

Specification for

Mild steel wire for general engineering purposes

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Cooperating organizations

The preparation of this British Standard was entrusted by the Iron and Steel Standards Policy Committee (ISM/-) to Technical Committee ISM/26, upon which the following bodies were represented:

Aluminium Federation
 Bicycle Association of GB
 British Cable Makers' Confederation
 British Rubber Manufacturers' Association
 British Steel Industry
 Federation of Wire Rope Manufacturers of Great Britain
 Forestry Commission
 Health and Safety Executive
 Sheffield Stainless Steel Manufacturers' Association
 Society of Chain Link Fencing Manufacturers
 Society of Motor Manufacturers and Traders Limited
 Spring Research and Manufacturers' Association
 Stainless Steel Fabricators' Association of Great Britain
 Stainless Steel Wire Industry Association
 Welding Manufacturers' Association (BEAMA Ltd.).
 Woven Wire Association
 Zinc Development Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Electricity Supply Industry in England and Wales
 Fencing Industry Association
 Wire Products Association

This British Standard, having been prepared under the direction of the Iron and Steel Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 April 1980

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Foreword

This British Standard has been prepared under the direction of the Iron and Steel Standards Committee and was originally issued in 1942 as a war emergency issue. In view of its general and continuing use this revision has been prepared. The standard is now technically updated and metricated and details of dimensional tolerances have been revised in keeping with current manufacturing practices. Provision is now made for three conditions of supply and five different conditions of finish.

BS 1052:1942 is withdrawn on publication of this revision.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General requirements

1 Scope

This British Standard specifies the requirements for mild steel wire, of round and other cross-sectional shapes, between 0.122 mm and 13.2 mm diameter or equivalent cross-sectional area. Three conditions of supply and five conditions of finish are specified.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1 wire

cold drawn or cold rolled mild steel wire of any cross-sectional shape

3.2 mild drawn or rolled

lightly drawn or rolled after annealing

3.3 hard drawn or rolled

Drawn or rolled to final size without annealing

NOTE This definition does not exclude, for finer sizes of wire, an interstage annealing treatment before final hard drawing or rolling.

3.4 coil

one length of wire in close-packed concentric rings

3.5 length

a straight piece of wire cut to a specified length

3.6 bundle

two or more coils bound together or a number of lengths bound together

3.7 consignment

any quantity of finished wire in coils or lengths delivered at one time

4 Information to be supplied by the purchaser

The following information shall be given on the enquiry or order:

- a) the number of this British Standard, i.e. BS 1052;

- b) the product form (coils or lengths) (see clause 3);
- c) the diameter or characteristic dimensions of the wire;
- d) the quantity;
- e) whether the wire is required to be welded (see clause 6);
- f) the condition of supply (see clause 7);
- g) the finish (see clause 8);
- h) any requirements for special protection (see clause 13);
- i) the tensile strength range, or, in the case of hard drawn or rolled wire of up to 1.25 mm diameter or equivalent cross-sectional area, the minimum tensile strength (see clause 15);
- j) any additional requirements, e.g. for packaging.

An example of this information to be supplied by the purchaser is:

BS 1052, coils, 2.5 mm diameter wire, 500 kg₂, mild drawn, bright, 340 N/mm² to 500 N/mm².

5 General

The wire shall comply with the requirements of section 1 and the specific requirements of section 2.

6 Quality of wire

6.1 Chemical analysis. The sulphur and phosphorus contents of the wire shall be each not greater than 0.05 % by cast analysis. If the wire is required to be welded, the carbon content shall be not greater than 0.18 % and the manganese content shall be not less than 10 times the sulphur content of the cast, nor greater than 1.00 %.

6.2 Defects. The finished wire shall be free from defects harmful to its end use.

7 Condition of supply

The wire shall be supplied in one of the following conditions specified by the purchaser:

- a) finally annealed;
- b) mild drawn or rolled;
- c) hard drawn or rolled.

8 Finish

The wire shall be supplied with one of the following finishes specified by the purchaser:

- a) a finish produced by final annealing: to be agreed with the manufacturer;
- b) bright;
- c) galvanized;

- d) coppered;
- e) tinned.

NOTE Wire may be supplied with other finishes if agreed at the time of enquiry and order.

9 Coating

9.1 Galvanized round wire. The galvanized coating on round wire shall comply with all of the requirements of BS 443, except that lower coating weights and dips may be agreed between the purchaser and the manufacturer depending upon the purpose for which the wire is required.

9.2 Galvanized sections other than round. Requirements for the galvanized coating on sections other than round shall be agreed between the purchaser and the manufacturer.

9.3 Coatings other than galvanized. Requirements for coatings other than galvanized shall be agreed between the purchaser and the manufacturer.

10 Selection of test pieces

10.1 A test piece of sufficient length to enable the relevant tests specified in section 2 of this standard to be carried out shall be selected in accordance with 10.2 from the wire in the condition in which it will be supplied to the purchaser. Apart from straightening the test lengths before testing, they shall not be treated in any way that would make them unrepresentative of the wire.

10.2 One test piece shall be taken from every ten or part of ten coils or bundles of lengths, if the mass of each coil or bundle of lengths is 50 kg or greater, subject to a rate of not less than one test piece per 1 000 kg.

