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

Transmissions synchrones par courroies — Courroies de symboles de pas MXL, XXL, XL, L, H, XH et XXH — Dimensions métriques et en inches

(Revision of ISO 5296-1:1989 and ISO 5296-2:1989)

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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 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.

ISO 5296 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts*, Subcommittee SC 4, *Synchronous belt drives*.

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

1 Scope

ISO 5296 specifies the principal characteristics of synchronous endless belts for use in synchronous belt drives[1)] for mechanical power transmission and where positive indexing or synchronization may be required.

The principal characteristics include:

a) nominal tooth dimensions;

b) length and width dimensions;

c) tolerances on these dimensions;

d) length-measurement specifications.

ISO 5296 applies to synchronous belt drives with pitch codes MXL, XXL, XL, L, H, XH and XXH, and to metric and inch dimensions.

2 Pitch codes

The pitch codes and the corresponding belt pitches are given in table 1.

Table 1 — Pitch Codes

Pitch code	Belt pitch[a]	
	mm	in.
MXL	2,032	0,080
XXL	3,175	0,125
XL	5,080	0,200
L	9,525	0,375
H	12,700	0,500
XH	22,225	0,875
XXH	31,750	1,250

[a] Carried to third decimal place because belt pitch is a defined value.

1) Synchronous belt drives have been known by various titles in the past: for example, timing belt drives, positive belt drives, and gear belt drives.

3 Dimensions and tolerances

3.1 Tooth dimensions

The nominal belt tooth dimensions are the same for one-sided and double-sided belts; they are given in table 2 and are shown in figures 1, 2, and 3.

Two types of double-sided synchronous belts are standardized. Type A (see figure 2) has symetrical teeth and Type B (see figue 3) has staggered teeth.

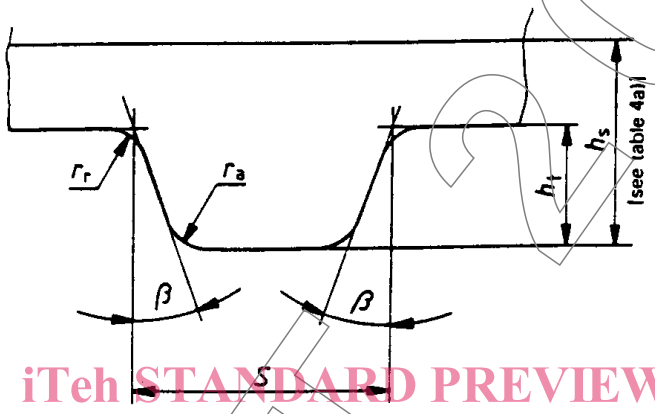

Figure 1 — Tooth Profile, One-Sided

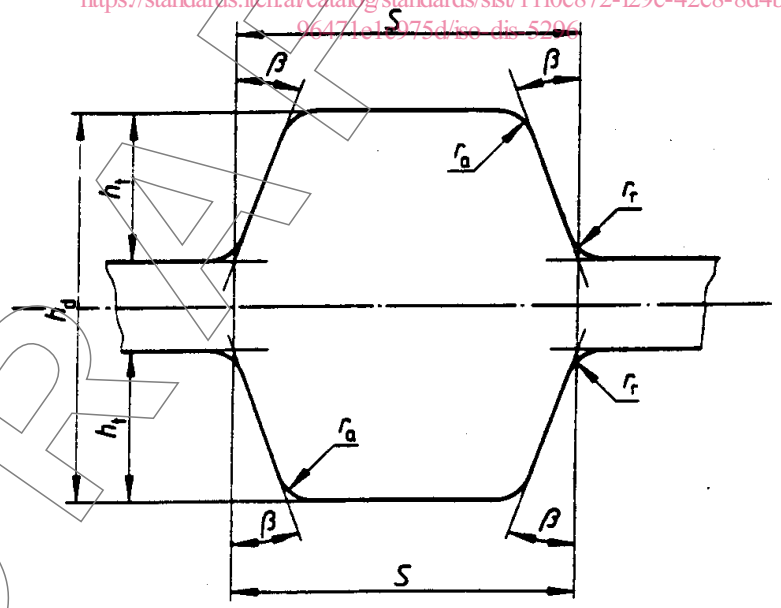

Figure 2 — Tooth Profile, Double-Sided (Type A)

