SLOVENSKI STANDARD
SIST ISO 5294:2013

01-december-2013

Nadomešča:
SIST ISO 5294:1997

Jermenski pogoni - Zobati jermenski pogoni - Jermenice

Synchronous belt drives - Pulleys

Transmissions synchrones par courroies - Poulies

Ta slovenski standard je istoveten z: **ISO 5294:2012**

ICS:

21.220.10	Jermenski pogoni in njihovi deli	Belt drives and their components

SIST ISO 5294:2013 **en**

INTERNATIONAL STANDARD

ISO 5294

Third edition
2012-12-01

Synchronous belt drives — Pulleys

Transmissions synchrones par courroies — Poulies

Reference number
ISO 5294:2012(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5294 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 4, *Synchronous belt drives*.

This third edition cancels and replaces the second edition (ISO 5294:1989), which has been technically revised.

Synchronous belt drives — Pulleys

1 Scope

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

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

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 are used interchangeably with the belts specified in ISO 5296.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 254, *Belt drives — Pulleys — Quality, finish and balance*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 5296, *Synchronous belt drives — Belts with pitch codes MXL, XXL, XL, L, H, XH and XXH — Metric and inch dimensions*

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.

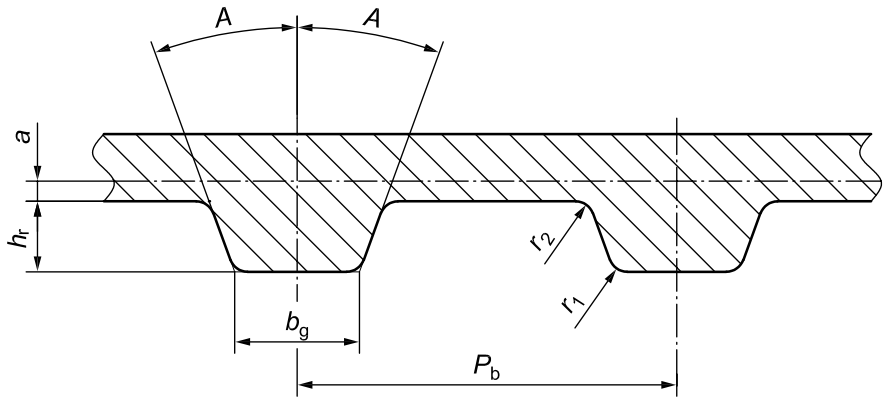

Figure 1 — Generating tool rack for pulleys with involute teeth

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.

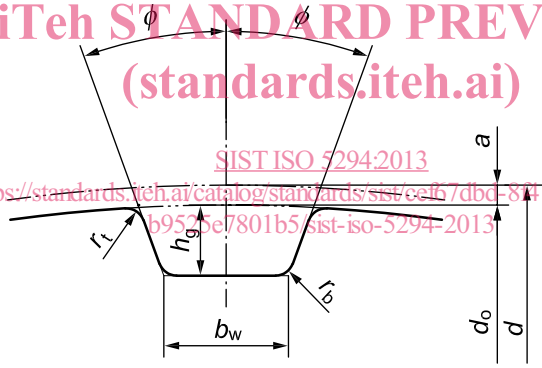

Figure 2 — Straight-sided teeth

3.3 Pitch-to-pitch tolerances

Tolerances on the amount of deviation of 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 1 — Dimensions and tolerances for generating tool rack for pulleys with involute teeth

Pitch code	Number of teeth in pulley Z	P_b		A	h_r		b_g		r_1		r_2		$2a$	
		mm	in.	degrees ±0,12	mm +0,05 0	in. +0,002 0	mm +0,05 0	in. +0,002 0	mm ±0,03	in. ±0,001	mm ±0,03	in. ±0,001	mm	in.
MXL	10 ≤ Z ≤ 23	2,032 ±0,008	0,080 ±0,000 3	28	0,64	0,025	0,61	0,024	0,30	0,012	0,23	0,009	0,508	0,020
	Z ≥ 24			20			0,67	0,026 5						
XXL	Z ≥ 10	3,175 ±0,011	0,125 ±0,000 4	25	0,84	0,033	0,96	0,038	0,30	0,012	0,28	0,011	0,508	0,020
XL	Z ≥ 10	5,080 ±0,011	0,200 ±0,000 4	25	1,40	0,055	1,27	0,050	0,61	0,024	0,61	0,024	0,508	0,020
L	Z ≥ 10	9,525 ±0,012	0,375 ±0,000 5	20	2,13	0,084	3,10	0,122	0,86	0,034	0,53	0,021	0,762	0,030
H	14 ≤ Z ≤ 19	12,700 ±0,015	0,500 ±0,000 6	20	2,59	0,102	4,24	0,167	1,47	0,058	1,04	0,041	1,372	0,054
	Z ≥ 20										1,42	0,056		
XH	Z ≥ 18	22,225 ±0,019	0,875 ±0,000 7	20	6,88	0,271	7,59	0,299	2,01	0,079	1,93	0,076	2,794	0,110
XXH	Z ≥ 18	31,750 ±0,025	1,250 ±0,001	20	10,29	0,405	11,61	0,457	2,69	0,106	2,82	0,111	3,048	0,120

