INTERNATIONAL STANDARD ISO 1395-1977/AMENDMENT 1

K-15-05

Published 1982-11-01

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Short pitch transmission precision bush chains and chain wheels

AMENDMENT 1

Amendment 1 to International Standard ISO 1395 was developed by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*, and was circulated to the member bodies in May 1981.

It has been approved by the member bodies of the following countries :

Austria	India	South Africa, Rep. of
Belgium	Italy	Spain
Brazil	Japan	Sweden
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Netherlands	USA
France	Poland	USSR
Germany, F. R.	Romania	

No member body expressed disapproval of the document.

Page 1

Replace sub-clause 3.4 by the following :

"**3.4 Minimum ultimate tensile strength**

3.4.1 The minimum 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 tables 1 and 1M, is 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.

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

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

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

ISO 1395-1977/A1-1982 (E)

UDC 621.855 **Ref. No. ISO 1395-1977/A1-1982 (E)**

Descriptors : precision equipment, chains, sprocket wheels, chain drives, specifications, dimensions, designation.

Printed in Switzerland

Price based on 3 pages

Replace sub-clause 3.5 by the following :

"**3.5 Proof loading**

It is recommended that all chains should be proof loaded to one-third of the minimum tensile breaking load given in tables 1 and 1M."

Page 3

Sub-clause 3.6; second paragraph, delete the words "49 times the pitch of the chain" and substitute "a minimum of 24 in (610 mm)".

Page 5

Tables 1 and 1M; delete the existing tables and substitute the tables on the following page (only columns 4 and 15 have been amended).

Page 8

Sub-clause 5.5.1

Amend "r_x" to read "tooth side radius" and "r_a" to read "shroud fillet radius".

Sub-clause 5.5.2

Amend as follows :

a) "r_x" to read "$r_{x\,nom} = p$";

b) "b_a" to read "$b_{a\,nom} = 0{,}13\,p$";

c) Delete "$r_{a\,act}$ = actual shroud radius provided";

d) "d_g" to read

"$d_g = p \cot \frac{180°}{z} - 1.04\,h_2 - 0.030$ in (where p and h_2 are expressed in inches)

or

$= p \cot \frac{180°}{z} - 1{,}04\,h_2 - 0{,}76$ mm (where p and h_2 are expressed in millimetres)."

Table 1 — Chain dimensions, measuring loads and breaking loads (Inch-pound units)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ISO chain number	Pitch	Bush diameter	Width between inner plates	Bearing pin body diameter	Bush bore	Chain path depth	Inner plate depth	Outer/ inter-mediate plate depth	Cranked link dimensions*			Trans-verse pitch	Width over inner link	Width between outer plates	Width over bearing pins			Ad-ditional width for joint fastener	Measuring load			Breaking load		
															Simple	Duplex	Triplex		Simple	Duplex	Triplex	Simple	Duplex	Triplex
	p	d_1 max.	b_1 min.	d_2 max.	d_3 min.	h_1 min.	h_2 max.	h_3 max.	l_1 min.	l_2 min.	c	p_1	b_2 max.	b_3 min.	b_4 max.	b_5 max.	b_6 max.	b_7 max.				min.	min.	min.
	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	lbf	lbf	lbf	lbf	lbf	lbf
04 C	0.250	0.130	0.122	0.091	0.092	0.247	0.237	0.205	0.104	0.121	0.003	0.252	0.189	0.191	0.36	0.61	0.86	0.10	10	20	30	780	1 560	2 340
06 C	0.375	0.200	0.184	0.141	0.143	0.366	0.356	0.307	0.156	0.181	0.003	0.399	0.294	0.296	0.52	0.92	1.32	0.13	16	32	48	1 750	3 500	5 250

Table 1M — Chain dimensions, measuring loads and breaking loads (Metric units)

	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	daN	daN	daN	daN	daN	daN
04 C	6,35	3,30	3,10	2,311	2,34	6,27	6,02	5,21	2,64	3,06	0,08	6,40	4,80	4,85	9,1	15,5	21,8	2,5	5	10	15	350	700	1 050
06 C	9,525	5,08	4,68	3,580	3,63	9,30	9,05	7,80	3,96	4,60	0,08	10,13	7,47	7,52	13,2	23,4	33,5	3,3	7	14	21	790	1 580	2 370

* Cranked links are not recommended for use on chains which are intended for onerous applications.

