IS 1673 (1984): Mild Steel Wire, Cold Heading Quality [MTD 4: Wrought Steel Products]

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Indian Standard

SPECIFICATION FOR MILD STEEL WIRE, COLD HEADING QUALITY

(Second Revision)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR MILD STEEL WIRE, COLD HEADING QUALITY

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 30 January 1984, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1960 and was revised in 1973. In this revision, the following main modifications have been made:

a) Title has been modified since wires to this specification are used for applications other than machine screws.

b) Size of the wires covered in the specification has been changed to 12·5 mm dia maximum to bring it in line with the maximum size specified for wire in IS : 1956 (Part 5)-1976*.

c) Provisions for reverse torsion test and crushing test have been made.

d) Reference has been given to IS : 8910-1978† for supply conditions.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers the requirements for two grades of cold drawn mild steel wire ranging from 1·60 to 12·50 mm diameter, suitable for the manufacture of machine screws by cold heading and thread rolling process.

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*Bright steel bar and steel wire (*first revision*).
†General technical delivery requirements for steel and steel products.
‡Rules for rounding off numerical values (*revised*).

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of mild steel wire cold heading quality shall be as laid down in IS : 8910-1978*.

3. TEMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Wire Rod — A semi-finished hot rolled product of relatively small cross section and very great length produced in coil form for cold drawing.

3.2 Wire — The product of a wire rod whose sectional area has been reduced at normal temperatures either by drawing through a specially prepared orfiace or passing under pressure between suitably driven rolls.

3.3 Coil — One continuous length of rod as drawn or rolled in the form of a coil.

4. MANUFACTURE

4.1 The manufacturing process of steel shall be determined by the manufacturer unless otherwise agreed to between the contracting parties.

4.2 Steel shall be supplied either in semi-killed or killed condition.

5. CHEMICAL COMPOSITION

5.1 Analysis of wire when analysed either by the method specified in the relevant parts of IS : 228† or any other established instrumental/chemical method shall be as given below. In case of dispute the procedure given in IS : 228† and its relevant parts shall be referee method.

Constituent	*Percent*
Carbon, *Max*	0·20
Manganese	0·30 to 0·60
Sulphur, *Max*	0·055
Phosphorus, *Max*	0·055

NOTE — When the steel is silicon killed, the product analysis shall show a minimum of 0·10 percent silicon. When the steel is aluminium killed, the requirement regarding minimum silicon content does not apply.

6. FREEDOM FROM DEFECTS

6.1 The material shall be practically free from external and internal defects such as pits, pores, pin holes and blisters, laps, grooves, cracks or flaws, shrink holes and slag inclusions.

*General technical delivery requirements for steel and steel products.
†Method for chemical analysis of steel (*second revision*) (issued in parts),

7. MECHANICAL PROPERTIES

7.1 Tensile Properties — The steel wire when tested in accordance with IS : 1521-1972* shall have the following properties:

Grade	*Ultimate Tensile Strength, MPa*
1	440 to 590
2	590 to 780

NOTE — 1 MPa = 1 N/mm^2 = 0·102 kgf/mm^2.

7.2 Reverse Torsion Test — When a sample specimen (length equivalent to 30 times of the diameter of the wire) twisted four times around 360° in one direction and four times back to its original position shall withstand twist without showing surface cracks.

7.3 Crushing Test — A specimen of length 1·5 times its diameter when upset cold to 1/3 of its length, shall not show any cracks in its flanks.

8. DIMENSIONS AND TOLERANCES

8.1 The wire shall be supplied to the sizes and tolerances as specified by the purchaser. If no tolerance is specified the following limits shall be applicable:

Diameter in mm	*Permissible Variation in mm*
From 1·60 up to and including 3·00	+ 0 − 0·060
Above 3·00 up to and including 6·00	+ 0 − 0·075
Above 6·00 up to and including 10·00	+ 0 − 0·090
Above 10·00 up to and including 12·50	+ 0 − 0·110

9. PACKING

9.1 Each coil of wire shall be bound and fastened compactly. The maximum weight of each coil shall be agreed to between the contracting parties.

*Method for tensile testing of steel wire (*first revision*).

10. MARKING

10.1 Each coil of wire shall be legibly marked with the grade, size of wire, date of manufacture, and trade-mark or name of the manufacturer.

10.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

11. SAMPLING AND CRITERIA FOR CONFORMITY

11.1 Sampling of wire and criteria for conformity for mechanical properties and chemical analysis shall be in accordance with IS : 10206-1982*.

*Methods of sampling of steel wire.