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MECHANICAL INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 25.120.30

J 61

Filing No.: 58496-2017

JB/T 13237-2017

**High pressure metal die casting units - Technical
requirements**

压铸单元 技术条件

Issued on: April 12, 2017

Implemented on: January 01, 2018

Issued by: Ministry of Industry and Information Technology of PRC

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High pressure metal die casting units - Technical requirements

1 Scope

This standard specifies the terms and definitions, technical requirements, inspection methods, inspection rules, marking, packaging, transportation, storage of die-casting units.

This standard applies to cold-chamber die-casting units and hot-chamber die-casting units (hereinafter referred to as die-casting units).

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

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

GB/T 7932 Pneumatic fluid power - General rules relating to systems

GB/T 7935 Hydraulic fluid power - General requirements for hydraulic components

GB/T 9969 General principles for preparation of instructions for use of industrial products

GB/T 13306 Plates

GB 20906 Safety requirements for high pressure metal diecasting units

GB/T 21269 Cold chamber die casting machines

GB/T 25371 Foundry machinery - Measurement method of sound pressure level

GB/T 25711-2010 Foundry machinery - General technical requirements

4 Technical requirements

4.1 General requirements

4.1.1 The hydraulic system and hydraulic components, of the die-casting unit, shall meet the requirements of GB/T 3766 and GB/T 7935.

4.1.2 The electrical system of the die-casting unit shall meet the requirements of GB 5226.1.

4.1.3 The pneumatic system of the die-casting unit shall meet the requirements of GB/T 7932.

4.1.4 Each component of the die-casting unit shall have nameplates and signs, which indicate the operation, lubrication, safety of hydraulic and pneumatic systems. The content and markings of nameplates and signs shall be correct. The signs shall meet the requirements of GB/T 13306. It is allowed to inlay and cast clear factory names and trademarks, on the die-casting machine.

4.1.5 The components of the die-casting unit shall have reliable lubrication devices. The die-casting machine shall adopt a centralized lubrication system; it shall have detection functions and sound and light alarms.

4.1.6 The hydraulic system of the die-casting unit shall be free of leakage. The temperature of the working fluid shall not exceed 55 °C, during continuous operation. An automatic alarm shall be issued, when the above-mentioned temperature is exceeded.

4.1.7 The working fluid medium of the die-casting unit shall meet the requirements of the technical documents. The internal cleanliness limit of the hydraulic cylinder shall not exceed 0.02% of the lower limit of the oil weight of the lubricating oil standard.

4.1.8 The adjustment valve stems of the control mechanisms of the die-casting unit shall be flexible, reliable, positioned correctly, after assembly.

4.1.9 The safety of the die-casting unit shall meet the requirements of GB 20906.

4.1.10 There shall be a safety interlock function, between the die-casting machine and the extractor, sprayer, ladler and other devices, to prevent mechanical damage, which is caused by mal-operation.

4.1.11 The technical documents, which are supplied together with the die-casting unit, shall at least include instructions for use, certificate of conformity, packing list. The instructions for use shall meet the requirements of GB/T 9969.

4.1.12 The robot shall set the three-dimensional space function. When it automatically sends and receives a set of digital signals or multiple sets of digital signals, in this space, the associated robot or equipment shall prevent interference and collision.

4.2 Die-casting machine

4.2.1 The die-casting unit shall have manual, semi-automatic, automatic working modes.

4.2.2 The cold-chamber die casting machine shall meet the requirements of GB/T 21269.

4.2.3 The hot-chamber die casting machine shall meet the requirements of JB/T 6309.3.

4.3 Extractor

4.3.1 The action of the extractor shall be sensitive and reliable.

4.3.2 The clamping diameter of the jaws shall correspond to the diameter of the pressure chamber of the die-casting machine.

4.3.3 The working length of the arm shall be greater than the distance, FROM the rear safety door TO the center of the machine.

4.3.4 The running track shall reach the working range of each job position.

4.3.5 The extractor shall have a soft floating function, to cooperate with the ejection action of the die-casting machine, thereby protecting the robot body and die-casting products from damage.

4.4 Sprayer

4.4.1 The sprayer shall meet the requirements of JB/T 12284.2.

4.4.2 The sprayer shall have an anti-drop device, to prevent the nozzle from falling, when the air pressure source stops.

4.4.3 The rising and falling speed of the sprayer shall be stable; it shall have a rapid descent deceleration function.

4.4.4 The spray nozzle's atomization of the sprayer shall be uniform; there shall be no dripping after spraying.

- Carried safety latch (the latch which is carried by personnel when entering the robot work area; if there is no such latch, the safety door cannot be fully automatic);
- Teaching safety latch (plug in during manual debugging).

4.8.2 The barriers shall have a safety interlock function, with other devices of the die-casting unit.

4.9 Dry running requirements

4.9.1 The dry running time shall not be less than 8 hours.

4.9.2 During operation, abnormal conditions that occur are allowed to be eliminated; the elimination time shall not exceed 0.5 h each time; the cumulative time shall not exceed 2 h.

4.9.3 The actions of pneumatic, hydraulic, electrical systems shall be coordinated and reliable.

4.9.4 The actions of each job position, during the operation of each device, shall be accurate, stable, reliable.

4.9.5 Each movement mechanism shall be stable; the fasteners shall be anti-loosing and reliable.

4.9.6 After 4 hours of dry running, the temperature rise of the rolling bearing shall not exceed 35 °C; the maximum temperature shall not exceed 70 °C.

4.9.7 Pneumatic and hydraulic systems shall not leak AND have good sealing.

4.9.8 The noise sound pressure level of the die-casting unit, under dry running conditions, shall not exceed 85 dB (A).

4.9.9 The one-time dry cycle time of the die-casting unit shall not be greater than the provisions of the technical documents.

4.10 Loaded operation requirements

4.10.1 The die-casting unit shall be subjected to dry running test, before loaded operation.

4.10.2 Under normal working conditions, carry out a physical die-casting test. During the test, various parameters shall meet the design requirements.

4.10.3 The actions of each movement mechanism shall be flexible, stable,

accurate, coordinated.

5 Inspection method

5.1 The cold-chamber die casting machine shall be inspected, in accordance with GB/T 21269.

5.2 The hot-chamber die casting machine shall be inspected, in accordance with JB/T 6309.3.

5.3 The sprayer shall be inspected, in accordance with JB/T 12284.2.

5.4 One dry cycle time is tested by a stopwatch. Its reading is the time, FROM the start of the die-casting unit's die closing action TO the end of the spraying work.

5.5 The noise shall be inspected, in accordance with the provisions of GB/T 25371.

5.6 The ladler shall be inspected, according to the provisions of JB/T 11554.

5.7 The determination of cleanliness shall meet the requirements of GB/T 31562.

5.8 Measurement of bearing temperature rise: Immediately after continuous no-load operation, use a point thermometer, to measure the highest temperature of the bearing housing immediately. Then add a correction value of 3 °C, to obtain the highest temperature of the bearing. The difference, BETWEEN the highest temperature of the bearing AND the ambient temperature, is the temperature rise of the bearing.

6 Inspection rules

6.1 Exit-factory inspection

6.1.1 Each die-casting unit shall be inspected by the inspection department of the manufacturer AND be accompanied by a product quality certificate, before leaving the factory.

6.1.2 If there is no special agreement, the inspection items of the die-casting unit shall include the following:

- The operation of each device of the die-casting unit shall be normal;
- The content specified in 4.1 ~ 4.9.

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