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

GB/T 7247.8-2025

**Safety of laser products - Part 8: Guidelines for the safe use of
lasers on humans**

激光产品的安全 第8部分：作用于人的激光安全使用指南

(English Translation)

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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 8 of GB/T 7247 Safety of Laser Products. GB/T 7247 has been published in 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 8: Guidelines for safe use of lasers on humans;
- Part 9: Maximum permissible exposure to incoherent optical radiation;

--- Part 13: Classification measurement of laser products;

--- Part 14: User Guide.

This document is equivalent to IEC TR60825-8:2022 "Safety of Laser Products Part 8: Guidelines for the safe use of lasers directed at humans" South".

The following minimal editorial changes have been made to this document.

--- Added notes to Scope, 3.9 and 3.10.

Introduction

GB/T 7247 "Laser Product Safety" 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 hazards varies greatly, and it is not possible to simply classify laser products using a unified safety limit.

Evaluate the classification system of optical radiation hazards of devices and laser products and determine control measures.

--- Part 2: Safety of optical fiber communication systems (OFCS). Based on the safety of optical fiber communication systems (OFCS) under reasonably foreseeable fault conditions [such as cable breakage, optical fiber...

The level is divided according to the degree of exposure to optical radiation in the event of loose (disconnected) fiber connectors, etc.

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

--- Part 3: Guide to laser shows and performances. For use in theater projections, stage performances and other similar places 3B and 4 laser any possible occurrence of laser radiation exceeding the maximum permissible exposure that may cause biological effects and hazards to human eyes and skin during laser operation the MPE analysis aims to clarify the responsibilities of on-site design, installation, operation and performance personnel, as well as risk control and evaluation.

Assessment to reduce risk.

--- Part 4: Laser protection screen. Aims to specify the permanent and temporary (such as maintenance and repair) Laser protection screens during the protection period and technical requirements for special laser protection screens to prevent personnel around the processing area from being exposed to laser radiation the hazards of shooting.

--- Part 5: Producer's checklist for GB/T 7247.1. This is intended to provide a reference checklist to ensure that Verify whether the product complies with the classification and

requirements of GB/T 7247.1 for equipment, and enhance the enforceability and Operability.

--- Part 8: Guidelines for safe use of lasers applied to humans. This guide aims to provide guidance on how to incorporate safe use of lasers into medical laser practice.

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

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

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

--- Part 12: Security of free-space optical communication systems (FSOCSs) for information transmission. Aims to give 180nm~ Manufacturing guide for laser products and systems for point-to-point or point-to-multipoint free-space optical data transmission in the 1mm wavelength range South, and safe use requirements to protect people from the potentially dangerous optical radiation produced by FSOCSs.

--- Part 13: Classification measurement of laser products. Aims to give the emission level of laser output energy in accordance with 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 in operation, safety precautions for thermal effects, optomechanical effects and related effects are given.

To prevent and protect other safety problems that may be caused to connectors, etc.

--- Part 18: Transmission system guide. Aims to specify the layout, installation and use requirements of light guide systems, including free space laser transmission systems.

transmission and optical fiber transmission, protective measures implemented to protect personnel from laser radiation hazards, and risk assessment methods.

--- Part 19: Mobile platform laser products. This section aims to provide the following information for laser products mounted on mobile platforms.

The velocity-dependent closest achievable position (VCPHA) is used to assess laser

hazards to avoid overshooting while ensuring safety.

The laser hazard is rigorously evaluated and precautions for applying this condition are given.

--- Part 20: Laser radiation safety requirements for products intended to expose the eyes or face. Intended to consider direct exposure to the face or eye area Possible failure of consumer Class 1 laser products (such as facial or retina/iris recognition, AR/VR/MR glasses/headsets, etc.) the FMEA method focuses on safety and provides requirements based on risk analysis to reduce the risk of product failure.

Failure may occur at any time during the service life, causing potential damage to the eyes and face.

--- Part 21: Automatic Emission Control (AEC). Aims to address the manufacturer's inclusion of Automatic Emission Control (AEC) in their laser products in order to reduce the hazards of light radiation and produce better performance products under unprotected conditions. This part is for AEC the report provides better guidance on performance requirements and the methods that can be used to determine hazard classifications and verify that they operate as intended.

Lasers emit visible or invisible optical radiation, or both. In some cases, this radiation is almost non-divergent.

Parallel beam. This means that the laser can maintain a high irradiance over a considerable distance. Due to the radiation characteristics of the laser, it may be harmful to the eyes.

and skin damage.

Lasers can be hazardous to anyone present during operation. Lack of protective measures, use of faulty laser equipment, beam pointing Errors or inappropriate laser control or settings may result in serious risk of injury (especially to the eyes) or adverse effects.

Laser products that come into contact with the skin are classified as Class 1C laser products. These laser systems contain safety devices to ensure that only Laser radiation can only be emitted when the interlock device detects good contact with the skin, thereby preventing laser radiation above Class 1 AEL from radiating into free space.

Class 1C laser systems are considered eye safe when used properly.

The purpose of this document is to enhance the knowledge and understanding of laser radiation and its effects on the environment by providing guidance on how to establish safety procedures, precautions, and operator controls.

This document is intended to guide the incorporation of laser safety aspects into medical laser practice and does not supersede existing or planned However, if there are no existing or planned national guidelines, the information provided in this document is very useful.