

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Video recording – 12,65 mm Type D-11 format –
Part 1: Tape recording

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Enregistrement vidéo – Format de Type D-11 12,65 mm –
Partie 1: Enregistrement de bande

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**Video recording – 12,65 mm Type D-11 format –
Part 1: Tape recording** **STANDARD PREVIEW**
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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Abbreviations and acronyms.....	8
4 Environment and test conditions	8
4.1 Environmental conditions	8
4.2 Calibration tape.....	8
4.3 Record locations and dimensions	8
5 Tape and cassette physical specifications	8
5.1 Magnetic tape specifications	8
5.2 Cassette specifications.....	9
6 Tape record physical parameters.....	31
6.1 Tape speed	31
6.2 Helical record physical parameters.....	31
6.3 Longitudinal record physical parameters	31
7 Longitudinal track signal and magnetic parameters.....	35
7.1 Longitudinal track-record parameters	35
7.2 Control track record parameters	35
7.3 Time- and control-code track-record parameters	35
7.4 Cue recording.....	36
8 Helical track signal parameters and magnetization.....	37
8.1 Overview	37
8.2 Introduction	37
8.3 Helical track data parameters	38
8.4 Channel coding	50
8.5 Magnetization.....	50
8.6 Video data outer correction	51
8.7 Data arrangement in audio data sectors	52
Annex A (normative) Digital interfaces	62
Annex B (informative) Tape transport and scanner.....	64
Annex C (informative) Compatibility with the other digital formats using Type-L derivative cassettes	67
Annex D (informative) Compatibility with analog Type-L.....	68
Bibliography.....	69
Figure 1 – Top- and side-view dimensions (S-Cassette).....	11
Figure 2 – Bottom-view dimensions (S-Cassette).....	12
Figure 3 – Datum areas, supporting areas, tape guides and associated dimensions (S- Cassette).....	14
Figure 4 – Reel location in the unlocked position (S-Cassette).....	15
Figure 5 – Protecting lid dimensions (S-Cassette).....	16
Figure 6 – Reel dimensions (S-Cassette).....	17

Figure 7 – Reel height in the unlocked position (S-Cassette)	17
Figure 8 – Unlocking lever insertion area (S-Cassette)	18
Figure 9 – Lid unlocking force (S-Cassette)	19
Figure 10 – Lid opening force (S-Cassette).....	19
Figure 11 – Reel spring force (S-Cassette)	19
Figure 12 – Safety plug strength (S-Cassette).....	20
Figure 13 – Extraction force (F1, F2) and friction torque (S-Cassette).....	20
Figure 14 – Top and side views (L-Cassette)	21
Figure 15 – Bottom view (L-Cassette)	22
Figure 16 – Datum areas, supporting areas and tape guides (L-Cassette).....	24
Figure 17 – Reel location in unlocked position (L-Cassette)	25
Figure 18 – Protecting lid (L-Cassette).....	26
Figure 19 – Reel dimensions (L-Cassette)	27
Figure 20 – Reel height in unlocked operation (L-Cassette)	27
Figure 21 – Unlocking lever insertion area (L-Cassette).....	28
Figure 22 – Lid unlocking force (L-Cassette).....	29
Figure 23 – Lid opening force (L-Cassette)	29
Figure 24 – Reel spring force (L-Cassette).....	29
Figure 25 – Safety plug strength (L-Cassette).....	30
Figure 26 – Extraction force (F1, F2) and friction torque (L-Cassette)	30
Figure 27 – Locations and dimensions of recorded tracks	33
Figure 28 – Locations and dimensions of tolerance zones of helical track records	34
Figure 29 – Recorded control code waveform	36
Figure 30 – Helical recording block diagram (Informative).....	37
Figure 31 – Helical playback block diagram (Informative).....	38
Figure 32 – Sector arrangement on helical track	39
Figure 33 – Sector and segment arrangement on helical track	40
Figure 34 – Video sync block format	41
Figure 35 – Audio sync block format	42
Figure 36 – Sync block identification bytes	43
Figure 37 – ID ₀ : Sync block number	45
Figure 38 – Segment, channel and track counts.....	47
Figure 39 – Video outer ECC	52
Figure 40 – 20/24 bit packing sequence.....	53
Figure 41 – Audio sample conversion block diagram.....	53
Figure 42 – Start and end sample number of burst data mode	54
Figure 43 – Continuous mode data mapping	55
Figure 44 – Audio auxiliary data words	56
Figure 45 – Audio data block layout	57
Figure 46 – Sync block shuffling (audio sector 0).....	58
Figure 47 – Sync block shuffling (audio sector 1).....	58
Figure 48 – Sync block shuffling (audio sector 2).....	59
Figure 49 – Sync block shuffling (audio sector 3).....	59

