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# INTERNATIONAL STANDARD



# 1275

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

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## Extended pitch precision roller chains and chain wheels for transmission and conveyors

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## 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.

International Standard ISO 1275 was drawn up by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*.

It was approved in March 1968 by the Member Bodies of the following countries :

Austria	Greece	South Africa, Rep. of
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Chile	Israel	Turkey
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The Member Body of the following country expressed disapproval of the document on technical grounds :

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## CONTENTS

	Page
<b>0 Introduction</b> . . . . .	1
<b>1 Scope and field of application</b> . . . . .	1
<b>2 References</b> . . . . .	1
<b>3 Transmission chains</b> . . . . .	2
<b>3.1 Nomenclature</b> . . . . .	2
<b>3.2 Designation</b> . . . . .	4
<b>3.3 Dimensions</b> . . . . .	4
<b>3.4 Breaking loads</b> . . . . .	4
<b>3.5 Proof loading</b> . . . . .	4
<b>3.6 Length accuracy</b> . . . . .	4
<b>3.7 Marking</b> . . . . .	4
<b>4 Chain wheels</b> . . . . .	7
<b>4.1 Nomenclature</b> . . . . .	7
<b>4.2 Diametral dimensions</b> . . . . .	8
<b>4.3 Tooth gap form</b> . . . . .	8
<b>4.4 Radial run-out</b> . . . . .	9
<b>4.5 Axial run-out (wobble)</b> . . . . .	9
<b>4.6 Pitch accuracy of wheel teeth</b> . . . . .	9
<b>4.7 Range of teeth</b> . . . . .	9
<b>4.8 Bore tolerance</b> . . . . .	9
<b>4.9 Marking</b> . . . . .	9
<b>5 Conveyor chains</b> . . . . .	9
<b>5.1 General</b> . . . . .	9
<b>5.2 Nomenclature</b> . . . . .	9
<b>5.3 Designation</b> . . . . .	9
<b>5.4 Dimensions</b> . . . . .	9
<b>5.5 Marking</b> . . . . .	9
<b>5.6 Attachments</b> . . . . .	12
<b>Appendix : Pitch circle diameters</b> . . . . .	14

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# Extended pitch precision roller chains and chain wheels for transmission and conveyors

## 0 INTRODUCTION

The provisions of this International Standard have been arrived at by including sizes of chains used by the majority of countries in the world, and by unifying dimensions, strength and other data in respect of which current national standards were differing. At the same time certain side ranges listed in some national standards, for which it was considered a universal usage had not been established, have been eliminated.

The whole field of application open to this medium of transmission has been covered by the ranges of chains already established. To achieve this the sizes of 25.4 mm (1.0 in) to 76.2 mm (3.0 in) pitch inclusive have been duplicated by the inclusion of chains derived from standards originating in the western hemisphere (suffix A) and, on the other hand, by chains representing the unification of the principal standards originating in Europe (suffix B), the two being complementary for the coverage of the widest possible field of application.

The part of this International Standard covering chain wheels represents the unification of all the relevant national standards in the world and includes, in particular, complete tolerances relating to tooth form which are absent from most current national standards.

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

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of extended pitch precision roller chains suitable for the mechanical transmission of power and for conveyors, together with those of their associated chain wheels. It specifies dimensions, tolerances, measuring loads and minimum breaking loads.

These extended pitch chains have been derived from some of the short pitch transmission precision roller chains covered by ISO/R 606 having certain common dimensions but being twice the pitch.

These chains are intended for use under less onerous conditions in respect of speed and power transmitted than are the base chains from which they are derived.

## 2 REFERENCES

- ISO/R 286, *ISO System of limits and fits – Part 1 : General, tolerances and deviations.*
- ISO/R 606, *Short pitch transmission precision roller chains and chain wheels.*

3 TRANSMISSION CHAINS

3.1 Nomenclature

The illustrations shown in Figures 1 to 3 do not define the actual form of the chain plates.

