



**SLOVENSKI STANDARD**  
**SIST ISO 9981:1997**  
**01-december-1997**

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**Jermenski pogoni - Jermenice in jermeni za mnogoterne klinaste jermene za avtomobilsko industrijo - Mere - Profili PK**

Belt drives -- Pulleys and V-ribbed belts for the automotive industry -- Dimensions -- PK profile

**iTeh STANDARD PREVIEW**

Transmissions par courroies -- Poulies et courroies striées pour la construction automobile -- Dimensions -- Profil PK

[SIST ISO 9981:1997](https://standards.iteh.ai/catalog/standards/sist/02734158-eae6-4e68-82fa-718c172a43af/sist-iso-9981-1997)

**Ta slovenski standard je istoveten z: ISO 9981:1990**

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**ICS:**

|           |                                       |                                      |
|-----------|---------------------------------------|--------------------------------------|
| 21.220.10 | Jermenski pogoni in njihovi deli      | Belt drives and their components     |
| 43.060.10 | Blok motorja in notranji deli motorja | Engine block and internal components |

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# INTERNATIONAL STANDARD

# ISO 9981

First edition  
1990-12-01

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## Belt drives — Pulleys and V-ribbed belts for the automotive industry — Dimensions — PK profile

**iTeh STANDARD PREVIEW**  
*Transmissions par courroies — Poulies et courroies striées pour la construction  
automobile — Dimensions — Profil PK*  
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Reference number  
ISO 9981 : 1990 (E)

## ISO 9981 : 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 9981 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Sub-Committee SC 1, *Veebelts and grooved pulleys*.

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Annex A of this International Standard is for information only.

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## Introduction

A V-ribbed belt drive is composed of an endless belt with a longitudinally ribbed traction surface which engages and grips, by friction, pulley grooves of similar shape. The belt ribbed surface fits the pulley grooves to make substantially total contact.

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# Belt drives — Pulleys and V-ribbed belts for the automotive industry — Dimensions — PK profile

## iTeh STANDARD PREVIEW (standards.iteh.ai)

### 1 Scope

This International Standard specifies the principal dimensional characteristics of V-ribbed pulley groove profiles, together with the corresponding endless V-ribbed belts, of PK profile which are used predominantly for automotive accessory drive applications.

The complete array of V-ribbed belts and pulleys of PH, PJ, PK, PL and PM profile for industrial and other non-automotive applications is the subject of ISO 9982. PK belt profile dimensions and tolerances are the same in both International Standards.

### 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.

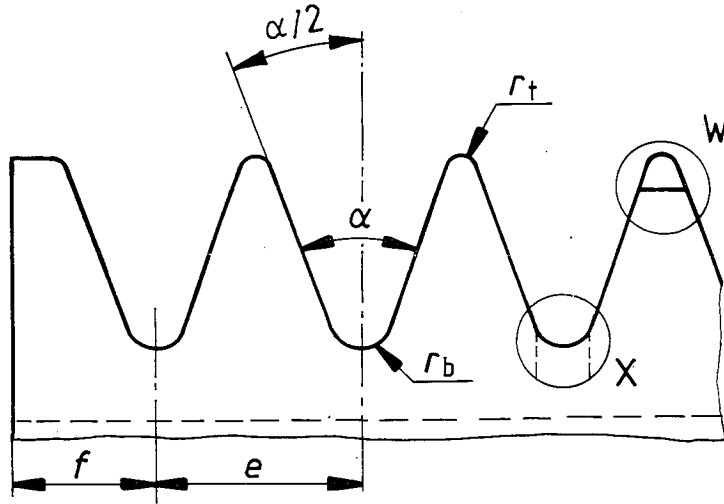
ISO 254 : 1981, *Quality, finish and balance of transmission pulleys.*

ISO 468 : 1982, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

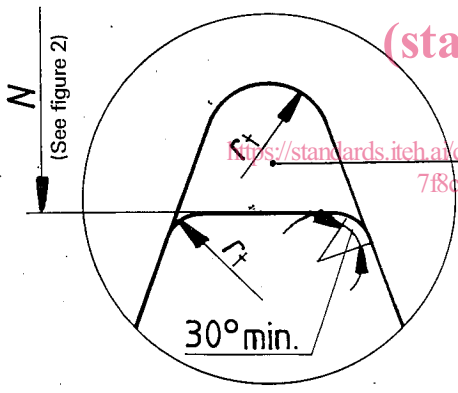
### 3 Pulleys

#### 3.1 Groove dimensions and tolerances

The groove dimensions of PK pulleys are shown on figures 1 and 2, and given in table 1.

