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# 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*

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## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation ~~on~~of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT~~)~~), see www.iso.org/iso/foreword.html~~the following URL:~~ .



This document was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 1, *Friction*.



This third edition cancels and replaces the second edition (ISO 255:1990), which has been technically revised.

The main changes are as follows:

— the normative references list has been updated, including adding of ISO 1081 (vocabulary);

— in Clause 2 and Bibliography, normative references are no longer dated;

— modifications made for clarification and to be in line with ISO drafting rules.

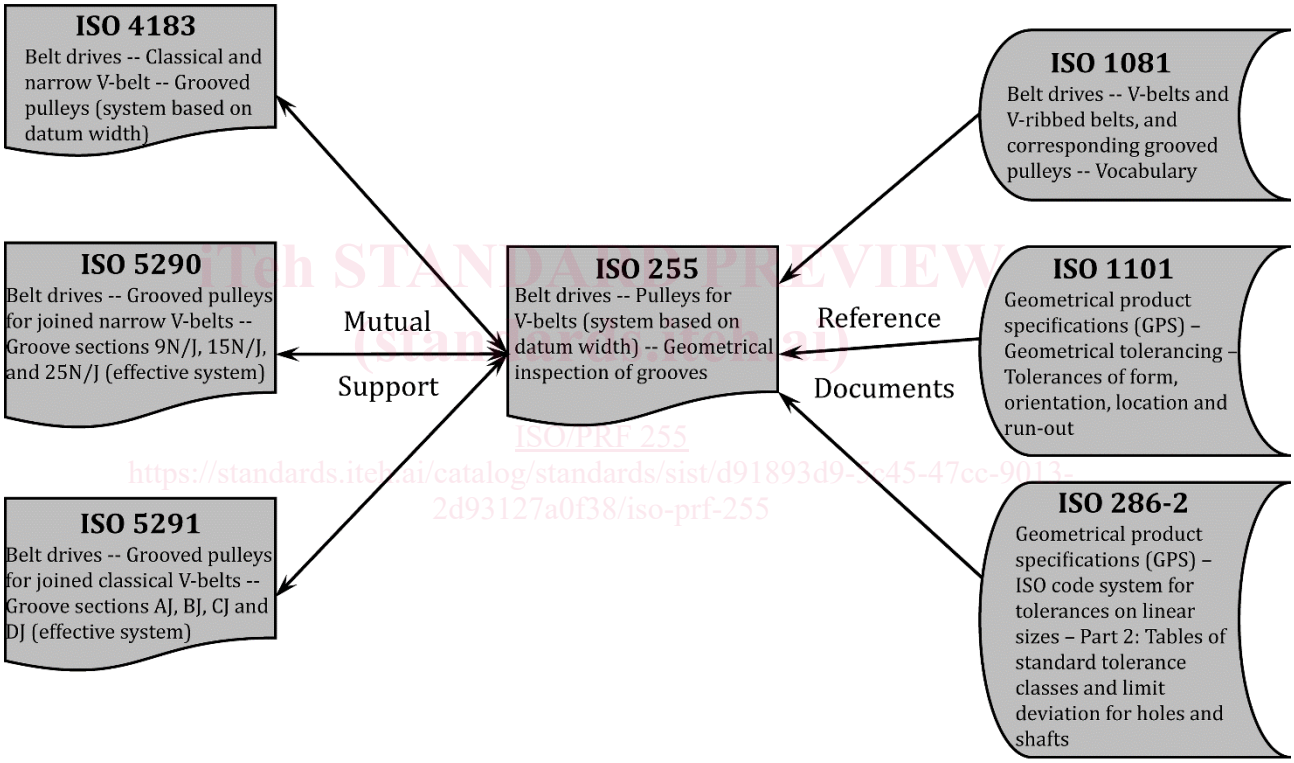
Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

# 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.

For user clarification, the interaction of this document with other relevant documents developed by ISO/TC 41/SC 1 and ISO/TC 213 "Dimensional and geometrical product specifications and verification" is given in Figure 1.



