

ICS 13.260
CCS C 66



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

GB 12158-2024

General requirements for preventing electrostatic accidents

防止静电事故通用要求

Issued on: December 31, 2024

Implemented on: January 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1	Scope
2	Normative References
3	Terms and Definitions
4	General Requirements...
4.1	Discharge and Ignition
4.2	Basic Anti-electrostatic Measures...
4.2.2	Accelerate electrostatic dissipation
4.2.3	Supplementary measures
5	Electrostatic Management Measures
5.1	General Requirements...
5.2	Organizational Management...
5.3	Documents...
5.4	Personnel...
5.5	Identification...
5.6	Inspection...
5.7	Signs and Records...
6	Area of Electrostatic Hazards
6.1	Division of Area of Electrostatic Hazards...
6.2	Electrostatic Discharge Ignition Limit
6.3	Charged Object Safety Management Limit
7	Solid Material Protection Measures
8	Liquid Material Protection Measures
8.1	Filling and Sampling
8.2	Stirring, Mixing and Blending...
8.3	Purging and Cleaning...
8.4	Anti-electrostatic Operation Requirements for Tank Trucks...
8.5	Anti-electrostatic Operation Requirements for Oil Tankers and Ships...
8.6	Anti-electrostatic Requirements for Aircraft Refueling...
8.7	Anti-electrostatic Requirements for Oil Drum Refueling...
8.8	Anti-electrostatic Requirements for Pipelines...
9	Anti-electrostatic Measures for Gaseous and Powdery Materials...
10	Human Body Electrostatic Protection Measures...

20 Zone

1 Scope

China's mandatory general requirements for preventing electrostatic accidents. Static electricity is generated wherever two materials separate - liquid flowing through a pipe, powder falling into a hopper, film unwinding, a person getting out of a seat - and in an atmosphere containing flammable vapour or combustible dust the spark that follows is an ignition source that needs no fault and leaves no trace. The measures are all about giving the charge somewhere to go before it accumulates: bonding and earthing everything conductive, controlling the flow rate of liquids into tanks, using conductive or dissipative materials for floors, footwear, clothing, containers and hoses, humidifying where that is practical, and ionising where it is not. The standard sets out those requirements generally, and it is the document the sector-specific rules for fuel handling, powder processing, printing and electronics assembly are built on.

This document specifies the general requirements for electrostatic protection, electrostatic management measures, requirements for area of electrostatic hazards, electrostatic protection measures for solid, liquid, gaseous and powdery materials, human body electrostatic protection measures, as well as analysis and determination of electrostatic accidents to prevent combustion and explosion caused by electrostatic discharge. This document is applicable to the design and management of area of electrostatic hazards. NOTE. protection against other electrostatic hazards (for example, electrostatic shock) may take this as a reference. This document does not apply to the prevention of electrostatic hazards of explosives and powders, electric initiating explosive devices, and fireworks.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 3684 Conveyor Belts - Electrical Conductivity - Specification and Test Method

GB/T 3836.26-2019 Explosive Atmospheres - Part

26.Electrostatic Hazards - Guidance

GB 6950 Safe Rest Conductivity of Light Fuel Oil

GB 8965.1 Protective Clothing - Flame Retardant Protective Clothing

GB/T 9572 Rubber and Plastics Hoses and Hose Assemblies - Determination of Electrical Resistance and Conductivity

GB 12014 Protective Clothing - Static Protective Clothing

GB/T 15463 Electrostatic Safety Terminology

GB 21148 Foot Protection - Safety Footwear

GB/T 22845 Anti-electrostatic Glove

GB 50058 Code for Design of Electrical Installations in Explosive Atmospheres

GB/T 50493 Standard for Design of Combustible Gas and Toxic Gas Detection and Alarm for Petrochemical Industry

3 Terms and Definitions

The terms and definitions defined in GB/T 15463 and GB 6951 and the following are applicable to this document.

