SLOVENSKI STANDARD

SIST HD 573 S1:2007

januar 2007

Videorekorderji tipa C

(istoveten HD 573 S1:1990)

Type C helical video tape recorders

ICS 33.160.40

Referenčna številka
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TYPE C HELICAL VIDEO TAPE RECORDERS

Magnétoscopes à enregistrement hélicoïdal de type C

Videobandgeräte mit Schrägspuraufzeichnung Format "C"

BODY OF THE HD

The Harmonization Document consists of:

- IEC 558 (1982) ed 1 + Amdt 1 (1987); IEC/SC 60B, not appended

This Harmonization Document was approved by CENELEC on 1990-06-01.

The English and French versions of this Harmonization Document are provided by the text of the IEC publication and the German version is the official translation of the IEC text. The German translation is not yet available.

According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level by or before 1990-12-15

to publish their new harmonized national standard by or before 1991-06-15

to withdraw all conflicting national standards by or before 1991-06-15.

Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC Central Secretariat.

The CENELEC National Committees are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

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Magnétoscopes à enregistrement helicoïdal de type C

Type C helical video tape recorders

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TYPE C HELICAL VIDEO TAPE RECORDERS

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by the Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by Sub-Committee 60B: Video Recording, of IEC Technical Committee No. 60: Recording.

Drafts were discussed at the meeting held in Palo Alto in 1979. As a result of this meeting, a draft, Document 60B(Central Office)40, was submitted to the National Committees for approval under the Six Months' Rule in March 1980.

The National Committees of the following countries voted explicitly in favour of publication:

Austria
Belgium
Canada
Denmark
Egypt
France
Germany
Israel
Italy
Japan
Korea (Republic of)
Netherlands
New Zealand
Poland
Romania
South Africa (Republic of)
Spain
Turkey
Union of Soviet Socialist Republics
United States of America

Other IEC publications quoted in this standard:

Publications Nos. 94: Magnetic Tape Sound Recording and Reproducing Systems.
347: Transverse Track Recorders.
461: Time and Control Code for Video Tape Recordings.
503: Spools for 1 in (25.4 mm) Video Magnetic Tape.

TYPE C HELICAL VIDEO TAPE RECORDERS

1. Scope

This standard applies to magnetic video recording and/or reproduction using 25.4 mm (1 in) tape on type C helical video tape recorders suitable for broadcast applications.

3. Object

The object of this standard is to define the electrical and mechanical characteristics of equipment which will provide for interchangeability of recordings. The requirements given are related to 525 line-60 field and/or 625 line-50 field systems.

3. Format description

Two video recording heads are used, one for the active period of the field and a part of the vertical interval and one for the remainder of the vertical interval. Use of the latter head is optional.

4. Environment

Tests and measurements made on the recorder to check the requirements of this standard shall be carried out under the following conditions:

Temperature (drum diameter)	23 ± 0.5 °C
Temperature (all other tests)	23 ± 1 °C
Relative humidity	48% to 52%
Barometric pressure	86 kPa to 106 kPa
Conditioning before testing:	24 h

5. Tapes and spools

5.1 *Dimensions of magnetic tape for television*

The magnetic tape used for television recording shall conform to the following dimensions:

	Millimetres	Inches
Width	$25.350^{+0.025}_{-0.025}$	$0.9980^{+0.001}_{-0.001}$
Maximum overall thickness	0.030	0.0012
Maximum longitudinal curvature	1.3 in 1 m	0.051 in 39.4

Note. - The curvature shall be measured by standard IEC procedures as shown in Figure 1, page 30.

5.2 *Spools*

5.2.1 Spools shall conform to the requirements of ISO Standard 1860. The preferred spool diameters are listed in IEC Publication 503: Spools for 1 in (25.4 mm) Video Magnetic Tape. If a friction ring is used, dimension *C* shall be:

$$115\,^{+2}_{-1}\ \text{mm}\ \ (4.528\,^{+0.079}_{-0.039}\ \text{in})$$

The friction ring shall not impair spool performance or long-term storage of tape. (See Tables I and II and Figure 2, page 30.)

TABLE I

Spool dimensions

Dimensions	Millimetres	Inches	Degrees
A	$76.2\,^{+0.1}_{-0.0}$	$3.000\,^{+0.004}_{-0.000}$	
C	$114.0\,^{+0.5}_{-0.0}$	4.500 ± 0.010	
D	$82.5\,^{+0.1}_{-0.0}$	3.250 ± 0.002	
E	$5.60\,^{+0.15}_{-0.00}$	$0.219\,^{+0.006}_{-0.000}$	
G			120.0 ± 0.1
H	0.65 max.	0.025 max.	
J	2.5 max.	0.098 max.	
K	91.5 min.	3.600 min.	
L	153 min.	6.000 min.	
M	30.8 ± 0.1	1.212 ± 0.003	

TABLE II

Dimension B

Millimetres	Inches
$203.0\,^{+0.5}_{-0.0}$	8.000 ± 0.010
$229.0\,^{+0.5}_{-0.0}$	9.000 ± 0.010
$248.0\,^{+0.5}_{-0.0}$	9.750 ± 0.010
$267.0\,^{+0.5}_{-0.0}$	10.500 ± 0.010

TABLE III

Approximate spool capacities

Diameter of spool		Approximate capacity based upon nominal thickness of 0.030 mm		Approximate maximum playing time (min)	
Millimetres	Inches	Metres	Feet	625 line-50 field system	525 line-60 field system
203	8	650	2 100	45	44
229	9	900	3 000	62	61
248	9.75	1 125	3 700	78	77
267	10.5	1 400	4 600	97	95

5.2.2 A minimum distance of 3 mm (0.12 in) from the tape to the spool periphery shall be allowed. Approximate spool capacities are given in Table III.