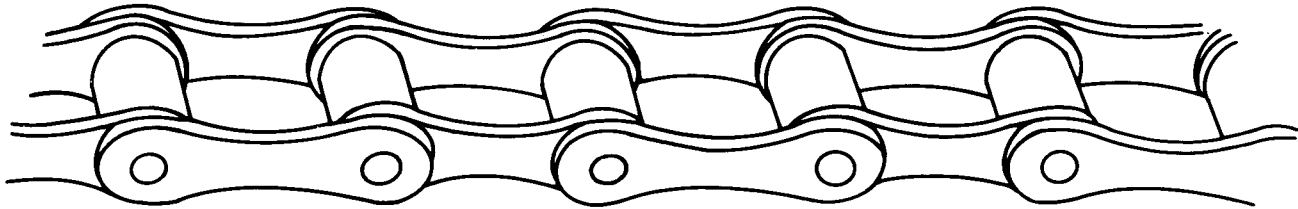


FIGURE 1 – Transmission chain

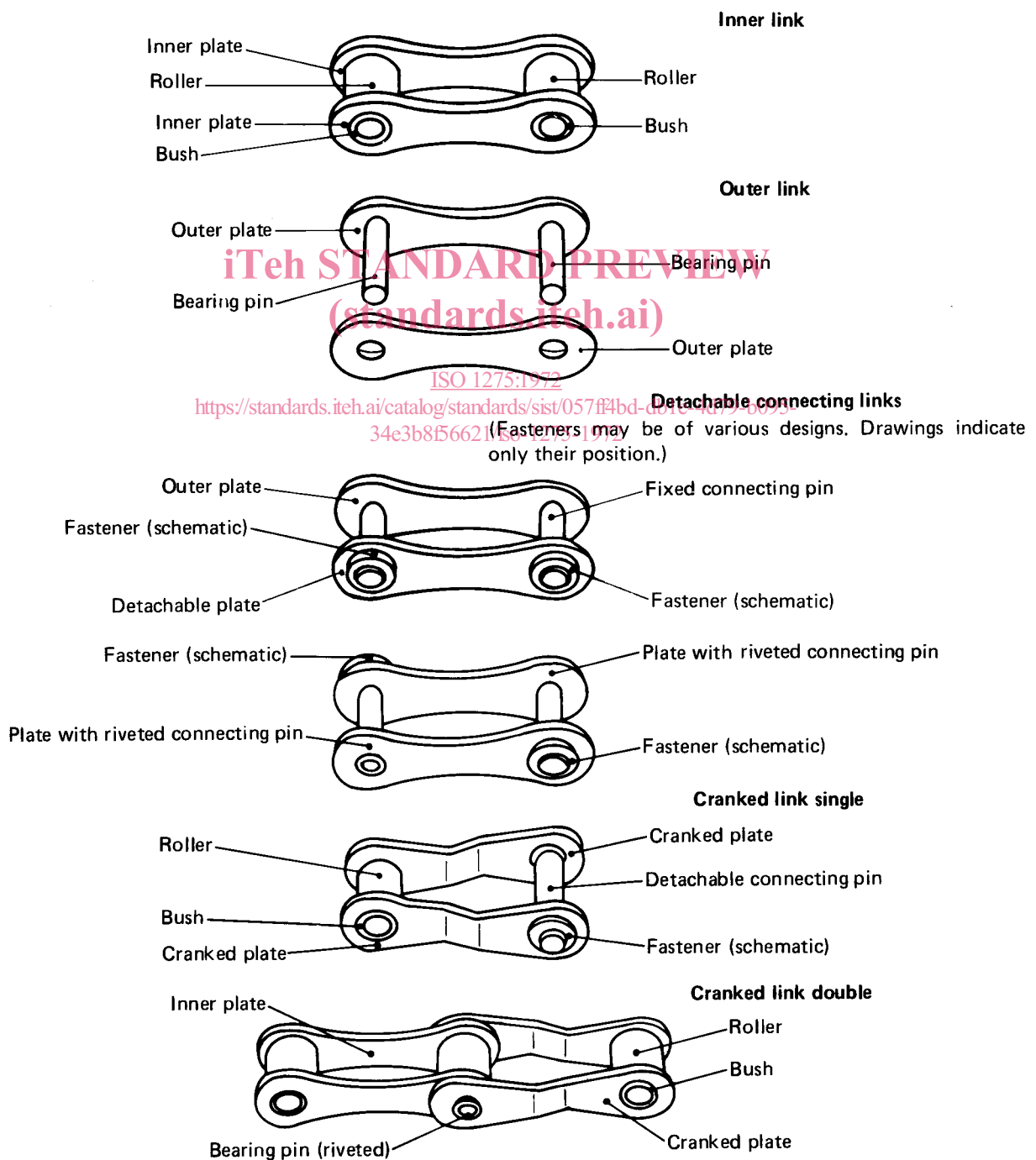
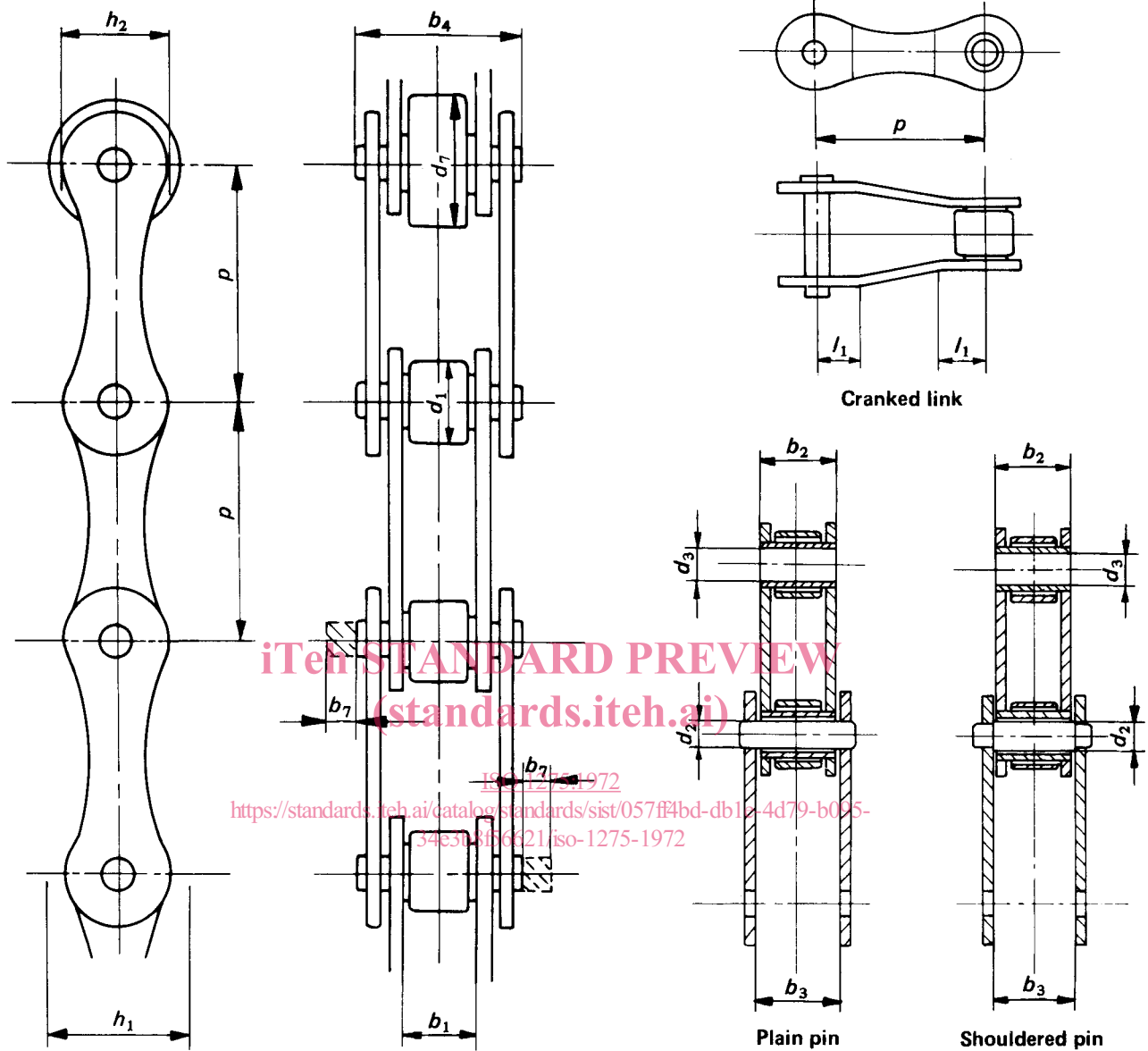


FIGURE 2 – Types of links



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The chain path depth  $h_1$  is the minimum depth of channel through which the assembled chain will pass.

