

Methods of measurement for consumer-use digital VTRs - Electronic and mechanical performances (IEC 62122:2002)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 62122:2003](https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003)

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

EUROPEAN STANDARD

EN 62122

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2002

ICS 33.160.40

English version

**Methods of measurement for consumer-use digital VTRs -
Electronic and mechanical performances
(IEC 62122:2002)**

Méthodes de mesure
pour les magnétoscopes numériques
destinés au grand public -
Performances électroniques
et mécaniques
(CEI 62122:2002)

Messverfahren für digitale
Videobandgeräte für den Heimgebrauch -
Elektrische und mechanische
Leistungsfähigkeit
(IEC 62122:2002)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8c178b3577/sist-en-62122-2003>
This European Standard was approved by CENELEC on 2002-05-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

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 100/452/FDIS, future edition 1 of IEC 62122, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62122 on 2002-05-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-05-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62122:2002 was approved by CENELEC as a European Standard without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 62122:2003](https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003)

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, 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 (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60094-3	1979	Magnetic tape sound recording and reproducing systems Part 3: Methods of measuring the characteristics of recording and reproducing equipment for sound on magnetic tape	EN 60094-3 ¹⁾	1996
IEC 60386	1972	Method of measurement of speed fluctuations in sound recording and reproducing equipment	-	-
IEC 60883	1987	Measuring method for chrominance signal-to-random noise ratio for video tape recorders	HD 527 S1	1989
IEC 61041-1	1990	Non-broadcast video tape recorders - Methods of measurement Part 1: General video (NTSC/PAL) and audio (longitudinal) characteristics	EN 61041-1	1995
IEC 61041-5	1997	Part 5: High-band video tape recorders, including those equipped with Y/C video connectors (NTSC/PAL)	EN 61041-5	1997
IEC 61834	Series	Recording - Helical-scan digital video cassette recording system using 6,35 mm magnetic tape for consumer use (525-60, 625-50, 1125-60 and 1250-50 systems)	EN 61834	Series
ITU-R Recommendation BT.471-1	1986	Nomenclature and description of colour bar signals	-	-
ITU-R Recommendation BT.500-10	2000	Methodology for the subjective assessment of the quality of television pictures	-	-

¹⁾ EN 60094-3 includes A1:1980 + A2:1988 to IEC 60094-3.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ITU-R Recommendation BT.1204	1995	Measuring methods for digital video equipment with analogue input/output	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

INTERNATIONAL STANDARD

IEC 62122

First edition
2002-03

Methods of measurement for consumer-use digital VTRs – Electronic and mechanical performances

*Méthodes de mesure pour les magnétoscopes
numériques destinés au grand public –
Performances électroniques et mécaniques*

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

© IEC 2002 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

X

For price, see current catalogue

CONTENTS

FOREWORD.....	7
1 Scope and object.....	8
2 Normative references.....	8
3 Terms and definitions	9
4 Measuring conditions	10
4.1 General	10
4.2 Environmental conditions	10
4.3 Power supply	10
4.4 Test signal.....	10
4.4.1 Video test signal	10
4.4.2 Colour bar signal	11
4.4.3 Video input signal for measuring audio characteristics.....	11
4.5 Measuring instruments.....	11
4.5.1 Noise meter	11
4.5.2 Audio signal generator	11
4.5.3 Audio level meter	11
4.5.4 Audio mixed frequency oscillator	12
4.5.5 Audio harmonic distortion meter	12
4.6 Video test tape	12
5 Methods of measurement for mechanical characteristics	12
5.1 General	12
5.2 Tape speed	12
5.2.1 Test signal.....	12
5.2.2 Measurement.....	12
5.2.3 Presentation of the results	13
5.3 Flatness of the RF envelope	13
5.3.1 Test signal.....	13
5.3.2 Block diagram.....	13
5.3.3 Measurement.....	13
5.3.4 Presentation of the result	14
5.4 Linearity	14
5.4.1 Test signal.....	14
5.4.2 Measurement.....	14
5.4.3 Presentation of the results	15
5.5 Effective area starting position	15
5.5.1 Test signal.....	15
5.5.2 Measurement.....	15
5.5.3 Presentation of the results	15
5.6 Track displacement measurement by image processing	15
5.6.1 Measurement system.....	15
5.6.2 Image processing technique.....	15
5.6.3 Measuring results	16

ITCI STANDARD PREVIEW
 (standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8cc278b35a17/sist-en-62122-2003>

