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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 7247.2-2024

**Safety of laser products - Part 2: Safety of optical fibre
communication systems (OFCSS)**
(English Translation)

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Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Requirements
4.1 Basic Requirements
4.2 OFCS protective cover
4.3 Optical Cable
4.4 Optical cable connector
4.5 Marking and identification
4.6 Requirements for institutions
4.7 Assessment of hazard level
4.8 Automatic Power Reduction (APR)
4.9 Hazard level requirements for location types
Appendix A (Informative) Scope of application
Appendix B (Informative) Explanation of the meaning of "hazard level"
B.1 Overview
B.2 Category
B.3 Hazard Level
B.4 Comments on 4.7
B.5 Comments on D.5
Appendix C (Informative) Hazard/Safety Analysis Methods
Appendix D (Informative) Application Guidelines for Safe Use of OFCS
D.1 Overview
D.2 Application area
D.3 OFCS power limit
D.4 Hazard level assessment example
D.5 Fault Analysis --- Instructions and Guidance

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 2 of GB/T 7247 Safety of Laser Products. GB/T 7247 has published the following parts.

- Part 1: Equipment classification and requirements;
- Part 2: Safety of optical fiber communication systems (OFCS);
- Part 3: Guidelines for laser shows and performances;
- Part 4: Laser protection screens;
- Part 5: Producer's checklist for GB/T 7247.1;
- Part 9: Maximum permissible exposure to incoherent optical radiation;
- Part 13: Classification and measurement of laser products;
- Part 14: User Guide.

This document replaces GB/T 7247.2-2018 "Safety of Laser Products Part 2: Safety of Optical Fiber Communication Systems (OFCS)" and Compared with GB/T 7247.2-2018, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope of application of this document has been expanded (see Chapter 1);
- b) Changed the definitions of terms. accessible position, automatic power reduction, hazard level 1, hazard level 1M, hazard level 2, hazard level 2M, 3R Class 3 hazard, Class 3B hazard, Class 4 hazard, manufacturers and optical fiber communication systems (see 3.1, 3.2, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.16 and 3.18 of the 2018 edition; 3.1, 3.2, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.16 and 3.18 of the 2018 edition);
- c) Changed the name of the term. Reasonably foreseeable event (see 3.19, 3.19 of the 2018 edition);
- d) Added the requirement to assess the hazard level according to the type of optical cable (see 4.1);
- e) The requirements for restricted positions and controlled positions have been changed (see 4.4.3 and 4.4.4, 4.4.2 and 4.4.3 of the 2018 edition);
- f) The content of marking and identification has been changed (see 4.5.1, 4.6.1 of the 2018 edition);

- g) Added the requirement that when the breakpoint's achievable emission hazard level is level 1 or level 1M, it is allowed to be indicated in the user information (See Table 3);
- h) The determination of hazard level based on condition 2 has been changed (see 4.7.1, 4.8.1 of the 2018 edition);
- i) Added the hazard level identification method for OFCS (see 4.7.2);
- j) The requirements for brief accessible exposure when using APR have been changed (see 4.7.4, 4.8.2 of the 2018 edition).

This document is equivalent to IEC 60825-2:2021 "Safety of Laser Products Part 2: Safety of Optical Fiber Communication Systems (OFCS)".

The following minimal editorial changes were made to this document.

--- Incorporated the revised contents of IEC 60825-2:2021/COR1.2021, and the outer margins of the relevant clauses are marked with Vertical double lines (||) are marked.

Introduction

GB/T 7247 is intended to consist of the following parts.

--- Part 1: Equipment classification and requirements. Due to the wide range of wavelength, energy and pulse characteristics of laser beams, when using laser products, the degree of potential hazard varies greatly, and it is not possible to simply classify laser products using uniform safety limits.

The classification system of the degree of optical radiation hazards of lasers and laser products is evaluated and control measures are determined.

--- Part 2: Safety of optical fiber communication systems (OFCS). Based on the safety of reasonably foreseeable fault conditions [such as cable break, optical fiber the level is divided according to the degree of exposure to optical radiation in the case of loose fiber connectors, etc.

The corresponding hazard level of accessible locations is specified based on the characteristics of the accessible locations to determine the equivalent safety protection measures.

--- Part 3: Guidelines for laser shows and performances. For 3B and 4 lasers used in similar venues such as theatre projections and stage performances.

For optical products, any possible occurrence during laser operation that exceeds the maximum permissible exposure that may cause biological effects and hazards to human eyes and skin.

The MPE analysis is given to clarify the responsibilities of on-site design, installation, operation and performance personnel, as well as risk control and evaluation.

Estimate to reduce risk.

--- Part 4: Laser protection screen. Aims to specify permanent and temporary (such as maintenance) enclosures used to enclose the working area of the laser processing machine.

During maintenance) laser protection screens, as well as technical requirements for dedicated laser protection screens to prevent people around the processing area from being excited Hazards of optical radiation.

--- Part 5: Producer's checklist for GB/T 7247.1. Aims to provide a reference inspection procedure to ensure Verify whether the product meets the classification and requirements of GB/T 7247.1 for equipment, and enhance the enforceability and Operability.

--- Part 8: Guidelines for the safe use of lasers on the human body. Aims to guide how to incorporate the safe use of lasers into medical laser practice.

Practice, establish safety procedures, preventive measures and user control measures, strengthen the establishment of a system for all personnel involved in the use of lasers the necessity of safety framework system and training.

--- Part 9: Maximum permissible exposure to incoherent optical radiation. This is intended to provide the maximum permissible exposure to artificial light sources with a wavelength of 180nm to 3000nm.

MPE limits for controlling optical radiation exposure to eyes and skin.

--- Part 12: Safety of free space optical communication systems (FSOCSs) for information transmission. Aims to give 180nm~ Guidelines for the manufacture of laser products and systems for point-to-point or point-to-multipoint free-space optical data transmission in the 1 mm wavelength range South, as well as safe use requirements to protect people from the potentially hazardous optical radiation generated by FSOCSs.

--- Part 13: Classification measurement of laser products. Aims to give the emission level of laser output energy according to GB/T 7247.1 Measurement and analysis methods give guidance on the classification of laser products.

--- Part 14: User Guide. It puts forward requirements for users to use laser products exceeding Class 1 and Class 2, aiming to help users Product users and their manufacturers understand the general principles of safety management, identify possible hazards, assess the severity of potential hazards, establish and Provide appropriate control measures.

--- Part 17: Safety of passive optical components and cables used in high optical power optical fiber communication systems.

For high optical powers above Class 3B operating in the system, safety precautions for thermal effects, optomechanical effects and related effects are given.