
International Standard



4184

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Classical and narrow V-belts — Lengths

Longueurs des courroies trapézoïdales classiques et étroites

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Foreword

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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 4184 was developed by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, and was circulated to the member bodies in October 1978.

It has been approved by the member bodies of the following countries :

Australia	France	Romania
Austria	Germany, F. R.	South Africa, Rep. of
Belgium	India	Sweden
Bulgaria	Ireland	United Kingdom
Chile	Italy	USSR
Finland	Netherlands	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
Czechoslovakia
USA

This International Standard cancels and replaces ISO Recommendations R 434, 460 and 608.

Classical and narrow V-belts — Lengths

0 Introduction

This International Standard cancels and supersedes the Recommendations ISO/R 434, 460 and 608 which are regrouped here.

1 Scope and field of application

This International Standard specifies, for classical and narrow V-belts of sections

- Y (for groove profile with datum width 5,3 mm)
- Z (for groove profile with datum width 8,5 mm)
- A (for groove profile with datum width 11 mm)
- B (for groove profile with datum width 14 mm)
- C (for groove profile with datum width 19 mm)
- D (for groove profile with datum width 27 mm)
- E (for groove profile with datum width 32 mm)
- SPZ (for groove profile with datum width 8,5 mm)
- SPA (for groove profile with datum width 11 mm)
- SPB (for groove profile with datum width 14 mm)
- SPC (for groove profile with datum width 19 mm)
- the recommended datum lengths;
- the tolerances for datum lengths;
- the conditions for measuring the datum length.

It is important that narrow belts are not used with pulleys uniquely designed for classical belts.

This International Standard (a combination of previous ISO Recommendations) does not imply that classical V-belts can be used as replacements on drives designed for the use of narrow V-belts.

2 References

ISO 1081, *Terms and definitions relating to drives using V-belts and grooved pulleys.*

ISO 4183, *Grooved pulleys for classical and narrow V-belts.*

3 Datum length

3.1 The standard lengths are the datum lengths under tension measured under the conditions specified in clause 5.

3.2 The nominal values of the standard lengths of V-belts in millimetres shall be selected from the R 20 series of preferred numbers.

3.2.1 Classical V-belts — Sections Y, Z, A, B, C, D, E

Standard lengths of V-belts of classical section Y are given in column 1 of annex A. They are taken from the former ISO Recommendation R 434.

Standard lengths of V-belts of classical sections Z, A, B, C, D and E corresponding to the R 20 series of preferred numbers are only applicable if the stock of moulds of the manufacturer conforms to this series. Otherwise, the lengths of these V-belts have to be those in columns 2 through 7 of annex A. These lengths are taken from the former ISO Recommendation R 608.

3.2.2 Narrow V-belts — Sections SPZ, SPA, SPB, SPC

Standard lengths of V-belts of narrow sections SPZ, SPA, SPB and SPC are given in annex B. Those for sections SPZ, SPA and SPB are taken from the former ISO Recommendation R 460.

4 Tolerances on datum lengths

4.1 Manufacturing tolerances for single belts

Table 1 gives the permissible tolerances for datum lengths.

Table 1 — Manufacturing tolerances of V-belts

Values in millimetres

Nominal datum length L_d	Permissible deviation for sections	
	Y, Z, A, B, C, D, E	SPZ, SPA, SPB, SPC
$L_d < 250$	+ 8, - 4	
$250 < L_d < 315$	+ 9, - 4	
$315 < L_d < 400$	+ 10, - 5	
$400 < L_d < 500$	+ 11, - 6	
$500 < L_d < 630$	+ 13, - 6	± 6
$630 < L_d < 800$	+ 15, - 7	± 8
$800 < L_d < 1 000$	+ 17, - 8	± 10
$1 000 < L_d < 1 250$	+ 19, - 10	± 13
$1 250 < L_d < 1 600$	+ 23, - 11	± 16
$1 600 < L_d < 2 000$	+ 27, - 13	± 20
$2 000 < L_d < 2 500$	+ 31, - 16	± 25
$2 500 < L_d < 3 150$	+ 37, - 18	± 32
$3 150 < L_d < 4 000$	+ 44, - 22	± 40
$4 000 < L_d < 5 000$	+ 52, - 26	± 50
$5 000 < L_d < 6 300$	+ 63, - 32	± 63
$6 300 < L_d < 8 000$	+ 77, - 38	± 80
$8 000 < L_d < 10 000$	+ 93, - 46	± 100
$10 000 < L_d < 12 500$	+ 112, - 56	± 125
$12 500 < L_d < 16 000$	+ 140, - 70	
$16 000 < L_d < 20 000$	+ 170, - 85	