6	Video characteristics (analogue input/output)	17
6.1	General	17
6.2	Luminance amplitude frequency response	17
6.2.1	Test signal	17
6.2.2	Block diagram	17
6.2.3	Measurement	17
6.2.4	Presentation of results	18
6.3	Chrominance amplitude frequency response	18
6.3.1	Test signal	18
6.3.2	Block diagram	18
6.3.3	Measurement	18
6.3.4	Presentation of results	18
6.4	Luminance diagonal resolution	19
6.5	Luminance frequency characteristics of diagonal resolution (i)	19
6.6	Luminance frequency characteristics of diagonal resolution (ii)	19
6.7	Luminance non-linear distortion	19
6.8	Luminance waveform distortion (linear distortion)	19
6.9	Chrominance waveform distortion	19
6.9.1	Test signal	19
6.9.2	Block diagram	19
6.9.3	Measurement	19
6.9.4	Presentation of results	20
6.10	Luminance vertical waveform distortion	20
6.11	Chrominance vertical waveform distortion	20
6.12	Automatic Gain Control (AGC) operation	20
6.13	Chrominance to luminance horizontal displacement	20
6.14	Chrominance to luminance vertical displacement	20
6.15	Luminance signal-to-noise ratio	20
6.15.1	General	20
6.15.2	Test signal	21
6.15.3	Block diagram	21
6.15.4	Measurement	21
6.15.5	Presentation of the results	22
6.16	Chrominance signal-to-noise ratio	22
6.16.1	General	22
6.16.2	Test signal	22
6.16.3	Block diagram	22
6.16.4	Measurement	23
6.16.5	Presentation of the results	23
7	Composite signal decoding characteristics (luminance and chrominance separation)	24
7.1	Luminance signal separation (general)	24
7.2	Luminance signal separation at colour change points	24
7.3	Chrominance signal separation	24
7.4	Chrominance signal separation with three dimensional processing	24
7.4.1	Test signal	24
7.4.2	Block diagram	24
7.4.3	Measurement	24
7.4.4	Presentation of results	25

7.5	Luminance signal separation with three dimensional signal processing.....	25
7.5.1	Test signal.....	25
7.5.2	Block diagram.....	25
7.5.3	Measurement.....	25
7.5.4	Presentation of results	25
8	Audio characteristics (analogue input/output)	25
8.1	General	25
8.2	Audio operational output voltage (with AGC)	26
8.2.1	Test signal.....	26
8.2.2	Block diagram.....	26
8.2.3	Measurement.....	26
8.2.4	Presentation of results	26
8.3	Audio operational input voltage (without AGC).....	26
8.3.1	Test signal.....	26
8.3.2	Block diagram.....	26
8.3.3	Measurement.....	26
8.3.4	Presentation of results	26
8.4	Audio maximum output voltage	26
8.4.1	Test signal.....	26
8.4.2	Block diagram.....	27
8.4.3	Measurement.....	27
8.4.4	Presentation of results	27
8.5	Amplitude frequency response.....	27
8.5.1	Test signal.....	27
8.5.2	Measurement.....	27
8.6	Phase difference between channels.....	27
8.6.1	Test signal.....	27
8.6.2	Measurement.....	27
8.6.3	Presentation of results	27
8.7	Signal-to-noise ratio.....	27
8.8	Dynamic range	27
8.8.1	Test signal.....	27
8.8.2	Measurement.....	28
8.8.3	Presentation of results	28
8.9	Harmonic distortion.....	28
8.10	Inter-modulation distortion	28
8.10.1	Test signal.....	28
8.10.2	Measurement.....	28
8.10.3	Presentation of result.....	28
8.11	Channel separation.....	28
8.11.1	Test signals	28
8.11.2	Measurement.....	28
8.11.3	Presentation of results	28
8.12	Wow-flutter.....	29
8.13	Pitch difference between record and playback.....	29
8.13.1	Test signal.....	29
8.13.2	Measurement.....	29
8.13.3	Presentation of results	29
9	Classification of the characteristics to be specified.....	29

