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

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**Photobiological safety of non-coherent light products - Part 1:
General requirements
(English Translation)**

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1 Scope

This document general requirements for the photobiological safety assessment, hazard types, emission limits, risk level classification methods, labeling and safety control measures of non-coherent light products.

This document applies to non-coherent light products with emission wavelengths between 200 nm~3000 nm, including various lamps and lamp systems, intentional viewing and unintentional viewing products, LED light-emitting devices, etc.

It also applies to non-coherent light products specified in GB/T 7247.1 that have similar functions to traditional light sources but are excited by lasers, such as laser projectors, automotive laser lighting, and other laser-excited broadband light sources. It does not apply to general laser products specified in GB/T 7247.1.

NOTE 1: The main contents of this document are also applicable to the assessment of risks from other sources of optical radiation that are not electrically generated, such as incandescent materials and gas-fired space heaters.

NOTE 2: Light radiation may not be the primary function of the product; for example, the light source in a refrigerator.

NOTE 3: Non-coherent light products are also commonly referred to as light sources, optical radiation sources, or non-coherent light sources. They are primarily distinguished from laser products that emit a single wavelength (very narrow bandwidth) in a directional manner and have distinct coherent characteristics.

This document does not specify safety requirements for specific application products.

General lighting (GLS) lamps and lamp systems, ultraviolet products, and projectors are all included in the scope of this document. Optical radiation safety standards developed for these specific application products shall provide specific risk group assessment criteria, risk levels, and safety control measures for each product.

Risk Classification facilitates risk assessment of products and helps determine the control measures required by users. Its purpose is to ensure that products on the market are as safe as possible. Products classified as Risk Category 3 are generally not suitable for general consumer use.

The following situations may also pose optical radiation safety issues but are outside the scope of this document.

- Distracting light;
- Glare;
- Flash blindness;

- Temporary visual impairment;
 - Light flickering;
 - Abnormal photosensitivity;
 - Exposure to photosensitizing chemicals or medications;
 - Children under three years old, or those with aphakia or artificial lenses;
 - Circadian rhythm disruption caused by light radiation;
 - Abnormal personal behavior, such as intentionally staring at a bright light source;
- and abnormal behavior caused by alcohol or drugs.

This document applies to non-coherent light products intended for use by normal adults with healthy eyes and skin. Furthermore, the optical radiation hazard types and corresponding emission limits used in this document only consider short-term use.

Risks arising from long-term use, such as skin cancer caused by long-term ultraviolet radiation exposure, are not considered in this document.

This document does not apply to electronic tanning lamps, ophthalmic instruments, or other devices for special medical applications. The safety requirements for these products are covered by other appropriate standards.

NOTE: In this document, adults refer to people who have received legally compulsory education and have a certain level of knowledge, and are generally not less than 18 years old.

2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 7247.1, Safety of laser products -- Part 1. Equipment classification and requirements (GB/T 7247.1-2012, IEC 60825-1:2007, IDT)

GB/T 30117.3-2019, Photobiological safety of lamps and lamp systems -- Part 3.

Guidelines for the safe use of intense pulsed light source equipment on humans (IEC TR 62471-3:2015, IDT)

GB/T 30117.4-2023, Photobiological safety of lamps and lamp systems -- Part 4.

Measuring methods (IEC TR 62471-4:2022, MOD)

GB/T 30117.5-2019, Photobiological safety of lamps and lamp systems -- Part 5.

Image projectors (IEC 62471-5:2015, IDT)

GB/T 34034-2017, Requirements of optical radiation safety for LED general lighting service

IEC 60050 (all parts), International electrotechnical vocabulary

NOTE: GB/T 2900 (all parts) Electrotechnical terminology [IEC 60050 (all parts)]

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 30117.3-2019, GB/T 30117.4-2023, GB/T 30117.5-2019, GB/T 34034-2017, IEC 60050 (all parts) as well as the followings apply.

3.1

accessible emission; AE

The radiation level measured at a certain distance from the product and under corresponding measurement conditions as specified in this document.

NOTE: The accessible emission is compared with the accessible emission limit (3.2) to determine the risk level of the product.

3.2

accessible emission limit; AEL

The maximum accessible emission (3.1) value permitted within a specific risk level.

3.3

action spectrum

A function used to express the relative spectral effectiveness of optical radiation for a specific effect on the eye or skin.

NOTE: Action spectrum is dimensionless (unit) and is normalized to its maximum value unless otherwise stated.

3.4

angle of acceptance

The field of view (3.12) plane (full) angle that limits the detector's ability to receive light radiation.

Unit. rad

Where,

H - Radiant exposure, in joules per square meter ($\text{J}\cdot\text{m}^{-2}$);

dQ - The radiant energy projected onto the surface containing the given point;