Two test pieces shall be taken from every 1 000 kg or part of 1 000 kg, if the individual masses of coils or bundles or lengths are each less than 50 kg.

11 Method of testing

11.1 Round wire. The procedures for mechanical testing of round wire shall be in accordance with the requirements of BS 4545.

11.2 Wire of section other than round. The procedures for mechanical testing of wire of section other than round shall be in accordance with the requirements of BS 4545. If a ductility test is to be carried out, the method of testing shall be agreed by the purchaser and the manufacturer.

11.3 Straining rate. For fixed-gear tensile-testing machines, the straining rate shall be preset to give a rate of separation of the grips of not less than 25 % and not greater than 50 % of the test length per minute.

12 Retests

12.1 If any test piece fails any of the tests specified in section 2, additional test pieces shall be taken and retested.

For wire supplied in coil form, one additional test piece shall be taken from each end of the same coil. Part of the coil may be discarded before taking the new test pieces. If the manufacturer wishes to withdraw that coil, the two test pieces shall be taken from another coil in the same consignment.

For wire supplied in lengths, four additional test pieces shall be taken from randomly chosen lengths in the same consignment.

12.2 If all the additional test pieces pass all the tests, the consignment shall be deemed to comply with the requirements of this standard. If any of the additional test pieces fails any of the tests, the consignment shall be deemed not to comply with the requirements of this standard.

13 Packaging and marking

Consignments of wire shall be suitably protected against corrosion during transportation. If special protection is required it shall be agreed at the time of enquiry and order.

Wire supplied in coils, bundles of coils or bundles of lengths shall be securely tied and shall carry a suitable label or labels on which shall be marked:

- a) the manufacturer's name;
- b) the number of this British Standard, i.e. BS 1052;

NOTE Marking BS 1052 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore the manufacturer's sole responsibility.

- c) the diameter or characteristic dimension of the wire;
- d) the condition of supply;
- e) the finish;
- f) the nominal tensile strength.

If additional markings are required they shall be agreed between the purchaser and the manufacturer.

Section 2. Specific requirements

14 Dimensions and tolerances

14.1 Round wire

14.1.1 Round wire of finish other than galvanized. For round wire of finish other than galvanized, the diameter of the wire shall be within the relevant tolerance specified in Table 1.

14.1.2 Galvanized round wire. For galvanized round wire, the diameter of the wire shall be within the relevant tolerance specified in Table 2.

14.2 Wire of section other than round. For wire of section other than round, the tolerance(s) on dimensions shall be agreed between the purchaser and manufacturer.

15 Tensile strength

15.1 With the exception of hard drawn or rolled wire of up to and including 1.25 mm diameter or equivalent cross-sectional area, the purchaser shall specify, for the relevant condition of supply, the required range of tensile strength within the limits given in Table 3. The difference between the minimum and maximum value of the range specified by the purchaser shall be 160 N/mm².

15.2 For hard drawn or rolled wire of up to and including 1.25 mm diameter or equivalent cross-sectional area, only the required minimum tensile strength shall be specified by the purchaser.

16 Ductility test

16.1 Round wire

16.1.1 Wrapping test on round wire. The wrapping test shall be applied to round wire of up to and including 4.75 mm diameter. The wire shall not break nor show defects that could lead to subsequent failure when eight complete turns of the wire are close-coiled around a mandrel of diameter equal to that of the wire.

16.1.2 Bend test on round wire. The bend test shall be applied to round wire of greater than 4.75 mm diameter. The wire shall not crack or fracture when bent through 90° around a mandrel of diameter equal to that of the wire. During the test, the wire shall be free to move longitudinally in the forming device.

16.3 Wire of section other than round. The requirements for a ductility test on wire of section other than round shall be agreed between the purchaser and the manufacturer.

Table 1 — Tolerances on diameter for round wire of finish other than galvanized

Nominal diameter		Tolerance on diameter
Over	Up to and including	
mm	mm	mm
0.122	0.4	± 0.015
0.4	1.0	± 0.02
1.0	1.6	± 0.025
1.6	2.5	± 0.03
2.5	13.2	± 0.05

Table 2 — Tolerances on diameter of galvanized round wire

Nominal diameter		Tolerance on diameter
Over	Up to and including	
mm	mm	mm
0.122	0.3	As agreed between purchaser and manufacturer
0.3	0.7	± 0.02
0.7	1.25	± 0.03
1.25	1.6	± 0.04
1.6	2.0	± 0.05
2.0	2.5	± 0.06
2.5	3.15	± 0.08
3.15	5.5	± 0.1
5.5	13.2	As agreed between purchaser and manufacturer

Table 3 — Limits for ranges of tensile strength values

Condition of supply	Limits on tensile strength range	
	Lower	Upper
	N/mm ²	N/mm ²
Finally annealed	280	500
Mild drawn or rolled	330	550
Hard drawn or rolled	500	950

Publications referred to

BS 443, *Specification for testing zinc coatings on steel wire and for quality requirements.*

BS 4545, *Methods for mechanical testing of steel wire.*

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