SLOVENSKI STANDARD
SIST EN 13827:2004

01-junij-2004

Trakovi traļ nih transporterjev z jeklenim vloģkom ï Preverjanje vodoravnega in navpiļ nega poloģaja jeklenega vloģka

Steel cord conveyor belts - Determination of the lateral and vertical displacement of steel cords

Stahlseil-Fördergurte - Prüfung der horizontalen und vertikalen Lage der Stahlseile

Courroies transporteuses a carcasse métallique - Détermination du déplacement latéral et vertical des câbles d'acier

Ta slovenski standard je istoveten z: **EN 13827:2003**

ICS:

53.040.20 Deli za transporterje Components for conveyors

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EUROPEAN STANDARD

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English version

Steel cord conveyor belts - Determination of the lateral and vertical displacement of steel cords

Courroies transporteuses à carcasse métallique - Détermination du déplacement latéral et vertical des câbles d'acier

Stahlseil-Fördergurte - Prüfung der horizontalen und vertikalen Lage der Stahlseile

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13827:2003) has been prepared by Technical Committee CEN/TC 188 “Conveyor belts”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies methods for the determination of the mean lateral displacement between cords, and for the determination of the vertical displacement of cords relative to a mean level of steel cords within a conveyor belt as described in prEN ISO 15236-1.

2 Normative references

Not applicable.

3 Method A. Determination of cord pitch and supported belt width

3.1 Apparatus

NOTE If there are other measuring tools with the same or better precision these can also be used.

3.1.1 Measuring tape, graduated in divisions of 1,0 mm.

3.1.2 Hand held optical magnifier, incorporating a scale graduated in divisions of 0,1 mm and having a magnification of not less than x8.

3.1.3 Dial gauge micrometer, graduated in divisions of 0,1 mm.

3.1.4 Flat horizontal surface to support the full width of the conveyor belt.

3.2 Test piece

The test piece shall be of full belt width and not less than 50 mm long. The cut edges shall be smooth, free of contamination and shall expose the cords clearly.

If the cut edges are not smooth enough the test piece can be prepared in a different way so that the position of the cords can be measured with a precision given in this European Standard.

3.3 Procedure

3.3.1 Determination of mean cord pitch (t_m)

Using the measuring tape (3.1.1), measure the distance to the nearest 1,0 mm between the outer edges of the first and last cord across the width of the test piece (see Figure 1), and record this value as ($b_t + d$).

Alternatively, use the measuring tape to measure the belt width to the nearest 1,0 mm and measure the thickness of the edge rubber, b_k, at both edges to the nearest 0,5 mm; ($b_t + d$) is the belt width less edge rubber thickness.

Using the micrometer (3.1.3), or the hand held optical magnifier (3.1.2), measure the diameter of either the first or the last cord in the test piece to the nearest 0,1 mm and record the value as (d).

Count the total number of cords across the width of the test piece and record the number as (n).

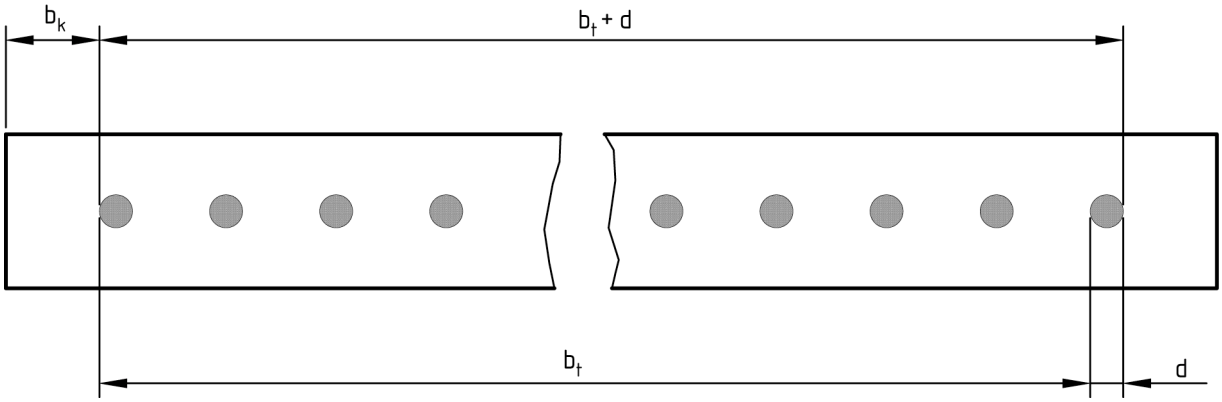

Figure 1 — Illustration of measurements taken for measurement of t_m

Calculate the mean cord pitch t_m as follows:

$$t_m = \frac{(b_t + d) - d}{(n-1)}$$

Express the result to the nearest 0,1 mm.

3.3.2 Measurement of supported belt width (b_t) (see Figure 1)

Calculate the supported belt width b_t as follows:

$b_t = (b_t + d) - d$

Express the results to the nearest 0,1 mm.

Calculate the percentage of the deviation of the actual supported belt width to the calculated supported belt width as follows:

$$\Delta b_t = \frac{b_t \times 100}{(n-1) \times t_m} - 100\ [\%]$$

3.3.3 Measurement of the cord pitches within a control section (see Figure 2)

Select any 21 consecutively adjacent cords within the test piece.

Using the micrometer (3.1.3) or the hand held optical magnifier (3.1.2), measure the pitches between the 21 cords and record them as $t_1, t_2, \ldots\ldots t_{20}$.

