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

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**Safety code for painting -- Safety for electrostatic spray
painting process
(English Translation)**

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1 Scope

This standard specifies the safety requirements for electrostatic spray painting process and equipment, paint storage and transportation, operation and maintenance, etc.

This standard is applicable to the design, manufacture, use, supervision and management of electrostatic spray painting process and equipment using combustible or combustible paint. The electrostatic spraying process using other flammable and explosive materials or water-based paint can be implemented with reference to this standard.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard;

however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB 3836.15-2000 Electrical apparatus for explosive gas atmospheres - Part

15: Electrical installations in hazardous areas (other than mines) (eqv IEC

60079-14:1996)

GB 4385 Technical requirements for antistatic footwear and conductive footwear (GB 4385-1995 neq ISO 8782-1: 1989)

GB 6514-1995 Safety code for painting - Safety, ventilation and air clean-up for painting process

GB 7691-2003 Safety code for painting - Safety management general rule

GB 8978 Integrated wastewater discharge standard

GB 12158 General guideline for preventing electrostatic accidents

GB/T 14441-1993 Safety code for painting - Terminology

GB 50058 Electrical installations design code for explosive atmospheres and fire hazard

GBJ 140 Code for design of extinguisher distribution in buildings

3 Terms and definitions

The terms specified in GB/T 14441-1993 as well as the following terms and definitions apply to this standard.

3.1

Electrostatic spray painting

Under the action of a high-voltage electric field, the spray painting method where the sprayed solvent-based paint drops are charged with a negative charge by the principle of corona discharge, then further atomized, adsorbed on the positively charged grounded substrate, finally discharged and attached to the substrate.

3.2

Working area for electrostatic spray painting

Painted area where electrostatic spray painting is performed.

3.3

Electrostatic atomizing head

Pneumatic, electric, hydraulic, ultrasonic or other forms of equipment with high-voltage electrostatic protection measures which, at the aid of centrifugal force or compressed air and electrostatic repulsion, electrostatically charge and fully atomize the paint, such as: electrostatic spray gun, spinning cup, throwing plate, fog bin, etc.

3.4

Booth for electrostatic spray painting

A completely enclosed or semi-enclosed room or enclosure structure with good mechanical

ventilation and lighting equipment, specially used for electrostatic spray painting. The indoor airflow organization can prevent paint mist and solvent vapor from escaping outward and make it concentrated and safely introduced into the exhaust system.

- d) There shall be explosion-proof seal when the tow line is lead into the junction box, accessory box or enclosure;
- e) It shall comply with the national provisions on electrical equipment in explosive hazardous areas.

4.5 Electrostatic painting equipment

Electrostatic painting equipment shall comply with the requirements specified in 9.3 of GB 3836.15-2000 and GB 50058; it shall only be installed and used in electrostatic painting areas when it meets the requirements of chapter 6 and chapter 7 of this standard.

4.6.1 The fire protection requirements of the electrostatic spray painting area

shall be implemented in accordance with the provisions of clause 5.4 and chapter 8 of GB 6514-1995.

4.6.2 The electrostatic spray booth shall be equipped with a combustible gas concentration and fire alarm device (explosion-proof detector), which shall be interlocked with automatic feeding stop, power cut off device, automatic fire extinguishing device, etc.

4.6.3 Automatic fire control valves shall be installed in the ventilation ducts which connect the electrostatic spray booth; the effective working conditions of the valves shall be maintained.

4.6.4 The building where the electrostatic painting area is located shall be equipped with fire extinguishing equipment according to the requirements specified in GBJ 140.

4.6.5 Automatic electrostatic painting equipment using combustible or

combustible paint shall be protected by a flame detection device. When a fire occurs, the flame detection device can react to the flame within 0.5 s and complete the following tasks:

- a) Turn on the local alarm near the electrostatic painting area and the alarm system that may be installed on the electrostatic spray painting equipment;
- b) Close the feeding system;
- c) Terminate all spraying operations;
- d) Stop all conveying equipment entering and leaving the electrostatic spray painting area;
- e) Cut off the power supply of the high voltage devices in the electrostatic

5.5 The wastewater produced in the electrostatic spray painting process shall be purified

and treated to meet the requirements of GB 8978.

6.1 Approved equipment

The electrostatic atomizing head is an electrostatic painting equipment fixed by mechanical clamping. Both the equipment and the equipment for eliminating static electricity shall comply with the requirements of chapter 6 of GB 7691-

2003, meanwhile it shall have the in-factory acceptance certificate.

6.2.1 The electrostatic spray painting area allows the installation of high-voltage

grids, electrodes, electrostatic atomizing heads and connecting cables.

6.2.2 Transformers, high-voltage power supplies, control devices and other

electrical components (such as plugs, etc.) shall be installed outside the electrostatic spray painting area.

6.2.3 Electrical equipment and ignition sources shall comply with the provisions of 5.4 of GB 6514-1995.

6.3 High-voltage electrostatic generator

The requirements of the high-voltage electrostatic generator shall be implemented in accordance with the provisions of 8.3 of GB 6514-1995.

6.4.1 Electrodes and electrostatic atomizing heads or the electrodes and

electrostatic atomizing heads on the robot shall be firmly installed on the base, support or moving device, meanwhile it shall have reliable ground insulation, its grounding resistance shall be greater than 1×10^{10} ohm.

6.4.2 When the fixed element is a thin metal wire, the metal wire shall be tightened at any time; it shall not use knotted, twisted or even hardened metal wire.

6.5 High-voltage cable

6.5.1

High-voltage cables shall be protected by armored cables or pipes to prevent mechanical damage or exposure to corrosive media.

6.5.2

High-voltage cables shall comply with the requirements of 8.4.5 in GB 6514-1995.