



BSI Standards Publication

Safety of laser products

Part 5: Manufacturer's checklist for IEC 60825-1

National foreword

This Published Document is the UK implementation of IEC TR 60825-5:2019. It supersedes PD IEC/TR 60825-5:2003, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/76, Optical radiation safety and laser equipment.

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 0 580 91694 6

ICS 31.260

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 30 November 2019.

Amendments/corrigenda issued since publication

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



TECHNICAL REPORT



Safety of laser products – Part 5: Manufacturer's checklist for IEC 60825-1

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.260

ISBN 978-2-8322-7563-4

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

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Identification	7
4.1 Details of the examiner	7
4.2 Laser product	9
5 Test (5) – Measurements for determining classification	10
6 Classification (4) – Classification procedure	12
7 Labelling for laser radiation (7)	15
7.1 General (7.1)	15
7.2 Warnings for invisible and visible laser radiation (7.11 and 7.12)	15
7.3 Class 1 laser products (7.2)	16
7.4 Class 1M laser products (7.2)	16
7.5 Class 1C laser products (7.3)	17
7.6 Class 2 laser products (7.4)	18
7.7 Class 2M products (7.4)	19
7.8 Class 3R laser products (7.5)	20
7.9 Class 3B laser products (7.6)	21
7.10 Class 4 laser products (7.7)	22
7.11 Radiation output and standards information (7.9)	24
7.12 Warning for potential hazard to the skin or anterior parts of the eye (7.13)	25
8 Engineering specification (6)	26
8.1 Protective housing (6.2)	26
8.2 Access panel and safety interlocks (6.2 and 6.3)	27
8.3 Remote interlock connector (6.4)	31
8.4 Manual reset (6.5)	31
8.5 Key Control (6.6)	32
8.6 Laser radiation emission warning (6.7)	33
8.7 Beam stop or attenuator (6.8)	34
8.8 Controls (6.9)	34
8.9 Viewing optics (6.10)	34
8.10 Scanning safeguard (6.11)	35
8.11 Scanning safeguard for Class 1C products (6.12)	35
8.12 "Walk-in" access (6.13)	36
8.13 Environmental considerations (6.14)	36
8.14 Protection against other hazards (6.15)	37
8.15 Power limiting circuits (6.16)	37
9 Other informational requirements (8)	38
9.1 Information for the user (8.1)	38
9.2 Purchasing and servicing information (8.2)	42
Annex A (informative) Attachments – Measurement results	43
Bibliography	44

Figure 5 – Alternative label for Class 1	16
Figure 6 – Alternative label for Class 1M.....	16
Figure 7 – Alternative label for Class 1C.....	17
Figure 8 – Alternative label for Class 2	18
Figure 9 – Alternative label for Class 2M.....	19
Figure 10 – Alternative label for Class 3R	20
Figure 13 – Alternative label for laser aperture	20
Figure 11 – Alternative label for Class 3B	21
Figure 13 – Alternative label for laser aperture	22
Figure 12 – Alternative label for Class 4	22
Figure 13 – Alternative label for laser aperture	23

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF LASER PRODUCTS –**Part 5: Manufacturer's checklist for IEC 60825-1**

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 upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative 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 60825-5, which is a Technical Report, has been prepared by IEC Technical Committee 76: Optical radiation safety and laser equipment.

This third edition cancels and replaces the second edition of IEC TR 60825-5 published in 2003. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) a new class, Class 1C, was introduced;
- b) the measurement condition 2 ("eye loupe" condition) was removed;
- c) for compliance with non-beam hazards (8.14.1) according to relevant product safety standards, a reference was made to corresponding product reports.

The text of this International Standard is based on the following documents:

Draft TR	Report on voting
76/585/DTR	76/608/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 is to be used in conjunction with IEC 60825-1:2014.

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

A list of all parts in the IEC 60825 series, published under the general title *Safety of laser products*, can be found on the IEC website.

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.

A bilingual version of this publication may be issued at a later date.

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

IEC 60825 consists of the following parts, under the general title *Safety of laser products*:

- Part 1: Equipment classification and requirements
- Part 2: Safety of optical fibre communication systems (OFCS)
- Part 3: Guidance for laser displays and shows
- Part 4: Laser guards
- Part 5: Manufacturer's checklist for IEC 60825-1
- Part 8: Guidelines for the safe use of laser beams on humans
- Part 12: Safety of free space optical communication systems used for transmission of information
- Part 13: Measurements for classification of laser products
- Part 14: A user's guide
- Part 17: Safety aspects for use of passive optical components and optical cables in high power optical fibre communication systems

SAFETY OF LASER PRODUCTS –

Part 5: Manufacturer's checklist for IEC 60825-1

1 Scope

This part of IEC 60825, which is a Technical Report, is applicable to laser products as described in IEC 60825-1:2014.

The checklist is intended for use by manufacturers of laser products and their agents to establish that each new or modified design complies with the requirements of IEC 60825-1:2014. The checklist is used in conjunction with IEC 60825-1, as relevant clauses and subclauses in IEC 60825-1 are referred to in the text.

The layout of the checklist is intended only as a guide. Manufacturers and examiners are encouraged to produce their own document, omitting questions and clauses that are not relevant to the types of product under examination, but noting in the appropriate positions the numbers of such clauses stating, for example: "Subclause 9.11.1: Question omitted – not applicable".

The manufacturer is responsible for ensuring that the examiner is a person competent in the inspection and classification of laser products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60825-1:2014, *Safety of laser products – Part 1: Equipment classification and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60825-1 apply.

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>

Throughout this document, the abbreviation N.A. means "not applicable".

4 Identification

4.1 Details of the examiner

Identification of the person responsible for examining and classifying the product under inspection: