

INTERNATIONAL
STANDARD

ISO
4183

Third edition
1995-07-01

**Belt drives — Classical and narrow
V-belts — Grooved pulleys (system based
on datum width)**

*Transmissions par courroies — Courroies trapézoïdales classiques et
étroites — Poulies à gorges (système basé sur la largeur de référence)*



Reference number
ISO 4183:1995(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4183 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 1, *Veebelts and grooved pulleys*.

This third edition cancels and replaces the second edition (ISO 4183:1989), of which it constitutes a minor revision.

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Belt drives — Classical and narrow V-belts — Grooved pulleys (system based on datum width)

1 Scope

This International Standard specifies the principal dimensions of grooved pulleys for classical V-belts (sections Y, Z, A, B, C, D and E) and narrow V-belts (sections SPZ, SPA, SPB and SPC) specified in the terminology system based on datum width.

It is important that narrow belts are not used with pulleys uniquely designed for classical belts, and, on the other hand, that multiple belt drives are not used with joined V-belts.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers*.

ISO 254:1990, *Belt drives — Pulleys — Quality, finish and balance*.

ISO 255:1990, *Belt drives — Pulleys for V-belts (system based on datum width) — Geometrical inspection of grooves*.

ISO 1081:1980, *Drives using V-belts and grooved pulleys — Terminology*.

ISO 1101:1983, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

3 Preliminary notes

3.1 The datum width is regarded as the basic dimension of standardization for the groove and for the corresponding classical and narrow V-belts considered as a whole.

3.2 Knowledge of the datum line position and of the datum width is essential for defining the groove profile, the datum diameter of the pulley and the location of the belt in the pulley groove.

4 Datum widths of profiles

The datum widths, w_d , of the profiles are specified in table 1.

Table 1

Groove profiles		w_d
Classical V-belts	Narrow V-belts	mm
Y		5,3
Z	SPZ	8,5
A	SPA	11
B	SPB	14
C	SPC	19
D		27
E		32

5 Groove angles

The groove angle α (see figure 1) shall be one of the following angles:

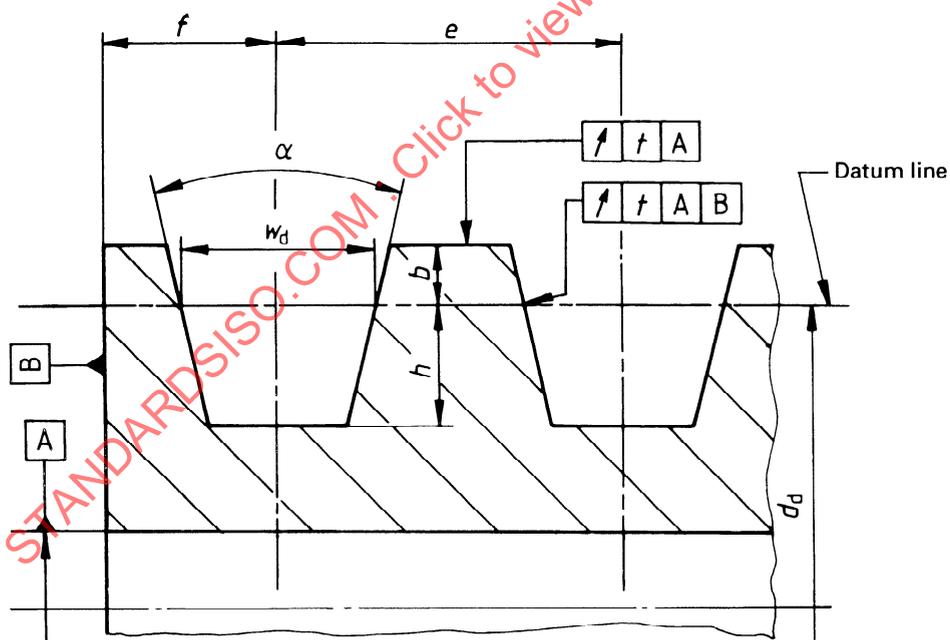
32°, 34°, 36°, 38°

The tolerance on the groove angle shall be $\pm 0,5^\circ$.

The relationship of groove angle, α , to datum diameter, d_d , is given in table 4.

6 Dimensions of the groove profiles

The dimensions of groove profiles are shown on figure 1 and specified in table 2.



NOTES

- 1 The axial and radial circular runout tolerances are shown in accordance with ISO 1101.
- 2 For the values of t , see table 3.