Figure 50 – AES3 channel sector shuffling..... 60

Figure A.1 – System overview..... 62

Figure B.1 – Possible scanner configuration (29,97 Hz, 25 Hz, 24 Hz and 23,98 Hz frame rates)..... 65

Figure B.2 – Possible longitudinal head location and tape wrap (29,97 Hz, 25 Hz, 24 Hz and 23,98 Hz frame rates) 66

Table 1 – Record location and dimensions (29,97PsF/59,94I, 25PsF/50I, 24 PsF and 23,98PsF systems) 32

Table 2 – ID₀: Sync block number 46

Table B.1 – Parameters for a possible scanner design..... 64

Table B.2 – Data rate and recorded wavelength..... 64

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[IEC 62356-1:2003](#)

<https://standards.iteh.ai/catalog/standards/sist/08914201-36dd-4c08-9a70-4f97a90011a1/iec-62356-1-2003>

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**VIDEO RECORDING –
12,65 mm TYPE D-11 FORMAT –**

Part 1: Tape recording

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International Standard IEC 62356-1 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment

This bilingual version (2013-07) corresponds to the monolingual English version, published in 2003-12.

The text of this standard was submitted to the national committees for voting under the Fast Track Procedure as the following documents:

CDV	Report on voting
100/629/CDV	100/699/RVC

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

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008-11. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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VIDEO RECORDING – 12,65 mm TYPE D-11 FORMAT –

Part 1: Tape recording

1 Scope

This International Standard specifies the format for the recording of Type D-11 compressed pictures, four channels of AES3 data and associated data which form helical records on 12,65 mm tape in cassettes. This standard also defines the helical track record parameters, the content and format of the longitudinal records and the cassette physical specifications.

The recording format supports frame frequencies of 30/1,001 Hz, 25 Hz, 24 Hz and 24/1,001 Hz.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61213:1993, *Analogue audio recording on video tape – Polarity of magnetization*

IEC 61237-1:1994, *Broadcast video tape recorders – Methods of measurement – Part 1: Mechanical measurements*

IEC 62356-2, *Video recording – 12,65 mm type D-11 format – Part 2: Picture compression and data stream*¹

IEC 62356-3, *Video recording – 12,65 mm type D-11 format – Part 3: Data mapping over SDTI*¹

ITU-R Recommendation BT.709:2004, *Parameter values for the HDTV* standard for production and international program exchange*

SMPTE 12M:1999, *Television – Audio and Film – Time and Control Code*

SMPTE 292M:1998, *Bit-Serial Digital Interface for High-Definition Television Systems*

SMPTE 276M:1995, *Transmission of AES-EBU Digital Audio Signals Over Coaxial Cable*

AES3-1992, *Serial transmission format for two-channel linearly represented digital audio data*

¹ To be published.

3 Abbreviations and acronyms

For the purposes of this document, the following abbreviations and acronyms apply.

AUX	Auxiliary
DCT	Discrete cosine transform
ECC	Error correcting code
EOB	End of block
I-NRZI	Interleaved non-return to zero inverted
MUX	Multiplex
VLC	Variable length coding

4 Environment and test conditions

4.1 Environmental conditions

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

- temperature: 20 °C ± 1 °C
 - relative humidity: 50 % ± 2 %
 - barometric pressure: from 86 kPa to 106 kPa
 - tape tension: 0,3 N ± 0,05 N
 - tape conditioning: not less than 24 h
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4.2 Calibration tape

Calibration tapes meeting the tolerances specified below should be made available by manufacturers of digital television tape recorders and players in accordance with this standard.

4.3 Record locations and dimensions

Geometrical location and dimensions of the recordings on the tape and their relative positions in regard to timing relations of the recorded signals shall be as specified in Figure 27 and Table 1 . Tolerances shown in Table 1 should, however, be reduced by 50 % for calibration tapes.

5 Tape and cassette physical specifications

5.1 Magnetic tape specifications

5.1.1 Base

The base material shall be polyester or equivalent.

