expands on that intent, offering several specific examples that exist in the various regions. Where the information is available, this document notes the regional specifications from which these examples are taken.

¹ Numbers in square brackets refer to the Bibliography.

GUIDANCE ON COLOUR CODING OF OPTICAL FIBRE CABLES

1 Scope

This document examines the need for and intent of colour coding of optical fibre cables. Further, this document lists the major colour codes in various regions throughout the world. Noting that decades of discussion of a universal recommended colour coding scheme has failed to bring about an agreement, this document does not intend to promote any listed colour code above any other.

This document includes regional information on the colour coding of units when different from the fibre code, and of jackets to convey information about the types of fibres within, or the types of performance expected. It also includes information on colours beyond the basic '12 set out in IEC 60304.

This document is not a normative document, but, rather, a guide to the subject of colour coding of cables.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Rationale

The need to uniquely identify a particular fibre within a cable is a common and rational requirement for cable standards. The determination of which fibre is which – without having to resort to "ringing it out" – is a key criteria in cable system management. A definition of an agreed cable colour coding scheme has been discussed in past years. But it has not been possible to reach agreement within the IEC because several embedded regional coding schemes exist that are part and parcel of the fibre system architecture.

The regional coding schemes are presented in Annexes A to G, as follows:

- Annex A: Germany;
- Annex B: North America;
- Annex C: Sweden;
- Annex D: Switzerland;
- Annex E: China;
- Annex F: Japan;
- Annex G: Brazil.