K-15-05

INTERNATIONAL STANDARD ISO 1395

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Short pitch transmission precision bush chains and chain wheels

Chaînes de transmission de précision à douilles, à pas court, et roues dentées correspondantes

First edition — 1977-01-15

UDC 621.855

Ref. No. ISO 1395-1977 (E)

Descriptors : precision equipment, chains, chain wheels, chain drives, specifications, dimensions, designation.

Price based on 10 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the technical committees were published as ISO Recommendations; these documents are in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*, has reviewed ISO Recommendation R 1395-1970 and found it technically suitable for transformation. International Standard ISO 1395 therefore replaces ISO Recommendation R 1395-1970, to which it is technically identical.

ISO Recommendation R 1395 had been approved by the member bodies of the following countries :

Austria	Greece	Sweden
Belgium	India	Switzerland
Brazil	Israel	Thailand
Czechoslovakia	Italy	Turkey
Chile	Japan	United Kingdom
Finland	Korea, Rep. of	Yugoslavia
France	Romania	
Germany	South Africa, Rep. of	

The member bodies of the following countries had expressed disapproval of the Recommendation on technical grounds :

U.S.A.*
U.R.S.S.

* Subsequently, this member body approved the Recommendation.

No member body disapproved the transformation of the Recommendation into an International Standard.

Printed in Switzerland

1395-77 4851903 0002734 2

Short pitch transmission precision bush chains and chain wheels

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of short pitch precision bush chains of simple and multiplex construction suitable for the mechanical transmission of power and allied applications, together with the tooth gap forms and rim profiles of their associated chain wheels. It covers dimensions, tolerances, measuring loads and minimum breaking loads.

It applies to chains of two pitches only, namely 0.25 in (6,35 mm and 0.375 in (9,525 mm).

The dimensions of chains specified ensure complete interchangeability of any given size and provide interchangeability of individual links of chains for repair purposes.

2 REFERENCE

ISO/R 286, *ISO system of limits and fits — Part I : General, tolerances and deviations.*

3 CHAINS

3.1 Nomenclature

Figures 1, 2 and 3 do not define the actual form of the chain plates. Dimensional definitions are contained in tables 1 and 1M.

3.2 Designation

Transmission precision bush chains are designated by the ISO chain numbers given in tables 1 and 1M, first column, the first two digits expressing the pitch in sixteenths of an inch. The chain numbers in tables 1 and 1M are supplemented by a hyphenated suffix, 1 for simple chain, 2 for duplex chain, 3 for triplex chain, etc. (for example 04C-1, 04C-2, 04C-3, etc.).

3.3 Dimensions

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

3.4 Breaking loads

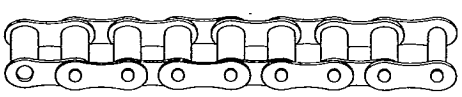
The test length shall have a minimum of five free pitches. The ends shall be attached to the testing machine shackles by a pin through the plate holes or through the bushes or by the bush common to an inner and outer link. The shackles shall be so designed as to allow universal movement; the actual method to be used is left to the discretion of the manufacturer.

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

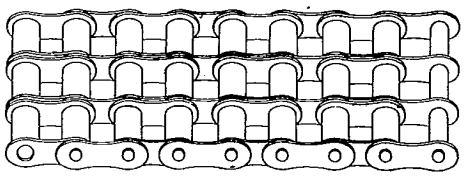
The minimum tensile breaking loads shall be those given in tables 1 and 1M.

3.5 Proof loading

All chains shall be proof loaded to one-third of the minimum tensile breaking load given in tables 1 and 1M.