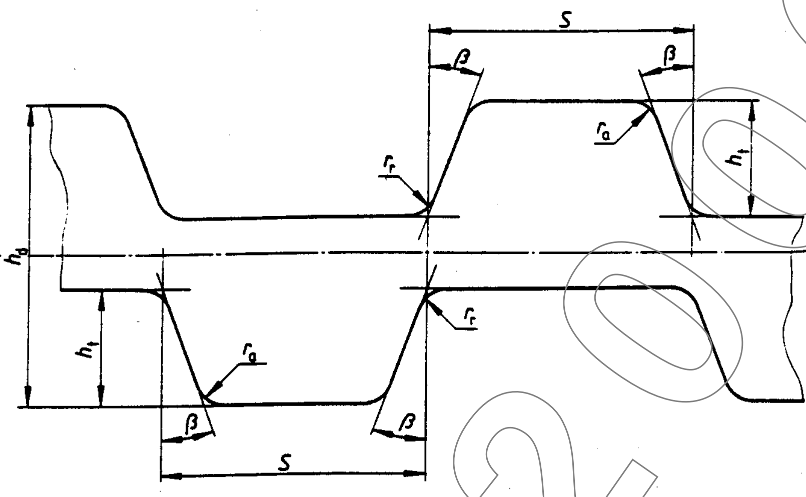

Figure 3 — Tooth Profile, Double-Sided (Type B)

Table 2 — Nominal Tooth Dimensions

Pitch Code	2β degrees	*s*		h_t		r_r		r_a	
		mm	in.	mm	in.	mm	in.	mm	in.
MXL	40	1,14	0,045	0,51	0,02	0,13	0,005	0,13	0,005
XXL	50	1,73	0,068	0,76	0,03	0,2	0,008	0,3	0,012
XL	50	2,57	0,101	1,27	0,05	0,38	0,015	0,38	0,015
L	40	4,65	0,183	1,91	0,075	0,51	0,020	0,51	0,02
H	40	6,12	0,241	2,29	0,09	1,02	0,040	1,02	0,04
XH	40	12,57	0,495	6,35	0,25	1,57	0,062	1,19	0,047
XXH	40	19,05	0,750	9,53	0,375	2,29	0,090	1,52	0,06

3.2 Belt Pitch Lengths and Tolerances

3.2.1 Single-Sided Belts

The belt pitch length and tolerances are given in Tables 3 and 4.

Table 3 — Pitch lengths and tolerances -- XL, L, H, XH, XXH belt sections

Belt length designation	Pitch length		Tolerance		Number of teeth for standard lengths				
	mm	in.	mm	in.	XL (0,200)	L (0,375)	H (0,500)	XH (0,875)	XXH (1,250)
60	152,40	6,000	±0,41	±0,016	30				
70	177,80	7,000	±0,41	±0,016	35				
80	203,20	8,000	±0,41	±0,016	40				
90	228,60	9,000	±0,41	±0,016	45				
100	254,00	10,000	±0,41	±0,016	50				
110	279,40	11,000	±0,46	±0,018	55				
120	304,80	12,000	±0,46	±0,018	60				
124	314,33	12,375	±0,46	±0,018		33			
130	330,20	13,000	±0,46	±0,018	65				
140	355,60	14,000	±0,46	±0,018	70				
150	381,00	15,000	±0,46	±0,018	75	40			
160	406,40	16,000	±0,51	±0,020	80				
170	431,80	17,000	±0,51	±0,020	85				
180	457,20	18,000	±0,51	±0,020	90				
187	476,25	18,750	±0,51	±0,020		50			
190	482,60	19,000	±0,51	±0,020	95				
200	508,00	20,000	±0,51	±0,020	100				
210	533,40	21,000	±0,61	±0,024	105	56			
220	558,80	22,000	±0,61	±0,024	110				
225	571,50	22,500	±0,61	±0,024		60			
230	584,20	23,000	±0,61	±0,024	115				
240	609,60	24,000	±0,61	±0,024	120	64	48		
250	635,00	25,000	±0,61	±0,024	125				
255	647,70	25,500	±0,61	±0,024		68			
260	660,40	26,000	±0,61	±0,024	130				
270	685,80	27,000	±0,61	±0,024		72	54		
285	723,90	28,500	±0,61	±0,024		76			
300	762,00	30,000	±0,61	±0,024		80	60		
322	819,15	32,250	±0,66	±0,026		86			
330	838,20	33,000	±0,66	±0,026			66		
345	876,30	34,500	±0,66	±0,026		92			
360	914,40	36,000	±0,66	±0,026			72		
367	933,45	36,750	±0,66	±0,026		98			
390	990,60	39,000	±0,66	±0,026		104	78		
420	1066,80	42,000	±0,76	±0,030		112	84		
450	1143,00	45,000	±0,76	±0,030		120	90		
480	1219,20	48,000	±0,76	±0,030		128	96		
507	1289,05	50,750	±0,81	±0,032				58	
510	1295,40	51,000	±0,81	±0,032		136	102		
540	1371,60	54,000	±0,81	±0,032		144	108		