The overall width of a chain with a joint fastener is :

- $b_4 + b_7$  for riveted pin end and fastener on one side;
- $b_4 + 1.6 b_7$  for headed pin end and fastener on one side;
- $b_4 + 2 b_7$  for fasteners on both sides.

FIGURE 3 – Key to Tables 1 to 4

### 3.2 Designation

Extended pitch transmission precision roller chains shall be designated by the standard ISO chain numbers given in Tables 1 to 4 first column. These chain numbers have been obtained by taking the ISO chain number for the base chain in ISO/R 606, and adding the prefix 2.

### 3.3 Dimensions

Chains shall conform to the dimensions given in Tables 1 to 4. 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 manufacturing tolerances.

For the purposes of this International Standard, dimensions for the simple (single strand) extended pitch chains only are shown.

### 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 the bushes or by the bush common to an inner or outer link. The shackles shall be so designed as to allow universal movement. The 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 to 4.

### 3.5 Proof loading

All chains shall be proof loaded to one-third of the minimum tensile breaking load given in Tables 1 to 4.

### 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 or 1 524 mm (60 in), whichever is less, 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 to 4 shall be applied.

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

$$\begin{matrix} + 0.15 \\ 0 \end{matrix} \%$$

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 shall be marked with :

- a) the manufacturer's name or trade mark;
- b) the ISO chain number (column 1 of Tables 1 to 4).



TABLE 1 — Chain dimensions, measuring loads and breaking loads of extended pitch transmission chains (metric units)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ISO chain number	Pitch $p$	Roller diameter $d_1$ max.	Width between inner plates $b_1$ min.	Bearing pin body diameter $d_2$ max.	Bush bore $d_3$ min.	Chain path depth $h_1$ min.	Plate depth $h_2$ max.	Cranked link min.	Width over inner link $b_2$ max.	Width between outer plates $b_3$ min.	Width over bearing pin $b_4$ max.	Additional width for joint fastener <sup>1)</sup> $b_5$ max.	Measuring load kN	Breaking load min. kN
208A	25.40	7.92	7.95	3.96	4.01	12.33	12.07	6.9	11.18	11.31	17.8	3.9	0.125	13.8
208B	25.40	8.51	7.75	4.45	4.50	12.07	11.81	6.9	11.30	11.43	17.0	3.9	0.125	17.8
210A	31.75	10.16	9.53	5.08	5.13	15.35	15.09	8.4	13.84	13.97	21.8	4.1	0.20	21.8
210B	31.75	10.16	9.65	5.08	5.13	14.99	14.73	8.4	13.28	13.41	19.6	4.1	0.20	22.2
212A	38.10	11.91	12.70	5.94	5.99	18.34	18.08	9.9	17.75	17.88	26.9	4.6	0.28	31.1
212B	38.10	12.07	11.68	5.72	5.77	16.39	16.13	9.9	15.62	15.75	22.7	4.6	0.28	28.9
216A	50.80	15.88	15.88	7.92	7.97	24.39	24.13	13.0	22.61	22.74	33.5	5.4	0.50	55.6
216B	50.80	15.88	17.02	8.28	8.33	21.34	21.08	13.0	25.45	25.58	36.1	5.4	0.50	42.3
220A	63.50	19.05	19.05	9.53	9.58	30.48	30.18	16.0	27.46	27.59	41.1	6.1	0.78	86.7
220B	63.50	19.05	19.56	10.19	10.24	26.68	26.42	16.0	29.01	29.14	43.2	6.1	0.78	64.5
224A	76.20	22.23	25.40	11.10	11.15	36.55	36.20	19.1	35.46	35.59	50.8	6.6	1.11	124.6
224B	76.20	25.40	25.40	14.63	14.68	33.73	33.40	19.1	37.92	38.05	53.4	6.6	1.11	97.9
228B	88.90	27.94	30.99	15.90	15.95	37.46	37.08	21.3	46.58	46.71	65.1	7.4	1.51	129.0
232B	101.60	29.21	30.99	17.81	17.86	42.72	42.29	24.4	45.57	45.70	67.4	7.9	2.00	169.0

1) The actual dimensions will depend on the type of fastener used but they should not exceed the dimensions in this column, and should be obtained by the purchaser from the manufacturer.