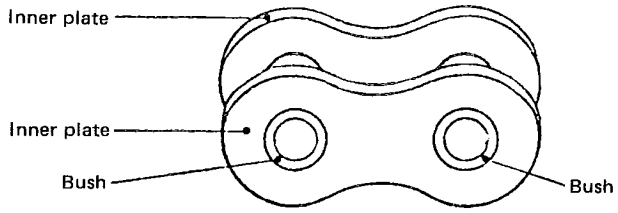


Bush chain, simple

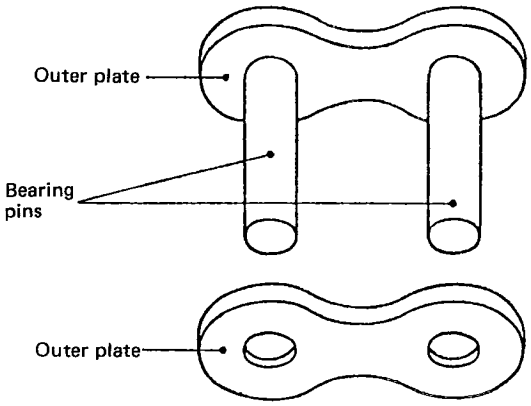


Bush chain, multiple (triplex)

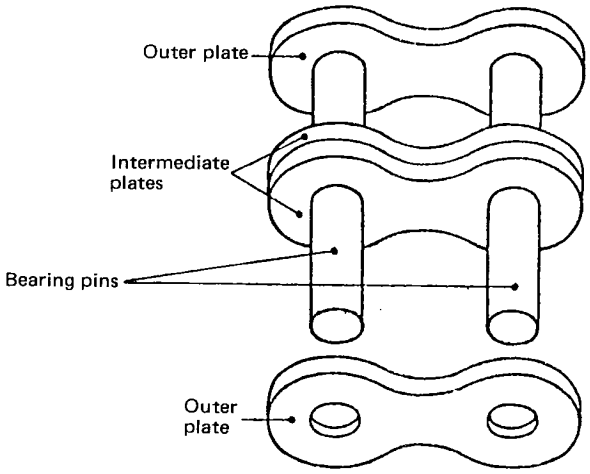
FIGURE 1 — **Types of chains**



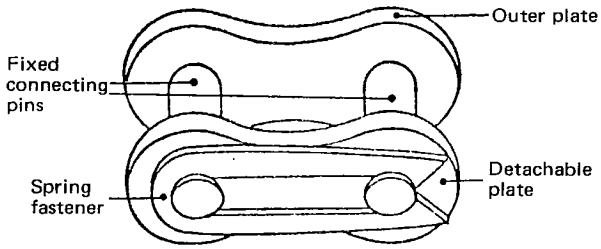
Inner link



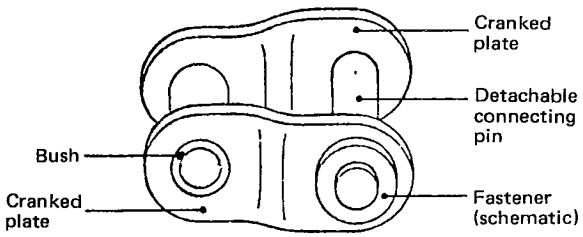
Outer link, simple



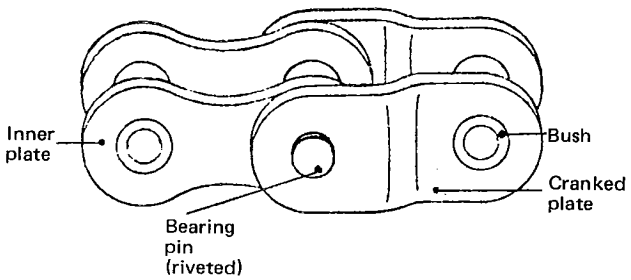
Outer link, duplex



Connecting link with spring fastener



Cranked link, single



Cranked link, double

FIGURE 2 — **Types of links**

3.6 Length accuracy

Finished chains shall be measured after proof loading (where applicable) but before lubricating.

The standard length for measurement shall be 49 times the pitch of the chain and shall terminate at each end in an inner link.

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

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

$$^{+\ 0,15\ \%}_{\ 0}$$

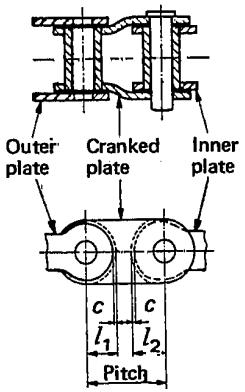
The length accuracy of chains which have to work in parallel shall be within the above limits but matched by agreement with the manufacturer.