5.3 *Magnetic tape properties*

5.3.1 The magnetic coating shall be longitudinally oriented.

5.3.2 The coercivity shall be more then 30×10^3 A/m.

6. Transport geometry parameters and description of the basic system

6.1 *Definitions of terms*

The following definitions of terms are given to assist in the correct understanding of this part of the standard.

6.1.1 *Scanner*

The mechanical assembly comprising a drum, rotating pole tips and tape-guiding elements. It is used to record and reproduce video tape recordings.

6.1.2 *Drum*

The circular cylinder around which tape is at least partially wrapped in order to form the head-to-tape interface of a video tape recording system.

6.1.3 *Upper drum*

That part of the drum in a helical-scan video recording system which does not contact the reference edge of the tape in this format.

6.1.4 *Lower drum*

That part of the drum in a helical-scan video recording system which contacts the reference edge of the tape and usually contains tape-guiding elements.

6.1.5 *Effective drum diameter*

The value of drum diameter which when used in theoretical calculations will correspond to the actual video record produced in a helical-scan video tape recording system. The effective value is equal to or greater than the actual drum diameter.

6.1.6 *Helix angle*

The angle formed between the path of the rotating pole tips and the tape-reference-edge guiding system on the scanner of a helical-scan video tape recording system.

6.1.7 *Track angle*

The angle of the recorded video track with respect to the reference edge of the tape in a helical video tape recording.

6.1.8 *Centre span tension*

The calculated value of tape tension at a point midway between tape entrance and exit guides of the scanner in a video tape recording system.

6.2 *Video and sync record system*

6.2.1 Exactly one field of video shall be recorded during each scanner revolution. The video record shall contain all active picture lines and sufficient vertical-sync information for playback synchronization. Information not contained in the video record is defined as the vertical-interval drop-out.

6.2.2 Recording of the missing vertical interval information shall be optional. However, no other information shall be recorded in the allotted tape area for 525-60 systems. A longitudinal audio track (audio 4) may be recorded in the area in lieu of the missing vertical information for 625-50 systems.

6.2.3 The optional record of the vertical interval information shall contain a number of horizontal TV lines during the vertical interval, those of the vertical interval including drop-out and sufficient overlap of information for playback switching.

6.3 *Scanner pole tips*

6.3.1 There shall be six circumferential pole tip locations as shown in Figure 3, page 31 (top view). When an operational pole tip is not required, a suitable inoperative tip shall be placed in the same location.

Note. – The inoperative tips have mechanical characteristics similar to those of the pole tips but without any electrical function. Their main function is to cause the tape to assume the same deformation as that produced when a pole tip is used in the same place.

6.3.2 Each tip projection shall be 0.06 ± 0.03 mm (0.0024 ± 0.0012 in) measured from the outer surface of the upper drum to the end of the pole tip.

6.3.3 The axial distance between each video-head pole tip and its associated sync-head pole tip shall be as shown in Figure 3 (side view).

6.4 *Scanner guides*

6.4.1 Location of the tape entrance and exit guides shall provide a tape-wrap angle such that the video record vertical-interval drop-out is 10.00 ± 0.25 horizontal lines for 525–60 systems or 11.90 ± 0.30 lines in 625–50 systems due to loss of head-to-tape contact, with no electronic switching of the recording signal. Start and end of the vertical-interval drop-out shall be measured at the half-amplitude points of the r.f. signal envelope produced by the video head. The measurements shall be made with a tip projection of 0.06 mm (0.0024 in).

6.4.2 The helix angle formed by the scanner and the associated tape guides shall be 2° 35′ 29″ ± 2″.

6.5 *Drum diameter and tape tension*

Effective drum diameter, tape tension, helix angle, and tape speed completely determine the video-record track angle. Different methods of design and/or minor variations in drum diameter and tape tension shall produce equivalent recordings for interchange purposes. Values and operating conditions specified in this sub-clause will produce the reference value of track angle.

6.5.1 The actual upper drum diameter shall be $134.620\ ^{+0.018}_{-0.000}$ mm ($5.300\ 00\ ^{+0.000\ 71}_{-0.000\ 00}$ in).

The actual lower drum diameter shall be $134.580\ ^{+0.000}_{-0.018}$ mm ($5.298\ 43\ ^{+0.000\ 00}_{-0.000\ 71}$ in).

6.5.2 The upper drum shall rotate in synchronism with the video tips.

6.5.3 The centre-span tape tension shall be 1.7 ± 0.3 N.

7. Dimensions and location of records

This part of the standard specifies the dimensions and locations of recorded video, audio and tracking control records.

7.1 *Test environment*

7.1.1 In addition to the general test environmental requirements of Clause 4, the following additional conditions shall be met in order to meet the requirements of Clause 7:

Tape tension: 1.7 ± 0.3 N

7.1.2 Conditioning before recording and testing

Environmental: stabilized at the measurement conditions

Tape tension: wound on a reel at 0.5 N to 3.0 N

7.1.3 The reference edge of the tape for dimensions in this standard shall be the lower edge as shown in Figure 4, page 32. The magnetic coating of the tape faces the observer in all figures.