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

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Excimer ultraviolet radiation sources - Safety specifications

准分子紫外辐射源 安全规范

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4 Safety Requirements and Test Methods

4.1 General Requirements The design and manufacture of radiation sources should ensure that they do not cause harm to users and the environment under normal use. By performing all the tests specified in this document, and using the radiation source with the control device of the specified type provided by the manufacturer or distributor, the radiation source can be effectively controlled. To check for compliance. Lighting design information is provided in Appendix B.

4.2 Marking

4.2.1 Marking of radiation sources Radiation sources should bear the following clear and durable markings. Radiation sources that are difficult to mark may not be marked, but at least... The following clear and firmly attached markings should be present on the sales packaging or label.

- a) Source identification (trademark, name of producer or distributor);
- b) Rated power (marked in "W" or "watt") or other markings that distinguish this radiation source;
- c) Product model;
- d) Safety warning signs (e.g., prevent ultraviolet radiation from harming the human body, harmful ozone generation, high voltage danger).

4.2.2 Markings on packaging, instructions or specifications In addition to the above-mentioned markings, all detailed instructions necessary to ensure correct installation and use should be included in the instruction manual provided with the radiation source. Provided on the packaging or specifications sheet. For example.

- a) Manufacturing date (year, quarter, or month);
- b) Risk groups for photochemical ultraviolet radiation hazards, and the relationship between irradiance and measurement distance;

- c) Instructive protection "Warning. Turn off the UV lamp before opening or moving the shielding enclosure" and "Warning. Use UV lamp during maintenance" Protective equipment to protect eyes and skin, or similar content; in addition, ultraviolet radiation warning signs should be displayed (see Figure 1), specifically... Warning messages should comply with GB/T 30117.6;
- d) Work instructions for use by non-professional operators (if applicable);
- e) Compatible control device model;
- f) Radiation source spectrum;
- g) Ozone concentration/ozone generation rate (in "mg/h" or "g/h");
- h) Guidance safeguards such as "Warning. Harmful ozone may be generated from this source" and "Warning. Use ozone protection during maintenance", or similar Similar content; in addition, ozone warning signs should also be displayed (see Figure 2).

4.3 Electrical Safety

4.3.1 Insulation Resistance The insulation resistance between the electrical connection of the radiation source and the insulating part should not be less than 2MΩ. Check whether the insulation resistance meets the requirements using the following methods.

a) Wrap conductive foil around the insulating part of the radiation source. Wrap the conductive foil carefully to ensure that it does not flashover to the edges of the insulating part. Electricity should be used to prevent the conductive foil from connecting to any electrode of the radiation source. Furthermore, if the structure of the radiation source makes it impossible to wrap the conductive foil, [further precautions should be taken]. In this case, there is no need to wrap the conductive foil; the insulation resistance measurement should be performed on any insulating part. Note

1. The conductive foil can be copper foil or aluminum foil.

b) Before placing the radiation source treated in step

a) into the humidity test chamber, it should be placed in an environment between $t^{\circ}\text{C}$ and $(t + 4)^{\circ}\text{C}$.

c) The radiation source should be subjected to 48 hours of humidity treatment in a humidity test chamber, with the relative humidity inside the chamber between 91% and 95%. The air temperature t inside the hot chamber should be any convenient value between 20°C and 30°C , and the temperature variation should be maintained within 1°C . Within. Note

2. In order to achieve the specified conditions in the heat and humidity test chamber, it is necessary to ensure that the air is continuously circulating inside the chamber, and an insulation test chamber is usually used.

d) Remove the radiation source from the humid chamber and remove any visible water droplets (if any) with blotting paper.

e) Insulation resistance should be measured immediately after the moisture test. The conductive foil should be measured by applying a 500V DC current for 1 minute. Insulation resistance at the electrical connection point with the radiation source. See Figures 3a) and 3b for schematic diagrams of the insulation resistance measurement locations.

a) Radiation source for type a

b) Radiation source for type b

4.3.2 Electrical strength There should be no electrical connection between the radiation source and its insulating parts (such as the housing or insulation devices) during the application of the test voltage. Flashover or breakdown. Check if the requirements are met using the following methods.

---After the insulation resistance test, immediately test the same location mentioned in 4.3.1.

---Measure by applying a 1-minute, 50Hz or 60Hz sine wave test voltage of $2U_{1000V}$. U refers to... Operating voltage. Initially, the applied voltage should not exceed half of the specified test voltage; then it should rapidly rise to the specified value. (The following appears to be an error.) Glow discharge that does not cause a drop in test voltage can be ignored.

4.4 Heat resistance and flame retardancy

4.4.1 General Requirements The insulating material of the radiation source should have sufficient heat resistance and flame retardancy. Conformity is checked according to

4.4.2 and 4.4.3.

4.4.2 Heat resistance Insulating materials for radiation sources should be pretreated in a heating chamber for 168 hours at the maximum operating temperature declared by the manufacturer or distributor. The maximum temperature shall be tested at the specified measurement point and the actual test temperature shall be $\pm 5\%$ of the declared maximum temperature. The test method shall be in accordance with the appendix. According to Regulation C, during testing, connectors such as wire terminals and cooling fans can be removed or placed outside the heating room. After pretreatment, the sample should not undergo any changes that threaten its future safety, and there should be no visible mechanical contact. The mouth and electrical interfaces are loose, cracked, swollen and shrinking. The pass/fail status is inspected visually. After the test, the insulation resistance and electrical strength of the radiation source should still meet the requirements of

4.3.1 and 4.3.2. Require.

4.4.3 Flame retardant The insulating material of the radiation source should have sufficient flame retardancy. Ceramic insulating materials are exempt from the following tests. It is advisable to use insulating material samples for testing and check whether they meet the requirements using the following methods.

---This part should be tested using a 650°C nickel-chromium glow wire. The testing instrument should conform to GB/T 5169.10. Require.

---The sample to be tested should be placed vertically on the holder and pressed against the hot wire with a force of 1N, preferably from the top edge of the sample. At a distance of 15mm or more. The portion of the hot wire extending into the sample should be within 7mm. After 30 seconds, remove the tip of the hot wire. Separate from the sample.

---After removing the hot wire, any flames or sparks must be extinguished within 30 seconds; any burning or molten droplets should not be allowed to escape. Five layers of silk paper will ignite; the five layers of silk paper should be laid flat. 200mm ± 5mm below the point of action of the sample.

---Before the test begins, the temperature of the hot wire and the heating current should be kept constant for 1 minute. During this time, ensure that heat radiation does not affect the sample. It has an impact.

---The temperature at the tip of the glow wire should be measured using a thermocouple with sheathed wire; the thermocouple with sheathed wire should conform to GB/T 5169.10 The prescribed construction and calibration.

Note. Take precautions to protect the health of testing personnel and prevent them from being exposed to the following threats.

---Explosions and fires;

---Inhalation of fumes and/or toxic substances;

---Toxic residues.

4.6 Radiation and related safety

4.6.1 Photobiological Safety When a radiation source is operating in a manned environment, the harmful effects of photochemical ultraviolet radiation on the skin and eyes (200nm~400nm) are measured at a distance of The risk group for. 200mm should not exceed the risk group declared by the manufacturer or distributor in the instruction manual. Conformity is inspected according to IEC 62471 (all parts). This clause does not apply to medical phototherapy radiation sources.

4.6.2 Ozone Generation When the radiation source is in operation, under human conditions, the permissible ozone concentration in the indoor air environment over 1 hour is 0.1 mg/m³. The conformity shall be checked by measurement in accordance with section