3.7 Marking

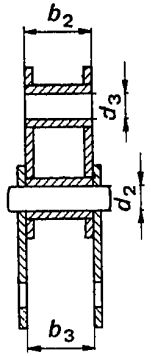
The chains should be marked with :

a) the manufacturer's name or trade mark;

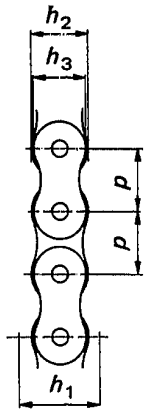
b) the ISO chain number (column 1 of tables 1 and 1M).



Cranked link



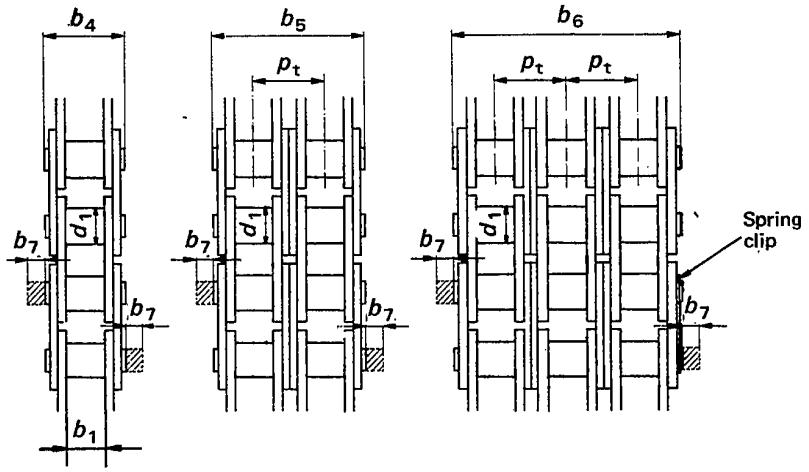
Section through chain



Depths and pitch

Dimension c represents the clearance between the cranked link plates and the straight plates available during articulation.

The chain path depth h_1 is the minimum depth of channel through which the assembled chain should be able to pass.



Simple Duplex Triplex

The overall width of a chain with a joint-fastener is equal to the width over the bearing pins, b_4, b_5 or b_6, plus b_7, for riveted pin (or plus 1,6 b_7 for headed pin end) if fastener is on one side only, or plus 2 b_7, if fastener is on both sides.

The width over bearing pins for chains wider than triplex $= b_4 + p_t$ (number of strands in chain − 1).

FIGURE 3 — **Key to tables 1 and 1M**

TABLE 1 — **Chain dimensions, measuring loads and breaking loads** (Inch-pound units)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ISO chain number	Pitch	Bush diameter	Width between inner plates	Bearing pin body diameter	Bush bore	Chain path depth	Inner plate depth	Outer/ inter-mediate plate depth	Cranked link dimensions*			Trans-verse pitch	Width over inner link	Width between outer plates	Width over bearing pins			Ad-ditional width for joint fastener	Measuring load			Breaking load		
															Simple	Duplex	Triplex		Simple	Duplex	Triplex	Simple	Duplex	Triplex
	p	d_1 max.	b_1 min.	d_2 max.	d_3 min.	h_1 min.	h_2 max.	h_3 max.	l_1 min.	l_2 min.	c	p_t	b_2 max.	b_3 min.	b_4 max.	b_5 max.	b_6 max.	b_7 max.				min.	min.	min.
	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	lbf	lbf	lbf	lbf	lbf	lbf
04 C	0.250	0.130	0.125	0.091	0.092	0.247	0.237	0.205	0.104	0.121	0.003	0.252	0.189	0.194	0.36	0.61	0.86	0.10	10	20	30	780	1 560	2 340
06 C	0.375	0.200	0.188	0.141	0.143	0.366	0.356	0.307	0.156	0.181	0.003	0.399	0.294	0.299	0.52	0.92	1.32	0.13	16	32	48	1 750	3 500	5 250

