INTERNATIONAL STANDARD

ISO 4347

Third edition
1992-08-15

Leaf chains, clevises and sheaves

Chaînes de levage à mailles jointives, chapes et galets de renvoi

INTERNATIONAL ISO

Reference number
ISO 4347:1992(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4347 was prepared by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*.

This third edition cancels and replaces the second edition (ISO 4347:1985), which has been technically revised.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Introduction

This International Standard has been prepared after examining the possibility of having one single series of chains derived directly from the short-pitch precision chains defined in ISO 606.

Consequently, this International Standard includes two series of chains, the one derived from the ISO 606 A series and ANSI B 29.8 being designated by the symbol LH, and the one from ISO 606 B series designated by the symbol LL.

The dimensions are shown in millimetres and are derived from the original dimensions in inches, which are given in annex A.

This page intentionally left blank

Leaf chains, clevises and sheaves

1 Scope

This International Standard specifies characteristics of chains used for general lifting purposes, together with the rim profiles of sheaves and the chain attachment ends of clevises. It covers dimensions, limits for interchangeability, length measurement, proof testing and minimum tensile strengths.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

ISO 606:—[1], *Short-pitch transmission precision roller chains and chain wheels.*

3 Chains

3.1 Nomenclature

The nomenclature of chains is indicated in figure 1 and tables 1 and 2; the figure does not necessarily define the actual form of the chain plates.

3.2 Chain designation

Leaf chains shall be designated by the same numerical components, taken from the standardized ISO chain number, as laid down in ISO 606 for chains with the same pitch: i.e. two digits expressing the pitch in sixteenths of an inch, preceded by the prefix LH for chains from the ISO 606 series A, and LL for chains from ISO 606 series B; followed by the two numbers indicating the number of plates on pin links and articulating links, respectively.

EXAMPLES

The designation of a chain with nominal pitch of 12,7 mm derived from chain 08B, consisting of pin links and articulating links, each including two plates is as follows:

LL 0822

The designation of a chain with nominal pitch of 19,05 mm, consisting of pin links including three plates and articulating links including four plates is as follows:

LH 1234

3.3 Dimensions

Chains shall conform to the dimensions given in tables 1 and 2. Maximum and minimum dimensions are specified to ensure interchangeability of complete chains in clevises. They represent limits for interchangeability, but are not the actual tolerances that should be used in manufacture.

NOTE 1 Chains from different manufacturers should not be placed together within the same application.

3.4 Tensile testing

3.4.1 The minimum tensile strength is that value which shall be exceeded when a tensile force is applied to a sample which is tested to destruction, 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 constructions. For application information, the manufacturers or their published data should be consulted.

1) To be published. (Revision of ISO 606:1982)

3.4.2 A tensile force, not less than that specified in table 1, 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 centreline, 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 force, i.e. the summit of the force/extension diagram.

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

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

3.5 Proof testing

All chains shall be proof tested by applying a tensile force equivalent to at least one-third of the minimum tensile strength given in table 1.

3.6 Length accuracy

As LL leaf chains are normally constructed from plates also used for short-pitch transmission roller chains, the actual pitch of the chain does not necessarily equal its nominal pitch but depends upon each manufacturer. For the specific chain length, consult the manufacturer.

Finished chains shall be measured after proof testing but before lubricating.

The standard measurement length for a chain shall be 49 pitches or 1 524 mm, whichever is the smaller, and the chain shall terminate with an identical link at each end.

The chain shall be supported throughout its entire length and a measuring force equal to 1/100 of the minimum tensile force given in table 1 shall be applied.

The measured length shall be the manufacturer's specified design length, subject to a tolerance of $\pm$ 0,25 %.

3.7 Cranked links

Cranked links shall not be used in leaf chains.

3.8 Marking

The chains shall be marked with

a) the manufacturer's name or trade mark;

b) the ISO chain number as given in table 1.

