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Die-casting unit - Safety signs

压铸单元 安全标志

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Die-casting unit - Safety signs

1 Scope

This standard specifies the design principles, content, type, installation location, content and method of warning (warning and prompt) signs, for the safety signs of die-casting unit.

This standard applies to die-casting production units, which are composed of cold-chamber and hot-chamber die-casting machines and auxiliary devices (such as ladler, extractor, sprayer, etc.), as well as the auxiliary devices, which are selected by the user.

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 2893.1 Graphical symbols - Safety colors and safety signs - Part 1: Design principles for safety signs and safety markings

GB 2893 Safety colors

GB 2894 Safety signs and guideline for the use

GB/T 4025 Basic and safety principles for man-machine interface, marking and identification - Coding principles for indicators and actuators

GB 5226.1-2008 Electrical safety of machinery - Electrical equipment of machines - Part 1: General requirements

GB/T 16273 (all parts) Graphical symbols for use on equipment

GB 16754 Safety of machinery - Emergency stop - Principles for design

GB 18209.2 Electrical safety of machinery - Indication marking and actuation - Part 2: Requirements for marking

GB/T 19671 Safety of machinery - Two-hand control device - Functional aspects and design principles

GB/T 19678 Preparation of instructions - Structuring, content and

professional and technical procedures, requirements, operating methods, which are related to safety.

Work warning signs shall be regarded as a supplement to safety signs.

The work warning sign consists of graphic symbols + text auxiliary signs (see legend 5 in Table 1).

See 3.4 for the content of work warning signs.

3.2 Design of safety signs

3.2.1 According to the assessment of the dangerous area of the die-casting unit, according to GB 20906, in the potentially dangerous areas (such as the die area, the forming mechanism area, the injection drive area, etc.), it shall respectively set the prohibition signs, warning signs, instruction signs, prompt signs, work warning signs, based on the types of possible dangers (such as mechanical hazards, thermal hazards, etc.).

3.2.2 The design, location and method of all safety signs shall comply with the requirements of GB/T 2893.1.

3.2.3 Safety signs distinguish the type and degree of hazard, mainly through shapes and colors. The parameters of the basic types of safety signs implement the provisions of GB 2894. The colors used for safety signs shall comply with the colors, which are specified in GB 2893.

3.2.4 The basic types of work warning signs:

- a) Warning signs + text auxiliary signs;
- b) Warning signs + graphic symbols + text auxiliary signs (see legend 5 in Table 1).

3.3 Use of safety signs

3.3.1 Safety signs shall clearly indicate the type of hazard that may occur AND/OR measures to prevent hazards from occurring. Try to use standard graphic symbols. When the content expressed by the safety signs requires text narration, it may use text auxiliary signs.

3.3.2 If necessary, the safety signs can use both Chinese and foreign languages, OR only the text required by the customer. However, the graphic symbols of all safety signs must comply with relevant standard requirements and local regulations; respect local cultural traditions and folklore.

Cut off the power supply and stop the hydraulic oil pump motor, during maintenance; discharge the oil pressure, before repairing the hydraulic system.

e) Debugging, such as:

It shall stop the operation of the hydraulic oil pump, when adjusting the thimble and sprayer,.

3.4.2 The language of work warning signs shall be short and clear. It shall not cause ambiguity.

3.5 Setting of safety signs

3.5.1 Nameplate

The die-casting machine shall have a permanent nameplate, that meets the requirements of 7.2 of GB 20906-2007. Other auxiliary devices shall have permanent nameplates, that comply with relevant national standards.

3.5.2 Setting location and content of safety signs

3.5.2.1 Front and rear safety doors of die-casting machine:

- a) It shall set a safety sign of "prohibition of crossing the protective device" (see No.5 in Table A.1);
- b) It is recommended to set up a safety sign of "No stay" (see No.2 in Table A.1);
- c) When necessary, the front safety door shall be provided with a work warning sign of "Please read the manual carefully", on the correct operation procedure (see No.7 in Table B.1).

