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Endless V-belts
Dimensions

DIN
2215

Endlose Keilriemen; Maße

For connection with the Recommendations R 52, R 253, R 434 and R 608 issued by the International Organization for Standardization (ISO), see Explanations.

Dimensions in mm

1. Belt profiles, minimum pitch diameters of pulleys, inside and pitch lengths of belts

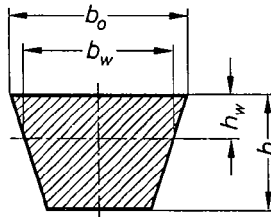


Figure 1. Belt profile

The illustration, particularly in so far as the back of the belt and the edges are concerned, is not definitive for the design.

Designation of a V-belt with belt profile symbol 17 and inside length $L_i = 1000$ mm:

V-belt 17 x 1000 DIN 2215

Designation of a set, consisting of 2 V-belts with belt profile symbol 13 and inside length $L_i = 1500$ mm:

Set V-belts 2 x 13 x 1500 DIN 2215

Table 1. Belt profile

Belt profile	Symbol	(5)	6	(8)	10	13	17	(20)	22	(25)	32	40
	ISO symbol	—	Y	—	Z	A	B	—	C	—	D	E
Upper belt width	$b_o \approx$	5	6	8	10	13	17	20	22	25	32	40
Pitch width ¹⁾	b_w	4,2	5,3	6,7	8,5	11	14	17	19	21	27	32
Belt height	$h \approx$	3	4	5	6	8	11	12,5	14	16	20	25
Height above pitch line	$h_w \approx$	1,3	1,6	2	2,5	3,3	4,2	4,8	5,7	6,3	8,1	12
Minimum pitch diameter (d_w min) of the associated V-belt pulley according to DIN 2217 Part 1 and DIN 2211 Part 1		20	28	40	50	71	112	160	180	250	355	500

Bracketed profiles are not to be used for new designs.

1) The pitch width b_w is that width of a V-belt which remains unchanged when the belt is bent perpendicularly to the base of its profile (width of neutral layer).

For V-belt pulleys, see DIN 2217 Part 1 and Part 2

Continued on pages 2 to 7
Explanations on page 7

Translation
Fachtechnisches Übersetzungsinstitut
Henry G. Freeman, Düsseldorf

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Table 2. Belt lengths

Belt profile	Symbol	(5)	6	(8)	10	Permissible variation of inside length or pitch length	Permissible difference between the pitch lengths L_w of the V-belts of a set for multi-groove drives						
	ISO symbol	—	Y	—	Z								
Inside length L_i ²⁾		Pitch length L_w ³⁾											
Series 1	Series 2												
160 170 180	185	171 181 191	200 205 215			+1 -2	0,5						
190 200		201 211											
212 224		209						223 235	224 227 239 250			+1,2 -2,5	0,6
236 250								247 261					
265 280								235					
300 315	311 326												
335 355 375	340	346 366 386	350 355 370 390	354 374 394	357 377 397	+2 -4	1						
400		383 385						400 411	415 419	422			

²⁾ Series 1 contains the commercially available inside lengths, graduated according to the preferred number series R 40.
Series 2 contains the inside lengths of comparable V-belts according to ISO/R 434 and ISO/R 608.

³⁾ The pitch length L_w is the length of a V-belt at the height of its pitch width b_w (length of the neutral layer).

Table 2. (continued)