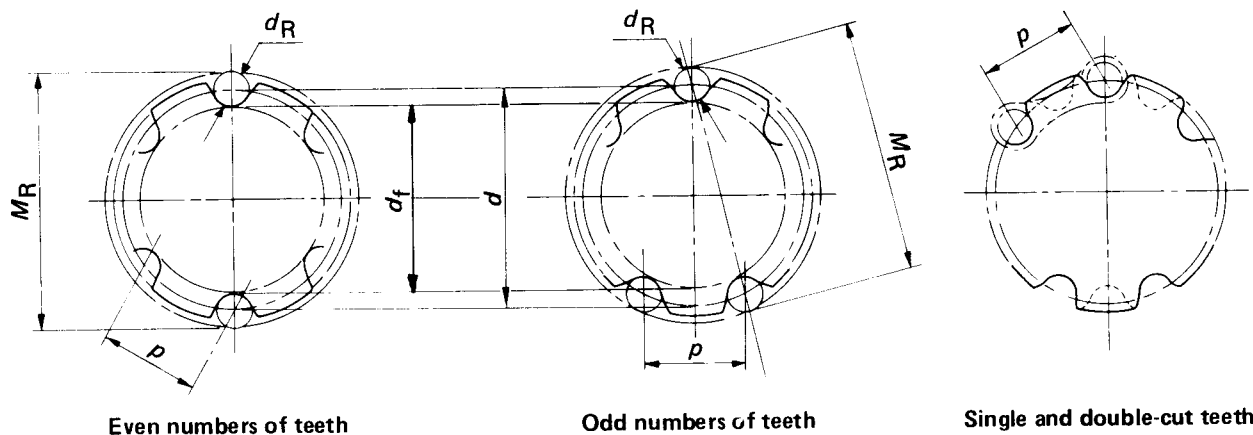
TABLE 2 — Chain dimensions, measuring loads and breaking loads of extended pitch transmission chains (inch-pound units)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ISO chain number	Pitch $p$	Roller diameter $d_1$ max.	Width between inner plates $b_1$ min.	Bearing pin body diameter $d_2$ max.	Bush bore $d_3$ min.	Chain path depth $h_1$ min.	Plate depth $h_2$ max.	Cranked link $l_1$ min.	Width over inner link $b_2$ max.	Width between outer plates $b_3$ min.	Width over bearing pin $b_4$ max.	Additional width for joint fastener <sup>1)</sup> $b_5$ max.	Measuring load	Breaking load
	in	in	in	in	in	in	in	in	in	in	in	in	lbf	lbf
208A	1.00	0.313	0.313	0.156	0.158	0.485	0.475	0.27	0.440	0.445	0.70	0.15	28	3 100
208B	1.00	0.335	0.305	0.175	0.177	0.475	0.465	0.27	0.445	0.450	0.67	0.15	28	4 000
210A	1.25	0.400	0.375	0.200	0.202	0.604	0.594	0.33	0.545	0.550	0.86	0.16	44	4 900
210B	1.25	0.400	0.380	0.200	0.202	0.590	0.580	0.33	0.523	0.528	0.77	0.16	44	5 000
212A	1.50	0.469	0.500	0.234	0.236	0.722	0.712	0.39	0.699	0.704	1.06	0.18	63	7 000
212B	1.50	0.475	0.460	0.225	0.227	0.645	0.635	0.39	0.615	0.620	0.89	0.18	63	6 500
216A	2.00	0.625	0.625	0.312	0.314	0.960	0.950	0.51	0.890	0.895	1.32	0.21	112	12 500
216B	2.00	0.625	0.670	0.326	0.328	0.840	0.830	0.51	1.002	1.007	1.42	0.21	112	9 500
220A	2.50	0.750	0.750	0.375	0.377	1.200	1.188	0.63	1.081	1.086	1.62	0.24	175	19 500
220B	2.50	0.750	0.770	0.401	0.403	1.050	1.040	0.63	1.142	1.147	1.70	0.24	175	14 500
224A	3.00	0.875	1.000	0.437	0.439	1.439	1.425	0.75	1.396	1.401	2.00	0.26	250	28 000
224B	3.00	1.000	1.000	0.576	0.578	1.328	1.315	0.75	1.493	1.498	2.10	0.26	250	22 000
228B	3.50	1.100	1.220	0.626	0.628	1.475	1.460	0.84	1.834	1.839	2.56	0.29	340	29 000
232B	4.00	1.150	1.220	0.701	0.703	1.682	1.665	0.96	1.794	1.799	2.65	0.31	450	38 000

