



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

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**Cast carbon steels for general engineering purposes
(English Translation)**

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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.

4 Casting Test Block

4.1

The test block for chemical analysis shall be prepared during the casting process.

4.2

The test block for mechanical performance can be cast separately or attached-cast itself in the middle of casting. If the purchaser has no requirements, the test block can be selected

by the manufacturer. The main size and specimen cutting position of the separately-cast test block shall meet the requirements for the diagram of separately- cast test block for mechanical performance. The position of the attached-cast test block shall be negotiated between supplier and purchaser.

5 Test Methods

5.1

The sampling method for chemical analysis shall be conducted as per the provisions of GB 222-81 Sampling Method for Chemical Analysis Specimen; the arbitration analysis for chemical compositions shall be conducted as per the provisions of GB 223.7-81 Mechanical Analysis Method for Iron, Steel and Alloy.

5.2

The tensile test shall be conducted as per the provisions of GB 228-76 Metal Tensile Test Method; while impact test shall be conducted as per the provisions of GB 2106-80 Metallic Materials - Charpy Impact Test (V-Notch).

6 Mechanical Performance

The mechanical performance of each designation of cast steel shall conform to the provisions of Table 2. Thereof, the manufacturer can select either the area reduction or impact toughness, if the purchaser has no requirements.

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.

7.3

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.

8.4 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.

8.5 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.

Appendix A (Supplement)

Relevant Provisions on Heat Treatment

A.1 Annealing, heating exceeds Ac 3, furnace cooled.

A.2 Normalizing, heating exceeds Ac 3, air cooled.

A.3 Quenching, heating exceeds Ac 3, quick cooling.

A.4 Tempering, heating is less than Ac 1.

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