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Replacing GB 7247.1-2012

Safety of Laser Products - Part 1: Equipment Classification and Requirements

激光产品的安全 第1部分：设备分类和要求

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents.

This Document is Part 1 of GB/T 7247 Safety of Laser Products. GB/T 7247 consists of the following parts:

--- Part 1: Equipment classification and requirements;

--- Part 2: Safety of optical fiber communication systems (OFCS);

--- Part 3: Guidance for laser display and shows;

--- Part 5: Manufacturer's checklist for GB/T 7247.1;

--- Part 9: Maximum allowable exposure to incoherent optical radiation;

--- Part 13: Measurements for classification of laser products;

This Document replaces GB 7247.1-2012 Safety of Laser Products – Part 1: Equipment Classification and Requirements. Compared with GB 7247.1-2012, this Document has the major technical changes as follows besides the structural adjustments and editorial modifications:

--- Add the provisions on the applicability of vacuum ultraviolet wavelength, temporary visual impairment caused by laser radiation, and laser products designed for traditional lighting (see Clause 1 of this Edition);

--- Delete the terms and definitions: α minimum value, protective enclosure (see 3.5 and

--- Add the terms and definitions: angle of subtend, Class 1C laser products, contact mode, eye safety (see 3.6, 3.19, 3.27 and 3.37 of this Edition);

--- Change classification to classification rules and change the content (see Clause 4 of this

Edition; Clause 8 of the 2012 Edition);

emission levels and product classification; and change the content (see Clause 5 of this Edition; Clause 9 of the 2012 Edition);

(see Clause 6 of this Edition; Clause 4 of the 2012 Edition);

--- Change the marking content (see Clause 7 of this Edition; Clause 5 of the 2012 Edition);

--- Change the content of user information (see Clause 8 of this Edition; Clause 6 of the This Document equivalently adopts IEC 60825-1:2014 Safety of Laser Products – Part 1: Equipment Classification and Requirements.

1:2014/ISH2:2017 as informative appendix NA "Interpretation of Relevant Parts of IEC 60825".

Please note some contents of this Document may involve patents. The issuing agency of

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this Document shall not assume the responsibility to identify these patents.

This Document was proposed by China Machinery Industry Federation.

This Document shall be under the jurisdiction of National Technical Committee on Optical Radiation Safety and Laser Equipment of Standardization Administration of China (SAC/TC 284).

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The historical editions replaced by this Document are as follows:

Introduction

energy and pulse characteristics of laser beams, the degree of potential hazards varies greatly when used; and laser products cannot be simply classified by unified safety limits. This Document aims to evaluate the classification system for the degree of optical radiation hazards of lasers and laser products and determine control measures.

--- Part 2: Safety of optical fiber communication systems (OFCS). The classification is based

on the degree of exposure to optical radiation under reasonably foreseeable fault conditions [such as optical cable breakage, loose (disconnected) optical fiber connectors, etc.]. It aims to specify the corresponding hazard level that occurs at accessible locations based on its extended and closed transmission characteristics, so as to determine the same safety protection measures.

that are used in similar venues such as theater projection and stage performances, an analysis is given of any possible occurrence during laser operation that exceeds the maximum permissible exposure (MPE) that may cause biological effects and hazards to the human eye and skin, it aims to clarify the responsibilities of on-site design, installation,

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operation and performance personnel, as well as risk control and assessment, so as to reduce risks.

temporary (such as during maintenance) laser protection screens used to enclose the working area of laser processing machines, as well as special laser protection screens; so as to prevent personnel around the processing area from being harmed by laser radiation.

inspection procedure to confirm whether the product complies with the classification and requirements of equipment specified in GB/T 7247.1, and to enhance the enforceability and operability of GB/T 7247.1 in use.

--- Part 8: Guidelines for safe use of lasers on the human body. It aims to provide guidance on how to incorporate safe laser use into medical laser practice, establish safety procedures, preventive measures and user control measures; and strengthen the need to establish a systematic safety framework system and training for all personnel involved in laser use.

MPE limits for controlling optical radiation exposure when artificial light sources of 180 nm to 3,000 nm illuminate human eyes and skin.

Information Transmission. It aims to provide guidelines for the manufacture of laser products and systems for point-to-point or point-to-multipoint free-space optical data transmission in the wavelength range of 180 nm to 1 mm, as well as safe use requirements to protect people from potentially hazardous optical radiation generated by FSOCSs.

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

--- Part 17: Safety of passive optical components and optical cables used in high optical power optical fiber communication systems. It aims to provide safety precautions for thermal effects, optomechanical effects and related effects for high optical powers above Class 3B operating in optical fiber communication systems, so as to prevent other safety issues for connectors, etc.

arrangement, installation, and use of light transmission systems, including free-space laser transmission and fiber-optic transmission, protective measures to be implemented to protect personnel from the hazards of laser radiation, and risk assessment methods.

reachable position (VCPHA) for laser products mounted on mobile platforms based on the platform movement conditions for evaluating laser hazards, so as to avoid overly strict evaluation of laser hazards while ensuring safety, and provides precautions for applying this condition.

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