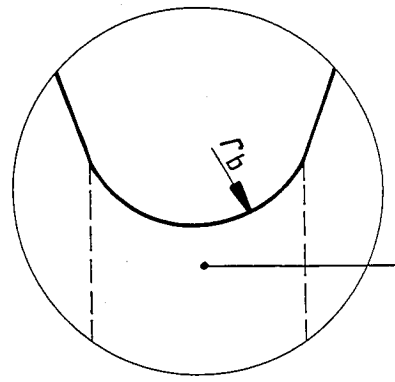


Alternative: Pulley tip profile  
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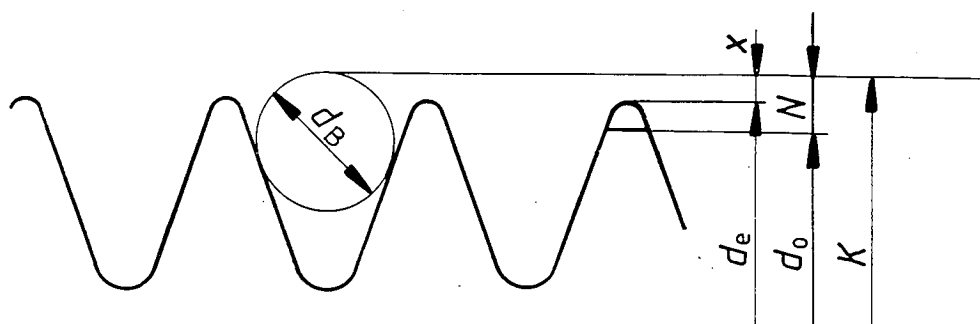
The actual configuration of the tip profile may lie anywhere between the maximum and minimum indicated. Any configuration shall have a transitional radius  $r_t$  corresponding to a 30° minimum arc tangent to the groove sidewall

X Alternative: Pulley groove bottom



The configuration of the groove bottom below  $r_b$  is optional

Figure 1 — Cross-section of pulley grooves



$d_e$  = effective diameter

$d_o$  = outer diameter

$K$  = diameter over balls or rods

$d_B$  = checking ball or rod diameter

Figure 2 — Pulley diameters

Table 1 — Dimensions of PK pulley grooves

Dimensions in millimetres

|                                      |                     |            |
|--------------------------------------|---------------------|------------|
| Groove pitch, $e$                    | $\pm 0,05^{1), 2)}$ | 3,56       |
| Groove half-angle, $\alpha/2^{3)}$   | $\pm 0^\circ 15'$   | $20^\circ$ |
| $r_t$                                | min.                | 0,25       |
| $r_b$                                | max.                | 0,5        |
| Checking ball or rod diameter, $d_B$ | $\pm 0,01$          | 2,5        |
| $2x$                                 | nom.                | 0,99       |
| $2N^{4)}$                            | max.                | 2,06       |
| $f$                                  | min.                | 2,5        |

1) The tolerance on  $e$  applies to the distance between the axes of two consecutive grooves.

2) The sum of all deviations from the nominal value  $e$  for all grooves in any one pulley shall not exceed  $\pm 0,3$ .

3) The centreline of the groove shall make an angle of  $90^\circ \pm 0,5^\circ$  with the axis of the pulley.

4)  $N$  is not related to the nominal diameter of the pulley but is measured from the actual ride position of the ball or rod in the pulley.

### 3.2 Minimum effective diameter

The minimum recommended effective diameter,  $d_e$ , for PK pulleys is 45 mm.

### 3.3 Tolerances on finished pulley

#### 3.3.1 Checking conditions

Profile, diameter and run-out tolerances shall be checked on the finished pulley without surface coating.

#### 3.3.2 Groove-to-groove diameter tolerances

The variation in diameters between the grooves in any one pulley shall not exceed 0,15 mm. This variation is obtained by comparing the diameters over balls or rods.

#### 3.3.3 Radial and axial circular run-out

Radial and axial circular run-outs shall not exceed 0,25 mm total indicator reading (TIR). Run-out in the two directions is measured separately with a ball mounted under spring pressure to ensure contact with the groove as the pulley is rotated.

#### 3.3.4 Groove finish

The pulley grooves shall have a surface roughness  $R_a \leq 3,2 \mu\text{m}$ . See ISO 254 and ISO 468 for definitions and the method of measurement.

### 3.4 Pitch diameter, $d_p$

The fit of a V-ribbed belt in the corresponding pulley is shown in figure 3. The true pitch diameter of a V-ribbed pulley is slightly larger than the effective diameter and its exact value is determined with the particular belt being used.

A nominal value of the effective line differential,  $b_e$ , of 2 mm may be used to calculate the speed ratio. If more precision is required, the belt manufacturer should be consulted.

Further information is given in ISO 8370.