1) The actual dimensions will depend on the type of fastener used but they should not exceed the dimensions in this column, and should be obtained by the purchaser from the manufacturer.

4 CHAIN WHEELS

4.1 Nomenclature

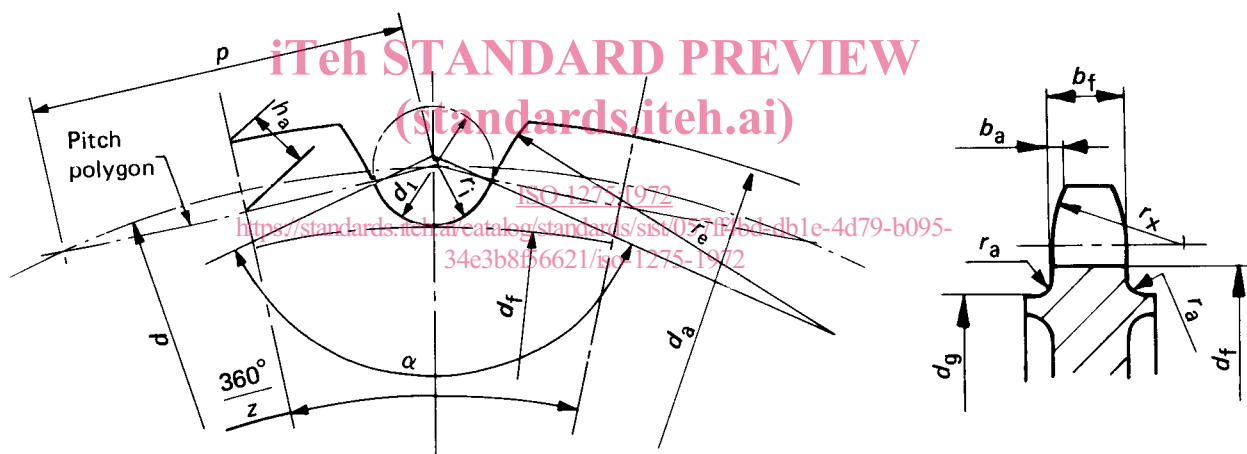


Even numbers of teeth

Odd numbers of teeth

Single and double-cut teeth

Full line =  $z$   
 Dash-dotted line =  $2z$



- $b_a$  = tooth side relief
- $b_f$  = tooth width
- $b_1$  = minimum width between inner plates
- $d$  = pitch circle diameter
- $d_a$  = tip diameter
- $d_f$  = root diameter
- $d_g$  = absolute maximum shroud diameter
- $d_R$  = measuring pin diameter
- $d_1$  = maximum roller diameter
- $h_a$  = height of tooth above pitch polygon
- $h_2$  = maximum plate depth

- $M_R$  = measurement over pins
- $p$  = chordal pitch and is equal to chain pitch
- $r_a$  = actual shroud radius
- $r_e$  = tooth flank radius
- $r_i$  = roller seating radius
- $r_x$  = minimum tooth side radius
- $z$  = number of teeth corresponding to the number of links that can be wrapped around the wheel
- $z_1$  = number of teeth for double-cut wheels =  $2z$
- $\alpha$  = roller seating angle

FIGURE 4 – Nomenclature of chain wheels