5.1.2 Tape width and width fluctuation

The tape width shall be 12,650 mm ± 0,005 mm. Tape width fluctuation shall not exceed 6 µm peak to peak. The value of tape width fluctuation shall be evaluated by measuring 10 points, each 20 mm apart, over a tape length of 200 mm.

5.1.1 Tape thickness

The tape thickness shall be from 12,5 µm to 13,8 µm.

5.1.2 Offset yield strength

The offset yield strength shall be greater than 15 N.

5.1.3 Magnetic coating

The magnetic tape used shall have a coating of metal particles or equivalent, longitudinally oriented. The coating coercivity shall be in the range of 120 000 A/m to 140 000 A/m, with an applied field of 800 000 A/m (10 000 oersted) as measured by a 50 Hz or 60 Hz BH meter or vibrating sample magnetometer (VSM).

5.2 Cassette specifications

5.2.1 Cassette dimensions

Two sizes of cassettes shall be identified as follows:

S cassette	96 × 156 × 25 mm	As shown in Figures 1 to 13
L cassette	145 × 254 × 25 mm	As shown in Figures 14 to 26

5.2.2 Tape length and recording time

Maximum tape length and recording time are recommended as follows:

S cassette	241 m ⁺² ₀ m	40 min for 29,97PsF/59,94I	48 min for 25PsF/50I	50 min for 24PsF	50 min for 23,98PsF
L cassette	732 m ⁺² ₀ m	124 min for 29,97PsF/59,94I	148 min for 25PsF/50I	155 min for 24PsF	155 min for 23,98PsF

5.2.3 Datum planes

Datum plane Z shall be determined by three datum areas, A, B and C, as shown in Figures 3a and 16a. Datum plane X shall be orthogonal to datum plane Z and shall include the centres of datum holes (a) and (b). Datum plane Y shall be orthogonal to both datum plane X and datum plane Z and shall include the centre of datum hole (a) as shown in Figures 2 and 15.

5.2.4 Tape winding

The magnetic coating side of the magnetic tape shall face outside on both the supply reel and the take-up reel as shown in Figures 4 and 17.

5.2.5 Label area and window area

The hatched areas shown in Figures 1 and 14 are for the label and window. Labels attached to the cassette shall not protrude above the outside cassette surface plane.

5.2.6 Guiding groove

For correct insertion into the VTR, four guiding grooves for S cassettes, as shown in Figures 1 and 2, and three guiding grooves for L cassettes, as shown in Figure 15, shall be provided.

5.2.7 Safety tab and safety plug for recording inhibition

For S cassettes, a safety plug at the supply reel side and a hole of minimum depth 10 mm from datum plane Z at the take-up reel side shall be provided as shown in Figure 2.

For L cassettes, a safety plug shall be provided at the take-up reel side as shown in Figure 15.

The safety plug shall not be deformed by 0,3 mm or more when a force of 2,0 N (204 gf) is applied to the centre of it, using a 2,5 mm diameter rod. See Figures 12 and 25.

5.2.8 Identification holes

Six identification holes (holes 1 to 6) shall be located as specified in Figures 2 and 15. For this format, holes 1, 2, 3, 4 and 6 shall be closed. Hole 5 shall be open.

5.2.9 Reels

5.2.9.1 Reel lock system

The reels shall be automatically unlocked when the cassette is inserted into the video tape recorder and/or player unit and automatically locked when the cassette is ejected from it.

The locations of the reels when in the unlocked position are shown in Figures 4 and 17. Dimensions of the reels are shown in Figures 6 and 19. Heights of the reels are shown in Figures 7 and 20.

The reel shall be completely released when the cassette lid is opened 23,5 mm minimum from datum plane Z.

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5.2.9.2 Reel spring force

The reels assembled in the cassette shall be pressed by the reel spring with a specified force under the conditions specified in Figures 11 and 24. The spring force shall be 1,5 N ± 0,5 N (153 gf ± 51 gf) for S cassettes and 3,5 N ± 0,5 N (357 gf ± 51 gf) for L cassettes when pressing on a reel 2,4 mm above datum plane Z as shown in Figures 11 and 24.

5.2.9.3 Extraction force

The force (F1, F2) required to pull the tape out from the reel shall not exceed 0,17 N (17 gf), as specified in Figures 13a and 26a.

