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

GB 16798-2023

Food machinery safety requirements

食品机械安全要求

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1 Scope

China's mandatory national standard for food machinery safety. Food machinery is subject to a demand no other machinery has, and it is the source of most of its hazards: it must be cleaned, thoroughly and often, in a wet environment, by people working at speed. That is why guards get removed, why interlocks get defeated, and why the injuries happen at cleaning rather than at running. The standard addresses both halves. The mechanical safety is conventional - guarding of cutting, mixing and conveying elements, emergency stops, isolation before access - but it is written knowing the machine will be opened daily. The hygiene half is what makes it a food standard: surfaces that can be cleaned rather than merely wiped, no crevices or dead spaces where product collects, materials that do not contaminate, and drainage so that water does not stand.

This document specifies the structural material requirements, equipment structure, equipment configuration and installation related to food machinery safety, as well as the implementation of standards. This document applies to machines and equipment used in food processing.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, for dated reference documents, only the version corresponding to the date applies to this document; for undated reference documents, the latest version (including all amendments) applies to this document.

GB/T 150 (all parts) Pressure vessels

GB/T 1173-2013 Casting aluminum alloy

GB 2894 Safety signs and guideline for the use

GB/T 3190 Chemical composition of wrought aluminium and aluminium alloys

GB/T 3280 Cold rolled stainless steel plate, sheet and strip

GB/T 3766 Hydraulic fluid power - General rules and safety requirements for systems and their components

GB 4053 (all parts) Safety requirements for fixed steel ladders and platform

GB/T 4237 Hot rolled stainless steel plate, sheet and strip

GB 5083 General rules for designing the production facilities in accordance with safety and health requirements

GB/T 5226.1 Electrical safety of machinery - Electrical equipment of machines - Part 1: General requirements

GB/T 7932 Pneumatic fluid power - General rules and safety requirements for systems and their components

GB/T 14253 General specification for light industry machinery

GB/T 14295-2019 Air filter

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Food machinery Machinery and equipment used in food processing processes.

3.2 Product Raw materials and auxiliary materials, as well as semi-finished products and finished products in food processing.

3.3 Working air Clean air used for product heating, cooling, drying, transportation, purging, inspection equipment sealing.

3.4 Area of product

4.1.1 Product contact surface materials shall meet product compatibility requirements. Structural materials shall also meet the requirements of corresponding usage conditions (such as product characteristics, temperature, pressure, medium characteristics, etc.).

4.1.2 Product contact surface materials shall be safe and traceable; it shall not affect the nature, purity, or quality of the product.

4.1.3 The contact between materials and products shall not produce substances, that are harmful or exceed the amount specified in the standards of the processed products, due to interaction.

4.1.4 Food machinery manufacturer shall inspect and accept materials and products. Information on purchased products shall comply with product labeling requirements and compatibility requirements.

4.1.5 When selecting materials, other risks that may endanger product safety that may exist under different use conditions shall be avoided, including but not limited to the following conditions: low temperature, ultraviolet radiation, microwaves, electromagnetic waves, gamma-radiation, ozone, etc.

4.2 Usage performance requirements

4.2.1 The contact between materials and products shall not cause the interaction to produce substances that pollute the product, affect the smell, color, quality of the product, or have adverse effects on the product processing process.

4.2.2 The material shall have the properties of heat resistance, chemical resistance, mechanical resistance.

4.2.3 When products, detergents, disinfectants come into contact with materials, the types and amounts of compounds formed on the surface of the materials or deep inside them shall not cause adverse consequences, that require additional processing of the equipment to remove these compounds.

4.2.4 The color of materials shall not present difficulties in assessing product quality or degree of contamination.

4.2.5 In order to adapt to different uses, materials used for parts with product contact surfaces shall have good processing performance (such as bendability, cutting ability, weldability, surface hardness, grindability, polishing, etc.), good thermal conductivity, corrosion resistance, resistance to liquid penetration, etc.

4.3 Structural material requirements for product contact surfaces

4.3.1 Stainless steel Stainless steel materials on product contact surfaces shall meet

product compatibility requirements. The designation and chemical composition of stainless steel materials shall comply with the requirements of GB/T 20878. Stainless steel cold-rolled plates shall comply with the requirements of GB/T 3280; stainless steel hot-rolled plates shall comply with the requirements of GB/T 4237; stainless steel plate materials for pressure-bearing equipment shall comply with the requirements of GB/T 24511. Stainless steel pipes and accessories for the food industry shall comply with the relevant requirements of QB/T 2467 and QB/T 2468. Stainless steel materials shall be easy to process, non-toxic, non-absorbent, highly corrosion-resistant, insoluble in food solutions, not produce metal ions that would damage the flavor of the product, have good resistance to liquid penetration, the surface can be polished, the appearance is bright, beautiful, easy to clean.

Note 1: For general purposes, austenitic stainless steel materials are used; the material designations are 06Cr19Ni10 (S30408), 022Cr19Ni10 (S30403), 06Cr17Ni12Mo2 (S31608), 022Cr17Ni12Mo2 (S31603). When the usage requirements are harsh, the designation used is 06Cr19Ni13Mo3 (S31708) and 022Cr19Ni13Mo3 (S31703) austenitic stainless steel materials. When necessary, in order to avoid stress corrosion cracking due to the presence of chloride ions, choose 022Cr23Ni5Mo3N (S22053) austenitic-ferrite type materials (such as the conditions for long-term storage of salt solutions).

Note 2: When martensitic stainless steel is used for special parts on product contact surfaces, such as blades, shaft parts, etc., the material designations used are 1Cr13, 2Cr13, 3Cr13, etc.

4.3.2 Aluminum and aluminum alloys Aluminum and aluminum alloy materials on product contact surfaces shall meet product compatibility requirements. Aluminum and aluminum alloys shall have certain corrosion resistance, be non-toxic and non-absorbent, be used for parts with complex shapes and product contact surfaces. Aluminum alloy materials for casting shall comply with the provisions of

4.1.8 in GB/T 1173-2013. Aluminum and aluminum alloy materials produced by pressure processing methods shall comply with the requirements of GB/T 3190.

4.3.3 Welding materials The welding materials shall have properties similar to those of the materials being welded, form a tight and solid structure in the welding area, be non-toxic and corrosion-resistant.

4.3.4.1 Plastic materials and products

4.4.2 Fiber materials Paper and paperboard materials and products shall meet product compatibility requirements. Natural protein fiber materials and products shall meet product compatibility requirements. Other fiber materials such as cotton fiber, wood fiber, linen and man-made fiber shall meet product compatibility requirements. Fiber materials shall be non-toxic, non-shedding, insoluble in water, not interact with the product; they shall not