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

GB 17440-2025

**Safety specification for the protection of dust explosion for
grain processing, storage and transportation system**

粮食加工、储运系统粉尘防爆安全规范

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1 Scope

GB 17440-2025 is the Chinese national standard on safety specification for the protection of dust explosion for grain processing, storage and transportation system, in the field of environment and health protection, safety. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 24 January 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2026. Classification: ICS 13.230, CCS C67. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the division and range of grain dust explosion hazardous areas in grain processing, storage and transportation systems, process system and equipment requirements, electrical requirements, requirements for buildings and structures, requirements for dust control, requirements for dust cleaning, requirements for pneumatic conveying, requirements for explosion control measures and requirements for operation safety management, and describes the corresponding verification methods. This document applies to the design, operation and safety management of the grain processing, storage and transportation systems involving combustible dust explosion hazards.

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 12158 General Guideline for Preventing Electrostatic Accidents

GB 15577 Safety Regulations for Dust Explosion Prevention and Protection

GB/T 15604 Terminology for Dust Explosion Prevention and Protection

GB/T 15605 Guide for Pressure Venting of Dust Explosions

GB/T 37241 Guide on Inerting for the Prevention of Explosions

GB 50016 Code of Design on Building Fire Protection and Prevention

GB 50057 Design Code for Protection of Structures against Lightning

GB 50058 Code for Design Electrical Installations in Explosive Atmospheres

GB 50037 General Code for Fire Protection of Buildings and Constructions

3 Terms and Definitions

The terms and definitions defined in GB/T 15604, and the following are applicable to this document.

3.1 grain A generic term for agricultural products for human consumption.

3.2 grain processing The process of producing raw grains into finished or semi-finished grains through specific processes.

3.3 grain storage and transportation Through grain circulation facilities and equipment, grains are transported and stored in accordance with specific processes, modes and routes.

3.4 source of dust release A place or position that can release combustible dust into the atmosphere.

3.5 explosive dust atmosphere Under atmospheric conditions, after a mixture of combustible dust and gaseous oxidant (mainly air) is ignited, an environment where combustion can propagate on its own.

3.6 protection for grain dust explosion Technologies and measures to prevent grain dust combustion and explosion, and reduce losses when dust combustion and explosion occur.

4 Division and range of Grain Dust Explosion Hazardous Areas

4.1 Dust explosion hazardous areas in grain processing, storage and transportation systems shall be divided into Zone 20, Zone 21 and Zone 22 in accordance with the frequency of occurrence and duration of grain dust explosive atmosphere.

4.2 The zone division and range of grain dust explosion hazardous areas shall be determined based on the process, properties of supplies, location of sources of grain dust release, amount and possibility of dust release, explosion conditions and dust removal by ventilation, site structure and layout, etc. An example of zone division is shown in Appendix A.

4.4 During the entire duration of the operation process, enterprises shall keep the documents on the zone division and description and regularly conduct dynamic assessments of the process's hazards and zone division.

5.1 Process Design

5.1.1 The design of grain processing, storage and transportation systems shall follow the principle of overall fortification. The design documents shall explain the division and range of grain dust explosion hazardous areas, as well as the measures for protection for grain dust explosion taken in terms of building structure, process system and equipment, dust

control and electrical aspects.

5.1.4 The process design shall select appropriate processes and equipment in accordance with the following requirements to reduce the generation of explosive dust atmosphere.

5.1.5 The process design and equipment shall be selected based on the following requirements to reduce the risk of the existence of non-electrical ignition sources in explosive dust atmosphere.

5.1.6 At the following locations in the grain conveying and processing process, magnetic separation or other devices for removing magnetic metal debris shall be installed.

5.2.1 General requirements

5.2.1.1 Explosion-proof measures shall be taken for mechanical equipment used in grain dust explosion hazardous areas.

5.2.2 Conveying equipment

5.2.2.1 Bucket elevators shall meet the following requirements.

5.2.2.2 The spiral shall not be scratched, collided or stuck.

5.2.2.3 The scraper conveyors shall meet the following requirements.

5.2.2.4 Roller belt conveyors and air cushion belt conveyors shall meet the following requirements.

5.2.5 Processing equipment

5.2.5.1 When grain enters high-speed rotating equipment for grinding, crushing, milling, shelling and other processing, magnetic separation equipment for removing metal impurities and cleaning equipment for removing inorganic impurities and other impurities shall be installed in front of the equipment.

5.3 Grain Drying System

5.3.1 The grain drying system shall take appropriate fire prevention and dust explosion protection measures based on its functions and structural characteristics.

5.3.2 The dryer shall be made of non-combustible materials, and its insulation materials shall be flame retardant.

5.3.3 The inner surface of the dryer shall be smooth and shall not have any structures, such as. lug bosses or upper grooves that may accumulate dust and supplies.

5.3.4 The exhaust port, feeding inlet and discharge outlet of the dryer shall be convenient for cleaning, maintenance and the use of fire extinguishing equipment.