

INTERNATIONAL STANDARD

**ISO
1977**

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2000-11-01

Conveyor chains, attachments and sprockets

Chaînes de manutention, plaques-attaches et roues dentées

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ISO 1977:2000

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 1977 was prepared by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*.

This first edition of ISO 1977 cancels and replaces ISO 1977-1:1976, ISO 1977-2:1974, and ISO 1977-3:1974, which have been technically revised.

Annex A forms an integral part of this International Standard.

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Introduction

ISO 1977 combines into a single document ISO 1977-1, ISO 1977-2 and ISO 1977-3, which covered metric-series chains and attachments, and chain wheels, while at the same time revising their technical content.

The principle technical changes are: a reduction in the flanged roller dimensions and the width between outer plates in the MC series of chains, an increase in the width between inner plates in M-series, MC56, MC112 and MC224 chains, and the addition of the small roller diameter to the MC series. New information on the calculation of sprocket tip diameters and tooth heights above root diameters is also given.

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Conveyor chains, attachments and sprockets

1 Scope

This International Standard specifies the characteristics of bush, plain and flanged roller chains of both solid and hollow bearing pin types designed for general conveying and mechanical handling duties, together with associated chain sprockets and attachments. The chain dimensions specified in this International Standard will ensure interchangeability of complete chains and individual links for repair purposes.

This International Standard is applicable to sprockets with from 6 to 40 teeth. Control criteria for sprockets are defined to ensure correct meshing, operation and transmission of load in use under normal operating conditions.

NOTE Controls do not necessarily determine sprocket design parameters.

Specifications are also given for K attachments and deep plates for use with the conveyor chains conforming to this International Standard.

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2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC 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*.

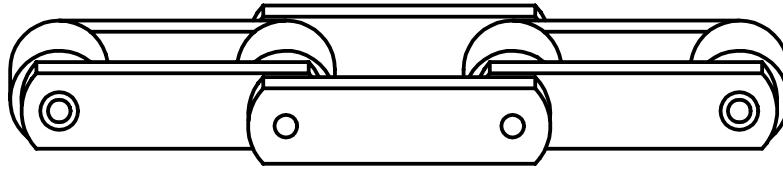
3 Chains

3.1 Nomenclature

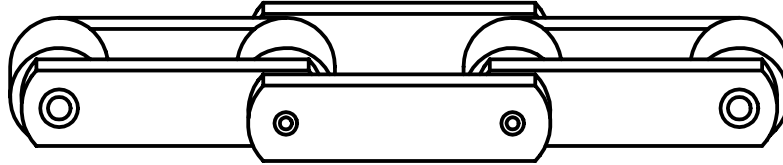
The nomenclature of the chains and their component parts is presented in Figure 1.

3.2 Dimensions

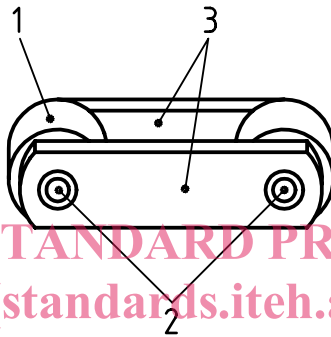
Conveyor chain dimensions shall conform to those given in Table 1 or Table 2 (see Figure 2). Both maximum and minimum dimensions are specified to ensure the interchangeability of links made by different chain manufacturers. Although these represent limits for interchangeability, they are not necessarily to be regarded as limits of tolerance for manufacture.



a) Solid-bearing pin chain



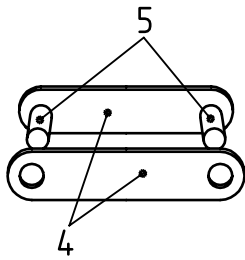
b) Hollow-bearing pin chain



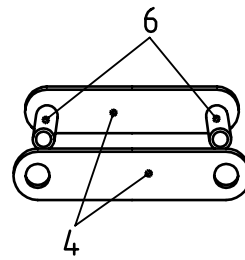
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c) Inner link

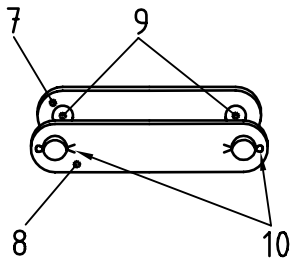
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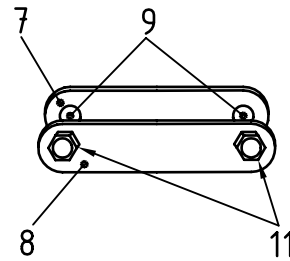
d) Outer link (solid-bearing pins)



