SLOVENSKI STANDARD
SIST EN 1637:1999

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Naprave za kontinuirni transport - Lahki trakovi traḷ nih transporterjev - Postopek za meritev elektriḷ ne upornosti

Light conveyor belts - Test methods for the measurement of the electrical resistances

Leichte Fördergurte - Prüfverfahren zur Messung der elektrischen Widerstände

Courroies transporteuses légeres - Méthodes d'essai pour la mesure des résistances électriques

Ta slovenski standard je istoveten z: EN 1637:1999

ICS:

53.040.20 Deli za transporterje Components for conveyors

SIST EN 1637:1999 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
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English version

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Leichte Fördergurte - Prüverfahren zur Messung der elektrischen Widerstände

This European Standard was approved by CEN on 8 January 1999.

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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.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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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of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

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.

1 Scope

This European Standard specifies test methods for determining the electrical resistances of light conveyor belts as described in EN 873. The resistances are surface resistance, volume resistance perpendicular to the belt plane and longitudinal and transverse volume resistance parallel to the belt plane. Furthermore this standard contains two test methods for determining the surface resistivity and the volume resistivity.

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.

ISO 471	Rubber-Standard temperatures, humidities and times for the conditioning and testing of test pieces
ISO 554	Standard atmospheres for conditioning and/or testing - Specifications
EN 873	Light conveyor belts - Principal characteristics and applications

3 Symbols

Symbol	Quantity	unit
R_{OA}	Electrical surface resistance, method A	Ω
R_{OB}	Electrical surface resistance, method B	Ω
R_{OG}	Electrical surface resistance for the determination of ρ_S	Ω
R_D	Electrical volume resistance perpendicular to the plane of the belt	Ω
R_{Di}	Electrical volume resistance in longitudinal and transverse direction parallel to the plane of the belt	Ω
ρ_S [1)]	Electrical surface resistivity	Ω
ρ_D	Electrical volume resistivity	$\Omega \cdot cm$
$d_{1/2/3}$	Diameter of electrode	cm
d_m	Middle of the gap diameter	cm
g	Width of the gap	cm
A	Surface of the electrode	cm^2
h	Thickness of test piece	cm

[1)] **The SI-unit of surface resistivity is the Ohm (Ω). In practice this is sometimes referred to as 'Ohm/square' or 'Ω/sq' or 'Ω/□'. The size of the square is immaterial.**

4 Electrical surface resistances

4.1 Method A : Measurement of the surface resistance R_{OA} omni-directionally

This is appropriate to belts which are electrically two-dimensionally isotropic in the plane of the belt.

4.1.1 Principle

An electric current of specified voltage is passed via electrodes through a suitably prepared test piece taken from the belt.

4.1.2 Apparatus

Testing device consisting of the following main parts:

4.1.2.1 Sheet of insulating material, a little larger than the test piece.

4.1.2.2 Two cylindrical and coaxial brass electrodes, the base of one being circular and the other annular. The dimensions and masses are given in figure 2. The bases of these electrodes shall be machined flat and polished. A flexible insulated wire shall be connected to each electrode.

4.1.2.3 Ohmmeter(resistance measuring instrument*)*, with a range up to 10^{10} Ω. The accuracy of measurement of the ohmmeter is ± 5%.

4.1.2.4 Source of direct current, adjustable up to 500 V, and not permitting an amperage greater than 10 mA.The source of current may be either an accumulator or a rectified, stabilized AC-power supply.

4.1.3 Test piece

4.1.3.1 Material

Test piece material shall be new, unused ('virgin'), but not tested earlier than five days after manufacture. It shall be free of any kind of contamination or superficial damages.

4.1.3.2 Dimensions

The test piece shall be square and shall be cut from the full thickness of the belt. The length of a side shall be 300 mm minimum.

4.1.3.3 Number

Three test pieces shall be taken. One test piece shall be taken from the middle of the belt, the other two test pieces shall be taken 100 mm from each of the belt edges.

4.1.3.4 Cleaning

If suitable clean both surfaces of the test piece by rubbing with fuller's earth, (hydrated magnesium-aluminium silicate), for example, using a clean cloth. After cleaning away all traces of the powder, wipe the surface with a clean cloth moistened with distilled water and then dry with a clean cloth.