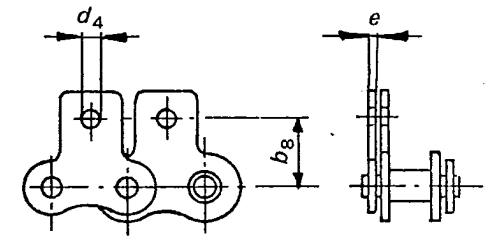
TABLE 1M — **Chain dimensions, measuring loads and breaking loads** (Metric units)

	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	daN	daN	daN	daN	daN	daN
04 C	6,35	3,30	3,18	2,311	2,34	6,27	6,02	5,21	2,64	3,06	0,08	6,40	4,80	4,93	9,1	15,5	21,8	2,5	5	10	15	350	700	1 050
06 C	9,525	5,08	4,77	3,580	3,63	9,30	9,05	7,80	3,96	4,60	0,08	10,13	7,47	7,60	13,2	23,4	33,5	3,3	7	14	21	790	1 580	2 370

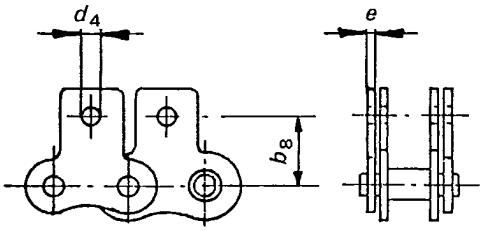
* Cranked links are not recommended for use on chains which are intended for onerous applications.

4 ATTACHMENTS

Standard attachments for use with 06 C size chain are shown in figures 4, 5 and 6. Dimensions shall conform to those shown in tables 2, 3 and 4.



a) extension one side of chain

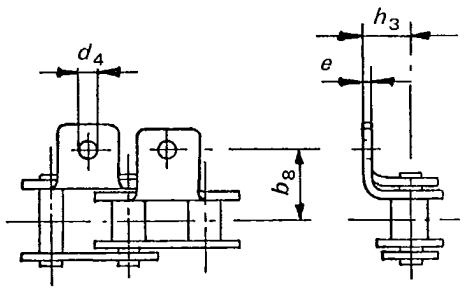


b) extension both sides of chain

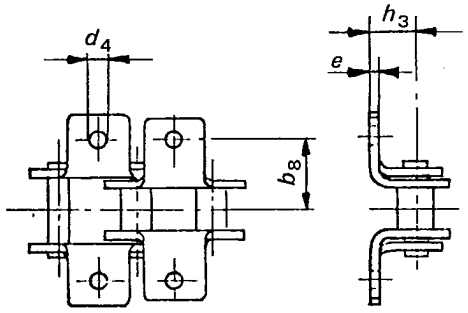
FIGURE 4 — Straight link plate extension

TABLE 2 — Dimensions of straight link plate extension

ISO chain number	d_4 min.		b_8		e	
	in	mm	in	mm	in	mm
06 C	0.102	2,59	0.375	9,53	0.050	1,27



a) extension one side of chain



b) extension both sides of chain

FIGURE 5 — Bent link plate extension

TABLE 3 — Dimensions of bent link plate extension

ISO chain number	d_4 min.		h_3		b_8		e	
	in	mm	in	mm	in	mm	in	mm
06 C	0.102	2,59	0.25	6,35	0.375	9,53	0.050	1,27

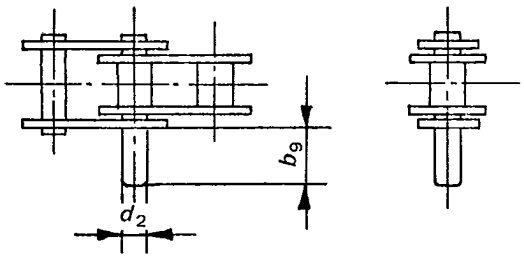


FIGURE 6 — Extended pin on one side of chain

TABLE 4 — Dimensions of extended pin

ISO chain number	d_2		b_9	
	in	mm	in	mm
06 C	0.141	3,58	0.375	9,53

5 CHAIN WHEELS

5.1 Nomenclature

The nomenclature for basic chain dimensions on which all wheel data are based will be found in figure 3. Chain wheel nomenclature is covered under the respective headings.