Belt profile	Symbol	(5)	6	(8)	10	13	17	(20)	22	(25)	Permissible variation of inside length or pitch length	Permissible difference between the pitch lengths L_w of the V-belts of a set for multi-groove drives
	ISO symbol	—	Y	—	Z	A	B	—	C	—		
Inside length L_i ²⁾		Pitch length L_w ³⁾										
Series 1	Series 2											
425	435	436	440	444	447						+ 2,5 - 5	1,3
450		450	461	465	469	472						
475		453	486	490	494	497						
500		485	511	515	519	522						
530	508	541	545	549	552						+ 3 - 6	1,6
560		571	575	579	582	590						
600		611	615	619	622	630						
630	603		645	649	652	660						
670	678		685	689	692	700	713				+ 4 - 8	2
710			725	729	732	740	753					
750			765	769	772	780	793					
800		758 760				780	790					
850	860 887 898		865	869	872	880	893				+ 5 - 10	2,5
900					920	930	943	948				
950					919	922	930	943	948			
		957			969	972	980	993	998			
1000		960				990		1000				
				1019	1022	1030	1043	1048				
1060	1057 1058				1080		1100				+ 6 - 10	3,2
1120	1070			1079	1082	1090	1103	1108				
1180	1167			1139	1142	1150	1163	1168				
1250	1220			1199	1202	1210	1223	1228	1232			
				1269	1272	1280	1293	1298	1302			
1320	1308				1330						+ 8 - 12,5	4
1400	1327			1339	1342	1350	1363	1368	1372	1381		
1500	1398				1420		1370					
				1419	1422	1430	1443	1448	1452	1461		
	1513			1519	1522	1530	1543	1548	1552	1561		
	1517						1560		1565			
1600	1518 1520				1540	1550						
				1619	1622	1630	1643	1648	1652	1661		

²⁾ and ³⁾ see page 2

Table 2. (continued)

Belt profile	Symbol	10	13	17	(20)	22	(25)	32	40	Permissible variation of inside length or pitch length	Permissible difference between the pitch lengths L_w of the V-belts of a set for multi-groove drives	
	ISO symbol	Z	A	B	—	C	—	D	E			
Inside length L_1 2)		Pitch length L_w 3)										
Series 1	Series 2											
1700	1610	1722	1640	1743	1748	1752	1761					
	1708		1730									1760
	1717		1760									
	1720		1750									
1800	1898	1822	1830	1843	1848	1852	1861			+ 10 - 12,5	5	
	1900		1930									1943
1900	1907	1922	1940	1950	1961							
	1910											1940
2000		2022	2030	2043	2048	2052	2061	2075				
2120	2020	2142	2050	2163	2168	2172	2181	2195				
	2137		2150									2180
	2143		2180									2195
	2170		2200									
2240	2257	2262	2270	2283	2288	2292	2301	2315		+ 12 - 12,5	6,3	
	2270		2300									2300
2360	2368	2382	2390	2403	2408	2412	2421	2435				
	2450		2420									2420
2500	2457	2522	2480	2500	2543	2548	2552	2561	2575			
	2650		2530									2543
2650	2657	2672	2680	2693	2698	2702	2711	2725				
	2663		2700									2700
	2665		2715									2715
	2670		2740									2740
2800	2827	2822	2830	2843	2848	2852	2861	2875		+ 15 - 12,5	8	
	2828		2870									2870
3000	3025	3030	3043	3048	3052	3061	3075	3082				
	3028		3080									3080
3150		3180	3193	3198	3202	3211	3225	3232				
3350	3157	3380	3200	3393	3398	3402	3411	3425	3432			
	3255		3425									3425
3550	3468	3580	3593	3598	3602	3611	3625	3632		+ 20 - 15	10	
	3557		3600									3600
3750	3655	3780	3793	3798	3802	3811	3825	3832				
	4000		4030									4043

2) and 3) see page 2

Table 2. (continued)

Belt profile	Symbol	13	17	(20)	22	(25)	32	40	Permissible variation of inside length or pitch length	Permissible difference between the pitch lengths L_w of the V-belts of a set for multi-groove drives
	ISO symbol	A	B	—	C	—	D	E		
Inside length L_i ²⁾		Pitch length L_w ³⁾								
Series 1	Series 2									
4250	4005				4060		4080		+ 25 - 16	12,5
	4008									
	4017		4060							
	4387	4280	4293	4298	4302	4311	4325	4332		
	4500	4530	4543	4548	4552	4561	4575	4582		
4750	4545				4600				+ 30 - 23	16
	4548									
	4578	4780	4793	4798	4802	4811	4825	4832		
	4777		4820							
5000	4958						5040			
5300	5030	5043	5048	5052	5061	5075	5082			
5600	5325	5330	5343	5348	5352	5361	5375	5382	+ 40 - 30	20
	5327		5370		5380					
	5328							5420		
	5338		5643	5648	5652	5661	5675	5682		
	6000		6043	6048	6052	6061	6075	6082		
6300	6018						6100	6100	+ 50 - 30	25
	6025									
	6027		6070		6100			6100		
	6048									
6700	6343	6348	6352	6361	6375	6382				
7100	6743	6748	6752	6761	6775	6782			+ 60 - 51	32
	6763									
	6765						6840			
	6768	7143	7148	7152	7161	7175	7182	7182		
	7500		7548	7552	7561	7575	7582	7582		
8000	7545				7600			7650	+ 60 - 51	32
	7548									
	7568		8048	8052	8061	8075	8082	8082		
8500			8548	8552	8561	8575	8582			
9000			9048	9052	9061	9075	9082		+ 50 - 30	25
	9048									
9500	9065					9140		9150	+ 60 - 51	32
	9068		9548	9552	9561	9575	9582	9582		
10000				10052	10061	10075	10082			
10600	10625				10652	10661	10675	10682	+ 60 - 51	32
	10648						10700			
11200					10700				+ 60 - 51	32
	11200				11252	11261	11275	11282		
11800					11852	11861	11875	11882	+ 60 - 51	32
	11800						12200			
12500	12125							12230	+ 60 - 51	32
	12148									
12500				12552	12561	12575	12582			