5.2.9.4 Friction torque

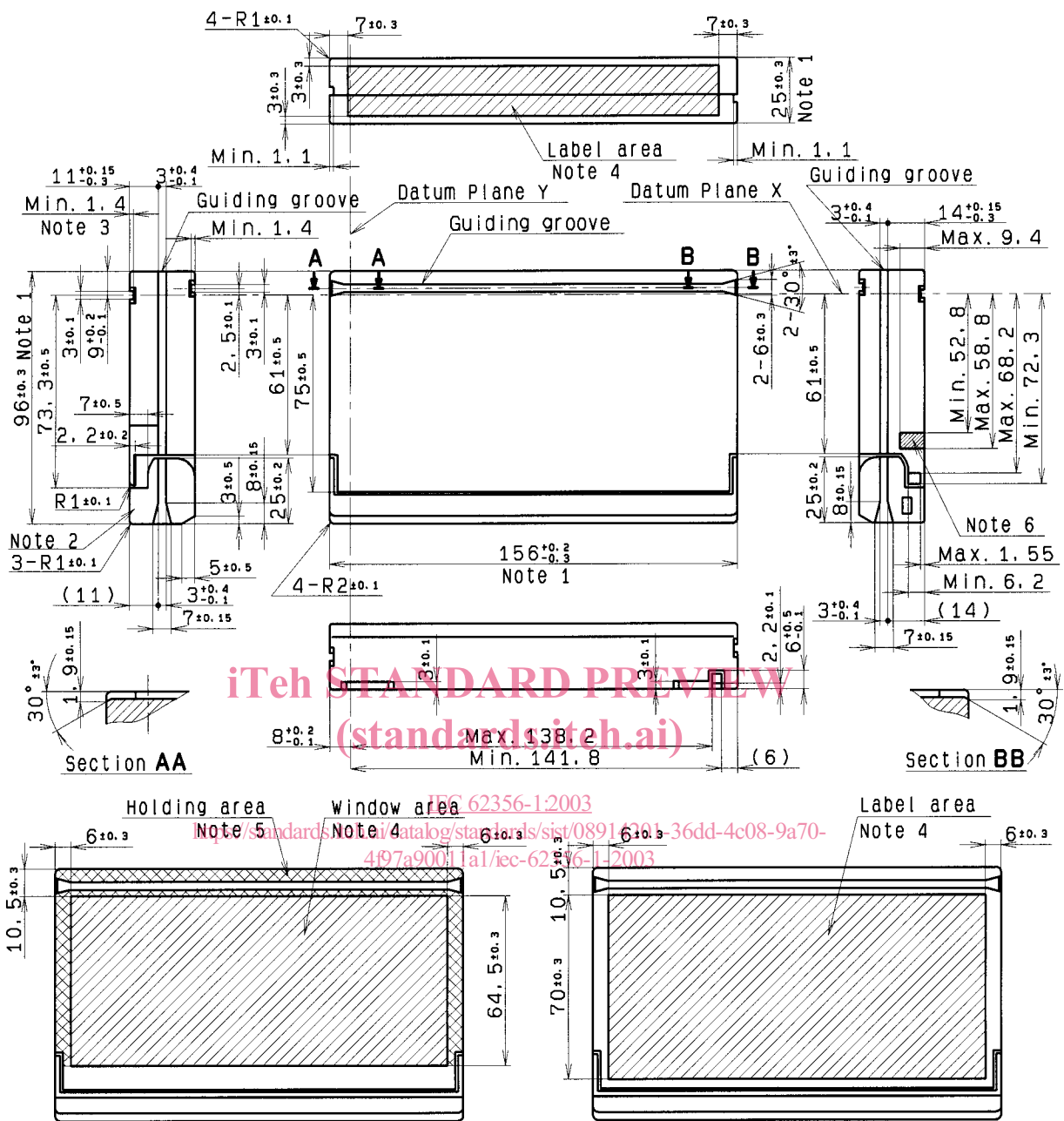
The torque required to wind the tape shall be less than 15 mN m (152 gf cm) for S cassettes and less than 30 mN m (305 gf cm) for L cassettes, as specified in Figures 13b and 26b.

5.2.10 Protecting lid

The cassette lid shall be automatically unlocked when the cassette is inserted into the video tape recorder and/or player unit and automatically locked when the cassette is ejected from it.

The unlocking lever insertion area is specified in Figures 8 and 21. The lid shall be unlocked when the lid lock lever is shifted in either direction A or B, as illustrated in Figures 9 and 22. The force required to unlock the lid shall be less than 1 N (101 gf) in the A direction or less than 1,5 N (152 gf) in the B direction.

The lid shall open 29,0 mm with a force of 1,5 N (152 gf) or less as specified in Figures 10 and 23.

