INTERNATIONAL STANDARD

ISO 255

Second edition
1990-11-01

Belt drives — Pulleys for V-belts (system based on datum width) — Geometrical inspection of grooves

Transmissions par courroies — Poulies à gorges pour courroies trapézoïdales (système basé sur la largeur de référence) — Contrôle géométrique des gorges

Reference number
ISO 255:1990(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 255 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*.

This second edition cancels and replaces the first edition (ISO 255:1981), of which it constitutes a technical revision.

Annex A forms an integral part of this International Standard. Annex B is for information only.

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Introduction

In drives using V-belts, the dimensions of the pulley grooves can be defined either on the basis of the datum width or on the basis of the effective width. As a result, two systems for definition and description of the dimensions of pulleys and belts have been developed. The two systems are independent of each other.

For the geometrical inspection of grooves defined on the basis of the datum width, necessary tests to ensure by mechanical means the conformity of a grooved pulley with standard specifications were specified, but modern quick or serial checking procedures for grooved pulley production control were not.

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Belt drives — Pulleys for V-belts (system based on datum width) — Geometrical inspection of grooves

1 Scope

This International Standard specifies the methods of checking the regularity of the grooves and pulleys for V-belts specified in the system based on datum width. The grooved pulleys may be designed for use with classical or narrow V-belts.

Inspection parameters and tolerances of grooved pulleys are specified in appropriate International Standards.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4183:1989, *Belt drives — Classical and narrow V-belts — Grooved pulleys (system based on datum width).*

3 Principle

Complete inspection of a grooved pulley carried out in four successive checking operations, in the following order:

— inspection of groove profile (see clause 4);

— inspection of groove spacing (see clause 5);

— inspection of datum diameter (see clause 6);

— inspection of run-out (see clause 7).

4 Groove profile

4.1 Specification

The groove profile shall be specified in the corresponding International Standard by the dimensions shown in figure 1 and given in table 1.

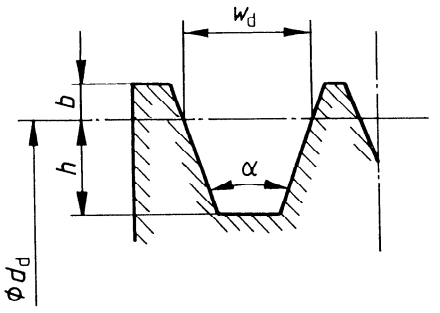


Figure 1 — Groove profile

Table 1 — Groove profile specification

Dimension	Symbol	Tolerance
Datum width	w_d	A specified value not subject to tolerance
Groove angle	α	$\pm \Delta\alpha$
Groove height above datum width	b	Minimum value
Groove depth below datum width	h	Minimum value

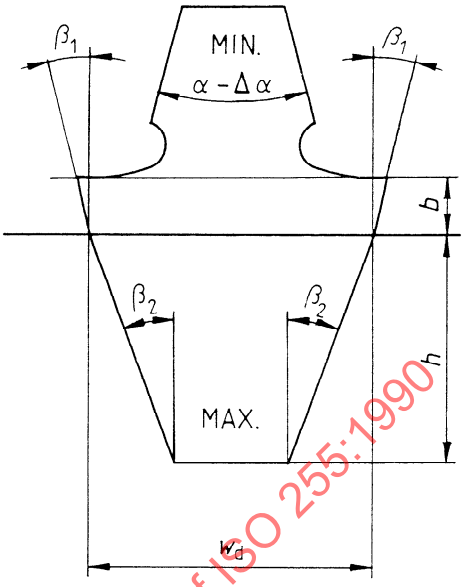
4.2 Inspection

4.2.1 Limit gauges

The groove profile shall be checked using a limit gauge shown diagrammatically in figure 2.

A gauge for each of the standard angles applicable to each groove section in the corresponding International Standard is required.

The limit gauges shall be marked with the groove section and the groove angle.



$$\beta_1 = \frac{\alpha - \Delta\alpha}{2}$$

$$\beta_2 = \frac{\alpha + \Delta\alpha}{2}$$

Figure 2 — Limit gauge

4.2.2 Operation

The limit gauge is shown in figure 2.