4.1.3.5 Conditioning

Before testing, the test piece shall be exposed during 24 h minimum to the standard test room climate of (23 ± 2) ° C and (50 ± 5) % relative humidity in accordance with ISO 471 and ISO 554.
If the light conveyor belt consists of materials with a high absorption of moisture, e.g. cotton or polyamide, the minimum conditioning time shall be 48 h.

4.1.3.6 Preparation

Prepare the test pieces in the following manner after conditioning according to 4.1.3.5.
To ensure good contact between electrodes and test piece a suitable contact agent shall be used. The electrical surface resistivity of the contact agent shall not be higher than 10^4 Ω. For checking this value, use the the same electrode arrangement as described in Clause 5.

A jelly of the following composition is suitable:

Anhydrous polyethylene glycol of molecular mass 600	800 parts by mass;
Water	200 parts by mass;
Potassium chloride	10 parts by mass;
Soft soap (pharmaceutical quality)	1 part by mass.

If the test piece surface is flat this jelly may be painted on the bottom surface of the cleaned electrodes. In case of textured surfaces two areas as shown in figure 1 shall be painted on the test piece. Great care shall be taken to ensure the accuracy of the dimensions of the areas, but the symmetry of the centre is not critical. The test shall be done immediately after painting. Instead of the jelly mentioned above conductive silver lacquer may be used. This lacquer shall be painted on to the test piece as described before. Conduct the test after evaporating the solvent.

4.1.4 Procedure

- Check test room climate.

- Place the test piece on the sheet of insulating material, with the test surface upwards.

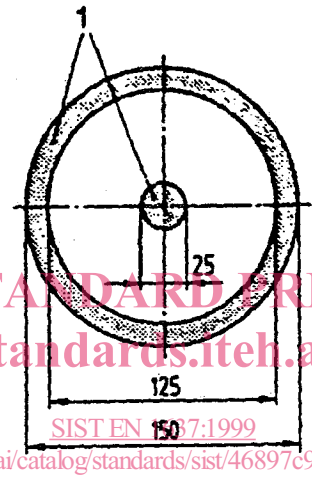
- Paint test piece or bottom surface of the cleaned electrodes with contact agent and let it evaporate if necessary.

- If necessary, clean the electrodes and place them on the test piece.

- Apply testing voltage to the electrodes starting with a low voltage to protect very fine antistatic layers against damage.

- Read off the value 1 min after applying the voltage.

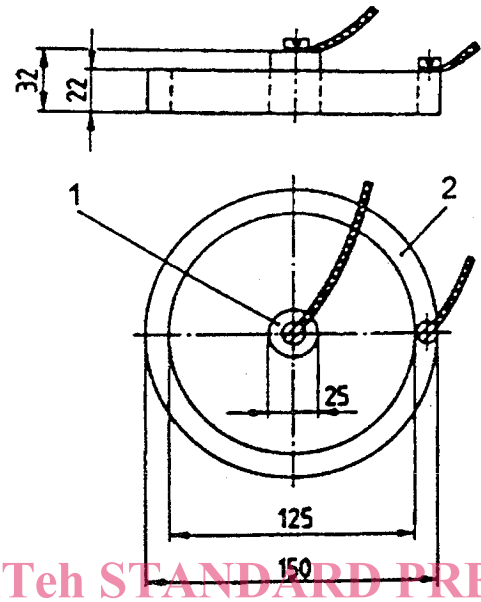
Dimensions in millimetres



1 Polyethylene-Glycol

Figure 1 : Design to be painted on the test piece

Dimensions in millimetres



1 Minimum mass 115g

2 Minimum mass 900g

Figure 2 : Electrodes

4.1.5 Expression of results

For each surface of the belt subjected to test, record the electrical resistance, in ohms, as the mean of the values for that surface noted for the three test pieces. Each single value is to be given, too.

Record the electrical resistance for the two surfaces of the belt separately.

4.1.6 Test report

The test report shall include the following information:

a) complete designation of the tested light conveyor belt material and the manufacturing date;

b) reference to this European Standard;

c) test room temperature and relative humidity;

d) conditioning period;