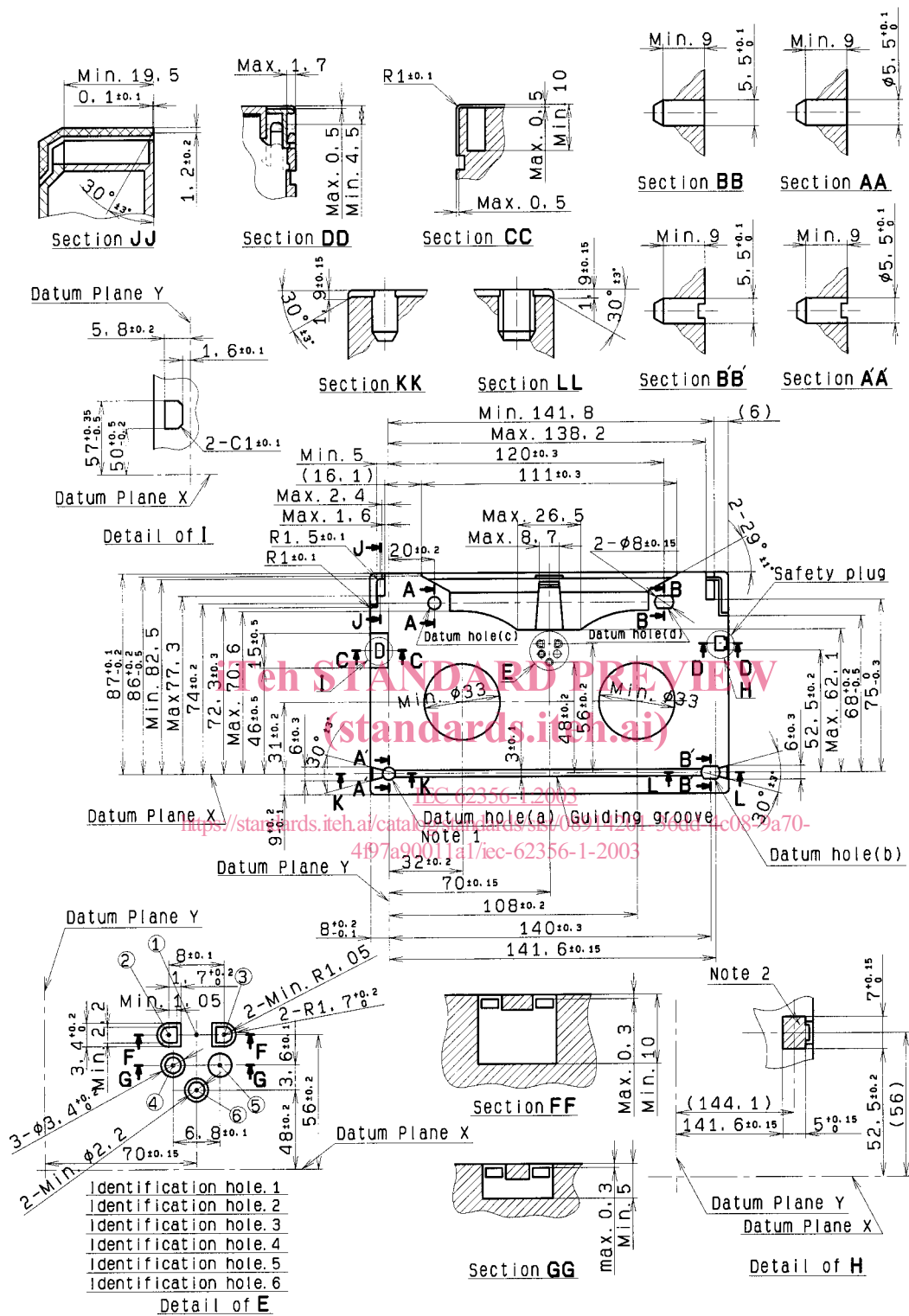


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Dimensions in millimetres

- NOTE 1 These dimensions are inspected by using limit gauges.
- NOTE 2 No part of the lid shall protrude beyond the bottom plane of the cassette when the lid opens nor when it closes.
- NOTE 3 These dimensions shall be specified based on datum plane Z.
- NOTE 4 Label and/or window areas shown by the hatched area are available for the label and/or window.
- NOTE 5 The cassette may be held in position by the recorder and/or player unit on the holding area shown by the cross-hatched area.
- NOTE 6 The fine-hatched area shows the acceptable range of plug-notch position and depth at the side.