The "MIN." end of the limit gauge is used to check the minimum value of the groove angle. The gauge shall contact the groove at the lower corners (see figure 3) or uniformly along the sidewalls.

The "MAX." end of the limit gauge is used to check the maximum value of the groove angle, the datum width, the groove height b and the groove depth h in the same operation.

The groove angle, the datum width, the groove height b and the groove depth h comply with the specifications if the corners of the gauge at width w_d contact the sidewalls of the groove and if the horizontal steps of the gauge are situated within the straight sidewalls of the groove (see figure 4).

The groove angle is too great if only the lower corners of the "MAX." end of the gauge contact the groove.

The datum width is too small or the groove height b too low if the horizontal steps of the gauge are situated above the straight sidewalls of the groove (see figure 5).

The groove depth h is too low if the gauge touches the bottom of the groove and the corners of the gauge at width w_d do not contact the sidewalls of the groove (see figure 6).

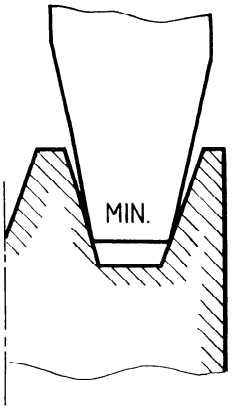


Figure 3 — Fitting of limit gauge in the groove to be checked

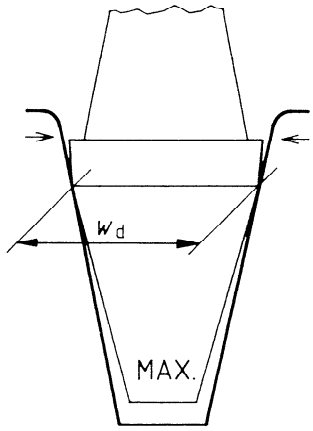


Figure 4 — Inspection of groove profile (good)

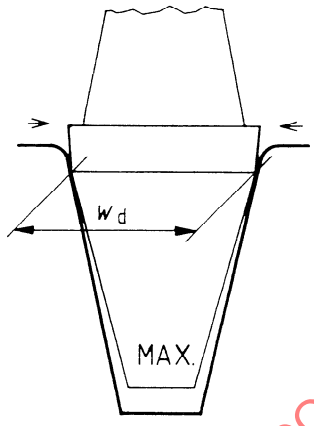


Figure 5 — Inspection of groove profile (bad)

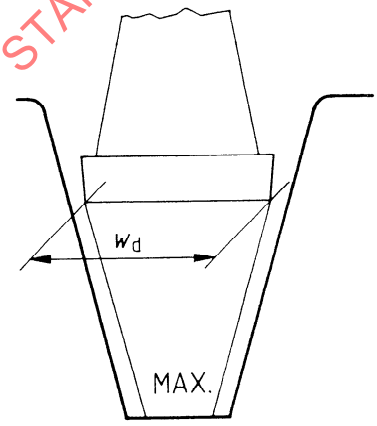


Figure 6 — Inspection of groove profile (bad)

5 Groove spacing

5.1 Specification

5.1.1 Groove spacings

The following dimensions shall be specified in the corresponding International Standard for multiple-groove pulleys (see figure 7):

— the distance between the axes of two consecutive grooves — nominal value e;

— the permissible tolerance on the nominal value e for the distance between any two grooves of a single pulley.

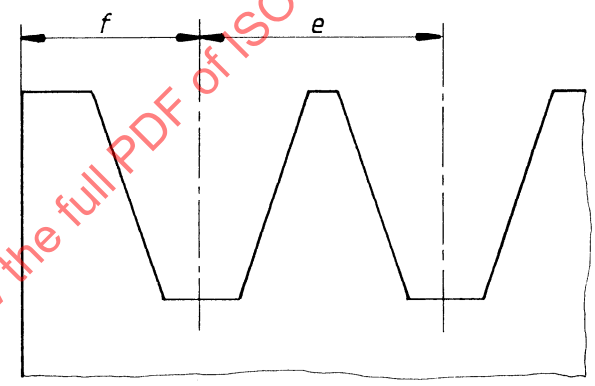


Figure 7 — Multiple groove pulley

5.1.2 Distance between edge of pulley and first group centre

A minimum value shall be specified for the distance f between the outside of the rim and the axis of the first groove for all single- and multiple-groove pulleys. A plus and minus tolerance may be assigned to the value of f in order to facilitate the alignment of the pulleys.