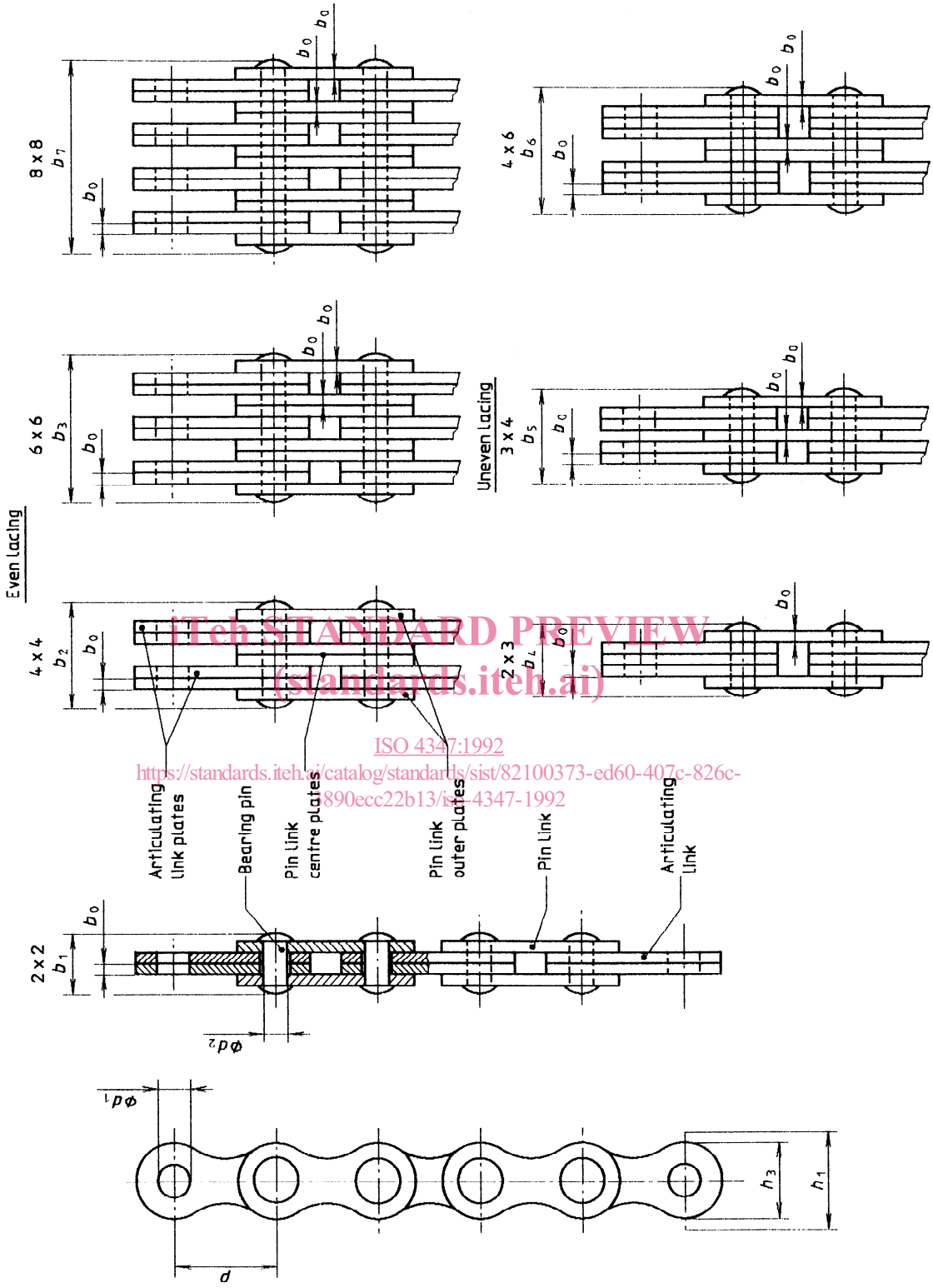

Figure 1 — Symbols related to tables 1 and 2, and to tables A.1 and A.2

Table 1 — Principal chain dimensions and minimum tensile strengths, LH series

ISO chain number	Pitch p nom.	Lacing	Thickness of plates b_0 max.	Hole diameter of articulating link plates d_1 min.	Bearing pin diameter d_2 max.	Chain path depth[1] h_1 min.	Plate depth h_3 max.	Width over riveted bearing pins b_1 to b_7 max.	Tensile strength min.
	mm		mm						kN
LH 0822[2]	12,7	2 × 2	2,08	5,12	5,09	12,32	12,07	11,05	22,2
LH 0823		2 × 3						13,16	22,2
LH 0834		3 × 4						17,4	33,4
LH 0844[2]		4 × 4						19,51	44,5
LH 0846		4 × 6						23,75	44,5
LH 0866[2]		6 × 6						27,99	66,7
LH 0888[2]		8 × 8						36,45	89
LH 1022[2]	15,875	2 × 2	2,44	5,98	5,96	15,34	15,09	12,9	33,4
LH 1023		2 × 3						15,37	33,4
LH 1034		3 × 4						20,32	48,9
LH 1044[2]		4 × 4						22,78	66,7
LH 1046		4 × 6						27,74	66,7
LH 1066[2]		6 × 6						32,69	100,1
LH 1088[2]		8 × 8						42,57	133,4
LH 1222[2]	19,05	2 × 2	3,3	7,96	7,94	18,34	18,11	17,37	48,9
LH 1223		2 × 3						20,73	48,9
LH 1234		3 × 4						27,43	75,6
LH 1244[2]		4 × 4						30,78	97,9
LH 1246		4 × 6						37,49	97,9
LH 1266[2]		6 × 6						44,2	146,8
LH 1288[2]		8 × 8						57,61	195,7
LH 1622[2]	25,4	2 × 2	4,09	9,56	9,54	24,38	24,13	21,34	84,5
LH 1623		2 × 3						25,48	84,5
LH 1634		3 × 4						33,76	129
LH 1644[2]		4 × 4						37,9	169
LH 1646		4 × 6						46,18	169
LH 1666[2]		6 × 6						54,46	253,6
LH 1688[2]		8 × 8						71,02	338,1
LH 2022[2]	31,75	2 × 2	4,9	11,14	11,11	30,48	30,18	25,37	115,6
LH 2023		2 × 3						30,33	115,6
LH 2034		3 × 4						40,23	182,4
LH 2044[2]		4 × 4						45,19	231,3
LH 2046		4 × 6						55,09	231,3
LH 2066[2]		6 × 6						65	347
