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# GB

NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

## GB/T 4357-1989

Replacing GB 4357-84

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### Carbon spring steel wires

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Approved on: February 02, 1989

Implemented on: January 01, 1990

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Approved by: Ministry of Metallurgical Industry of the PRC

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## Carbon spring steel wires

### 1 Subject content and scope of application

This Standard specifies the classification, dimension, shape, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of carbon spring steel wires.

This Standard applies to cold-drawn non-alloy steel wires for springs, with circular cross section, used for machinery.

### 2 References

GB 228 Metallic materials - Tensile testing

GB 239 Metallic materials - Wire-torsion test

GB 342 Dimension, shape, weight and tolerance for cold-drawn round steel wires

GB 1298 Carbon tool steels - Technical requirements

GB 2103 General provisions for checking, packing, marking and quality certification of steel wire

GB 2976 Metallic materials - Wire-wrapping test

GB 4354 Quality carbon steel wire rods

GB 6397 Metallic materials - Tensile test specimen

### 3 Classification, code

According to the purpose of steel wires, they are divided into three classes:

Class B: for low stress springs;

Class C: for medium stress springs;

Class D: For high stress springs.

1.00 mm and diameter allowable deviation of h11, is marked as:

Carbon spring steel wire  $\frac{1.00-h11-GB\ 342-82}{D-GB\ 4357-89}$

Order according to steel grade and tensile strength class:

A carbon spring steel wire made of T9A, with mechanical properties of Class D, diameter of 1.00 m and diameter allowable deviation of h11, is marked as:

Carbon spring steel wire  $\frac{1.00-h11-GB\ 342-82}{T9A-D-GB\ 4357-89}$

## 5 Technical requirements

### 5.1 Designation and chemical composition

**5.1.1** Steel wires shall be made of the designations specified in GB 4354 and GB 1298. They can also be made of steel wire rods of other designations with similar quality.

**5.1.2** The sulphur content of steel wire rods is not greater than 0.030 %, and the sulfur content is not greater than 0.020 %.

### 5.2 Mechanical properties

The tensile strength of steel wires shall comply with the provisions of Table 2.

The tensile strength of steel wires of intermediate dimensions is in accordance with the provisions of the adjacent larger dimension.

**Table 2**

| Diameter<br>mm | Tensile strength, MPa |             |             |
|----------------|-----------------------|-------------|-------------|
|                | Class B               | Class C     | Class D     |
| 0.08           | 2 400~2 800           | 2 740~3 140 | 2 840~3 240 |
| 0.09           | 2 350~2 750           | 2 690~3 090 | 2 840~3 240 |
| 0.10           | 2 300~2 700           | 2 650~3 040 | 2 790~3 190 |
| 0.12           | 2 250~2 650           | 2 600~2 990 | 2 740~3 140 |
| 0.14           | 2 200~2 600           | 2 550~2 940 | 2 740~3 140 |
| 0.16           | 2 150~2 550           | 2 500~2 890 | 2 690~3 090 |
| 0.18           | 2 150~2 550           | 2 450~2 840 | 2 690~3 090 |
| 0.20           | 2 150~2 550           | 2 400~2 790 | 2 690~3 090 |

|   |               |                                     |                                                                  |  |
|---|---------------|-------------------------------------|------------------------------------------------------------------|--|
|   |               |                                     | bent at 90° in different directions along an arc of $R = 10$ mm. |  |
| 6 | Wrapping test | 10 %, not less than 3 rods, one end | GB 2976                                                          |  |

## 7 Inspection rules

**7.1** Inspection and acceptance shall be carried out by the technical supervision department of the supply party.

### 7.2 Batching rules

Steel wires shall be inspected and accepted in batches. Each batch shall consist of steel wires of the same designation, the same strength class and the same diameter.

### 7.3 Re-inspection

The re-inspection of steel wires shall be carried out according to the provisions of GB 2103.

There are two specimens for tensile strength and two specimens for torsion. If each of them has one specimen of which the test result is not qualified, the unqualified item can be re-inspected. At this point, the two ends of the steel wire rod shall be removed for a certain length and then two specimens shall be taken for re-inspection. The results must meet the provisions of this Standard.

## 8 Packaging, marking and quality certificate

The packaging, marking and quality certificate of steel wires shall comply with the provisions of GB 2103. The type of packaging shall meet the requirements of Class III, and other types are indicated in the contract.

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