Annex A (informative) Error rate	44
A.1 Definition	44
A.2 Block diagram	44
A.3 Measurement	44
A.4 Presentation of the results	45
A.5 Example 1	45
A.6 Example 2	45
Bibliography	47
Figure 1 – Basic block diagram of measurement system	30
Figure 2 – Measuring method for track interval	30
Figure 3 – Measuring block diagram for RF envelope flatness	31
Figure 4 – Measuring method for RF envelope flatness	31
Figure 5 – Cross-tape track height for DV format	31
Figure 6 – Cross-tape track height for D-VHS format	32
Figure 7 – Measuring method for linearity	32
Figure 8 – Measuring method for the starting position	32
Figure 9 – Block diagram of the measurement system	33
Figure 10 – Schematic diagram of the image processing technique	34
Figure 11 – Illustration of track displacement distribution (model)	35
Figure 12 – Example of calculation results	35
Figure 13 – Test signal for luminance amplitude frequency response	36
Figure 14 – Measuring block diagram for composite video signal	36
Figure 15 – Measuring block diagram for S video signal	36
Figure 16 – Test signal for chrominance amplitude frequency response	37
Figure 17 – Test signal for luminance non-linear distortion	37
Figure 18 – Test signal for luminance waveform distortion	37
Figure 19 – Test signal for chrominance waveform distortion	38
Figure 20 – Measuring method for chrominance waveform distortion	38
Figure 21 – Composite video test signal for luminance signal-to-noise ratio	39
Figure 22 – S luminance test signal for luminance signal-to-noise ratio	39
Figure 23 – S chrominance test signal for luminance signal-to-noise ratio	39
Figure 24 – Block diagram for composite video input	39
Figure 25 – Block diagram for S video input	40
Figure 26 – Composite video test signal for chrominance signal-to-noise ratio	40
Figure 27 – S luminance test signal for chrominance signal-to-noise ratio	40
Figure 28 – S chrominance test signal for chrominance signal-to-noise ratio	41
Figure 29 – Test signal for 3D chrominance signal separation	41
Figure 30 – Measuring block diagram for chrominance signal separation	41
Figure 31 – Measuring method for 3D chrominance signal separation	42
Figure 32 – Test signal for 3D luminance signal separation	42
Figure 33 – Measuring block diagram for luminance signal separation	42

Figure 34 – Measuring method for 3D luminance signal separation 43

Figure 35 – Block diagram for audio characteristics 43

Figure A 1 – Structure of Data-synchronisation blocks 46

Figure A 2 – Structure of DV format data-synchronisation blocks 46

Figure A 3 – Structure of D-VHS format data-synchronisation blocks 46

Table 1 – Setting of the colour noise meter for luminance measurement 21

Table 2 – Example: white level of test signal (8 bit system) 22

Table 3 – Setting of the colour noise meter for chrominance measurement 23

Table 4– Example: Chrominance level of test signal (8 bit system) 23

Table 5 – Classification of the characteristics to be specified 29

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62122:2003

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHODS OF MEASUREMENT FOR CONSUMER-USE DIGITAL VTRs – ELECTRONIC AND MECHANICAL PERFORMANCES

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62122 has been prepared by TA 7: Moderate data rate storage media and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

FDIS	Report on voting
100/452/FDIS	100/480/RVD

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

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

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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

METHODS OF MEASUREMENT FOR CONSUMER-USE DIGITAL VTRs – ELECTRONIC AND MECHANICAL PERFORMANCES

1 Scope and object

This standard specifies the basic methods of measurement for evaluating the electronic and mechanical performances of consumer-use digital VTRs.

The formats of open reel VTRs, Beta, VHS, and 8 mm VTRs have been standardized. Methods of measurement for these analogue VTRs have been standardized in IEC 61041-1, IEC 61041-2, IEC 61041-3, IEC 61041-4, IEC 61041-5, and IEC 61146-3. Digital VTR 6,35 mm DV format and 12,65 mm D-VHS format have now been brought on the market. The methods of measurement for these consumer-use digital VTRs should be specified and standardized.

With these measurement techniques, some items for the evaluation of performances specific to digital VTRs have also been included.

There are two objectives for the proposed methods of measurement. One is to check the interchangeability and characteristics of the equipment under test which are indispensable to manufacturers, and the other is to evaluate the quality of image and sound, which concerns the customer. The latter is a priority for consumer satisfaction.

Since a consumer can use only general-purpose instruments, any test which needs dismantling of apparatus and requires special instruments is in principle not specified. As error rate is important for digital equipment, an example of a method for measuring error rate is given in annex A.

<https://standards.iteh.ai/catalog/standards/sist/1d57e089-945d-4504-ba13-8ee278b35a17/sist-en-62122-2003>

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 60094-3:1979, *Magnetic tape sound recording and reproducing systems – Part 3: Methods of measuring the characteristics of recording and reproducing equipment for sound on magnetic tape*

IEC 60386:1972, *Method of measurement of speed fluctuations in sound recording and reproducing equipment*

IEC 60883:1987, *Measuring method for chrominance signal-to-random noise ratio for video tape recorders*

IEC 61041-1:1990, *Non-broadcast video tape recorders – Methods of measurement – Part 1: General, video (NTSC/PAL) and audio (longitudinal) characteristics*

IEC 61041-5:1997, *Non-broadcast video tape recorders – Methods of measurement – Part 5: High-band video tape recorders including those equipped with Y/C video connectors (NTSC/PAL)*

IEC 61834 (all parts), *Recording – Helical-scan digital video cassette recording system using 6,35 mm magnetic tape for consumer use (525-60, 625-50, 1125-60 and 1250-50 systems)*

ITU-R BT.471-1:1986, *Nomenclature and description of colour bar signals*

ITU-R BT.500-10:2000, *Methodology for the subjective assessment of the quality of television pictures*

ITU-R BT.1204:1995, *Measuring methods for digital video equipment with analogue input/output*