

Specification for

Steel roller chains, types S and C, attachments and chain wheels for agricultural and similar machinery

[ISO title: Steel roller chains, types S and C, attachments and chain wheels]

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- British Forging Industry Association
- British Industrial Truck Association
- Institution of Mechanical Engineers
- Mechanical Handling Engineers' Association
- Precision Chain Manufacturers' Association

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National foreword

This revision of BS 2947, which has been prepared under the direction of the Mechanical Engineering Standards Committee, supersedes BS 2947:1970, which is withdrawn. It is identical with ISO 487:1984 “*Steel roller chains, types S and C, attachments and chain wheels*”, published by the International Organization for Standardization (ISO).

In this revision the opportunity has been taken to introduce types C 550 and C 620 chains together with details of a range of special attachment plates for the C 550 chain. A description of the various attachment plates and their basic uses is also included.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker for metric values. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Where the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International Standard	Corresponding British Standard
ISO 606:1982	BS 228:1984 <i>Specification for short pitch transmission precision roller chains and chainwheels</i> (Identical)

The Technical Committee has reviewed the provisions of ISO 185, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A related British Standard for ISO 185 is BS 1452:1977 “*Specification for grey iron castings*”.

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 to iv, pages 1 to 18, 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.

1 Scope and field of application

This International Standard specifies the characteristics of a range of steel roller chains dimensionally derived from the malleable iron type, suitable for conditions of operation and maintenance prevailing in such fields as agriculture, building, quarrying and related industry, mechanical handling, etc., together with associated chain wheels. The dimensions are given in inches and in millimetres; the latter are conversions from the basic inch dimensions.

2 References

ISO 185, *Grey cast iron — Classification*¹⁾.

ISO 606, *Short pitch transmission precision roller chains and chain wheels*.

3 Chains

3.1 Nomenclature

Figure 1 and Figure 2 do not define the actual form of the chain plates.

3.2 Designation

Steel roller chains shall be designated by the standard ISO chain numbers as given in Table 1 and Table 1M.

3.3 Dimensions

The chains shall conform to the dimensions given in Table 1 and Table 1M. Maximum and minimum dimensions are specified to ensure the interchangeability of links produced by different makers of chain. They represent limits for interchangeability, but are not the actual tolerances that should be used in manufacture.

3.4 Minimum ultimate tensile strength

3.4.1 The minimum ultimate tensile strength is the minimum strength of samples tested to destruction in tensile loading, as defined in **3.4.2**. This strength is not a working load. It is intended primarily as a comparative figure between chains of various materials and constructions. For application information, the manufacturers or their published data should be consulted.

3.4.2 A tensile load, not less than that specified in Table 1 and Table 1M, shall be applied slowly to the ends of a chain length containing at least five free pitches, by means of shackles permitting free movement on both sides of the chain centre line, in the normal plane of articulation.

Failure shall be considered to have occurred at the first point where increasing extension is no longer accompanied by increasing load, i.e. the first crest on the load/extension diagram.

Tests in which failures occur adjacent to the shackles shall be disregarded.

3.4.3 The tensile test shall be considered a destructive test. Even though a chain may not fail when subjected to the minimum breaking load, it will have been stressed beyond the yield point and will be unfit for service.

3.5 Proof loading

All chains should be proof loaded during manufacture to at least one third of the minimum ultimate tensile load given in Table 1 and Table 1M.

3.6 Length

Finished chains shall be measured after proof loading (where applicable) but before lubricating. The standard length for measurement shall be a minimum of 20 times the pitch with a maximum length of 1 524 mm (60 in), and shall terminate with an inner link at each end.

The chain shall be supported throughout its entire length and the measuring load in Table 1 and Table 1M shall be applied.

To comply with this International Standard, the length shall be the nominal length subject to the

limits of tolerance $+0,25\%$.

The length accuracy of chains which have to work in parallel shall be within the limits above but matched in agreement with the manufacturer.

3.7 Bearing pin

The bearing pin ends shall be rivetted on all outer links. A detachable link may, however, be used for connecting the ends of the chain, where the use of a rivetted link is inconvenient.

3.8 Cranked link

To obtain an odd number of pitches in a chain, a cranked link is required. The crank shall be central between pins. Using the symbols of Table 1 and Table 1M, its length shall not exceed $p - 1,15 h_2$. Attachment plates shall not be part of a cranked link.

3.9 Marking

The chain should be marked with

- the manufacturer's name or trade mark;
- the ISO chain number (see column 1 of Table 1 and Table 1M).

¹⁾ At present at the stage of draft. (Revision of ISO/R 185:1961.)

4 Attachment plates and links

The four basic types of attachment plates and links covered by this International Standard are as follows:

4.1 C11, C13, C17 and C117 attachment links

Attachment links which form a “tooth” or “beak” on the chain for use in harvesting machines, for example corn picking. The dimensions shall conform to those specified in Table 2, Table 2M, Table 3 and Table 3M.

4.2 F1 and F4 attachment plates

Attachment plates which form a vertical platform to serve as a pusher. Each attachment plate accepts one fixing bolt for this purpose. The dimensions shall conform to those specified in Table 4, Table 4M, Table 5 and Table 5M.

4.3 K1 and K8 attachment plates

Attachment plates which form a platform suitable to accommodate slats and similar attachments. Each attachment plate accepts one fixing bolt for this purpose. Dimensions shall conform to those specified in Table 6, Table 6M, Table 7, Table 7M, Table 8 and Table 8M.²⁾

The maximum length of K1 and K8 attachment plates and/or of their bending radius shall be such as to preclude interference with the plates of adjoining links having the maximum depth (as shown in column 6, plate depth h_2 , of Table 1 and Table 1M).

4.4 M1 attachment plates

Attachment plates which serve as pushers or to accept staybars and similar attachments. The dimensions shall conform to those specified in Table 9 and Table 9M.

The length of M1 attachment plates (in the direction along the chain) shall not exceed 87 % of the pitch (half this amount on either side of the link centre).

NOTE The form and length of attachment plates should provide for the possibility of their use on adjoining links of the chain, noting that the attachment plates may be placed on one side or on both sides of the chain, and on either the inner or the outer link, or on both.

5 Chain wheels

5.1 General

5.1.1 Materials

Grey iron castings of grade 15, in accordance with ISO 185, are of adequate strength for the chain wheels.

5.1.2 Dimensions of teeth

The dimensions of the teeth shall comply with the requirements of either 5.2 or 5.3, according to the application and the method of manufacture, as agreed between purchaser and wheel manufacturer.

5.1.3 Range of teeth

This International Standard applies primarily to the following range of teeth:

- preferred: 7, 9, 11, 13, 15, 17, 18, 27 and 30;
- non-preferred: 6, 8, 10, 12, 14, 16 and 34.

5.1.4 Marking

Chain wheels shall be marked with:

- a) the manufacturer's name or trademark;
- b) the number of teeth;
- c) the chain designation.

5.2 Dimensions of teeth on general purpose chain wheels

5.2.1 Tooth form

The teeth shall have the form illustrated in Figure 11, with the dimensions given in Table 10, Table 11 and Table 11M.

5.2.2 Tooth profile

The teeth shall have the profile and the dimensions given in Table 12 and Table 12M.

5.2.3 Root diameter, d_f

The root diameters shall be as stated in Table 13 and Table 13M. They should be checked by using the measurement over pins procedure, given in the Annex, with the measuring pins touching the working faces of the teeth.

²⁾ The dimensions not specified in these tables are at the discretion of the manufacturer.