International Standard 255

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Pulleys for classical and narrow V-belts — Geometrical inspection of grooves

Poulies pour courroies trapézoïdales classiques et étroites — Vérification géométrique des gorges

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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 255 was developed by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, and was circulated to the member bodies in June 1980.

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

Austria	India	South Africa, Rep. of
Belgium	Ireland	Spain
Canada	Italy	Sweden
Egypt, Arab Rep. of	Japan	United Kingdom
Finland	Korea, Dem. P. Rep. of	USA
France	Korea, Rep. of	USSR
Germany, F. R.	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Czechoslovakia

This International Standard cancels and replaces ISO Recommendation R 255-1962, of which it constitutes a technical revision.

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Pulleys for classical and narrow V-belts — Geometrical inspection of grooves

1 Scope and field of application

This International Standard specifies the requirements to ensure the regularity of the grooves of pulleys for classical and narrow V-belts and the methods of checking.

2 References

ISO 286/1, *ISO system of limits and fits — Part 1 : General, tolerances and deviations.*[1]

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

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

3 Principle

Complete inspection of a pulley groove (see figure 1) should be carried out in five successive checking operations, in the order given below :

— Inspection of groove angle α (clause 4)

— Inspection of outside diameter and cylindricity of the pulley (clause 5)

— Inspection of datum diameter d_d (clause 6)

— Inspection, for the various successive grooves of a single pulley, of height of groove above datum line (dimension b) (clause 7)

— Inspection of the concentricity of the datum circumference (clause 8).

It should first of all be noted that what is important is the regularity of the grooves (regularity of form for one groove and regularity from one groove to another), rather than exact knowledge of the datum diameter itself.

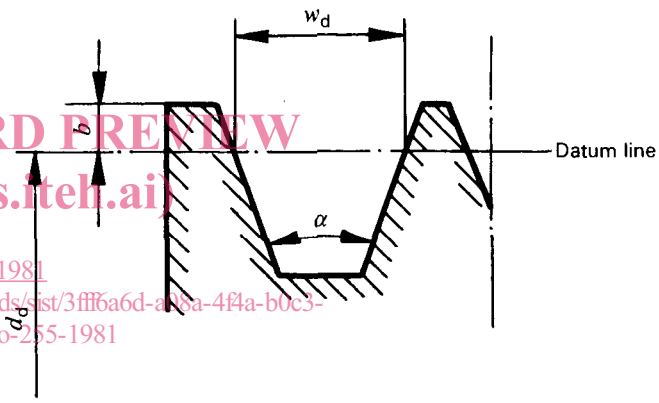


Figure 1 — Groove profile

4 Inspection of groove angle

4.1 The deviation between the true groove angle and the standard value of this angle should not exceed in either direction,

1° for the sections	Y,	(w_d = 5,3 mm)
	Z, SPZ	(w_d = 8,5 mm)
	A, SPA	(w_d = 11 mm)
	B, SPB	(w_d = 14 mm)
30' for the sections	C, SPC	(w_d = 19 mm)
	D,	(w_d = 27 mm)
	E,	(w_d = 32 mm)

1) At present at the stage of draft. (Revision of ISO/R 286-1962).

4.2 The groove angle should be checked by means of a limit gauge on the lines of that shown diagrammatically in figures 2 and 3.

It is necessary to have one gauge for each of those standard angles (38°, 36°, 34°, 32°), which apply to the respective section in the conditions laid down in ISO 4183.

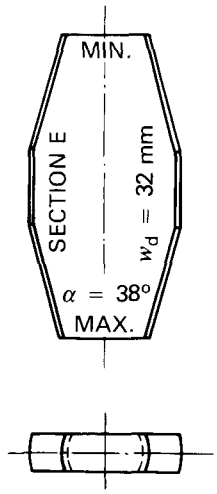


Figure 2 — Limit gauge

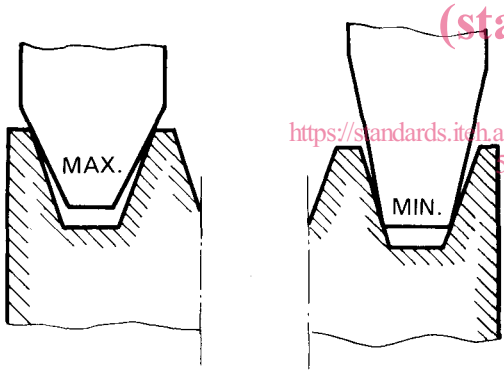


Figure 3 — Placement of limit gauge in the groove to be checked

5 Inspection of external diameter and cylindricity of the pulley

Use the usual methods.