5.2 Diametral dimensions of wheel rim

5.2.1 *Nomenclature*

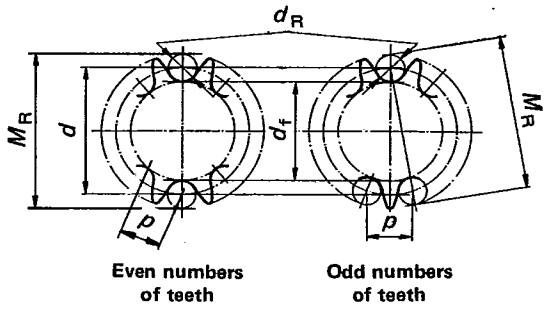


FIGURE 7 — **Diametral dimensions**

p = chordal pitch, equal to chain pitch

d_R = measuring pin diameter

z = number of teeth

d = pitch circle diameter

d_f = root diameter

M_R = measurement over pins

5.2.2 *Dimensions*

5.2.2.1 PITCH CIRCLE DIAMETER

$$d = \frac{p}{\sin \frac{180^\circ}{z}}$$ (see the annex for pitch circle diameters in relation to the number of teeth)

5.2.2.2 MEASURING PIN DIAMETER

$d_R = d_1$ (see 5.3.1) subject to tolerance limits

$$^{+\ 0.000\ 5\ \text{in}\ (0{,}01\ \text{mm})}_{0}$$

5.2.2.3 ROOT DIAMETER

$d_f = d - d_1$ subject to the following tolerance limits :

Root diameter	Upper deviation	Lower deviation
$d_f \leqslant 5$ in (127 mm)	0	0.010 in (0,25 mm)
$d_f \leqslant 9.85$ in (250 mm)	0	0.012 in (0,30 mm)
$d_f > 9.85$ in (250 mm)	0	h11*

* See ISO/R 286.

5.2.2.4 MEASUREMENT OVER PINS

M_R for *even* numbers of teeth $= d + d_R$ min.

M_R for *odd* numbers of teeth $= d \cos \frac{90^\circ}{z} + d_R$ min.

The measurement over pins of wheels with *even* numbers of teeth shall be carried out over pins inserted in opposite tooth gaps.

The measurement over pins of wheels with *odd* numbers of teeth shall be carried out over pins in the tooth gaps most nearly opposite.

The limits of tolerance for the measurement over pins are identical to those for corresponding root diameters.

5.3 Wheel tooth gap forms

5.3.1 *Nomenclature*

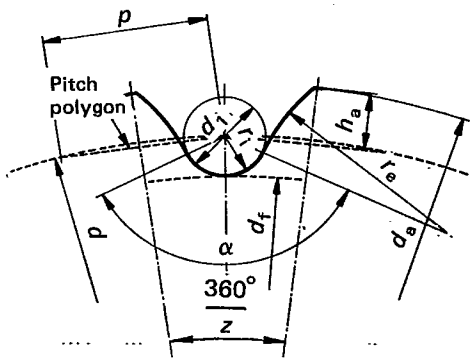


FIGURE 8 — **Tooth gap forms**

p = chordal pitch, equal to chain pitch

d = pitch circle diameter

d_1 = bush diameter, maximum

r_i = bush seating radius

α = bush seating angle

r_e = tooth flank radius

h_a = height of tooth above pitch polygon

d_a = tip diameter

d_f = root diameter

z = number of teeth

5.3.2 *Dimensions*

The limits of the tooth gap form are determined by the minimum and maximum tooth gap forms. The actual tooth gap form provided by cutting or an equivalent method shall

have tooth flanks of a form lying between the minimum and maximum flank radii and blending smoothly with the bush seating curve subtending the respective angles.

5.3.2.1 MINIMUM FORM

r_e max. $= 0{,}12\, d_1\, (z + 2)$

r_i min. $= 0{,}505\, d_1$

α max. $= 140° - \dfrac{90°}{z}$

5.3.2.2 MAXIMUM FORM

r_e min. $= 0{,}008\, d_1\, (z^2 + 180)$

r_i max. $= (0.505\, d_1 + 0.008\, \sqrt[3]{d_1})$ in (where d_1 is expressed in inches)

or $= (0{,}505\, d_1 + 0{,}069\, \sqrt[3]{d_1})$ mm (where d_1 is expressed in millimetres)

α min. $= 120° - \dfrac{90°}{z}$

5.4 Tooth heights and tip diameters

5.4.1 *Nomenclature*

See 5.3.

