SLOVENSKI STANDARD
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Jermenski pogoni - Zobati jermenski pogoni - Jermenice

Synchronous belt drives -- Pulleys

Transmissions synchrones par courroies -- Poulies

Ta slovenski standard je istoveten z: **ISO 5294:1989**

ICS:

21.220.10	Jermenski pogoni in njihovi deli	Belt drives and their components

SIST ISO 5294:1997 **en**

INTERNATIONAL STANDARD

ISO 5294

Second edition
1989-07-15

Synchronous belt drives — Pulleys

Transmissions synchrones par courroies — Poulies

Reference number
ISO 5294 : 1989 (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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5294 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts).*

The second edition cancels and replaces the first edition (ISO 5294 : 1979), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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Synchronous belt drives — Pulleys

1 Scope

This International Standard specifies the principal characteristics of synchronous pulleys for use in synchronous endless belt drives[1] for mechanical power transmission and where positive indexing or synchronization may be required.

The principal characteristics include

a) tooth dimensions and tolerances;

b) pulley dimensions and tolerances;

c) quality specification.

As far as dimensions are concerned, the pulleys specified in this International Standard, for pitch code MXL, may be used interchangeably with the belts specified in ISO 5296-1 and ISO 5296-2.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 254 : 1981, *Quality, finish and balance of transmission pulleys.*

3 Tooth dimensions

3.1 Involute teeth

3.1.1 The involute tooth profile results in different dimensions for each pulley diameter. Therefore, to specify the involute tooth dimensions would require a very voluminous table. For this reason, as well as because of the difficulty in specifying the curved side of an involute tooth, dimensions are specified for the generating tool rack required to produce the involute tooth.

3.1.2 Dimensions and tolerances for the generating tool rack for synchronous pulleys with involute teeth are given in table 1 and figure 1.

1) These drives have been known under various names in the past, for example: timing belt drives, positive belt drives, gear belt drives.

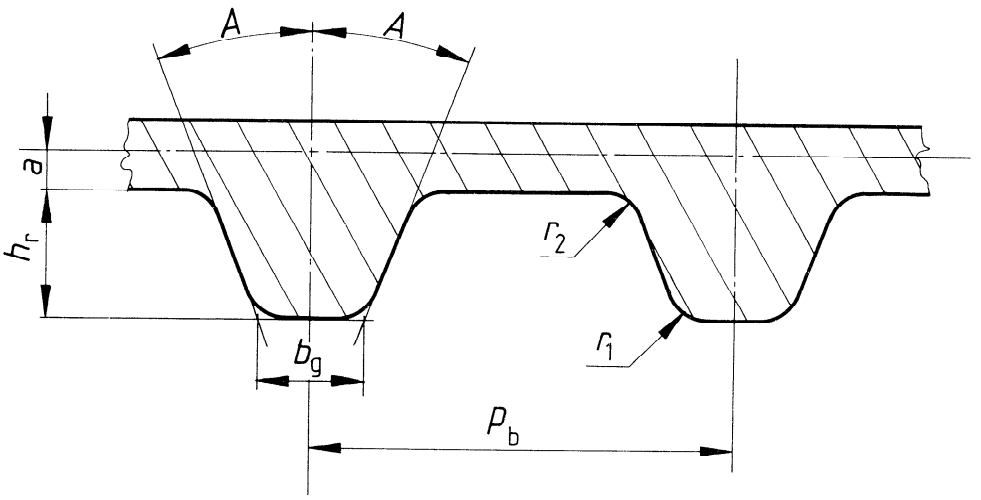

Figure 1 — Generating tool rack for pulleys with involute teeth

Table 1 — Dimensions and tolerances for generating tool rack for pulleys with involute teeth

Pitch code	Number of teeth in pulley z	p_b mm ± 0,003	p_b in ± 0,000 1	A degrees ± 0,12	h_r mm +0,05 0	h_r in +0,002 0	b_g mm +0,05 0	b_g in +0,002 0	r_1 mm ± 0,03	r_1 in ± 0,001	r_2 mm ± 0,03	r_2 in ± 0,001	$2u$ mm	$2u$ in
MXL	$10 \leqslant z \leqslant 23$	2,032	0,08	28	0,64	0,025	0,61	0,024	0,3	0,012	0,23	0,009	0,508	0,02
	$z \geqslant 24$			20			0,67	0,026 5						
XXL	$z \geqslant 10$	3,175	0,125	25	0,84	0,033	0,96	0,038	0,3	0,012	0,28	0,011	0,508	0,02
XL	$z \geqslant 10$	5,08	0,2	25	1,4	0,055	1,27	0,05	0,61	0,024	0,61	0,024	0,508	0,02
L	$z \geqslant 10$	9,525	0,375	20	2,13	0,084	3,1	0,122	0,86	0,034	0,53	0,021	0,762	0,03
H	$14 \leqslant z \leqslant 19$	12,7	0,5	20	2,59	0,102	4,24	0,167	1,47	0,058	1,04	0,041	1,372	0,054
	$z > 19$										1,42	0,056		
XH	$z \geqslant 18$	22,225	0,875	20	6,88	0,271	7,59	0,299	2,01	0,079	1,93	0,076	2,794	0,11
XXH	$z \geqslant 18$	31,75	1,25	20	10,29	0,405	11,61	0,457	2,69	0,106	2,82	0,111	3,048	0,12