6 Inspection of datum diameter

6.1 If the pulley is acknowledged to be cylindrical

The external diameter d_{ext} being determined by means of a good precision instrument, the datum diameter d_d may be determined by means of the depth gauge represented diagrammatically in figure 4 hereafter. The mark on the sliding part makes it possible to read on the fixed part half the difference b between the external diameter and the datum diameter.

The datum diameter d_d of the groove concerned is given by the following relation :

$$d_d = d_{ext} - 2b$$

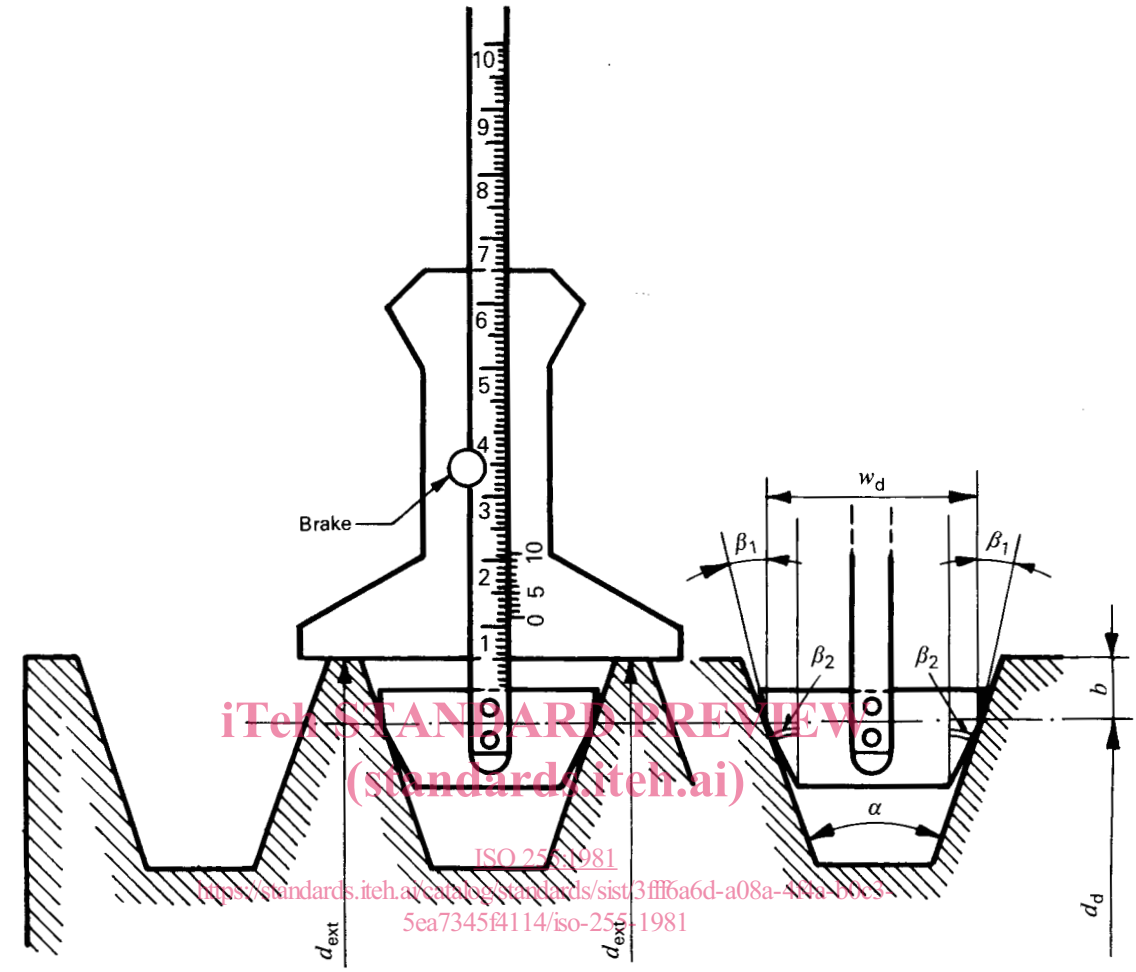
If the pulley contains several grooves, each of these should be checked separately.

6.2 If the pulley is not acknowledged to be cylindrical

Use two cylindrical rollers of diameter d conformable to table 1, in which the values for d have been determined for any groove profile, so that the simultaneous contact of the roller with the two sides is very closely made at the level of the datum circumference.

Place these two rollers in the groove to be checked, (as in figure 5) and put them in contact with the latter. Then measure the distance K from the externally tangent planes to the rollers and parallel to the axis of the pulley (this distance can be measured by means of a plane and parallel assay instrument, for example, a vernier caliper).