5.4.2 *Dimensions*

d_a max. $= d + 1{,}25\, p - d_1$

d_a min. $= d + p\left(1 - \dfrac{1{,}6}{z}\right) - d_1$

It should be noted that d_a min. and d_a max. can be applied arbitrarily both to the minimum and maximum gap forms, subject to the limitations imposed by the cutter on d_a max.

To facilitate the construction of the tooth gap form to a large scale on a drawing board, the tooth height above the pitch polygon can be obtained from the following formulae :

$$h_a \text{ max.} = 0{,}625p - 0{,}5\, d_1 + \frac{0{,}8\, p}{z}$$

$$h_a \text{ min.} = 0{,}5\, (p - d_1)$$

Note that h_a max. is related to d_a max., and h_a min. to d_a min.

5.5 Wheel rim profiles

5.5.1 *Nomenclature*

For wheel rim in axial plane sectioned through centre of tooth gap.

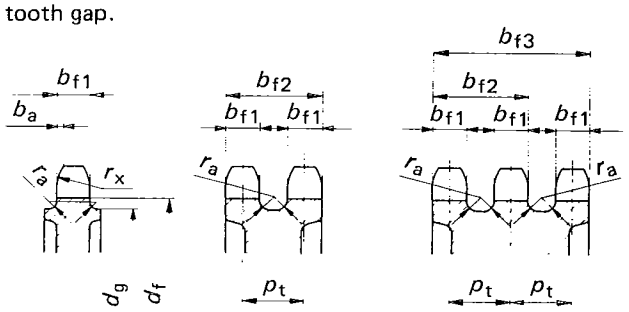


FIGURE 9 – **Wheel rim profiles**

b_{f1} = tooth width

b_{f2} and b_{f3} = widths over teeth

r_x = minimum tooth side radius

b_a = tooth side relief

r_a = shroud radius

d_g = absolute maximum shroud diameter

d_f = root diameter of wheels

p = chain pitch

p_t = transverse pitch of strands

b_1 = width between inner plates, minimum

h_2 = inner plate depth, maximum

5.5.2 *Dimensions*

b_{f1} for simple chain wheels $= 0{,}93\, b_1$: h14*

b_{f1} for duplex and triplex chain wheels $= 0{,}91\, b_1$: h14*

b_{f1} for quadruplex chain wheels and above $= 0{,}88\, b_1$: h14*

b_{f2} and b_{f3} = (number of strands $- 1$) $\times\, p_t + b_{f1}$ (tolerance h14* on b_{f1})

$r_x = p$

b_a = 0,1 p min. to 0,15 p max.

$r_{a\,act}$ = actual shroud radius provided

$d_g = p \cot \dfrac{180°}{z} - 1.05\, h_2 - 0.040 - 2r_{a\,act}$ in (where p, h_2 and r_a are expressed in inches)

or

$= p \cot \dfrac{180°}{z} - 1{,}05\, h_2 - 1{,}00 - 2r_{a\,act}$ mm (where p, h_2 and r_a are expressed in millimetres).

* See ISO/R 286.

5.6 Radial run-out

5.6.1 *Nomenclature*

See 5.2.

5.6.2 *Dimensions*

Radial run-out between the bore and root diameter shall not exceed a value for total indicator reading derived from

0.000 8 d_f + 0.003 in, or 0.006 in, whichever is the greater (where d_f is expressed in inches) up to a maximum of 0.030 in;

or

0,000 8 d_f + 0,08 mm, or 0,15 mm, whichever is the greater (where d_f is expressed in millimetres) up to maximum of 0,76 mm.

5.7 Axial run-out (wobble)

5.7.1 *Nomenclature*

See 5.2.

5.7.2 *Dimensions*

Axial run-out, measured with reference to the bore and the flat part of the side face of the teeth, shall not exceed a value for total indicator reading derived from

0.000 9 d_f + 0.003 in (where d_f is expressed in inches) up to a maximum of 0.045 in;

or

0,000 9 d_f + 0,08 mm (where d_f is expressed in millimetres) up to a maximum of 1,14 mm.