5.2 Inspection

Measure pulley groove spacing using a pulley groove tool and sets of interchangeable balls for each individual groove section. The ball diameter shall be as specified in 6.1.2.

Measure the groove spacing e, using the groove spacing locator which consists of a vernier gauge incorporating sets of interchangeable balls for each individual groove section (see figure 8); the ball diameters are given in table A.1. The movable ball slide shall be tightened after the balls have been properly placed in the grooves. Measure the distance x using a vernier caliper or micrometer. The

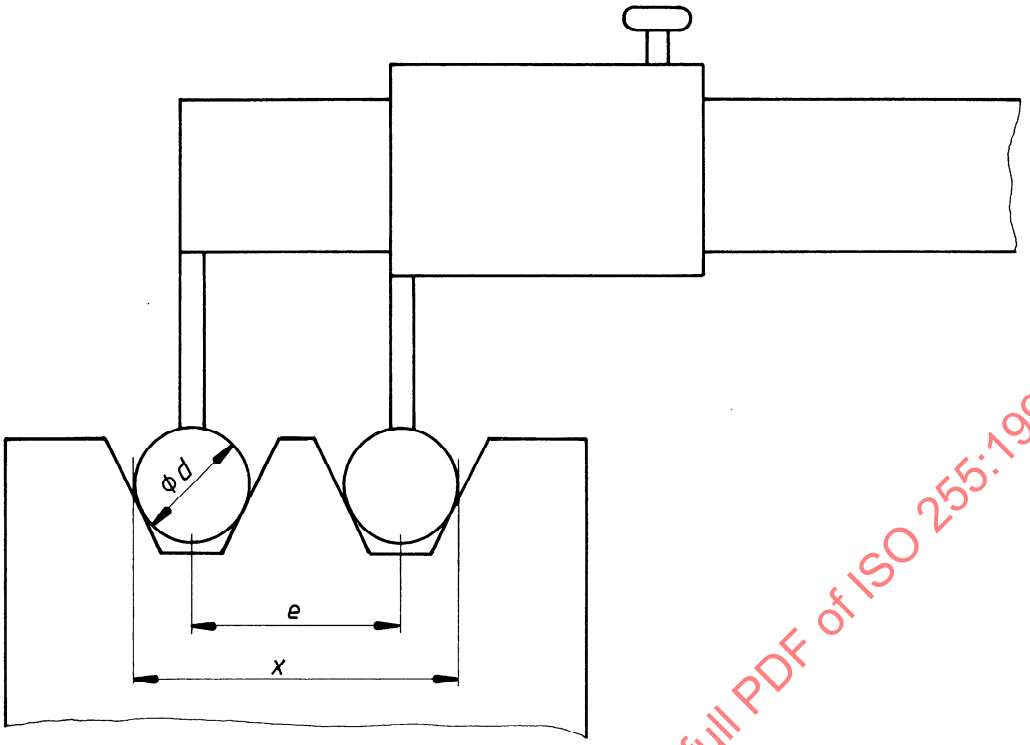


Figure 8 — Groove spacing locator

measured groove spacing, e, is equal to the measured dimension, x, minus the diameter of the inspection ball used.

6 Datum diameter

6.1 Specifications

6.1.1 Datum diameter

The following dimensions shall be specified in the corresponding International Standard:

— the datum diameter — nominal value d_d;

— the permissible tolerance on the nominal value d_d;

— for multiple-groove pulleys, the permissible variation of the datum diameters measured in any two grooves of a single pulley.

6.1.2 Checking balls or rods

The following dimensions shall be specified in the corresponding International Standard:

— the diameter of balls or rods, d;

— the permissible tolerance on d;

— the corrective term $2h_s$.

The diameters d shall be determined so that the simultaneous contact of the ball or the rod with the two groove sides is very closely made at the level of the datum diameter.