Table 3 (cont.)— Pitch lengths and tolerances -- XL, L, H, XH, XXH belt sections

Belt length designation	Pitch length		Tolerance		Number of teeth for standard lengths				
	mm	in.	mm	in.	XL (0,200)	L (0,375)	H (0,500)	XH (0,875)	XXH (1,250)
560	1422,40	56,000	±0,81	±0,032				64	
570	1447,80	57,000	±0,81	±0,032			114		
600	1524,00	60,000	±0,81	±0,032		160	120		
630	1600,20	63,000	±0,86	±0,034			126	72	
660	1676,40	66,000	±0,86	±0,034			132		
700	1778,00	70,000	±0,86	±0,034			140	80	56
750	1905,00	75,000	±0,91	±0,036			150		
770	1955,80	77,000	±0,91	±0,036				88	
800	2032,00	80,000	±0,91	±0,036			160		64
840	2133,60	84,000	±0,97	±0,038				96	
850	2159,00	85,000	±0,97	±0,038			170		
900	2286,00	90,000	±0,97	±0,038			180		72
980	2489,20	98,000	±1,02	±0,040				112	
1000	2540,00	100,000	±1,02	±0,040			200		80
1100	2794,00	110,000	±1,07	±0,042			220		
1120	2844,80	112,000	±1,12	±0,044				128	
1200	3048,00	120,000	±1,12	±0,044					96
1250	3175,00	125,000	±1,17	±0,046			250		
1260	3200,40	126,000	±1,17	±0,046				144	
1400	3556,00	140,000	±1,22	±0,048			280	160	112
1540	3911,60	154,000	±1,32	±0,052				176	
1600	4064,00	160,000	±1,32	±0,052					128
1700	4318,00	170,000	±1,37	±0,054			340		
1750	4445,00	175,000	±1,42	±0,056				200	
1800	4572,00	180,000	±1,42	±0,056					144

Table 4 — Pitch lengths and tolerances -- MXL and XXL belt sections

Belt length designation	Pitch length		Tolerance		Number of teeth for standard lengths	
	mm	in.	mm	in.	MXL	XXL
36,0	91,44	3,600	±0,41	±0,016	45	
40,0	101,60	4,000	±0,41	±0,016	50	
44,0	111,76	4,400	±0,41	±0,016	55	
48,0	121,92	4,800	±0,41	±0,016	60	
50,0	127,00	5,000	±0,41	±0,016		40
56,0	142,24	5,600	±0,41	±0,016	70	
60,0	152,40	6,000	±0,41	±0,016	75	48
64,0	162,56	6,400	±0,41	±0,016	80	
70,0	177,80	7,000	±0,41	±0,016		56
72,0	182,88	7,200	±0,41	±0,016	90	
80,0	203,20	8,000	±0,41	±0,016	100	64
88,0	223,52	8,800	±0,41	±0,016	110	