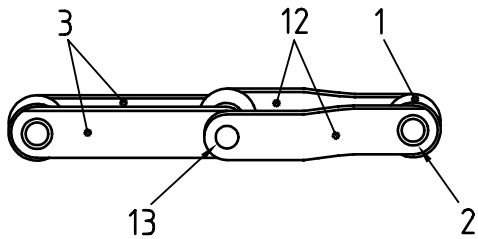
e) Outer link (hollow-bearing pins)



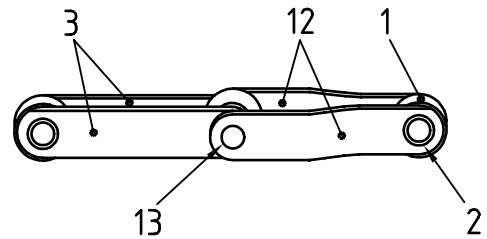
f) Connecting link (cotter pin fasteners)



g) Connecting link (nut fasteners)



h) Cranked link double (solid-bearing pin)



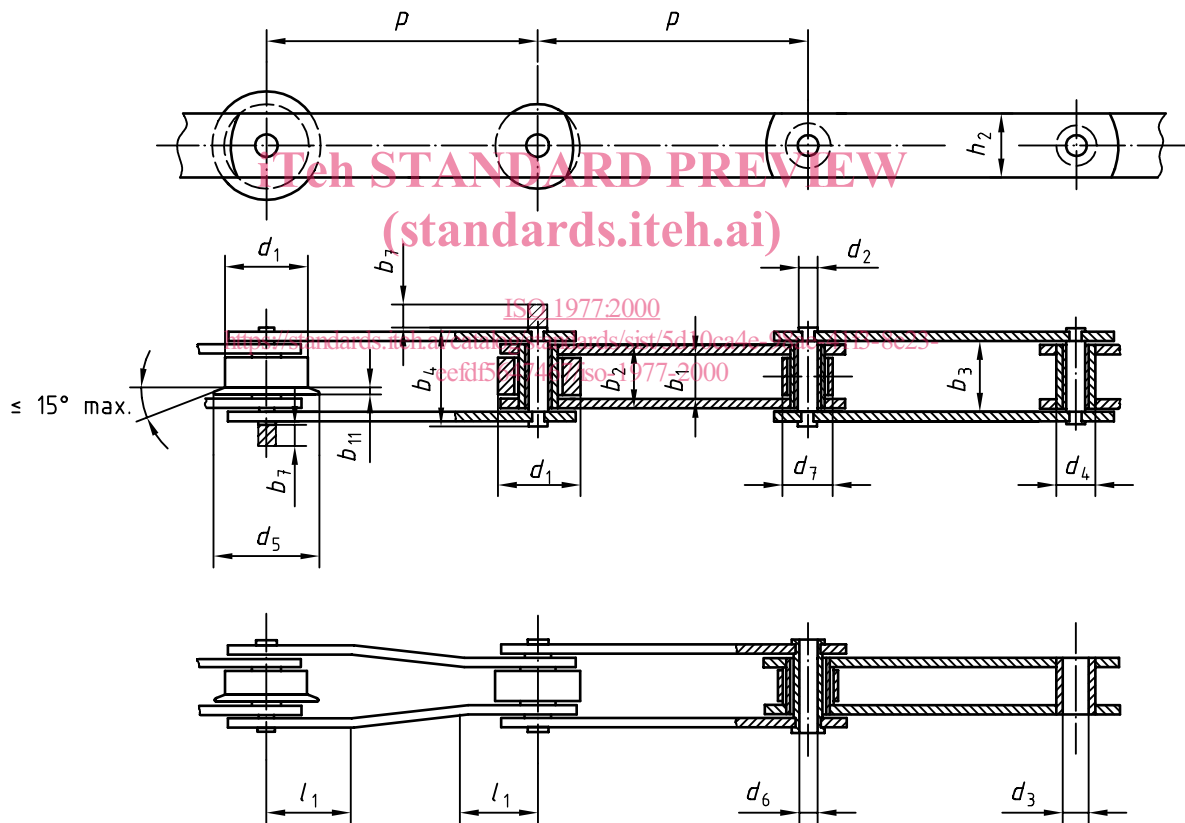
i) Cranked link double (hollow-bearing pin)

Key

- | | | |
|------------------------|--------------------------------------|--------------------------|
| 1 Roller | 6 Bearing pins (hollow) | 11 Nut fasteners |
| 2 Bush | 7 Fixed outer plate | 12 Cranked plate |
| 3 Inner plate | 8 Detachable plate | 13 Bearing pin (riveted) |
| 4 Outer plate | 9 Connecting pins | |
| 5 Bearing pins (solid) | 10 Cotter pin fasteners ^a | |

^a The type of fastener (cotter pin, nut, etc.) is optional.

