SLOVENSKI STANDARD
SIST ISO 5293:2012

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Nadomešča:
SIST ISO 5293:1997
SIST ISO/TR 10357:1997

Naprave za kontinuirni transport - Trakovi tračnih transporterjev - Ugotavljanje prehodne razdalje iz tridelne koritaste oblike v ravno obliko traku

Conveyor belts - Determination of minimum transition distance on three idler rollers

Courroies transporteuses - Détermination de la distance minimale de transition d'auge à trois rouleaux égaux

Ta slovenski standard je istoveten z: ISO 5293:2004

ICS:

53.040.20	Deli za transporterje	Components for conveyors

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Conveyor belts — Determination of minimum transition distance on three idler rollers

Courroies transporteuses — Détermination de la distance minimale de transition d'auge à trois rouleaux égaux

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5293 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

This second edition cancels and replaces ISO 5293:1981 and ISO/TR 10357:1989, which have been technically revised.

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Conveyor belts — Determination of minimum transition distance on three idler rollers

1 Scope

This International Standard specifies the formula for calculating conveyor belt transition distances and details its application and derivation.

This International Standard is not suitable or valid for light conveyor belts as described in ISO 21183-1[1].

2 Normative references

The following referenced documents are indispensable for the application 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 1537, *Continuous mechanical handling equipment for loose bulk materials — Troughed belt conveyors (other than portable conveyors) — Idlers*

ISO 9856, *Conveyor belts — Determination of elastic and permanent elongation and calculation of elastic modulus*

3 Calculation of minimum transition distance

The formula for calculating the transition distance, the derivation of which is given in Annex A, is as follows:

$$L_1 = \frac{h}{\sin\lambda}\left[\frac{M}{\Delta T}(1-\cos\lambda)\right]^{0,5}$$

where

L_1　　is the transition distance, expressed in metres;

h　　is the vertical distance, expressed in metres, the belt edge raises or lowers in the transition (see Figure 1);

λ　　is the idler trough angle;

M　　is the elastic modulus, expressed in newtons per millimetre, measured under tension T_R;

T_R　　is the maximum recommended belt-to-belt joint tension (RMBT), expressed in newtons per millimetre, for a steady-state condition of the conveyor;

ΔT　　is the induced belt edge stress, expressed in newtons per millimetre, in the transition.
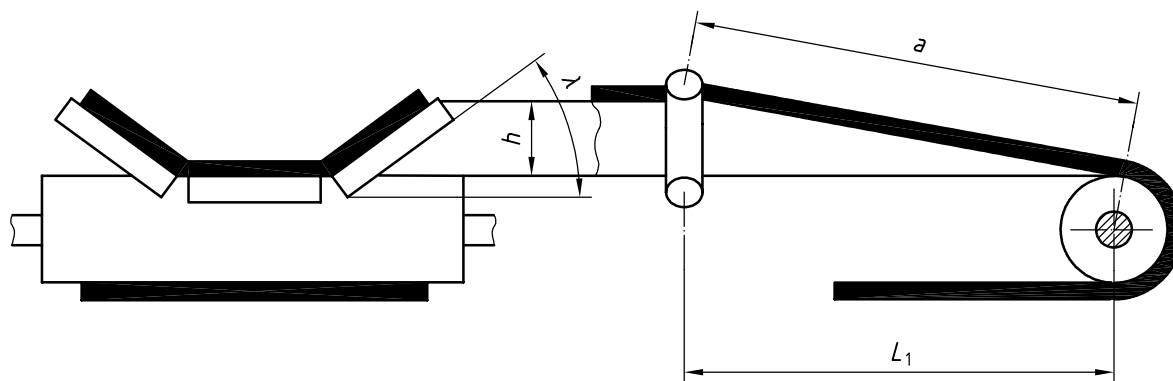
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Figure 1 — Transition distance

4 Application of the formula for transition distance

4.1 General

Calculate the transition distance by using appropriate values of M, h and ΔT as described in 4.2 to 4.4, as appropriate.

4.2 Values of elastic modulus, M, of belt

Determine the values in accordance with ISO 9856.

4.3 Values of vertical distance, h, which the belt edge raises or lowers

4.3.1 General

Calculate the values from the idler trough angle λ (see Figure 1) and the position of the terminal pulley with respect to the centre idler roller. Four common situations are described in 4.3.2 and 4.3.3.

4.3.2 Three equal length roller

4.3.2.1 The pulley is on a line with the top centre idler roller (see Figure 2).

$$h = \frac{b \sin \lambda}{3}$$

where

- h is the vertical distance, expressed in metres, that the belt edge raises or lowers in the transition (see Figure 1);

- b is the width, expressed in metres, of the belt;

- λ is the idler trough angle.

Figure 2 — Pulley on line with top centre idler roller

4.3.2.2   The pulley is elevated by 1/3 of the trough depth above the line of centre idler roller (see Figure 3).

h is then equal to 2/3 full trough depth, i.e.

$$h = \frac{2}{3} \times \frac{b \sin \lambda}{3} = \frac{b \sin \lambda}{4,5}$$

where

h is the vertical distance, expressed in metres, the belt edge raises or lowers in the transition (see Figure 1);

b is the width, expressed in metres, of the belt;

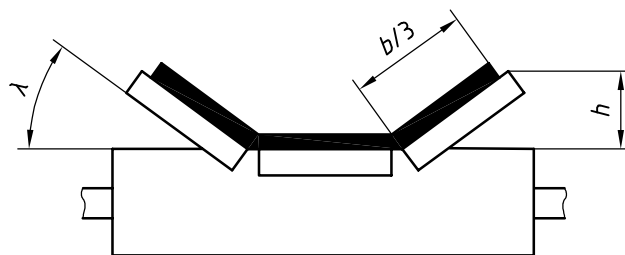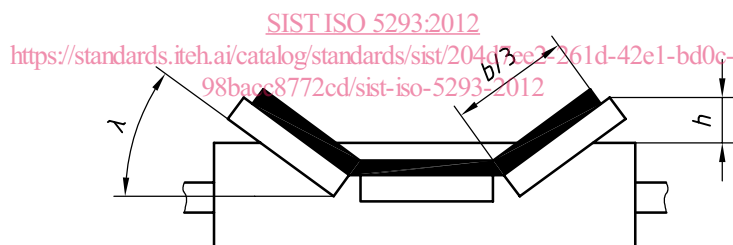λ is the idler trough angle.

Figure 3 — Pulley elevated by 1/3 of trough depth above line of centre idler roller

4.3.3   Long centre roller

4.3.3.1   The pulley is on a line with the top centre idler roller (see Figure 4).

$$h = b_1 \times \sin \lambda$$

where

h is the vertical distance, expressed in metres, the belt edge raises or lowers in the transition (see Figure 1);

b_1 is the amount of belt width, expressed in metres, on one of the outer rollers, i.e. $(b = 2b_1 + b_2)$;

λ is the idler trough angle.