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

GB/T 16601.3-2017

**Lasers and laser-related equipment -- Test methods for
laser-induced damage threshold -- Part 3: Assurance of laser
power (energy) handing capabilities**

激光器和激光相关设备 激光损伤阈值测试方法 第3部分：激光功率(能量)承受能力确信

(English Translation)

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Foreword

GB/T 16601 "Laser and laser related equipment laser damage threshold test method" is divided into 4 parts.

- Part 1. Definitions and General Rules;
- Part 2. Threshold Determination;
- Part 3. Confidence in laser power (energy) tolerance;
- Part 4. Inspection, detection and measurement.

This part is Part 3 of GB/T 16601.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This section uses the redrafted method to modify the use of ISO 21254-3:2011 "laser and laser related equipment laser damage threshold test Method Part 3. Laser Power (Energy)

Capability Confidence." the technical differences between ISO 21254-3:2011 and this part are as follows.

--- On the normative reference documents, this section made adjustments with technical differences to adapt to China's technical conditions, adjust the situation the focus is reflected in Chapter 2, "Normative References," and the specific adjustments are as follows.

- Replaced ISO 10110-7 with non-equivalent international standard GB/T 1185;
 - Replaced ISO 21254-1:2011 with GB/T 16601.1-2017 modified to adopt international standards;
 - Added reference to GB/T 16601.4-2017 (ISO/T R21254-4:2011, MOD) (see Chapter 7).
- Added the term "hexagonal close packing arrangement" (see 3.10).

Introduction

This section describes two verification methods that verify the power density (energy density) withstand capability of coated and uncoated optical components.

These two methods give consistent measurement results and can therefore be used for acceptance tests or comparisons of test results in different test labs.

Both methods apply to all combinations of laser wavelength and pulse width. However, unless the same wavelength and pulse width are used for measurement Degrees, otherwise the comparison of laser damage threshold data can be misleading.

Laser and laser related equipment laser damage threshold Test methods Part 3. Laser power (Energy) capacity assurance Warnings - Estimation of damage data may overestimate the laser damage threshold. Test toxic materials (such as ZnSe, GaAs, CdTe, ThF4 sulfide, Be, Cr, Ni) may cause serious health hazards. For details, see the attachment in GB/T 16601.1-2017 Record A.

1 Scope

This part of GB/T 16601 specifies the ability of the surface of the two verification optical components to withstand the laser power density (energy density).

method.

The first method provides a rigorous test method that satisfies specified confidence requirements in the case of known potential defects.

The second method provides a simple and therefore economical test method and empirically deduces the results of the test.

This section applies to the optical power density of the surface of the laser (energy density) to be confident.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 1185 Surface defects of optical components (GB/T 1185-2006, ISO 10110-7:1996, NEQ) GB/T 16601.1-2017 Laser and laser-related equipment laser damage threshold test method Part 1. Definitions and general rules (ISO 21254-1:2011, MOD) GB/T 16601.4-2017 Laser and laser-related equipment Laser damage threshold test method Part 4. Inspection, detection and Measurement (ISO/T R21254-4:2011, MOD)

3 Terms and Definitions

The terms and definitions defined in GB/T 1185 and GB/T 16601.1-2017 apply to this document.

Confident horizontal assurancelevel the energy density/power density or line power density of the laser radiation incident on the surface of the test optical element.

Confident area assurancearea A_{ϕ} the value of $H(x,y)$ is greater than or equal to the area of the confidence level ϕ .

Confidencelevel confidence the probability of successful completion of a test.