²⁾ and ³⁾ see page 2

Table 2. (continued)

Belt profile	Symbol	22	(25)	32	40	Permissible variation of inside length or pitch length	Permissible difference between the pitch lengths L_w of the V-belts of a set for multi-groove drives
	ISO symbol	C	—	o D	E		
Inside length L_i ²⁾		Pitch length L_w ³⁾					
Series 1	Series 2						
14000	13625	14052	14061	13700	14082	+ 80 - 76	40
	13668			14075			
	15125			15200			
16000	15198	16052	16061	16075	16082		
				15280			
18000	16718	18052	18061	18075	18082	+ 90 - 100	50

2) and 3) see page 2

2. Material, construction and finish

At the manufacturer's choice, except where special agreements are made.

The V-belts are to be so manufactured as to ensure satisfactory seating in the grooves of the associated V-belt pulleys; in particular, the neutral layer of the belt should be at the same height as the pitch width b_w of the pulley groove.

3. Power transmission capacity

For V-belts; calculation of drives and power ratings, see DIN 2218.

4. Measurement of V-belt length

The pitch length L_w or the inside length L_i are determined as follows:

The V-belt is placed over two equal-sized test V-belt pulleys according to Figure 2, the pulley groove being defined in Figure 3 and its dimensions in Table 3.

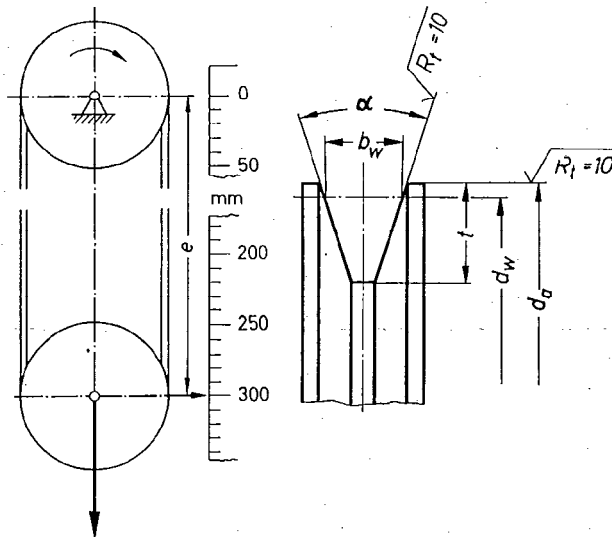
The movable test pulley is then loaded so that the measurement tension Q (see Table 3) is applied to the belt. To ensure proper seating of the belt in the grooves, the pulleys should be turned sufficiently often - with the belt loaded - to cause the belt to make at least 3 revolutions prior to measurement of the centre distance e .