Figure 1

Table 2

Dimensions in millimetres

Groove profiles		w_d	b min.	h min.	e ¹⁾	Tolerance on e ²⁾	Sum of deviations of e ³⁾	f ⁴⁾ min.
Classical V-belts	Narrow V-belts							
Y		5,3	1,6	4,7	8	± 0,3	± 0,6	6
Z	SPZ	8,5	2	7 9	12	± 0,3	± 0,6	7
A	SPA	11	2,75	8,7 11	15	± 0,3	± 0,6	9
B	SPB	14	3,5	10,8 14	19	± 0,4	± 0,8	11,5
C	SPC	19	4,8	14,3 19	25,5	± 0,5	± 1	16
D		27	8,1	19,9	37	± 0,6	± 1,2	23
E		32	9,6	23,4	44,5	± 0,7	± 1,4	28

1) The use of higher values for dimension e can be justified in certain special cases, for instance in the case of pressed-sheet pulleys. Whenever certain types of pulleys include values of dimension e not in conformity with this International Standard, their use with a standardized pulley may require caution.

2) The tolerances apply to the distance between the axes of two consecutive grooves.

3) The sum of all deviations from the nominal value e for all grooves in any one pulley shall not exceed the value stated in the table.

4) Variations in the value f should be taken into consideration in the alignment of the pulleys.

7 Datum diameters

NOTE 1 Table 3 also specifies the values, t , of the axial and radial circular runout tolerances, as shown on figure 1.

7.1 Series of datum diameters

The nominal values of datum diameters, d_d , specified in table 3 are selected from the R 40 series of preferred numbers, in accordance with ISO 3.

Table 3

d_d nom. $\pm 0,8\%$	t	Degree of preference for datum diameters according to the groove profiles						
		Y	Z SPZ	A SPA	B SPB	C SPC	D	E
mm	mm							
20	0,2	+						
22,4		+						
25		+						
28		+						
31,5		+						
35,5		+						
40		+						
45		+						
50		+		+				
53		+		+				
56		+		•				
60		+		•				
63		+		•				
67		+		•				
71		+		•				
75		+		•	+			
80	+		•	+				
85	+		•	+				
90	+		•	•				
95	+		•	•				
100	+		•	•				
106	0,3		•	•				
112		+	•	•				
118			•	•				
125		+	•	•	+			
132			•	•	•			
140			•	•	•			
150			•	•	•			
160		•	•	•				
170	0,4		•	•	•			
180			•	•	•			
190			•	•	•			
200			•	•	•	+		
212			•	•	•	•		
224			•	•	•	•		
236			•	•	•	•		
250			•	•	•	•		

d_g nom. $\pm 0,8 \%$	t mm	Degree of preference for datum diameters according to the groove profiles						
		Y	Z SPZ	A SPA	B SPB	C SPC	D	E
265	0,5		*	*	*	*		
280			*	*	*	*		
300								
315				*	*	*		
335								
355				*	*	*	+	
375							+	
400				*	*	*	+	
425	0,6			*	*	*	+	
450							+	
475							+	
500				*	*	*	+	+
530								+
560					*	*	+	+
600						*	+	+
630				*	*	*	+	+
670	0,8			*	*	*	+	+
710							+	+
750							+	
800				*	*	*	+	+
850								+
900						*	+	+
950								+
1 000						*	+	+
1 060	1				*	*	+	+
1 120							+	+
1 180								+
1 250						*	+	+
1 350								
1 400						*	+	+
1 500							+	+
1 600						*	+	+
1 700	1,2						+	+
1 800								+
1 900								+
2 000						*	+	+
2 120								
2 240								+
2 360								
2 500								+

NOTES

- 1 Datum diameters marked with + are recommended for use with classical V-belts only.
- 2 Datum diameters marked with * are recommended for use with narrow V-belts and classical V-belts.
- 3 Datum diameters not marked are not recommended.

7.2 Groove angles in relation to given datum diameters

Under average operating conditions, the groove angle of pulleys used should be in accordance with the values specified in table 4 as a function of the diameter.

Table 4

Groove profile		d_d , mm, for $\alpha =$			
Classical V-belts	Narrow V-belts	38°	36°	34°	32°
Y		—	> 60	—	≤ 60
Z	SPZ	> 80	—	≤ 80	—
A	SPA	> 118	—	≤ 118	—
B	SPB	> 190	—	≤ 190	—
C	SPC	> 315	—	≤ 315	—
D		> 475	≤ 475	—	—
E		> 600	≤ 600	—	—

7.3 Minimum datum diameters

The minimum datum diameters of grooved pulleys as a function of the V-belts are specified in table 5.

Table 5

Groove profile for use with V-belts	d_d min.
	mm
Y	20
Z	50
A	75
B	125
C	200
D	355
E	500
SPZ	63
SPA	90
SPB	140
SPC	224

7.4 Differences between datum diameters of any two grooves

The maximum differences between the datum diameters of any two grooves of the same pulley, as far as they are used for a multiple V-belt drive, are specified in table 6.

Table 6

Groove profiles	Maximum admissible difference
	mm
Y	0,3
Z, A, B, SPZ, SPA, SPB	0,4
C, D, E, SPC	0,6

8 Quality, surface finish and balancing of pulleys

The quality, surface finish and balancing of pulleys are specified in ISO 254.

9 Inspection

The geometrical inspection of pulleys and grooves is specified in ISO 255.

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