### 3.5 Designation of pulleys

A V-ribbed pulley for the automotive industry is characterized by the number of grooves, the profile and the effective



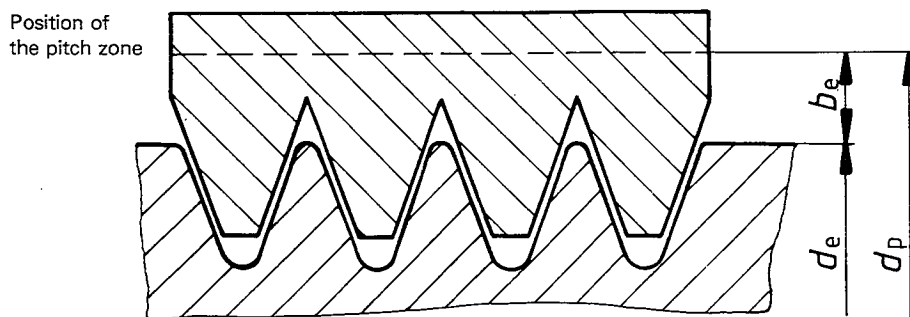
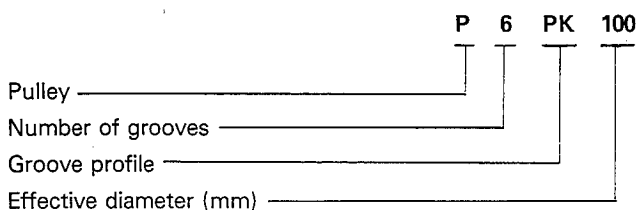


Figure 3 — Determination of pitch diameter

diameter. It is designated by a series of numbers and letters as follows:

- a) the first letter "P" indicates a pulley;
- b) the first set of numbers indicates the number of grooves;
- c) the second set of letters indicates the groove profile;
- d) the second set of numbers indicates the effective diameter, in millimetres.

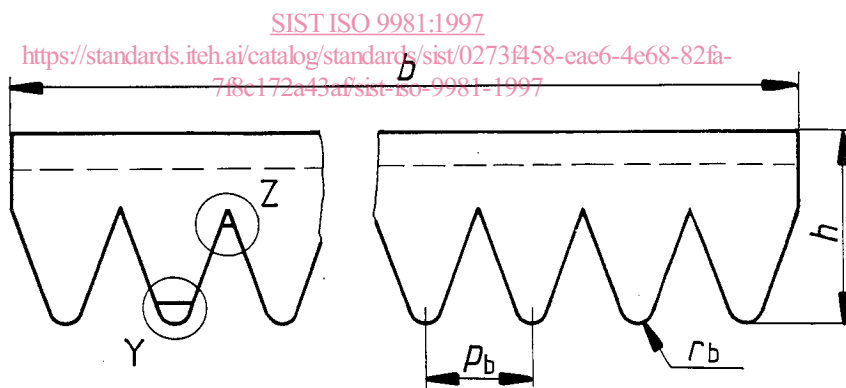
EXAMPLE



4 Belts

4.1 Belt dimensions

The dimensions of the PK belts are shown on figure 4 and given in table 2.



Nominal width of the belt  $b = n \times p_b$   
 where  $n$  is the number of ribs

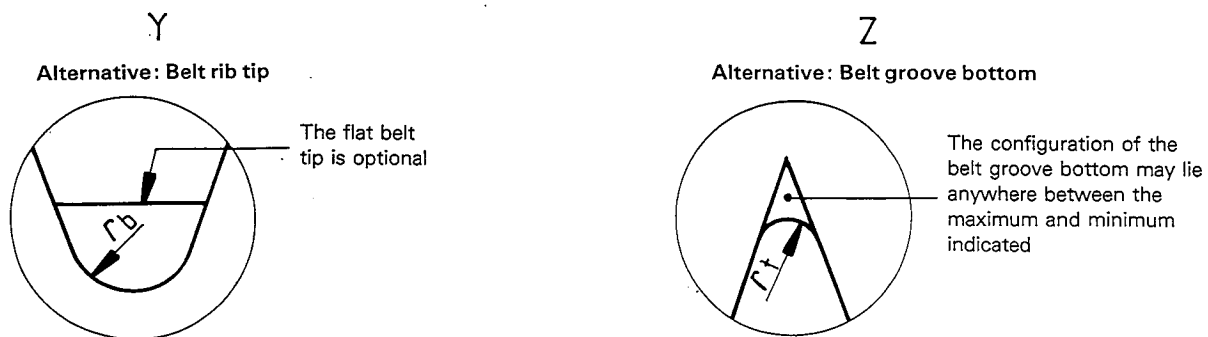


Figure 4 — Cross-section of belt