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

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**Technical specification of lighting environment for plant
factories with electric lighting**

人工光型植物工厂光环境技术规范

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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.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed by China Light Industry Federation.

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Technical specification for light environment of artificial light plant factory

1 Scope

This document specifies the general requirements for the light environment of artificial light plant factories, the technical requirements for photon irradiance and power density, and describes the requirements for The corresponding verification method.

This document is applicable to the design and setting of the light environment of the plant cultivation area in the production-type artificial light plant factory, for teaching or demonstration purposes.

Artificial light plant factories or planters shall be implemented accordingly.

This document is not applicable to the light environment used to provide visual lighting in artificial light plant factories.

2 Normative references

GB 17625.1

GB/T 44941

3 Terms and definitions

The terms and definitions defined in GB/T 44941 and the following apply to this document.

3.1

Plant factories where light radiation is wholly or partly based on artificial light sources.

3.2 Lighting environment

< Plants> A collection of physical conditions of light in a scene that may affect plant growth and development.

3.3 $E_{p,av}$

The average value of photon irradiance at each point on a given plane.

Note. Mean photon irradiance is used to define the average photon irradiance over a specific wavelength range, such as the photobiologically effective mean photon irradiance (wavelength range 280nm~800nm), photosynthetically active average photon irradiance

(wavelength range 400nm~700nm), ultraviolet average photon irradiance (wavelength range 280nm~400nm), blue light average photon irradiance (wavelength range 400nm~500nm), green light average photon irradiance (wavelength range 500nm~600nm), red light average photon irradiance (wavelength range 600nm~700nm), far infrared light average photon irradiance (wavelength range 700nm~800nm).

3.4

The ratio of the minimum photon irradiance to the average photon irradiance on a given plane.

Note 1. Photon irradiance uniformity is a dimensionless quantity with a maximum value of 1.

Note 2. Photon irradiance uniformity is used to define the photon irradiance uniformity for a specific wavelength range. For the specific wavelength range, see the note in 3.3.