



SLOVENSKI STANDARD
SIST EN 61146-3:1999

01-april-1999

Video cameras (PAL/SECAM/NTSC) - Methods of measurement -- Part 3: Non-broadcast camera-recorders (IEC 61146-3:1997)

Video cameras (PAL/SECAM/NTSC) - Methods of measurement -- Part 3: Non-broadcast camera-recorders

Videokameras (PAL/SECAM/NTSC) - Meßverfahren -- Teil 3: Kamerarecorder für den Gebrauch außerhalb des Rundfunks

Caméras vidéo (PAL/SECAM/NTSC) - Méthodes de mesure -- Partie 3: Caméscopes hors de la radiodiffusion

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English version

**Video cameras (PAL/SECAM/NTSC) - Methods of measurement
Part 3: Non-broadcast camera-recorders
(IEC 61146-3:1997)**

Caméras vidéo (PAL/SECAM/NTSC)
Méthodes de mesure
Partie 3: Caméscopes hors de la
radiodiffusion
(CEI 61146-3:1997)

Videokameras (PAL/SECAM/NTSC)
Meßverfahren
Teil 3: Kamerarecorder für den
Gebrauch außerhalb des Rundfunks
(IEC 61146-3:1997)

This European Standard was approved by CENELEC on 1997-10-01. 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.

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

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Foreword

The text of document 100B/52/FDIS, future edition 1 of IEC 61146-3, prepared by SC 100B, Recording, of 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 61146-3 on 1997-10-01.

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) 1998-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1998-07-01

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 61146-3:1997 was approved by CENELEC as a European Standard without any modification.

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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 60068-1	1988	Environmental testing Part 1: General and guidance	EN 60068-1 ¹⁾	1994
IEC 60107-1	1977	Recommended methods of measurement on receivers for television broadcast transmissions Part 1: General considerations - Electrical measurements other than those at audio-frequencies	-	-
IEC 60268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 ²⁾	1989
IEC 60268-4	1972	Part 4: Microphones	-	-
IEC 60268-8	1973	Part 8: Automatic gain control devices	-	-
IEC 60386	1972	Method of measurement of speed fluctuations in sound recording and reproducing equipment	-	-
EN 60735	1991	Measuring methods for video tape properties	EN 60735	1991
IEC 60756	1991	Non-broadcast video tape recorders Time base stability	EN 60756	1993
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 61041-2	1994	Part 2: Video characteristics chrominance SECAM	EN 61041-2	1996

1) EN 60068-1 includes the corrigendum October 1988 + A1:1992 to IEC 60068-1.

2) HD 483.1 S2 includes A1:1988 to IEC 60268-1.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61041-3	1993	Part 3: Audio characteristics for FM recording	EN 61041-3	1995
IEC 61146-1	1994	Video cameras (PAL/SECAM/NTSC) Methods of measurement Part 1: Non-broadcast single-sensor cameras	EN 61146-1	1996

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Méthodes de mesure –

Partie 3:
Caméscopes hors de la radiodiffusion

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Video cameras (PAL/SECAM/NTSC) –
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Part 3:
Non-broadcast camera-recorders

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CONTENTS

	Page
FOREWORD.....	7
INTRODUCTION.....	9
Clause	
1 General.....	11
1.1 Scope.....	11
1.2 Normative references	11
1.3 Conditions.....	13
2 Video characteristics of the complete unit.....	15
3 Video characteristics related to the camera part only	17
4 Other anomalies due to the recorder section	17
4.1 Chrominance to luminance intermodulation (PAL/NTSC).....	17
4.2 Luminance to chrominance crosstalk and moirés	19
4.3 Luminance to chrominance displacement.....	21
4.4 Assembly edit system.....	23
4.5 Insert edit system.....	29
4.6 Tape damage in pause mode.....	29
5 Time base.....	29
6 Audio characteristics	29
6.1 Signal-to-noise ratio (automatic gain control (AGC) on).....	29
6.2 Amplitude/frequency response	31
6.3 Harmonic distortion.....	33
6.4 Wow and flutter.....	33
6.5 AGC operation range and hold time	33
6.6 Directional response of the microphone	35
6.7 Audio dub or insert quality (audio hole)	37
6.8 Hi-fi audio tracking accuracy.....	41
6.9 Audio FM recording	43
7 Viewfinder screen luminance	43
8 Automatic system and others.....	43
8.1 Automatic exposure.....	43
8.2 Automatic focusing	43
9 Classification	43
9.1 General.....	43
9.2 Classification of the characteristics to be specified	45

	Page
Figures	
1 Chrominance to luminance intermodulation (PAL/NTSC).....	47
2 Luminance to chrominance crosstalk and moirés.....	47
3 Subcarrier band-pass filter characteristics.....	49
4 Output signal of band-pass filter.....	49
5 Luminance to chrominance displacement.....	51
6 Block diagram of the circuit arrangement for video timing of the edit system.....	57
7 Frame timing of the start time.....	57
8 Frame timing of the overwrite frame number (1).....	59
9 Frame timing of the overwrite frame number (2).....	59
10 Circuit arrangement for measurement of audio characteristics.....	61
11 Amplitude/frequency response.....	61
12 Circuit arrangement for measurement of signal-to-noise ratio (AGC on).....	63
13 Circuit arrangement for measurement of AGC operation range and hold time.....	65
14 Curve showing output level as a function of input level.....	65
15 Hold time.....	67
16 Directional response of the microphone.....	67
17 Polar diagram of microphone sensitivity.....	69
18 Block diagram of test system.....	69
19 Timing chart of the hole or the overlap at a record pause or insert point.....	71
20 Timing chart of the hole or the overlap at the insertion and the dubbed point.....	71
21 Circuit arrangement for measurement of hi-fi audio tracking accuracy.....	73
22 Time difference between the video and audio signals.....	73
Annex A – Bibliography.....	75