3.1 static conductor Under the conditions of use, the material with a volume resistivity less than or equal to 10^6 m (i.e., the conductivity is greater than or equal to 10^6 S/m) or the solid surface with a surface resistivity less than or equal to 10^7 . NOTE. the volume resistivity and surface resistivity of various materials and surfaces need to be tested in the temperature and humidity environment specified by the standard test method. If the test conditions are optional, the conditions of use refer to the temperature and humidity conditions closest to the environment of use.

3.2 static sub-conductor Under the conditions of use, the material with a volume resistivity greater than 10^6 m and less than 10^{10} m (i.e., the conductivity is greater than 10^{10} S/m and less than 10^6 S/m) or the solid surface with a surface resistivity greater than 10^7 and less than 10^{11} . NOTE. the volume resistivity and surface resistivity of various materials and surfaces need to be tested in the temperature and humidity environment specified by the standard test method. If the test conditions are optional, the conditions of use refer to the temperature and humidity conditions closest to the environment of use.

3.3 static non-conductor Under the conditions of use, the material with a volume resistivity greater than or equal to 10^{10} m (i.e., the conductivity is less than or equal to 10^{10} S/m) or the solid surface with a surface resistivity greater than or equal to 10^{11} . NOTE. the volume resistivity and surface resistivity of various materials and surfaces need to be tested in the temperature and humidity environment specified by the standard test method. If the test conditions are optional, the conditions of use refer to the temperature and humidity conditions closest to the environment of use.

3.4 minimum ignition energy; MIE Under normal temperature and pressure conditions, the minimum electrical energy required to [Source: GB 6951-1986, 1.1]

3.13 relaxation time of charge The time required for the charge (or potential) on a charged body to dissipate to $1/e$ (about 37%) of its initial value.

3.14 relaxation chamber A thick-diameter pipe section or relaxation storage tank installed in the pipeline system to slow down the flow of charged liquid flowing in the pipe, so that the charge can be thoroughly leaked and attenuated to a safe range.

3.15 time of response; time of rest When producing in a place with electrostatic hazards exist, the interval time required from the equipment stopping operation to the static electricity carried by the material (usually liquid) dissipating to below the safe value, allowing the next operation to be carried out.

3.16 electrostatic discharge The phenomenon that the electric field strength formed by a charged object exceeds the breakdown field strength of the surrounding medium, or contacts with other objects, causing the charge to dissipate or transfer.

3.17 electrostatic accident An unexpected incident that causes casualties or property loss due to electrostatic discharge.

4.1 Discharge and Ignition

4.1.1 The workplace shall reduce the generation of high ignition capacity electrostatic discharge types, such as spark discharge and propagating brush discharge. Different discharge forms have different ignition capabilities. The characteristics of typical electrostatic discharges and their ignition capabilities are shown in Table 1. Appendix A for the table of electrostatic electrification polarity sequence.

4.2.1.2 In the design of production process, the impact, friction and separation process shall be reduced by optimizing the process, and the contact area and pressure of the relevant materials shall be reduced, the number of contacts shall be reduced, and the movement and separation speed shall be reduced.

4.2.2 Accelerate electrostatic dissipation

4.2.2.1 In the area of electrostatic hazards, all static conductors insulated from the earth shall be earthed. Metal objects shall be in conductive connection with the earth through metal conductors. Static conductors and sub-conductors other than metals shall be indirectly earthed.

4.2.2.2 The anti-electrostatic earthing wire shall not utilize the neutral wire of the power supply, shall not be shared with the exclusive downlead for lightning protection, and shall not be connected to the earth in series.

4.2.2.3 The earthing resistance shall not be greater than 100Ω . The leakage resistance of the static conductor shall not be greater than $1.0 \times 10^6 \Omega$, and the leakage resistance of the static sub-conductor shall not be greater than $1.0 \times 10^9 \Omega$. When a leakage resistor is required