3.2 Straight-sided teeth

3.2.1 Involute teeth are normally recommended for synchronous belt drives. Since straight-sided teeth are in use, their specifications are also included.

3.2.2 Dimensions and tolerances for straight-sided teeth (see figure 2) are given in table 2.

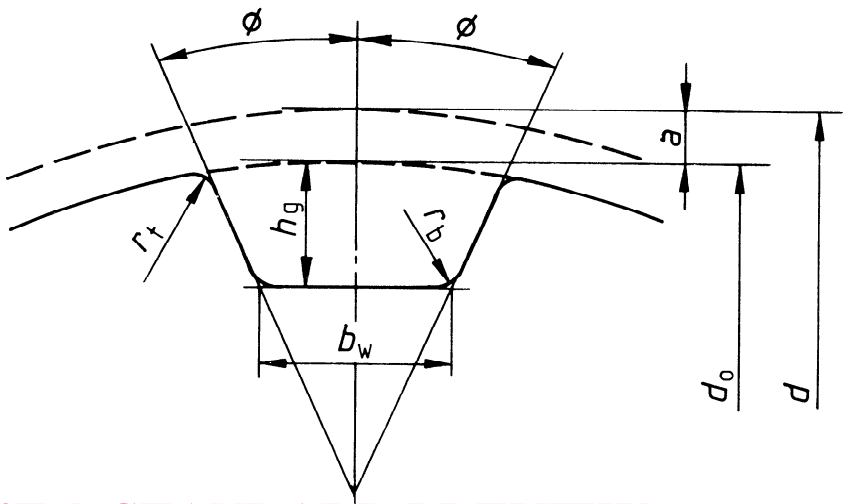

Figure 2 — Straight-sided teeth

Table 2 — Dimensions and tolerances for pulleys with straight-sided teeth

Pitch code	b_w		h_g		ϕ degrees	r_b max.		r_t		$2a$	
	mm	in	mm	in	± 1,5	mm	in	mm	in	mm	in
MXL	0,84 ± 0,05	0,033 ± 0,002	0,69 $^{0}_{-0,05}$	0,027 $^{0}_{-0,002}$	20	0,25	0,01	0,13 $^{+0,05}_{0}$	0,005 $^{+0,002}_{0}$	0,508	0,02
XXL	0,96 $^{+0,05}_{0}$	0,038 $^{+0,002}_{0}$	0,84 $^{0}_{0,05}$	0,033 $^{0}_{-0,002}$	25	0,35	0,014	0,3 ± 0,05	0,012 ± 0,002	0,508	0,02
XL	1,32 ± 0,05	0,052 ± 0,002	1,65 $^{0}_{-0,08}$	0,065 $^{0}_{-0,003}$	25	0,41	0,016	0,64 $^{+0,05}_{0}$	0,025 $^{+0,002}_{0}$	0,508	0,02
L	3,05 ± 0,1	0,12 ± 0,004	2,67 $^{0}_{-0,10}$	0,105 $^{0}_{-0,004}$	20	1,19	0,047	1,17 $^{+0,13}_{0}$	0,046 $^{+0,005}_{0}$	0,762	0,03
H	4,19 ± 0,13	0,165 ± 0,005	3,05 $^{0}_{0,13}$	0,12 $^{0}_{-0,005}$	20	1,6	0,063	1,6 $^{+0,13}_{0}$	0,063 $^{+0,005}_{0}$	1,372	0,054
XH	7,9 ± 0,15	0,311 ± 0,006	7,14 $^{0}_{-0,13}$	0,281 $^{0}_{-0,005}$	20	1,98	0,078	2,39 $^{+0,13}_{0}$	0,094 $^{+0,005}_{0}$	2,794	0,11
XXH	12,17 ± 0,18	0,479 ± 0,007	10,31 $^{0}_{-0,13}$	0,406 $^{0}_{-0,005}$	20	3,96	0,156	3,18 $^{+0,13}_{0}$	0,125 $^{+0,005}_{0}$	3,048	0,12

3.3 Pitch-to-pitch tolerances

Tolerances on the amount of deviation of belt pitch between adjacent teeth, and on the summation of deviations within 90° arc of a pulley, are given in table 3. This tolerance applies to the distance between the same point on either the right or left corresponding flanks of adjacent teeth.

