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Cold chamber die casting machines

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Foreword

This document is drafted in accordance with the provisions of GB/T 1.1—2020 Directives for Standardization — Part 1: Structure and Drafting Rules of Standardization Documents.

This document replaces GB/T 21269—2018 Cold Chamber Die Casting Machines.

Compared with GB/T 21269—2018, besides structural adjustments and editorial modifications, the main technical changes are as follows:

—— Added normative references to GB/T 25370 and GB/T 37371—2019 (see Clause 3);

—— Revised the term “idle cycle time” (see 3.10, 3.10 of the 2018 edition);

—— Revised the definition of “accumulator”, and added the term and definition of “hydraulic accumulator” (see 3.15, 3.15 of the 2018 edition);

—— Deleted the terms and definitions of “injection pressure, displacement–time curve”, “slow injection speed”, “pressure intensification time” and “fast injection pressure” (see 3.17, 3.20, 3.24, 3.25 of the 2018 edition);

—— Added the term and definition of “injection pressure, displacement, velocity–time curve” (see 3.17);

—— Added the term, definition, tolerance and inspection method of “mold opening repeat positioning accuracy” (see 3.26 and B.4);

—— Added the term, definition and technical requirements of “built-in clamp unit” (see 3.27 and 5.1.17);

—— Added the schematic diagram of horizontal cold chamber die casting machine (non-toggle type) (see Figure 3);

—— Revised the schematic diagram of vertical cold chamber die casting machine (see Figure 4, Figure 3 of the 2018 edition);

—— Revised the energy efficiency grade requirements for die casting machines (see 5.1.15, 6.1.15 of the 2018 edition);

—— Revised “Accuracy” and its inspection methods (see 5.3, 6.5, Annex B, Clause 5 of the 2018 edition);

—— Added main injection performance parameters for horizontal cold chamber die casting machines with 50000 kN < F ≤ 60000 kN (see Table 1);

—— Revised “Safety requirements” (see 5.5, 6.4 of the 2018 edition);

—— Revised “No-load test run” (see 5.7, 6.6 of the 2018 edition);

—— Revised “Load test run” (see 5.8, 6.7 of the 2018 edition);

—— Added the test method for energy consumption (see 6.3);

—— Added the inspection method for appearance quality (see 6.4);

—— Revised the noise measurement method (see 6.7, 7.1.5 of the 2018 edition);

—— Revised the judgment method for closed-loop control speed error (see 6.8, 7.4.2 of the 2018 edition);

—— Added the test method for no-load test run (see 6.9);

—— Added the test method for load test run (see 6.10);

—— Added provisions allowing type inspection to be conducted at the user's site (see 7.2.4);

—— Revised the basic parameters of horizontal cold chamber die casting machines (see Table A.1, Table 2 of the 2018 edition).

Attention is drawn to the possibility that some contents of this document may involve patents.

The issuing body of this document shall not be responsible for the identification of patents.

This document is proposed by China Machinery Industry Federation.

This document is under the jurisdiction of National Technical Committee 186 on Foundry Machinery of Standardization Administration of China (SAC/TC 186).

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This document was first issued in 2007, and revised for the first time in 2018.

This is the second revision.

Cold chamber die casting machines

1 Scope

This document specifies the technical requirements of cold chamber die casting machines (including horizontal cold chamber die casting machines and vertical cold chamber die casting machines) in terms of basic parameters, service performance, safety, and environmental adaptability.

It describes the corresponding test methods and inspection rules, and stipulates the contents of marking, packaging, transportation, and storage.

This document applies to the design, manufacture, acceptance, packaging, transportation, and storage of cold chamber die casting machines.

2 Normative References

The following documents, through normative reference in this document, constitute indispensable provisions of this document.

For dated references, only the edition corresponding to that date applies to this document; for undated references, the latest edition of the referenced document (including all amendments) applies to this document.

GB/T 158 T-slots on machine tool tables and corresponding bolts

GB/T 191 Pictorial marking for handling of packages

GB/T 1348—2019 Spheroidal graphite iron castings

GB/T 1800.1 Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances for linear and angular dimensions without individual tolerance indications — Part 1: Basics of tolerances, deviations and fits

GB 2893 Safety colours

GB 2894 Safety signs and guidelines for the use

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

GB/T 5226.1—2019 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 7935 Hydraulic components — General specifications

GB/T 9969 Instructions for use of industrial products — General

GB/T 13306 Name plates

GB/T 16754 Safety of machinery — Emergency stop function — Principles for design

GB/T 17421.1—1998 Test code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or finishing conditions

GB 20905 Foundry machinery — Safety requirements

GB/T 20906 Foundry machinery — Die-casting machines and die-casting units — Safety specifications

GB/T 25370 Foundry machinery — Vocabulary

GB/T 31562 Foundry machinery — Determination of cleanliness

GB/T 37371—2019 Die casting units — Vocabulary

GB/T 39962—2021 Die casting machines — Minimum allowable values of energy efficiency and energy efficiency grades

JB/T 8356 Packaging for machine tools — Specifications

3 Terms and Definitions

For the purposes of this document, the terms and definitions defined in GB/T 25370, GB/T 37371—2019 and the following apply.

3.1 die height

Thickness of a closed die casting die.

Note: The distance between the moving die mounting plate and the fixed die mounting plate when the die casting die is closed.

3.2 moving platen stroke

Maximum travel distance of the moving die mounting plate.

3.3 space between tie bars

Internal horizontal and vertical dimensions between the tie bars of a die casting machine.

3.4 ejection force

Maximum thrust generated by the ejection mechanism of a die casting machine during casting ejection.

3.5 ejection stroke

Maximum movement distance of the ejection mechanism of a die casting machine.

3.6 maximum metal shot weight

Maximum mass of molten metal permitted to be poured into the shot sleeve per shot.

3.7 horizontal cold-chamber die casting machine

Cold chamber die casting machine with a horizontally mounted shot sleeve.

3.8 vertical cold-chamber die casting machine

Cold chamber die casting machine with a vertically mounted shot sleeve.

3.9 diameter of shot sleeve

Inner diameter of the shot sleeve.

3.10 dry cycle time

Time required for each dry cycle performed by a die casting machine in accordance with its operating sequence.

Note 1: For horizontal cold-chamber die casting machines in automatic mode, the total time of mold closing, injection, mold opening, injection return, ejection and ejection return.

Note 2: For vertical cold-chamber die casting machines, the total time of mold closing, injection, injection return, material return, material return reset, mold opening, ejection and ejection return.

3.11 shot position

Position of the shot sleeve on the fixed die mounting plate.

Note: Generally determined by the symmetrical center of the die casting machine tie bars and the number and distance of downward adjustable positions from the center.

3.12 diameter of shot sleeve flange

(For horizontal cold-chamber die casting machines) Diameter of the portion of the shot sleeve flange protruding from the fixed die mounting plate after installation.

3.13 height of shot sleeve flange

(For horizontal cold-chamber die casting machines) Distance that the shot sleeve flange protrudes from the working surface of the fixed die mounting plate after installation.