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

GB/T 5959.12-2020

**Safety in installations for electroheating and electromagnetic
processing - Part 12: Particular requirements for infrared
electroheating**

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Foreword

GB/T 5959 has the following 14 parts.

--- GB/T 5959.1 Safety of electrothermal and electromagnetic treatment devices Part 1.

General requirements;

--- GB 5959.2 Safety of electric heating devices Part 2. Special requirements for electric arc furnace devices;

--- GB 5959.3 Safety of electric heating devices Part 3. Special for induction and conductive heating devices and induction melting devices

Claim;

--- GB 5959.4 Safety of electric heating devices Part 4. Special requirements for resistance heating devices;

--- GB/T 5959.41 Safety of electric heating devices Part 41. Particular requirements for resistance heating equipment Glass heating and melting

Chemical device;

--- GB 5959.5 Safety of electric heating devices Part 5. Special requirements for plasma devices;

--- GB 5959.6 Safety of electric heating devices Part 6. Safety specifications for industrial microwave heating equipment;

--- GB 5959.7 Safety of electric heating devices Part 7. Special requirements for devices with electron guns;

--- GB 5959.8 Safety of electrothermal installations Part 8. Special requirements for electros slag remelting furnaces;

--- GB 5959.9 Safety of electric heating devices Part 9. Special requirements for

high-frequency dielectric heating devices;

--- GB/T 5959.10 Safety of electric heating devices Part 10. Particular requirements for resistive heating systems for industrial and commercial use;

--- GB/T 5959.11 Safety of electric heating devices Part 11. Special requirements for liquid metal electromagnetic force acting devices;

--- GB/T 5959.12 Safety of electric heating and electromagnetic treatment devices Part 12. Special requirements for infrared electric heating devices;

--- GB 5959.13 Safety of electric heating devices Part 13. Particular requirements for electric heating devices with explosive atmosphere.

This part is part 12 of GB/T 5959.

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

The translation method used in this part is equivalent to the use of IEC 60519-12:2016 "Safety of Electrothermal and Electromagnetic Processing Devices Part 12. For Infrared "Special requirements for electric heating devices".

The following editorial changes have been made in this section.

--- Because the number 3.2 in IEC 60519-12:2016 is repeated, this part corrects the number in Chapter 3.

This part is proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Industrial Electric Heating Equipment Standardization Technical Committee (SAC/TC121).

This section was drafted by: Xi'an Electric Furnace Research Institute Co., Ltd., National Infrared and Industrial Electric Heating Product Quality Supervision and Inspection Center, Dalian Li

University of Technology, Chengdu Xingminjiang Electric Heating Appliance Co., Ltd., Hangzhou Wuyuan Technology Industrial Co., Ltd., Shenzhen Zhuoxian Industrial Co., Ltd.,

Dongguan Hongyang Thermal Energy Technology Co., Ltd., Jiangsu Datang Electric Manufacturing Co., Ltd., Xuchang Infrared Technology Research Institute Co., Ltd., Xiangli Electric

Products (Shenzhen) Co., Ltd., Nanjing Danlian Technology Co., Ltd., Huludao Shengtai Special Light Source Co., Ltd., National Electric Furnace Quality Supervision

Inspection Center, Xi'an China Metallurgical New Materials Co., Ltd.

Introduction

The scope of this part is the different types and designs of infrared equipment used by the industry for many different purposes. In addition to some special features described in Chapter 1

Exception, this section applies to all types of industrial infrared equipment.

Because many different types of electric heating equipment emit dangerous levels of infrared radiation, GB/T 5959.1-2019 provides

Based on all general requirements for optical radiation, this section provides specific requirements and practical methods for infrared equipment.

Refer to GB 5959.4-2008 [1], this section contains all types of industrial electric heating equipment not given in GB/T 5959.1-2019

Infrared radiation hazard.

The discussion of infrared radiation in this section is very detailed. As far as the industry is concerned, there is no separate useful resource for simple, general, and user

Convenient and cost-effective measurement method.

Other causes of infrared radiation risk are.

- Electric heating equipment manufacturers generally do not hire optical radiation measurement experts, nor are they equipped with optical laboratories for accurate measurements;
 - Operators engaged in necessary measurement tasks often have limited experience and can only appreciate simple and easy-to-use guidelines;
 - The scope of GB/T 20145-2006 is limited to luminaires, but the standard can be used for other light sources, so its core content applies, such as
- If possible, it can be simplified and used in this section;
- This section adds a diagram of the classification specified in GB/T 20145-2006 and is included in GB/T 5959.1-2019;
 - Related documents of American National Standards Institute/North American Society of Lighting Engineering, ANSI/IESNARP27 series [6-8], are based on

Recommended by ICNIRP [5]. They do not provide additional material regarding this section and its reference documents.

Safety of electrothermal and electromagnetic treatment devices

Part 12. Special requirements for infrared electric heating devices

1.1 Scope

This article of GB/T 5959.1-2019 is replaced by the following.

instead.

This part of GB/T 5959 stipulates that infrared radiation usually generated by infrared emitters significantly exceeds thermal convection and heat transfer within the device

Guide, as a heat transfer method, the safety requirements of industrial electric heating equipment and devices that transfer energy to the material being processed. A further limitation of the scope is

The maximum spectral radiation wavelength in air or vacuum is above 780nm, and a wide-band continuous spectrum is emitted by such as thermal radiation or high-voltage arc Infrared transmitter.

GB/T 5959.1-2019 defines infrared as optical radiation with a frequency range between approximately 400THz and 300GHz. In a vacuum

The corresponding wavelength range in 780nm ~ 10μm. Industrial infrared heating usually uses infrared with a rated temperature of 500 degrees C ~ 3000 degrees C

Source, the radiation emitted from these infrared sources is mainly in the wavelength range of 780nm ~ 10μm.

Since the emission wavelength of a large number of thermal emitters may be lower than 780nm or higher than 3000nm, this section also considers the visible

Problems with the safety of light and radiation with wavelengths exceeding 3000 nm.

This section does not apply to.

--- Infrared device with laser or light-emitting diode (LED) as the main radiation source --- GB/T 20145-2006 and

IEC 60825-1..2014 [2] applies to such devices;

--- Utilities appliances;

--- Laboratory electrical appliances --- IEC 61010-1..2010 [3] applies to such appliances;

--- Resistance heating bare wire, electric heating tube or electric heating rod as the heating element, and infrared radiation is not the dominant vice in the expected application

The function of the electric heating device is specified by GB 5959.4-2008 [1];

--- Infrared heating equipment with a nominal total power of less than 250W for all infrared emitters;

--- Handheld infrared device.

Industrial infrared electric heating equipment within the scope of this part usually uses the