For fabricated (welded) wheels, 0.010 in (0,25 mm) may be accepted if the above formulae give smaller values.

5.8 Pitch accuracy of wheel teeth

Pitch accuracy of wheel teeth is important and chain manufacturers should be consulted for details.

5.9 Range of teeth

This International Standard primarily applies to a range of teeth from 9 to 150 inclusive.

The preferred range of numbers of teeth is 17, 19, 21, 23, 25, 38, 57, 76, 95 and 114.

5.10 Bore tolerance

Unless otherwise agreed between the manufacturer and the purchaser, bores shall be to H8 limits.*

5.11 Marking

Wheels should be marked with :

a) maker's name or trade mark;

b) number of teeth;

c) chain designation (ISO chain number and/or maker's equivalent).

* See ISO/R 286.

ANNEX

PITCH CIRCLE DIAMETERS

The following table gives correct pitch circle diameters for wheels to suit a chain of unit pitch (for example 1 in, 1 mm). The pitch circle diameters for wheels to suit a chain of any other pitch are directly proportional to the pitch of the chain.

Number of teeth z	Pitch circle diameter	Number of teeth z	Pitch circle diameter	Number of teeth z	Pitch circle diameter
9	2,923 8	57	18,152 9	105	33,427 5
10	3,236 1	58	18,471 0	106	33,745 8
11	3,549 4	59	18,789 2	107	34,064 0
12	3,863 7	60	19,107 3	108	34,382 3
13	4,178 6	61	19,425 5	109	34,700 6
14	4,494 0	62	19,743 7	110	35,018 8
15	4,809 7	63	20,061 9	111	35,337 1
16	5,125 8	64	20,380 0	112	35,655 4
17	5,442 2	65	20,698 2	113	35,973 7
18	5,758 8	66	21,016 4	114	36,291 9
19	6,075 5	67	21,334 6	115	36,610 2
20	6,392 5	68	21,652 8	116	36,928 5
21	6,709 5	69	21,971 0	117	37,246 7
22	7,026 6	70	22,289 2	118	37,565 0
23	7,343 9	71	22,607 4	119	37,883 3
24	7,661 3	72	22,925 6	120	38,201 6
25	7,978 7	73	23,243 8	121	38,519 8
26	8,296 2	74	23,562 0	122	38,838 1
27	8,613 8	75	23,880 2	123	39,156 4
28	8,931 4	76	24,198 5	124	39,474 6
29	9,249 1	77	24,516 7	125	39,792 9
30	9,566 8	78	24,834 9	126	40,111 2
31	9,884 5	79	25,153 1	127	40,429 5
32	10,202 3	80	25,471 3	128	40,747 8
33	10,520 1	81	25,789 6	129	41,066 0
34	10,838 0	82	26,107 8	130	41,384 3
35	11,155 8	83	26,426 0	131	41,702 6
36	11,473 7	84	26,744 3	132	42,020 9
37	11,791 6	85	27,062 5	133	42,339 1
38	12,109 6	86	27,380 7	134	42,657 4
39	12,427 5	87	27,699 0	135	42,975 7
40	12,745 5	88	28,017 2	136	43,294 0
41	13,063 5	89	28,335 5	137	43,612 3
42	13,381 5	90	28,653 7	138	43,930 6
43	13,699 5	91	28,971 9	139	44,248 8
44	14,017 6	92	29,290 2	140	44,567 1
45	14,335 6	93	29,608 4	141	44,885 4
46	14,653 7	94	29,926 7	142	45,203 7
47	14,971 7	95	30,244 9	143	45,522 0
48	15,289 8	96	30,563 2	144	45,840 3
49	15,607 9	97	30,881 5	145	46,158 5
50	15,926 0	98	31,199 7	146	46,476 8
51	16,244 1	99	31,518 0	147	46,795 1
52	16,562 2	100	31,836 2	148	47,113 4
53	16,880 3	101	32,154 5	149	47,431 7
54	17,198 4	102	32,472 7	150	47,750 0
55	17,516 6	103	32,791 0		
56	17,834 7	104	33,109 3		