6.2 Inspection

Use two cylindrical balls or rods of diameter d in accordance with 6.1.2. Place these two balls or rods in the groove to be checked (see figure 9). Measure the distance, K, between the planes that are externally tangent to the balls or rods and parallel to the axis of the pulley. This distance can be measured using a plane and parallel assay instrument, for example a vernier caliper.

The datum diameter, d_d, of the groove is then given by the following relationship:

$$d_d = K - 2h_s$$

where

$2h_s$ is the corrective term given in 6.1.2.

If the pulley has several grooves, each of them shall be checked separately.

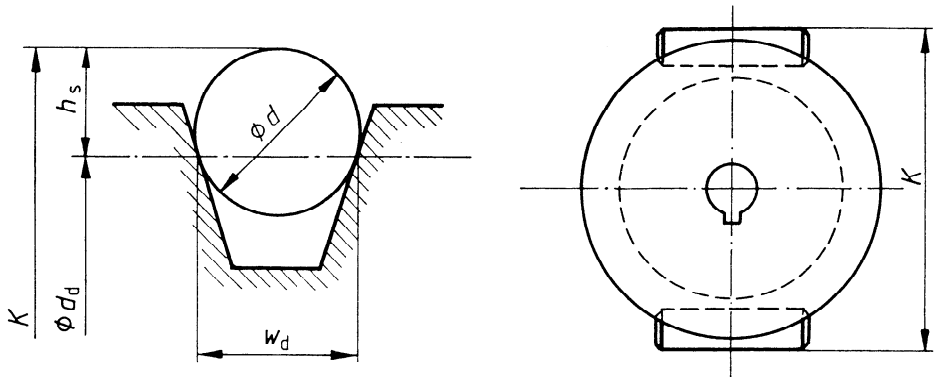


Figure 9 — Fitting of rods in the groove to be checked

7 Run-out tolerances

7.1 Specifications

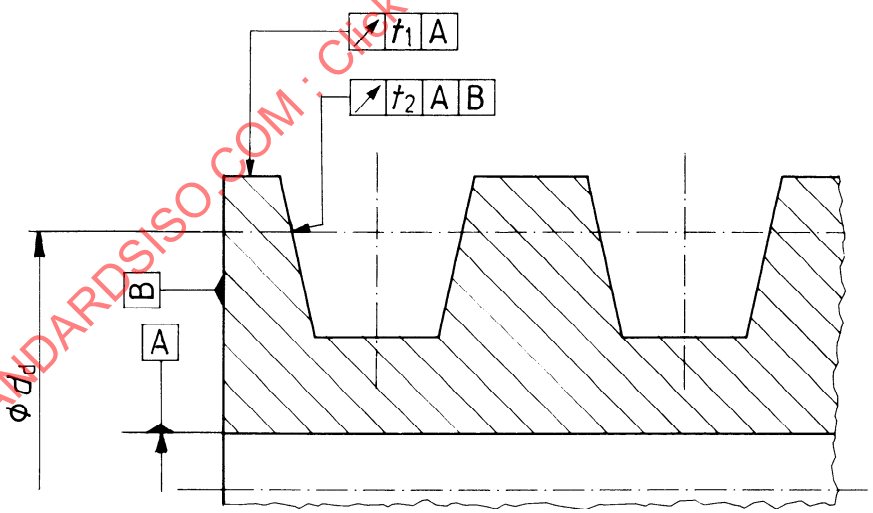
The following dimensions shall be specified in the corresponding International Standard (see figure 10):

— the radial circular run-out tolerance, t_1, of the outside diameter. The datum A is the axis of the bore;

— the axial circular run-out tolerance, t_2, measured perpendicular to the groove sidewall at the datum diameter. The common datum is formed by the datum A of the axis of the bore and the datum B of the grooved pulley face fitted to the collar of the shaft.

7.2 Inspection

The radial and axial circular run-outs shall not be greater than the values specified at the measurement positions (see figure 10) during one revolution about the datum axis A.



NOTE — The radial and axial circular run-out tolerances are shown in accordance with ISO 1101.

Figure 10 — Radial and axial circular run-out tolerances