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Cast Carbon Steels for General Engineering Purposes

一般工程用铸造碳钢

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Cast Carbon Steels for General Engineering Purposes

1 Scope

1.1 This Standard specifies the technical requirements of cast carbon steels for general engineering purposes.

1.2 For cast-welded structural parts, this Standard does not include the performance of welding methods and welded structures.

2 Manufacture

The steelmaking process and the casting process shall be determined by the manufacturer.

3 Chemical Compositions

The chemical compositions of each designation of cast steel shall conform to the provisions of Table 1.

7 Heat Treatment

7.1 If there are no special requirements during the ordering process, the heat treatment process shall be determined by the manufacturer.

7.2 The commonly used heat treatment process is one of the following:

Annealing;

Normalizing;

Normalizing + tempering;

Quenching + tempering.

The relevant provisions on heat treatment can refer to Appendix A (Supplement).

7.3 Heat treatment may be carried out after the casting has cooled below the phase transition temperature range.

7.4 The furnace temperature in heat treatment shall be effectively controlled.

8 Inspection Rules

8.1 Each inspection shall be carried out by the technical inspection department of the manufacturer; but the purchaser reserves the right to re-inspect according to the items specified in the ordering contract.

8.2 The chemical compositions of the steel shall be inspected according to the smelting furnace-number in furnace by furnace.

8.3 The test block for mechanical performance shall be conducted heat treatment together with the castings it represents.

8.3.1 When a batch of castings with the same designation and different furnace-numbers are conducted heat treatment, they shall be inspected as per the furnace-number.

8.3.2 When a batch of castings with the same furnace-number, under the conditions of fixed heat treatment process and stable heat treatment quality, are conducted heat treatment in different furnaces, the random sampling is permitted.

8.3.3 When the capacity of the smelting furnace is less than 500kg, under the condition of stable smelting process, for the castings with the same designation pouring in each casting number and smelting in one shift, they are allowed to be processed as per the

castings with the same furnace-number in one batch.

8.4 For the mechanical performance test, take one tensile specimen and three impact specimens per furnace-number.

8.4.1 The tensile test results shall conform to the provisions of Table 2; the average value of the impact test results shall conform to the provisions of Table 2; any one values among the three ones shall not be less than the 2/3 specified value.

8.4.2 When the tensile or impact test results are less than the provisions of 8.4.1, such test item shall be re-inspected.

8.4.2.1 When tension is retested, take two backup specimens from the same furnace-number for test; thereof, if one of the specimens does not conform to the provisions of Table 2, then repeat the heat treatment against such furnace-number of castings.

8.4.2.2 When impact toughness is retested, take three backup specimens from the same furnace-number for test; and they shall conform to the provisions of 8.4.1; plus such results and the original results; re-calculate the average value, which shall conform to the provisions of Table 2; otherwise, repeat the heat treatment against such furnace-number of castings.

8.4.3 Without the agreement of the purchaser, the number of the repeat heat treatments shall be no more than twice. (except tempering)

8.4.4 The repeat heat treatment of castings shall be as specified in 8.3; then all of them shall be subjected to the mechanical performance test as per the provisions of 8.4.

8.5 If the specimen is disqualified due to the casting defects mechanical performance, then take backup specimen to repeat the test.

8.6 When the backup specimens are insufficient, allow to take sample from the castings, the sampling position shall be determined by the manufacturer. The performance indexes shall be negotiated between the supplier and the purchaser.

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