Dimensions in millimetres



$$\beta_1 = \frac{a \text{ min.}}{2}$$

$$\beta_2 = \frac{a \text{ max.}}{2}$$

Figure 4 — Depth gauge

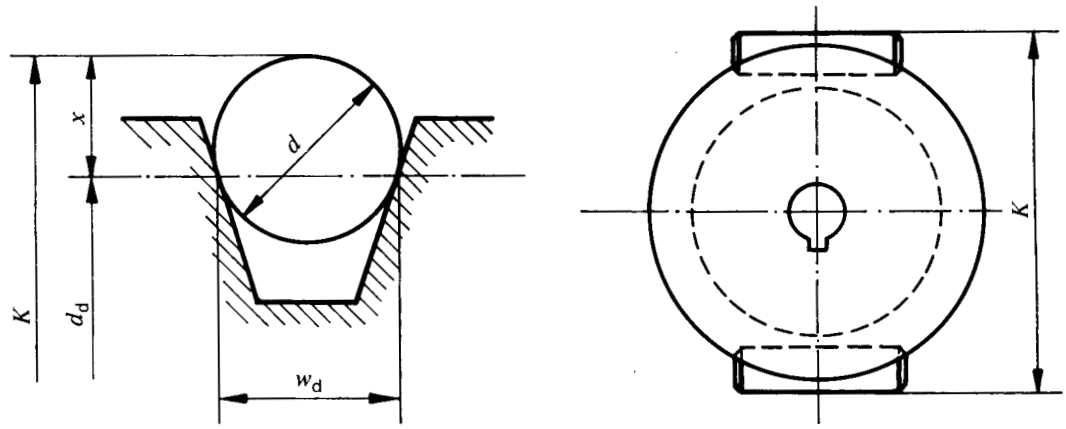


Figure 5 — Placement of rollers in the groove to be checked

The datum diameter d_d of the groove concerned is then given by the following relation :

$$d_d = K - 2x$$

If the pulley contains several grooves, each of these should be checked separately.

Table 1 shows the values for d and for the correction $2x$ for the different sections of standard groove profile.

The values of the correction $2x$ have been purposely rounded, as the knowledge of the deviations in datum diameters between the grooves of a single pulley is more important, for the reception of the latter, than is that of the exact value of the datum diameter of the different grooves.

Table 1

Dimensions in millimetres

Sections		Diameter of roller d	Tolerances on d*	Correction $2x$ (rounded)
Y		5,5	0 −0,012	7
Z	SPZ	9,0	0 −0,036	12
A	SPA	11,6	0 −0,043	15
B	SPB	14,7	0 −0,110	19
C	SPC	20,0	0 −0,130	26
D		28,5	0 −0,130	37
E		33,8	0 −0,160	44

* Tolerances conform to ISO 286/1.

7 Inspection, for the successive grooves of a single pulley, of height of groove above datum line (dimension b)

7.1 The following inspection method gives a measurement and not only an estimation. Inspection should be carried out for each of the grooves in the pulley.

Use the depth gauge shown in figure 4, (the fixed part rests on the rims of the groove). The finger should have the form shown diagrammatically in figure 4.[1)]

7.2 The readings taken for the depth of the finger in the successive grooves of a single pulley should not reveal any deviations greater than the value shown for each section in table 2.

Table 2

Sections		Maximum deviation dimension b in a single meridian section
Y		0,2
Z	SPZ	0,2
A	SPA	0,2
B	SPB	0,2
C	SPC	0,3
D		0,5
E		0,6

8 Inspection of the concentricity of the datum circumference

The maximum permissible variation between the extreme values found when measuring the dimension b, for a single groove, is given by the following table 3.

Table 3

Dimensions in millimetres

Datum diameter			Maximum variation[1)] dimension b for a single groove
20	to	28	0,13
31,5	to	45	0,16
50	to	80	0,19
85	to	118	0,22
125	to	180	0,25
190	to	250	0,29
265	to	315	0,32
355	to	400	0,36
425	to	500	0,40
530	to	630	0,44
670	to	800	0,50
900	and	1 000	0,56
1 060	to	1 250	0,66
1 400	to	1 600	0,78
1 800	to	2 000	0,92
2 240	and	2 500	1,10

1) IT 11 (see ISO 286/1).

The variation is given for the different meridian sections of each groove of a single pulley.

NOTE — The above verifications do not preclude the need to establish that bore and groove are coaxial.

1) The following are not recommended :

— the rounded form, which does not allow the pitch line to be located accurately enough, and

— the rectangular form, because of rapid wear of the corners.