LH 2088[2]		8 × 8						84,81	462,6
LH 2422[2]	38,1	2 × 2	5,77	12,74	12,71	36,55	36,2	29,62	151,2
LH 2423		2 × 3						35,43	151,2
LH 2434		3 × 4						47,07	244,6
LH 2444[2]		4 × 4						52,88	302,5
LH 2446		4 × 6						64,52	302,5
LH 2466[2]		6 × 6						76,15	453,7
LH 2488[2]		8 × 8						99,42	605

ISO chain number	Pitch p nom.	Lacing	Thickness of plates h_0 max.	Hole diameter of articulating link plates d_1 min.	Bearing pin diameter d_2 max.	Chain path depth[1] h_1 min.	Plate depth h_3 max.	Width over riveted bearing pins b_1 to b_7 max.	Tensile strength min.
	mm		mm						kN
LH 2822[2]	44,45	2 × 2	6,55	14,31	14,29	42,67	42,24	33,55	191,3
LH 2823		2 × 3						40,16	191,3
LH 2834		3 × 4						53,37	315,8
LH 2844[2]		4 × 4						59,97	382,6
LH 2846		4 × 6						73,18	382,6
LH 2866[2]		6 × 6						86,39	578,3
LH 2888[2]		8 × 8						112,8	765,1
LH 3222[2]	50,8	2 × 2	7,52	17,49	17,46	48,74	48,26	39,01	289,1
LH 3223		2 × 3						46,58	289,1
LH 3234		3 × 4						61,72	440,4
LH 3244[2]		4 × 4						69,29	578,3
LH 3246		4 × 6						84,43	578,3
LH 3266[2]		6 × 6						99,57	857,4
LH 3288[2]		8 × 8						129,84	1 156,5
LH 4022[2]	63,5	2 × 2	9,91	23,84	23,81	60,88	60,33	51,74	433,7
LH 4023		2 × 3						61,7	433,7
LH 4034		3 × 4						81,61	649,4
LH 4044[2]		4 × 4						91,57	867,4
LH 4046		4 × 6						111,48	867,4
LH 4066[2]		6 × 6						131,39	1 301,1
LH 4088[2]		8 × 8						171,22	1 734,8

1) Chain path depth is the minimum depth of channel through which the assembled chain will pass.

2) These chains have reduced fatigue strength and wear life compared with uneven lacings of the same pitch and same minimum tensile strength. This should be taken into account when selecting a chain for a particular application.