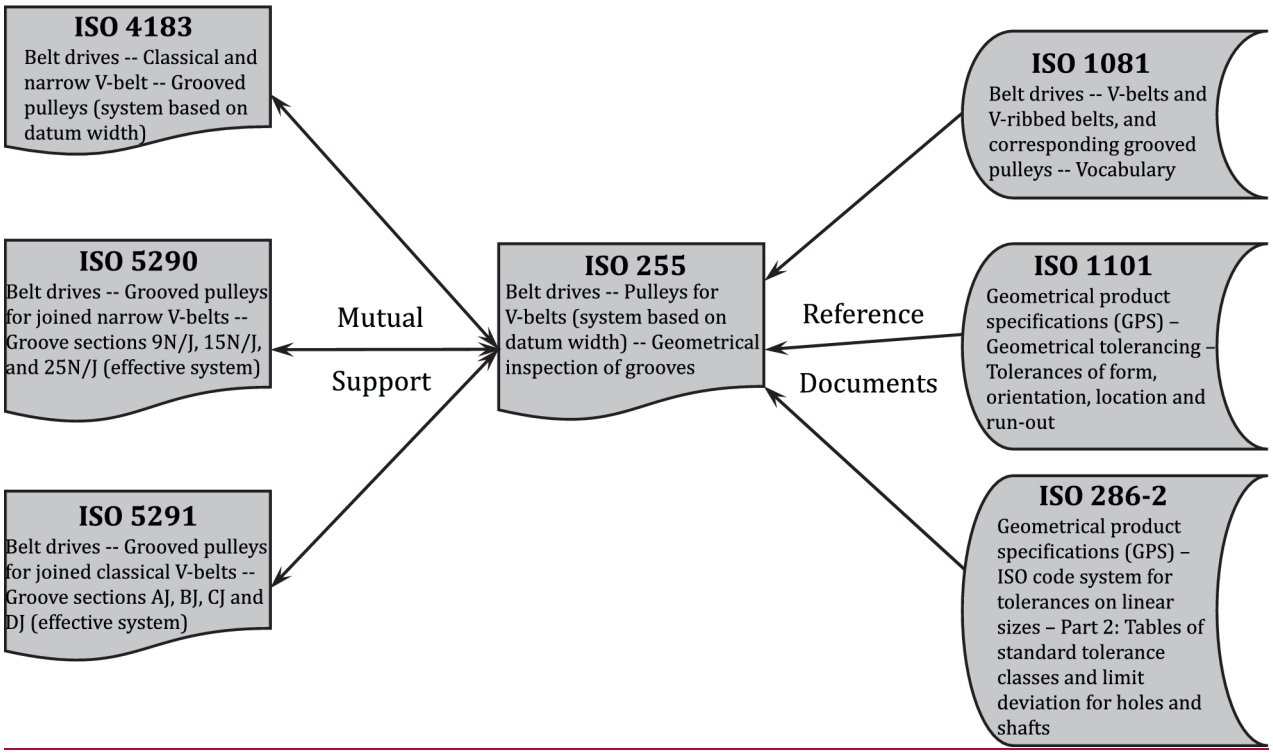



**Figure 1 — Interaction of this document with other relevant documents developed by ISO/TC 41/SC 1 and ISO/TC 213**

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

## 1 Scope

This document 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 covered by appropriate International Standards.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1081, *Belt drives — V-belts and V-ribbed belts, and corresponding grooved pulleys — Vocabulary*



## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1081 apply.



ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

## 4 Symbols ~~and abbreviated terms~~

For the purpose of this document, the symbols ~~and abbreviated terms~~ given in ISO 1081 and the following apply.

| Symbol | Definition |
|---|---|
| $b$ | Groove height above datum width |
| $d$ | Diameter of balls or rods |
| $d_d$ | Datum diameter - nominal value |
| $d_o$ | Outside diameter – nominal value |
| $e$ | Distance between the axes of two consecutive grooves - nominal value |
| $f$ | Distance between the outside of the rim and the axis of the first groove for all single- and multiple-groove pulleys |
| $h$ | Groove depth below datum width |
| $h_s$ | Corrective term |
| $K$ | Distance between the planes that are externally tangent to the balls or rods and parallel to the axis of the pulley |

| Symbol | Definition |
|---|---|
| $t_1$ | Radial circular run-out tolerance of the outside diameter |
| $t_2$ | Axial circular run-out tolerance measured perpendicular to the groove sidewall at the datum diameter |
| $w_d$ | Datum width |
| $x$ | Measured dimension |
| $\alpha$ | Groove angle |

# 5 Principle

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

— inspection of groove profile (see Clause 6);

— inspection of groove spacing (see Clause 7);

— inspection of datum diameter (see Clause 8);

— inspection of run-out (see Clause 9).

# 6 Groove profile



## 6.1 Specification

The groove profile dimensions (see dimensions shown in Figure 2 and summarized in Table 1) are given in ISO 4183.