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

Pitch code	b_w				h_g		Φ degrees ±1,5	r_b max.		r_t				$2a$	
	mm		in.		mm	in.		mm	in.	mm		in.		mm	in.
MXL	0,84	±0,05	0,033	±0,002	$0{,}69_{-0{,}05}^{0}$	$0{,}027_{-0{,}002}^{0}$	20	0,25	0,010	$0{,}13_{0}^{+0{,}05}$		$0{,}005_{0}^{+0{,}002}$		0,508	0,020
XXL	$0{,}96_{0}^{+0{,}05}$		$0{,}038_{0}^{+0{,}002}$		$0{,}84_{-0{,}05}^{0}$	$0{,}033_{-0{,}002}^{0}$	25	0,35	0,014	0,30	±0,05	0,012	±0,002	0,508	0,020
XL	1,32	±0,05	0,052	±0,002	$1{,}65_{-0{,}08}^{0}$	$0{,}065_{-0{,}003}^{0}$	25	0,41	0,016	$0{,}64_{0}^{+0{,}05}$		$0{,}025_{0}^{+0{,}002}$		0,508	0,020
L	3,05	±0,10	0,120	±0,004	$2{,}67_{-0{,}10}^{0}$	$0{,}105_{-0{,}004}^{0}$	20	1,19	0,047	$1{,}17_{0}^{+0{,}13}$		$0{,}046_{0}^{+0{,}05}$		0,762	0,030
H	4,19	±0,13	0,165	±0,005	$3{,}05_{-0{,}13}^{0}$	$0{,}120_{-0{,}005}^{0}$	20	1,60	0,063	$1{,}60_{0}^{+0{,}13}$		$0{,}063_{0}^{+0{,}005}$		1,372	0,054
XH	7,90	±0,15	0,311	±0,006	$7{,}14_{-0{,}13}^{0}$	$0{,}281_{-0{,}005}^{0}$	20	1,98	0,078	$2{,}39_{0}^{+0{,}13}$		$0{,}094_{0}^{+0{,}005}$		2,794	0,110
XXH	12,17	±0,18	0,479	±0,007	$10{,}31_{-0{,}13}^{0}$	$0{,}406_{-0{,}005}^{0}$	20	3,96	0,156	$3{,}18_{0}^{+0{,}13}$		$0{,}125_{0}^{+0{,}005}$		3,048	0,120

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.
$d_o \leq 25{,}4$	$d_o \leq 1$	0,03	0,001	0,05	0,002
$25{,}4 < d_o \leq 50{,}8$	$1 < d_o \leq 2$	0,03	0,001	0,08	0,003
$50{,}8 < d_o \leq 101{,}6$	$2 < d_o \leq 4$	0,03	0,001	0,10	0,004
$101{,}6 < d_o \leq 177{,}8$	$4 < d_o \leq 7$	0,03	0,001	0,13	0,005
$177{,}8 < d_o \leq 304{,}8$	$7 < d_o \leq 12$	0,03	0,001	0,15	0,006
$304{,}8 < d_o \leq 508{,}0$	$12 < d_o \leq 20$	0,03	0,001	0,18	0,007
$508{,}0 < d_o$	$20 < d_o$	0,03	0,001	0,20	0,008

4 Pulley dimensions

All geometric tolerancing references are as defined in ISO 1101.

4.1 Pulley width

The pulley width designation and the minimum actual pulley width required, b_f for flanged pulleys, and 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.

Table 4 — Pulley widths

Pitch code	Pulley width designation		Minimum flanged pulley width b_f		Minimum unflanged pulley width b_f'[a]	
	Metric dimensions	Inch (Imperial) dimensions	mm	in.	mm	in.
MXL	3,2 4,8 6,4	012 019 025	3,8 5,3 7,1	0,15 0,21 0,28	5,6 7,1 8,9	0,22 0,28 0,35
XXL	3,2 4,8 6,4	012 019 025	3,8 5,3 7,1	0,15 0,21 0,28	5,6 7,1 8,9	0,22 0,28 0,35
XL		025 031 037	7,1 8,6 10,4	0,28 0,34 0,41	8,9 10,4 12,2	0,35 0,41 0,48
L		050 075 100	14,0 20,3 26,7	0,55 0,80 1,05	17,0 23,3 29,7	0,67 0,92 1,17
H		075 100 150 200 300	20,3 26,7 39,4 52,8 79,0	0,80 1,05 1,55 2,08 3,11	24,8 31,2 43,9 57,3 83,5	0,98 1,23 1,73 2,26 3,29

[a] The minimum unflanged pulley width, b_f', may be reduced when the alignment of the drive can be controlled, but shall not be less than the minimum flanged pulley width, b_f.