



SLOVENSKI STANDARD

SIST EN 1718:1999

01-april-1999

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Light conveyor belts - Test method for the measurement of the electrostatic field generated by a running light conveyor belt

Leichte Fördergurte - Prüfverfahren zur Messung des von einem laufenden leichten Fördergurt erzeugten elektrostatischen Feldes

Courroies transporteuses légères - Méthode d'essai pour le mesurage du champ électrostatique engendré par une courroie transporteuse légère en marche

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ICS:

53.040.20 Deli za transporterje Components for conveyors

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English version

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electrostatic field generated by a running light conveyor belt

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einem laufenden leichten Fördergurt erzeugten
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This European Standard was approved by CEN on 8 November 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by July 1999, and conflicting national standards shall be withdrawn at the latest by July 1999.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies a method of test for the measurement of the electrostatic field generated by a running light conveyor belt as described in EN 873.

This dynamic procedure is required since the antistatic behaviour of light conveyor belts can in many cases not always sufficiently be described by measurement of the electrical resistances described in prEN 1637.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 873	Light conveyor belts - Principal characteristics and applications
prEN 1637	Light conveyor belts - Test methods for the measurement of the electrical resistances
prEN 1723	Light conveyor belts - Determination of the relaxed elastic modulus
ISO 22	Belt drives - Flat transmission belts and corresponding pulleys - Dimensions and tolerances
ISO 471:1995	Rubber - Temperatures, humidities and times for conditioning and testing
ISO 554	Standard atmospheres for conditioning and/or testing - Specifications
ISO 4287-1	Surface roughness - Terminology - Part 1 : Surface and its parameters

3 Principle

The test piece runs under specified conditions and produces an electrostatic field of which the course of its variation with time is recorded.

The test is carried out successively with both sides of the belt in contact with the pulleys.

4 Apparatus

Testing apparatus (see figure 1) consists of the following main parts:

4.1 Pair of pulleys.

The pulleys shall be electrically connected and earthed.

4.1.1 Material : steel

4.1.2 Dimensions : diameter is 200 mm or larger, rim width is 120 mm

4.1.3 Surface finish : raw, unplated surface roughness of maximum $R_a = 1,6 \mu\text{m}$, in accordance with ISO 4287-1.

Final coating is of chromium plating.

4.1.4 Drive pulley : fixed, cylindrical.

4.1.5 Driven pulley : moveable for tensioning, crowned in accordance with ISO 22 (h = 0,6 mm).

4.2 Tensioning device

To achieve uniform surface pressures, the test piece shall be loaded according to its $k_{1\%}$ value (see table 1) by means of a suitable tensioning device.

Table 1: Shaft load required

$k_{1\%}$ N/mm ¹)	shaft load F N
≤2.5	50
>2.5 - 10	300
>10 - 30	900
>30	as per agreement

1) $k_{1\%}$ value has to be established in accordance with prEN 1723.

4.3 Drive.

The belt runs directly from the drive pulley to the measuring device at a speed of 5 m/s.

4.4 Measuring device : standard commercial electrostatic field meter with signal output.

4.5 Recording : e.g. y/t recorder.

4.6 Electrostatic field corrections

4.6.1 Field distortion created by the measuring electrode

Correction is obtained by equipping the electrode with an earthed steel plate of 200 mm x 200 mm (see figure 1).

Edges all round are bent-up with a radius of approximately 10 mm (see figure 1).

Lower surface of electrode is flush with the lower surface of steel plate.

4.6.2 Field distortion created by the test piece return side

The test piece return side generates its own field. The field to be measured shall be shielded from it by means of an earthed steel plate of 600 mm x 200 mm (see figure 1).

Edges all round are bent-up with a radius of approximately 10 mm (see figure 1).

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5 Test piece

5.1 Material

Test piece material shall be new, unused ('virgin'), and shall not be tested earlier than five days after manufacture.

It shall not contain any contaminations or superficial damages.

5.2 Dimension

Endless length shall be (2500 ±50) mm

Width shall be (100 ±1) mm

5.3 Endless joining

Test piece shall be joined endless according to the producer's standard recommendations.

5.4 Cleaning of the pulleys

The pulleys shall be metallic clean.

5.5 Conditioning

Before testing expose the test piece for a minimum of 24 h to a test room climate of (23 ± 2) °C and (50 ± 5) % relative humidity as specified in ISO 471 and ISO 554.

To obtain results with high conductivity belts, the relative humidity may have to be reduced to $(25 \pm 5) \%$.

6 Procedure

Conveyor belts which, due to their construction require pulley diameters of more than 200 mm, shall be tested with the smallest diameter admissible, following the manufacturer's indication.

- Check the test room climate (see 5.5).
- Clean both pulleys (see 5.4) and if necessary remove any dust from the shielding steel plates.
- Install endless joined (see 5.3) and conditioned (see 5.5) test piece on test device with the normal running side in contact with the pulleys.
- Tension the test piece in accordance with 4.2.
- Install the recorder.
- Position the measuring device on the centre line of the test piece, 500 mm from the centre of the drive pulley, with a space of 25 mm between the test piece surface which is not in contact with the pulley (see figure 1).
- Start the test piece and run it from the drive pulley directly to the field measuring device.
- Record the electrostatic field strength E in volts per meter.
- The measurement time shall be 30 mins.
- Repeat the same procedure with the other side of the belt in contact with the pulleys.

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Before testing expose the test piece for a minimum of 24 h to a test room climate of $(23 \pm 2)^\circ\text{C}$ and $(60 \pm 5) \%$ relative humidity as a preconditioning step.