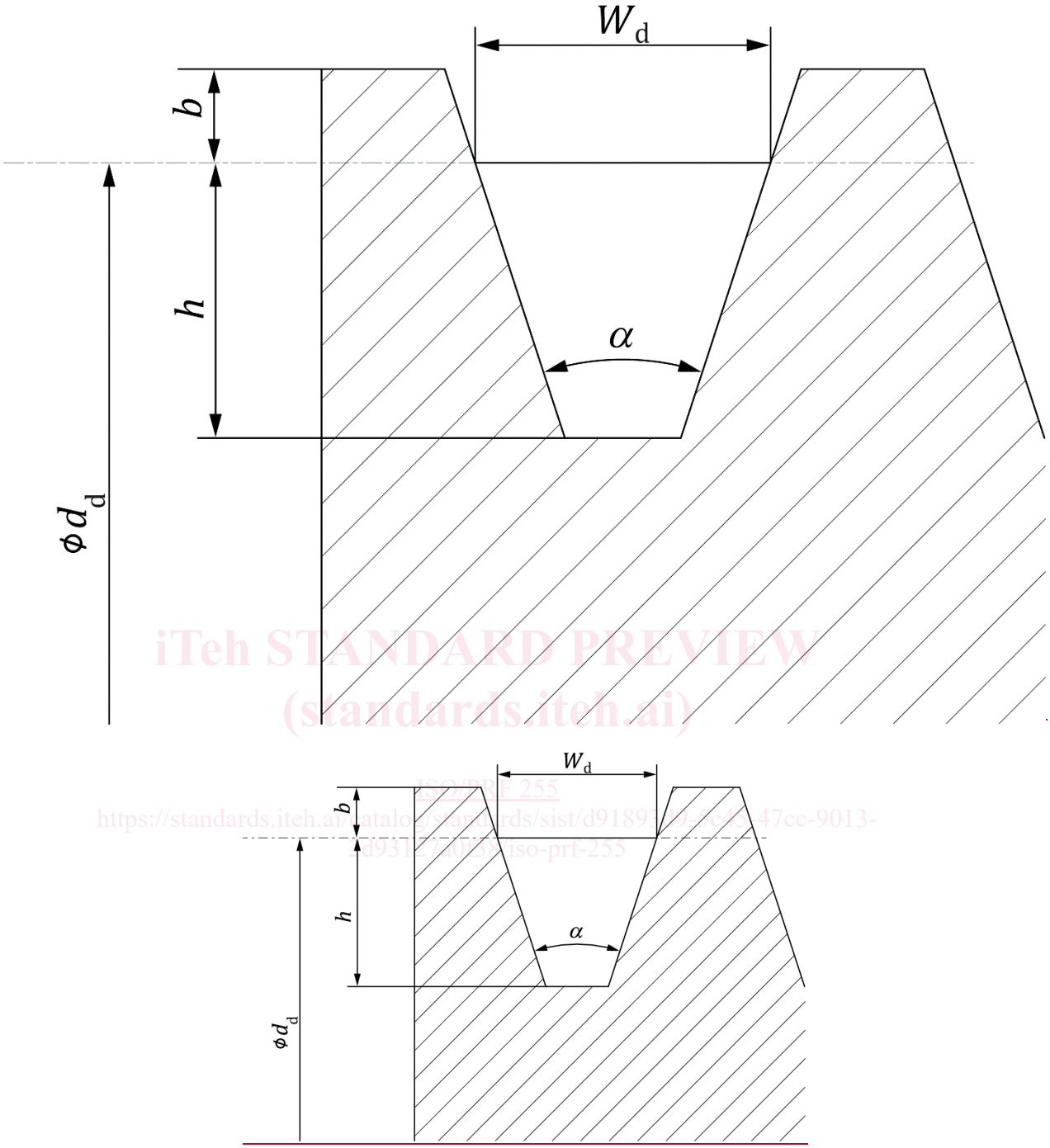





**Figure 2 — Groove profile**

**Table 1 — Groove profile specification**

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

## 6.2 Inspection

### 6.2.1 Limit gauges

The groove profile shall be checked using a limit gauge shown diagrammatically in Figure 3.

A gauge for each of the standard angles applicable to each groove section, as specified in ISO 4183, is required.

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

### 6.2.2 Operation

The limit gauge is shown in Figure 3.

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 4) 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~~conform 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 5).

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 6).

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 7).