The tolerances of the classical V-belts of sections Y, Z, A, B, C, D and E are approximately + 1,2 p and - 0,6 p , where p is calculated with a certain degree of approximation, using the formula :

$$p = 0,8 \sqrt[3]{L} + 0,006 L$$

where L is the preferred number in the R 10 series equal to or immediately greater than the length expressed in millimetres.

The tolerances of the narrow V-belts of sections SPZ, SPA, SPB and SPC are approximately

$$\pm 0,01 L$$

where L is the preferred number in the R 10 series equal to or immediately greater than the length expressed in millimetres.

4.2 Belt matching tolerances of belts in the same set

Table 2 gives the values for the tolerances on the lengths of V-belts of the same set in multiple-grooved drives

Table 2 — Belt matching tolerances

Values in millimetres

Nominal datum length L_d	Maximum difference between the lengths of belts of the same set for sections	
	Y, Z, A, B, C, D, E	SPZ, SPA, SPB, SPC
$L_d < 1 250$	2	2
$1 250 < L_d < 2 000$	4	2
$2 000 < L_d < 3 150$	8	4
$3 150 < L_d < 5 000$	12	6
$5 000 < L_d < 8 000$	20	10
$8 000 < L_d < 12 500$	32	16
$12 500 < L_d < 20 000$	48	—

5 Conditions for measuring datum length

For the measurement of the datum length, set the belt up on two identical pulleys with datum circumference according to table 3 and having functional dimensions according to ISO 4183. The pulleys shall be mounted on parallel horizontal axes on a testing-bench. Apply to the sliding pulley the measuring force indicated in table 3. Rotate the pulleys in order that the belt may effect one to three rotations and thus may seat properly in the pulley grooves. Measure the distance between the axes of the pulleys.

The datum length L_d is given by the formula

$$L_d = 2 E + C_d$$

where

E is the distance between the axes of the pulleys;

C_d is the pulley datum circumference.

Table 3 — Measurement characteristics

Belt section	Datum circumference of the measuring pulleys mm	Measuring force N
Y	90	40
Z	180 or 300	110
A	300 or 450	200
B	400 or 600	300
C	700 or 1 000	750
D	1 000	1 400
E	1 800	1 800
SPZ	300	360
SPA	450	560
SPB	600	900
SPC	1 000	1 500

6 Designation and marking

The physical dimensions of classical and narrow V-belts are designated by one or three letters representing the section (classical or narrow) followed by the appropriate datum length (see annexes A and B).

for example : A 1 550 or SPA 1 250

All classical or narrow V-belts manufactured in accordance with this International Standard shall be marked legibly and durably on the outer non-working face with the appropriate designation.

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Annex A

Standard datum lengths in millimetres of classical V-belt sections

Y	Z	A	B	C	D	E
200	405	630	930	1 565	2 740	4 660
224	475	700	1 000	1 760	3 100	5 040
250	530	790	1 100	1 950	3 330	5 420
280	625	890	1 210	2 195	3 730	6 100
315	700	990	1 370	2 420	4 080	6 850
355	780	1 100	1 560	2 715	4 620	7 650
400	920	1 250	1 760	2 880	5 400	9 150
450	1 080	1 430	1 950	3 080	6 100	12 230
500	1 330	1 550	2 180	3 520	6 840	13 750
	1 420	1 640	2 300	4 060	7 620	15 280
	1 540	1 750	2 500	4 600	9 140	16 800
		1 940	2 700	5 380	10 700	
		2 050	2 870	6 100	12 200	
		2 200	3 200	6 815	13 700	
		2 300	3 600	7 600	15 200	
		2 480	4 060	9 100		
		2 700	4 430	10 700		
				4 820		
			5 370			
			6 070			

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