



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

**GB/T 18569.1-2020**

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**Safety of machinery - Reduction of risks to health resulting  
from hazardous substances emitted by machinery - Part 1:  
Principles and specifications for machinery manufacturers**

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### 1 Scope

This Part of GB/T 18569 specifies the principles and specifications for the control of risks to health, which are caused by hazardous substances emitted by machinery.

This Part applies to machinery, that poses a risk to human health, due to the emission of hazardous substances.

This Part does not apply to substances, that are harmful to health only because of their explosion, combustion, radioactivity, OR because they are in a state of extreme temperature or pressure.

### 2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is

applicable to this standard.

GB/T 15706-2012 Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010, IDT)

### 3 Terms and definitions

The terms and definitions, which are defined in GB/T 15706-2012, as well as the following terms and definitions, apply to this document.

3.1 Intended use Use the machine according to the information provided in the instruction manual.

[GB/T 15706-2012, 3.23] 3.2 Hazardous substance Chemical or biological substances or preparations, which are harmful to health.

Example. Substances or preparations, which are classified as highly toxic, toxic, harmful, corrosive, irritating, allergic, carcinogenic, mutagenic, teratogenic, pathogenic, suffocating.

Note. For the definitions of "chemical preparations" and "biological preparations", see EN 1540.

#### 4.1 Machinery manufacturers shall identify hazards and assess foreseeable risks to

health from hazardous substances. This process shall, as far as possible, cover any potential hazards arising from the exposure of personnel to the machine, at all stages of the machine's entire life cycle.

Note. The detailed risk assessment method is given in GB/T 15706.

#### 4.2 The level of risk depends on the nature of the hazardous substance, the likelihood

of personal exposure, the degree of exposure. The health effects of harmful substances can be.

- Short-term or long-term;
- Reversible or irreversible.

#### 4.3 Hazardous substances can be in any physical state (gaseous, liquid, solid) AND can

affect the human body in the following ways.

- Inhalation;
- Ingestion;

- Contact with skin, eyes, mucous membranes;
- Penetrates through the skin.

#### **4.4 Hazardous substances can be produced from.**

- Any part of the machine;
- Substances present in the machine;
- Machine-processed or machine-used materials and/or substances, which are derived directly or indirectly from materials.

#### **4.5 The life cycle of a machine may include the following stages (see 5.4 of GB/T**

- Maintenance, such as emptying the filter bags;
- Dismantling, such as dismantling lead-acid battery packs, removing asbestos insulation;
- Fuel combustion, such as exhaust gas from internal combustion engines;
- Food mixing utensils;
- Metalworking, such as nitrosamines from water-soluble metalworking lubricants.

#### **5.1.3 Some examples of airborne hazardous substances are as follows.**

- Respiratory irritants, such as sulfur dioxide, chlorine, cadmium fumes;
- Sensitizers, such as isocyanates, enzymes, turpentine gas;
- Carcinogens, such as asbestos, chromium(VI), benzene, polyethylene monomers;
- Fibrous dust, such as free crystalline silicon, asbestos, cobalt;
- Asphyxiants, such as nitrogen, argon, methane;
- Biological preparations, such as *Legionella pneumophila*, dust from fermented hay;
- Harmful substances, that affect specific parts of the body, such as mercury (affects the nervous system and kidneys), lead (affects the nervous system and blood), carbon tetrachloride (affects the nervous system and liver), carbon monoxide (affects the blood).

#### **5.1.4 Airborne emissions can be assessed by measuring the concentration of the**

substance, in the breathing zone of the person. Measurements are often compared to corresponding benchmarks.

#### **5.1.5 For airborne contaminants, there are many methods of air sampling and sample**

analysis. Sampling methods and analytical techniques should be selected, according to the nature of airborne contaminants.

#### **5.2.1 Non-airborne emissions can be the primary source of exposure to hazardous**

substances, through ingestion, contact with the skin, eyes or mucous membranes, or penetration through the skin (see 4.3).

#### **5.2.2 Non-airborne emissions can occur, under a variety of conditions, including.**

- Migration from open sources, such as splash and evaporation/condensation leading to secondary emissions;
- Opening machinery, e.g. for maintenance;
- Access to machinery, e.g. for inspection;
- Material handling, such as loading, sampling, cleaning;
- Handling parts of the machine, such as dismantling;
- Incorrect operation, such as overfilling;
- Leaks, e.g. at pump seals, flanges;
- Rupture.

#### **5.2.3 Exposure to non-airborne emissions can cause health damage, due to the effects**

of various hazardous properties associated with different materials. Examples of these materials include.

- Corrosives, such as sulfuric acid;
- Irritants, such as wet cement;
- Sensitizers, such as chromates, epoxy resins;
- Carcinogens, such as used quenching oils, beryllium oxide, polycyclic aromatic hydrocarbons;
- Biological preparations, such as contaminated cutting oils, contaminated blood.

Damage to health can be located at the point of contact of the body OR the result of action on a part of the body (systemic or organ-specific). For some substances, both conditions may occur, such as benzene.