Figure 1 – Top- and side-view dimensions (S-Cassette)



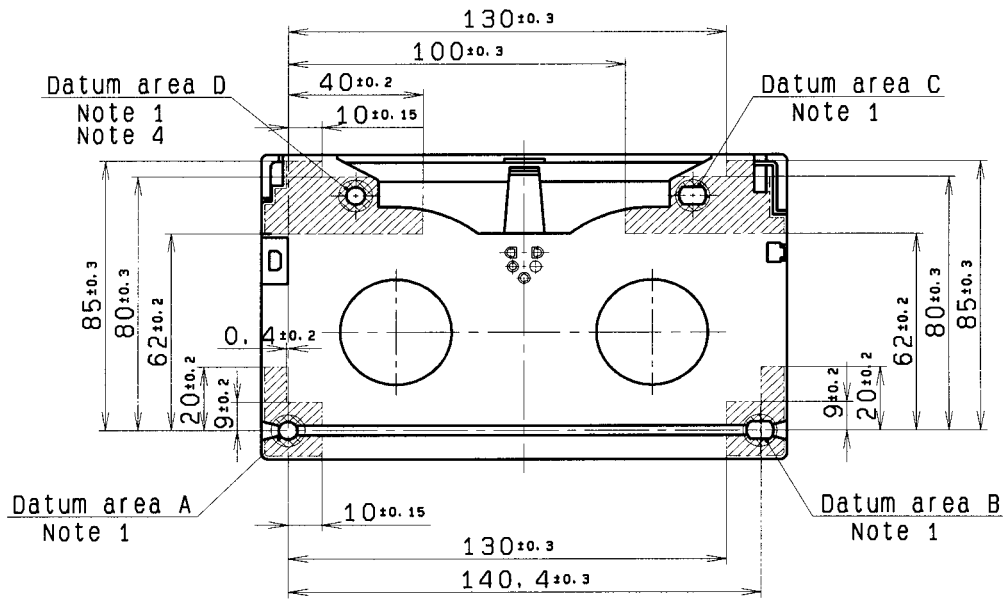
IEC 2550/03

Dimensions in millimetres

NOTE 1 Datum hole (a) is primary.

NOTE 2 The cross-hatched area shows the VTR detection area.

Figure 2 – Bottom-view dimensions (S-Cassette)



IEC 2551/03

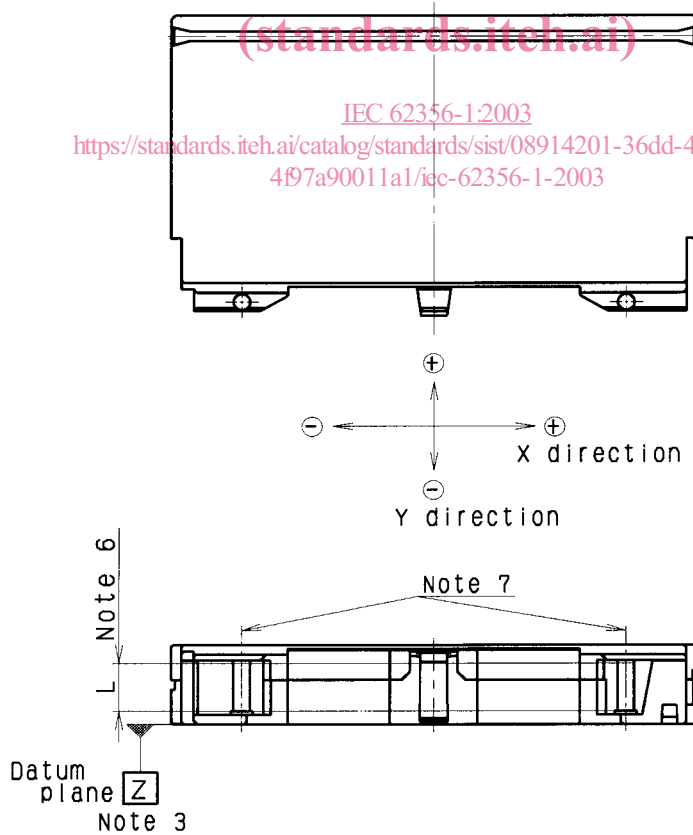
Figure 3a – Datum areas and supporting areas

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Dimensions in millimetres

Figure 3b -Tape guides