The pitch length L_w is determined from twice the centre distance e plus the pitch circumference U_w of the test V-belt pulleys, i.e. from the following equation

$$L_w = 2e + U_w$$

The inside length L_i ⁴⁾ is found as follows:

- for belt profile 5 - : $L_i \approx L_w - 11$
- for belt profile 6 (Y): $L_i \approx L_w - 15$
- for belt profile 8 - : $L_i \approx L_w - 19$
- for belt profile 10 (Z): $L_i \approx L_w - 22$
- for belt profile 13 (A): $L_i \approx L_w - 30$
- for belt profile 17 (B): $L_i \approx L_w - 43$
- for belt profile 20 - : $L_i \approx L_w - 48$
- for belt profile 22 (G): $L_i \approx L_w - 52$
- for belt profile 25 - : $L_i \approx L_w - 61$
- for belt profile 32 (D): $L_i \approx L_w - 75$
- for belt profile 40 (E): $L_i \approx L_w - 82$



Measurement tension Q

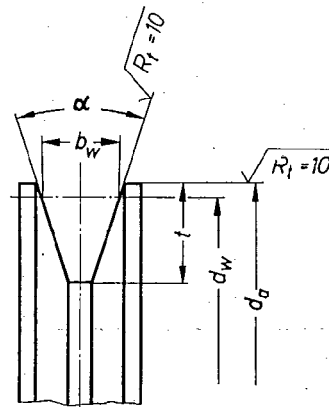


Figure 3. Test V-belt pulley made of steel

⁴⁾ The series of pitch lengths L_w is calculated from the series of inside lengths L_i according to the following equation:

$$L_w = L_i + 2 \cdot \pi \cdot (h - h_w)$$

Figure 2. Arrangement for measuring the pitch length L_w or the inside length L_i

Table 3. Test V-belt pulleys and measurement tension

Belt profile		Test V-belt pulleys						Measurement tension Q N
		Pitch circumference U_w	Pitch diameter d_w $\pm 0,05$	Outside diameter d_a $\pm 0,05$	Pitch width b_w	Groove angle α $\pm 10'$	Groove depth t	
Symbol	ISO symbol							
5	—	70	22,28	24,88	4,2	32°	5	29
6	Y	90	28,65	31,85	5,3	32°	6	39
8	—	140	44,56	48,56	6,7	32°	8	78
10	Z	180	57,30	62,30	8,5	34°	10	108
13	A	300	95,50	102,10	11	34°	12	196
17	B	400	127,32	135,72	14	34°	15	294
20	—	520	165,52	175,12	17	34°	18	735
22	C	700	222,82	234,22	19	34°	20	735
25	—	800	254,65	267,25	21	34°	22	735
32	D	1200	381,98	398,18	27	36°	28	1373
40	E	1800	572,96	596,96	32	36°	36	1765

Explanations

The profiles Y, Z, A, B, C, D, E correspond to ISO Recommendations

R 52 - 1957 and R 253 - 1962

Grooved pulleys for V-belts;

Poulies à gorges pour courroies trapezoidales.

The pitch lengths L_w of V-belts with the profiles Y, Z, A, B, C, D, E according to ISO Recommendations

R 434 - 1965 and R 608 - 1967

Lengths of V-belts;

Longueurs des courroies trapezoidales

have been additionally included in DIN 2215.

Series 1 of Table 2 contains the commercially available inside lengths graduated according to the preferred number series R 40. The inside lengths belonging to the ISO pitch lengths are listed in Series 2 of Table 2. They have been calculated from the following equation

$$L_i = L_w - 2 \cdot \pi \cdot (h - h_w)$$

The inside lengths L_i are being retained as designation lengths, because a change-over to pitch lengths would have caused great confusion among practical users.

The tension values for measuring the V-belt lengths correspond to the ISO Recommendations R 434 and R 608.

The permissible variations for the inside lengths or pitch lengths are in the tolerance ranges according to ISO/R 608. They amount to approximately $\left(\begin{smallmatrix} +0.5 \\ -1 \end{smallmatrix}\right)\%$ for lengths up to 1000 mm and come out at about $\pm 0.5\%$ for longer lengths.

The permissible differences between the pitch lengths L_w of a set for multi-groove drives have been defined according to Series R 10; they correspond to ISO/R 460, 1st option (but with Series R 10 instead of R 5) and to the existing provision in DIN 2215 at 0.25%. The tolerances are allowed larger than in the case of narrow V-belts, because the V-belts according to DIN 2215 are more adaptable than the narrow type.

Within the context of the standardized range of sizes the widely differing applications of belts call for appropriate types of composition which could not be covered by the standard.