Table 3 — Pitch-to-pitch tolerances

Outside diameter d_o		Allowable deviation of pitch			
		Between any two adjacent teeth		Summation within a 90° arc	
mm	in	mm	in	mm	in
$d_o \leqslant 25,4$	$d_o \leqslant 1$	0,03	0,001	0,05	0,002
$25,4 < d_o \leqslant 50,8$	$1 < d_o \leqslant 2$	0,03	0,001	0,08	0,003
$50,8 < d_o \leqslant 101,6$	$2 < d_o \leqslant 4$	0,03	0,001	0,1	0,004
$101,6 < d_o \leqslant 177,8$	$4 < d_o \leqslant 7$	0,03	0,001	0,13	0,005
$177,8 < d_o \leqslant 304,8$	$7 < d_o \leqslant 12$	0,03	0,001	0,15	0,006
$304,8 < d_o \leqslant 508$	$12 < d_o \leqslant 20$	0,03	0,001	0,18	0,007
$d_o > 508$	$d_o > 20$	0,03	0,001	0,2	0,008

4 Pulley dimensions

4.1 Pulley width

The pulley width designation, the nominal pulley width, and the minimum actual pulley width required, b_f for flanged pulleys, b_f' for unflanged pulleys (see figure 3), are given in table 4.

Users are advised that the values given for b_f apply also to pulleys with only one flange.

4.2 Pulley diameter

4.2.1 Pulley diameters are given in table 5.

Table 4 — Pulley widths

Pitch code	Pulley width designation	Nominal pulley width		Minimum flanged pulley width b_f		Minimum unflanged pulley width b_f'	
		mm	in	mm	in	mm	in
MXL	012	3,2	0,12	3,8	0,15	5,6	0,22
	019	4,8	0,18	5,3	0,21	7,1	0,28
	025	6,4	0,25	7,1	0,28	8,9	0,35
XXL	012	3,2	0,12	3,8	0,15	5,6	0,22
	019	4,8	0,18	5,3	0,21	7,1	0,28
	025	6,4	0,25	7,1	0,28	8,9	0,35
XL	025	6,4	0,25	7,1	0,28	8,9	0,35
	031	7,9	0,31	8,6	0,34	10,4	0,41
	037	9,5	0,37	10,4	0,41	12,2	0,48
L	050	12,7	0,5	14	0,55	17	0,67
	075	19,1	0,75	20,3	0,8	23,3	0,92
	100	25,4	1	26,7	1,05	29,7	1,17
H	075	19,1	0,75	20,3	0,8	24,8	0,98
	100	25,4	1	26,7	1,05	31,2	1,23
	150	38,1	1,5	39,4	1,55	43,9	1,73
	200	50,8	2	52,8	2,08	57,3	2,26
	300	76,2	3	79	3,11	83,5	3,29
XH	200	50,8	2	56,6	2,23	62,6	2,46
	300	76,2	3	83,8	3,3	89,8	3,54
	400	101,6	4	110,7	4,36	116,7	4,59
XXH	200	50,8	2	56,6	2,23	64,1	2,52
	300	76,2	3	83,8	3,3	91,3	3,59
	400	101,6	4	110,7	4,36	118,2	4,65
	500	127	5	137,7	5,42	145,2	5,72

NOTE — The minimum unflanged pulley width (b_f') may be reduced when the alignment of the drive can be controlled, but shall be not less than the minimum flanged pulley width (b_f).

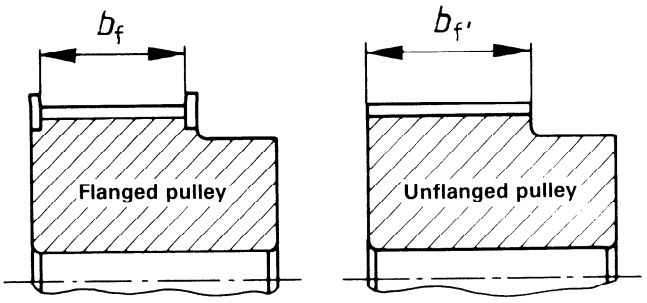

Figure 3 — Minimum pulley width