Figure 1 — Chain parts



- | | | |
|---------------------------------|-----------------------------------------|-----------------------------|
| d_1 plain roller diameter | b_3 width between outer plates | d_6 hollow-pin bore |
| d_2 bearing-pin body diameter | b_4 width over bearing pins | d_7 small roller diameter |
| d_3 bush bore | b_7 additional width for joint faster | |
| d_4 bush diameter | l_1 cranked link dimension | |
| d_5 flange diameter | Flange roller dimensions: | |
| d_6 hollow-pin bore | — d_5 flange diameter | |
| d_7 small roller diameter | — b_{11} flange width | |

NOTE 1 Bearing pins may be of necked design, as shown here, or plain as in Figure 1.

NOTE 2 These illustrations do not define the true form of the chain plates, pins, bushes or rollers.

Figure 2 — Chain dimensions and symbols (see Table 1 and Table 2)

Table 1 — Solid pin conveyor chain dimensions and characteristics

ISO chain No. (basic)	Tensile strength kN min.	d_1 mm max.	Pitch ^{a b c} p mm														
			40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000
M20	20	25	X														
M28	28	30		X													
M40	40	36															
M56	56	42			X												
M80	80	50															
M112	112	60				X											
M160	160	70					X										
M224	224	85						X									
M315	315	100							X								
M450	450	120															
M630	630	140															
M900	900	170									X						

- a Pitch, p , is a theoretical reference dimension used in the calculation of chain lengths and sprocket dimensions, and is not intended for use in the inspection of individual links.
- b Those pitches indicated by an X are for bush and small roller chains.
- c Those pitches within the shaded area are the preferred pitches.
- d The cranked link dimension l_1 also determines the maximum plate length and the limit of the path of articulation taking minimum play into account.

Table 2 — Hollow pin conveyor chain dimensions and characteristics

ISO chain No. (basic)	Tensile strength kN	d_1 mm max.	Pitch ^{a b} p mm											d_2 max.	d_3 min.	d_4 max.	h_2 max.
			63	80	100	125	160	200	250	315	400	500					
MC28	28	36												13	13,1	17,5	26
MC56	56	50												15,5	15,6	21,0	36
MC112	112	70												22	22,2	29,0	51
MC224	224	100												31	31,2	41,0	72

- a Pitch, p , is a theoretical reference dimension used in the calculation of chain lengths and sprocket dimensions, and is not intended for use in the inspection of individual links.
- b Those pitches within the shaded area are the preferred pitches.
- c The cranked link dimension l_1 also determines the maximum plate length and the limit of the path of articulation taking minimum play into account.

Table 1 (continued)

d_2	d_3	d_4	h_2	b_1	b_2	b_3	b_4	b_7	Measuring Force kN	l_1^d	d_5	b_{11}	d_7
max.	min.	max.	max.	min.	max.	min.	max.	max.		min.	max.	max.	max.
6	6,1	9	19	16	22	22,2	35	7	0,4	12,5	32	3,5	12,5
7	7,1	10	21	18	25	25,2	40	8	0,56	14	36	4	15
8,5	8,6	12,5	26	20	28	28,3	45	9	0,8	17	42	4,5	18
10	10,1	15	31	24	33	33,3	52	10	1,12	20,5	50	5	21
12	12,1	18	36	28	39	39,4	62	12	1,6	23,5	60	6	25
15	15,1	21	41	32	45	45,5	73	14	2,24	27,5	70	7	30
18	18,1	25	51	37	52	52,5	85	16	3,2	34	85	8,5	36
21	21,2	30	62	43	60	60,6	98	18	4,5	40	100	10	42
25	25,2	36	72	48	70	70,7	112	21	6,3	47	120	12	50
30,	30,2	42	82	56	82	82,8	135	25	9	55	140	14	60
36	36,2	50	103	66	96	97	154	30	12,5	66,5	170	16	70
44	44,2	60	123	78	112	113	180	37	18	81	210	18	85

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Table 2 (continued)

b_1	b_2	b_3	b_4	b_7	Measuring Force kN	l_1^c	d_5	b_{11}	d_6	d_7
min.	max.	min.	max.	max.		min.	max.	max.	min.	max.
20	28	28,3	42	10	0,56	17,0	42	4,5	8,2	25
24	33	33,3	48	13	1,12	23,5	60	5	10,2	30
32	45	45,5	67	19	2,24	34,0	85	7	14,3	42
43	60	60,6	90	24	4,50	47,0	120	10	20,3	60