SLOVENSKI STANDARD
SIST EN 60094-4:1999/A1:1999

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Magnetic tape sound recording and reproducing systems -- Part 4: Mechanical magnetic tape properties -Amendment A1 (IEC 60094-4:1986/A1:1994)

Magnetic tape sound recording and reproducing systems -- Part 4: Mechanical magnetic tape properties

Systeme für Tonaufzeichnung und -wiedergabe auf Magnetband -- Teil 4: Mechanische Eigenschaften von Magnetbändern

Systèmes d'enregistrement et de lecture du son sur bandes magnétiques -- Partie 4: Propriétés mécaniques des bandes magnétiques

Ta slovenski standard je istoveten z: **EN 60094-4:1994/A1:1994**

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Descriptors: Magnetic tape recording, sound recording and reproduction, mechanical property, method of measurement

Amendment A1 to the English version of EN 60094-4

Magnetic tape sound recording and reproducing systems
Part 4: Mechanical magnetic tape properties
(IEC 94-4:1986/A1:1994)

Systèmes d'enregistrement et de lecture du son sur bandes magnétiques
Partie 4: Propriétés mécaniques des bandes magnétiques
(CEI 94-4:1986/A1:1994)

Systeme für Tonaufzeichnung und -wiedergabe auf Magnetband
Teil 4: Mechanische Eigenschaften von Magnetbändern
(IEC 94-4:1986/A1:1994)

This amendment A1 modifies the European Standard EN 60094-4:1994. It was approved by CENELEC on 1993-12-08. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CENELEC member.

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

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

FOREWORD

The text of document 60A(CO)155, as prepared by Sub-Committee 60A: Sound recording, of IEC Technical Committee 60: Recording, was submitted to the IEC-CENELEC parallel vote in April 1993.

The reference document was approved by CENELEC as amendment A1 to EN 60094-4 on 8 December 1993.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1995-07-01
- latest date of withdrawal of conflicting national standards	(dow)	1995-07-01

ENDORSEMENT NOTICE

The text of amendment 1:1994 to the International Standard IEC 94-4:1986 was approved by CENELEC as an amendment to the European Standard without any modification.

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
IEC
94-4

1986

AMENDEMENT 1
AMENDMENT 1

1994-07

Amendement 1

Systèmes d'enregistrement et de lecture du son sur bandes magnétiques

Partie 4:
Propriétés mécaniques des bandes magnétiques

Amendment 1

Magnetic tape sound recording and reproducing systems

Part 4:
Mechanical magnetic tape properties

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by sub-committee 60A: Sound recording, of IEC technical committee 60: Recording

The text of this amendment is based on the following documents:

DIS	Report on Voting
60A(CO)155	60A(CO)162

Full information on the voting for the approval of this amendment can be found in the voting report indicated in the above table.

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5.4 *Transverse cupping (for professional tapes only)*

Replace the existing subclause by the following new subclause:

5.4 *Transverse cupping* (optional)

Definitions

Transverse cupping is a continuous, transverse curvature (convex or concave), across the full tape width.

It shall be measured as the radius of the curvature in the transverse direction of the tape sample.

Method A

A tape sample of 30 cm in length is freely suspended from a clamp and placed between the measuring equipment guides with its concave side facing the rotating template as shown in figure 3, page 23.

The template has a sector periphery of various radii and is rotated until a sector of the same radius as the tape is found.

A lamp is fitted to facilitate the measurement.

It is necessary to ensure that heat generated by the lamp does not influence the measurement.

Result

The radius of the tape curvature is derived from the relevant template sector and is expressed in millimetres.

Method B

For optical measurements the following principle may be applied:

The transversely cupped tape is regarded as a cylindrical concave mirror. It is illuminated by a tubular lamp. The filament will concide with its image if its distance from the tape surface is twice the focal length of the concave mirror. This distance is also the radius of the transverse cupping.

Practical measurement

A piece of tape is placed on two rollers (R1 and R2) having a minimum distance *d* of 10 times the tape width (see figure 7). The ends of the tape are loaded with weights W of 0,01 N (approximately 1 *gf*) per mm tape width enabling the tape to lie flat.

The rollers are mounted on a device (see figure 8) which can be moved in order to adjust the distance of the tape surface from the filament lamp.

The sharpness of the image of the filament is observed through a ground glass (GG) and semitransparent mirror (M). If sharpness is reached the distance is read on a regular scale in millimetres.

Result

The measured distance between tape and lamp filament is given as transverse cupping in millimetres.

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5.10 *Tensile tests*

NOTE TO THE PROJECT – The measurement of the modulus of elasticity of a magnetic tape gives a very useful means to the manufacturer and the user of magnetic tapes with respect to the true and efficient applicable forces which a magnetic tape can withstand without any remaining damages. The values of the modulus of elasticity multiplied by the cross-section area of the tape gives the maximum applicable force for this tape. The measuring can be done with any usual tensile tester.

Add, on page 21, a new subclause 5.10.3:

5.10.3 *Modulus of elasticity* (optional)

Definition

The modulus of elasticity is the tension force necessary for a certain linear expansion of the tape under the influence of this force while the sample has to be in the linear section of the Hooke-curve and any changing of the cross-section of the tape has to be non-negligible.

Methods

The measuring equipment is a commonly used and commercially available tensile tester.

The distance between the clamps at the beginning of the test shall be 100 mm, the length of the sample to be tested shall be about 280 mm. The clamps including the test sample shall be moved with a constant velocity of 100 mm/min.

The construction of the clamps has to ensure a uniform configuration of forces and flow of the test sample inside the clamps.

Each kind of tape has to be tested with its original width.

Result

The modulus of elasticity shall be calculated as follows:

$$E = \frac{(F_2 - F_1) \times L_0}{a_0 \times b_0 \times \Delta L}$$

where

E is the modulus of elasticity by tensile test, in MPa;

F_1 is the force at the beginning of the linear section of the Hooke-curve, in N;

F_2 is the force in a distance far enough from F_1 to get good measuring results but within the linear section of the Hooke-curve, in N;

L_0 is the clamped length of the test sample = 100 mm;

$a_0 \times b_0$ is the cross-section area of the tape at the beginning of the test in mm²;

ΔL is the linear expansion of the test sample between the tensile forces F_1 and F_2, in mm.

The arithmetical average value and the standard deviation resulting from five measurements shall be noted.