NOTE If these requirements cannot be met within this control section, the control section may be increased in multiples of 20 pitches until all pitches are measured.

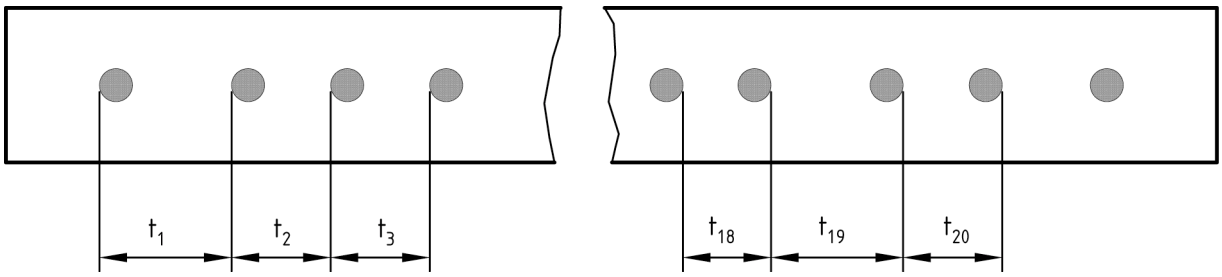

Figure 2 — Illustration of measurements taken of cord pitches in control section

4 Method B. Determination of the vertical displacement of cords relative to a mean level.

NOTE This test can only be conducted on a conveyor belt that has a uniform cover on at least one side. This is because the outer surface of the uniform cover is used as the base datum for measurements of cord height. Variations in the base datum will adversely effect the precision of the test.

4.1 Apparatus

NOTE If there are other measuring tools with the same or better precision these can also be used.

4.1.1 A dial gauge micrometer as described in 3.1.3.

4.1.2 A hand held optical magnifier as described in 3.1.2.

4.1.3 A flat surface as described in 3.1.4.

4.2 Test piece

Use the test piece described in 3.2.

4.3 Procedure

4.3.1 Measurement of mean cord height (h_m)

At evenly spaced intervals across the width of the test piece select a number of cords equal to 10 % of the total number of cords in the belt.

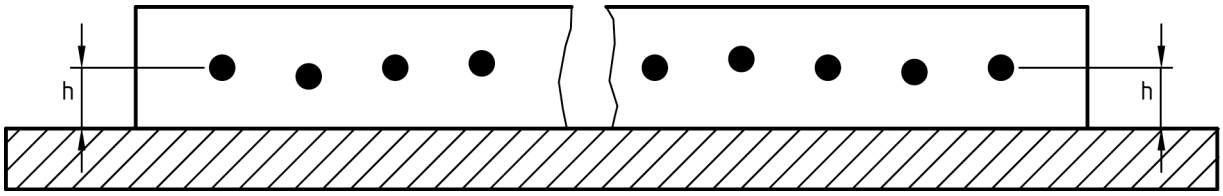

Figure 3 — Measurement of mean cord height (h_m)

Place the test piece with the uniform cover down, on the horizontal surface (3.1.4). If necessary ensure that the test piece remains flat by using clamps.

Using the micrometer (4.1.1) or the optical magnifier (4.1.2) measure the height of each of the selected cords relative to the bottom surface of the belt. The measurement being taken to the upper edge of the cord (see Figure 3). Record the individual measurements h_1, h_2, h_3 .... h_n.

Calculate the mean height h_m as follows:

$$h_m = \frac{h_1+h_2+h_3+....h_n}{n}$$

where n is the number of cords selected.

4.3.2 Measurement of displaced cords above and below the mean value (h)

Identify any cords which appear to be higher or lower than the mean level h_m.

Measure to the nearest 0,5 mm the height h of the upper edge of the cord over the bottom surface and calculate the difference Δh, in the level of each displaced cord relative to the mean height, h_m, ignoring whether the deviation is positive or negative (see Figure 4).

Arrange the results into three levels of severity Δh_1, Δh_2 and Δh_3 and tabulate the results in the form shown in Table 1. Calculate the percentage based on the total number of cords across the test piece.

Table 1 — Evaluation of height differences

	Δh_1		Δh_2		Δh_3	
Total number of cords in the test piece	No of cords $h \leq h_m \pm$ 1,0 mm		No of cords $h > h_m \pm 1{,}0$ mm and $\leq h_m \pm 1{,}5$ mm		No of cords $h > h_m \pm 1{,}5$ mm	
	Quantity	Percentage	Quantity	Percentage	Quantity	Percentage

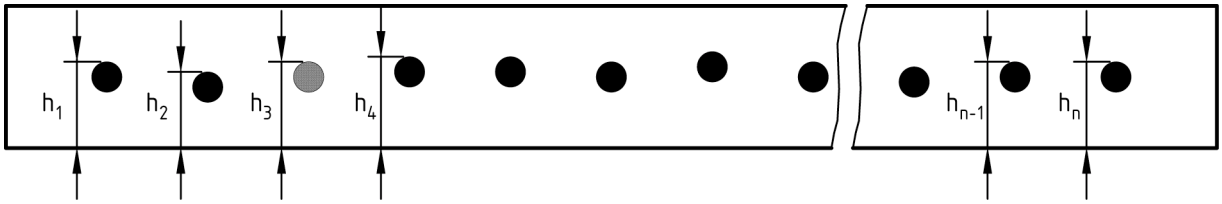

Figure 4 — Illustration of measurement of cord height