Table 2 — Principal chain dimensions and minimum tensile strengths, LL series

ISO chain number	Pitch p nom.	Lacing	Thickness of plates h_0 max.	Hole diameter of articulating link plates d_1 min.	Bearing pin diameter d_2 max.	Chain path depth[1] h_1 min.	Plate depth h_3 max.	Width over riveted bearing pins h_1, h_2, h_3 max.	Tensile strength min.
	mm		mm						kN
LL 0822 LL 0844 LL 0866	12,7	2 × 2 4 × 4 6 × 6	1,3	4,46	4,45	11,18	10,92	7,6 13 18,4	17,8 31,1 44,5
LL 1022 LL 1044 LL 1066	15,875	2 × 2 4 × 4 6 × 6	1,65	5,09	5,08	13,98	13,72	9,3 16,1 22,9	22,2 44,5 66,7
LL 1222 LL 1244 LL 1266	19,05	2 × 2 4 × 4 6 × 6	1,9	5,73	5,72	16,39	16,13	10,7 18,5 26,3	28,9 57,8 86,7
LL 1622 LL 1644 LL 1666	25,4	2 × 2 4 × 4 6 × 6	3,2	8,3	8,28	21,34	21,08	17,2 30,2 43,2	58 116 174
LL 2022 LL 2044 LL 2066	31,75	2 × 2 4 × 4 6 × 6	3,7	10,21	10,19	26,68	26,42	20,1 35,1 50,1	95 190 285
LL 2422 LL 2444 LL 2466	38,1	2 × 2 4 × 4 6 × 6	5,2	14,65	14,63	33,73	33,4	28,4 49,4 70,4	170 340 510
LL 2822 LL 2844 LL 2866	44,45	2 × 2 4 × 4 6 × 6	6,45	15,92	15,9	37,46	37,08	34 60 86	200 400 600
LL 3222 LL 3244 LL 3266	50,8	2 × 2 4 × 4 6 × 6	6,45	17,83	17,81	42,72	42,29	35 61 87	260 520 780
LL 4022 LL 4044 LL 4066	63,5	2 × 2 4 × 4 6 × 6	8,25	22,91	22,89	53,49	52,96	44,7 77,9 111,1	360 780 1 080
LL 4822 LL 4844 LL 4866	76,2	2 × 2 4 × 4 6 × 6	10,3	29,26	29,24	64,52	63,88	56,1 97,4 138,9	560 1 120 1 168

1) Chain path depth is the minimum depth of channel through which the assembled chain will pass.

4 Clevises

4.1 Dimensions

The dimensions of terminal clevises for use with LH series and LL series leaf chains shall be as given in tables 3 and 4 and figure 2. Limiting dimensions laid down in these tables are for the purpose of ensuring acceptance of chains built in accordance with the previously published standards.

4.2 Minimum tensile strength

The clevises and the pins used to anchor chains shall withstand at least the same minimum tensile forces as the chains (see 3.4.1 and 3.4.2).

4.3 Length adjustment

In multi-strand applications, where it becomes necessary within the chain assembly to compensate for small length differences between strands, it is always desirable to provide within the anchoring device a length adjustment equal to at least one pitch of the chain.

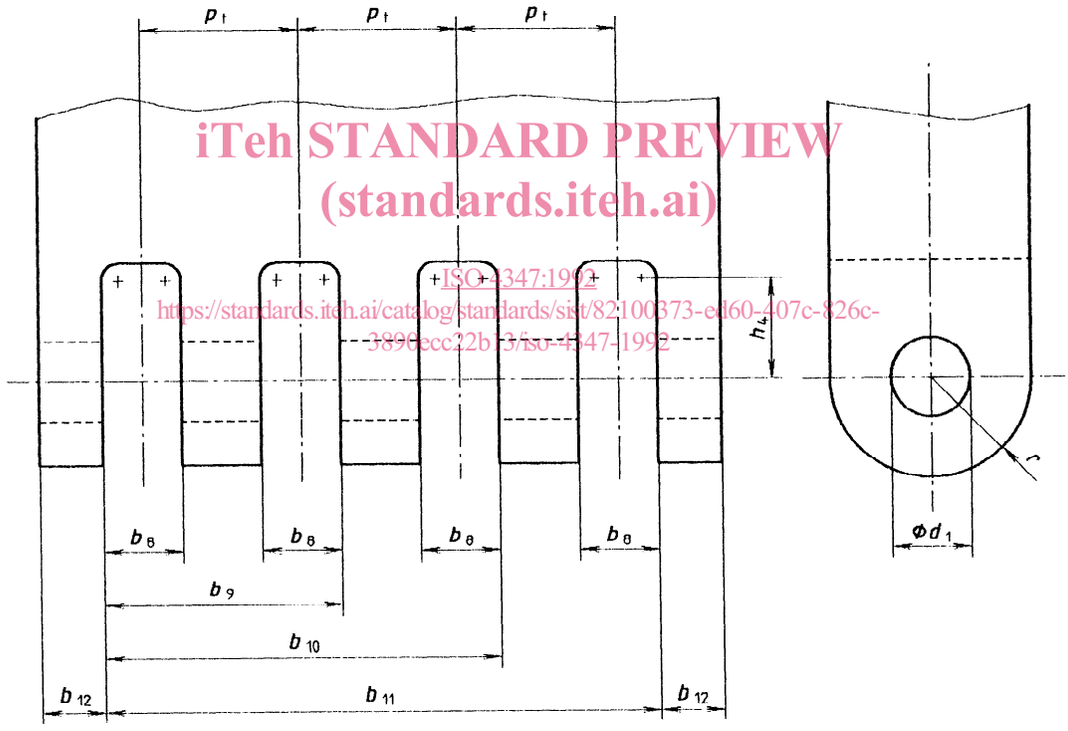

Figure 2 — Dimensions of terminal clevises