3.5.2.2 Fence door of die-casting production unit:

On the fence door, which is equipped with the safety interlocking device, it shall set the safety sign of "No entry" (see No.1 in Table A.1).

3.5.2.3 Working platforms, which have a height greater than 0.25 m:

- a) It shall set a safety sign of "No jumping off" (see No.6 in Table A.1);
- b) It shall set a safety of "Beware of falling" (see No.11 in Table A.1).

3.5.2.4 Near the nozzle of the hot-chamber die-casting machine:

(see No.13 in Table A.1).

3.5.2.9 Die-casting unit without fence:

- a) A safety sign of "beware of burns" shall be set at the eye-catching position of the ladler (see No.9 in Table A.1);
- b) A work warning sign of "Beware of mechanical squeezing" shall be set at the eye-catching position of the ladler (see No.5 in Table B.1);
- c) A safety sign of "Beware of falling objects" shall be set at the eye-catching position of the extractor (see No.10 in Table A.1);
- d) The safety signs of "Beware of burns" (see No.9 in Table A.1), "Protective gloves must be worn" (see No.16 in Table A.1), "Protective shoes must be worn" (see No.17 in Table A.1), "Protective clothing must be worn" (see No.18 in Table A.1) shall be set, in the furnace area.

3.5.2.10 Die-casting machine (cold-chamber die-casting machine/hot-chamber die-casting machine):

A safety sign of "No fire extinguishing with water" shall be set (see No.4 in Table A.1).

3.5.2.11 For moving parts, that may cause danger to the human body (such as movable plate, toggle mechanism, moving parts of the ladler, etc.), use a color mark, that is significantly different from that of the adjacent area. It is recommended to use orange, which has black stripes, as a safety prompt mark.

3.6 Other safety signs

3.6.1 Safety signs in electrical installations

3.6.1.1 The color of wires, in electrical installations, shall be set, in accordance with the requirements in 13.2 of GB 5226.1-2008.

3.6.1.2 The setting of the emergency stop button shall comply with the provisions of GB 16754.

3.6.1.3 The markings of the man-machine interface (operation panel, display screen, control station, etc.) shall comply with the requirements of GB/T 4025.

3.6.1.4 The two-hand control device shall meet the requirements of GB/T 19671.

3.6.1.5 The setting of the alarm shall meet the requirements of GB 18209.2.

3.6.2 Safety signs in the manual

3.6.2.1 The product manual, which is provided to the user, shall be in accordance with the provisions of GB/T 19678. It shall have a special chapter, which explains the safety precautions.

3.6.2.2 The safety signs shall be used correctly, in the parts of the manual that involve safety content.

3.6.2.3 In the instruction manual, which is provided to the customer, the safety-related parts, including transportation, installation, operation, maintenance, disassembly, shall be reminded of the type of safety.

3.6.3 Safety signs for pressure (gas/liquid) devices

3.6.3.1 The obvious parts of the pressure vessel (accumulator) shall be provided with the pressure vessel's product nameplate and safety signs.

3.6.3.2 Pressure vessels shall have relevant marks, that comply with national legal procedures for inspection and certification.

3.6.3.3 The pressure vessel shall have a description of the rated operating pressure.

3.6.3.4 The operating parts and functions of hydraulic and/or pneumatic valves shall be clear AND use the same symbols as in the circuit diagram.

3.6.4 Transportation and hoisting safety signs

Set up hoisting safety signs at appropriate locations.

4 Durability of safety signs and their connections

4.1 The safety signs shall maintain firm connections, clear pictures and texts, long-lasting color, resistance to damage due to environmental factors (such as liquid, gas, climate, temperature, light), wear resistance, dimensional stability, in the whole service life (the whole process from manufacturing, transportation, installation, adjustment, use, maintenance, until discarding) of the machine.

4.2 The size and material of safety signs (including work warning signs) can be determined, according to needs, provided that the requirements of relevant standards are met.

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