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[SIST-EN-61146-3:1999](#)

<http://standards.iteh.ai/catalog/standards/sist/9bc98895-04de-4256-b400-ba3b63c6b0f/sist-en-61146-3-1999>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**VIDEO CAMERAS (PAL/SECAM/NTSC) –
METHODS OF MEASUREMENT –
Part 3: Non-broadcast camera-recorders**

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 reports or guides and they are accepted by the National Committees in that sense.
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- 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 61146-3 has been prepared by subcommittee 100B: Recording, 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
100B/52/FDIS	100B/92/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.

IEC 61146 consists of the following parts, under the general title *Video cameras (PAL/SECAM/NTSC) – Methods of measurement*

- Part 1: Non-broadcast single-sensor cameras
- Part 2: Two and three sensor professional cameras
- Part 3: Non-broadcast camera-recorders
- Part 4: Automatic functions of video cameras and camera recorders

Annex A is for information only.

INTRODUCTION

A camera-recorder is a combination of several devices, such as a video camera, video recorder, microphone and an electronic or through-the-lens (TTL) viewfinder. The appropriate measurements should be adopted for the following cases:

- a) The camera section only is used as a video camera in the monitoring mode. The methods of measurement should be in accordance with IEC 61146-1.
- b) The camera-recorder has both a playback capability and an audio-video microphone/camera output, which may be electronics-to-electronics (E to E), passing through the recorder, but not recorded on the tape. Audio and video inputs may, or may not, be provided. The methods of measurement of all characteristics of the complete unit should be in accordance with this standard.
- c) The camera-recorder has no playback facility. The tape containing the test signals is played back on a high quality calibrated player. Measurements are made on the playback signal in accordance with this standard.

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VIDEO CAMERAS (PAL/SECAM/NTSC) – METHODS OF MEASUREMENT – Part 3: Non-broadcast camera-recorders

1 General

1.1 Scope

The measuring methods described in this part of IEC 61146 concern the assessment of the performance of non-broadcast camera-recorders (NTSC/PAL/SECAM). The appropriate measurements are to be applied according to whether the camera-recorder has a tube or semi-conductor camera. In the case of a camera-recorder without playback capability, the details of the separate player used for the measurements shall be stated. In this standard, the characteristics apply to the camera-recorder as a complete entity.

This standard defines test patterns and measurement conditions so as to enable the comparison of the results of measurements. The standard does not specify limiting values for the various quantities for acceptable performances, since that is not the object of this standard. The methods of measurement are designed to enable the assessment of the performance of the camera-recorder by using the lens for input and any available output from the device (e.g. separate luminance and chrominance signals or composite signal output).

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61146. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61146 are encouraged to investigate the possibility of applying the most recent edition of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60068-1: 1988, *Environmental testing – Part 1: General and guidance*

IEC 60107-1: 1977, *Recommended methods of measurement on receivers for television broadcast transmissions – Part 1: General considerations – Electrical measurements other than those at audio-frequencies*

IEC 60268-1: 1985, *Sound system equipment – Part 1: General*

IEC 60268-4: 1972, *Sound system equipment – Part 4: Microphones*

IEC 60268-8: 1973, *Sound system equipment – Part 8: Automatic gain control devices*

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

IEC 60735: 1991, *Measuring methods for video tape properties*

IEC 60756: 1991, *Non-broadcast video tape recorders – Time base stability*

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

IEC 61041-2: 1994, *Non-broadcast video tape recorders – Methods of measurement – Part 2: Video characteristics chrominance SECAM*

IEC 61041-3: 1993, *Non-broadcast video tape recorders – Methods of measurement – Part 3: Audio characteristics for FM recording*

IEC 61146-1:1994, *Video cameras (PAL/SECAM/NTSC) – Methods of measurement – Part 1: Non-broadcast single-sensor cameras*

1.3 Conditions

1.3.1 Environmental conditions

All measurements shall be carried out within the environmental conditions specified by the manufacturer. The ambient temperature and relative humidity during testing shall be noted with the test results. Other details of the test environment may be included if relevant. The recommended ambient temperature is $20\text{ °C} \pm 2\text{ °C}$ according to IEC 60068-1. An adequate warm-up time shall be allowed.

1.3.2 Performance of measurement

Unless otherwise stated, the measurements shall be carried out as follows.

Measurements of the performance of the complete unit shall be made on the playback signal from the recorder section immediately after recording, on the same unit if it has playback capability. Where a camera output is available, the camera should be set to the optimum conditions before making the test recording. Where no camera output is available, it may be necessary to make a series of recordings at different camera settings to establish optimum settings for the camera before making the test recording.

Measurements related to camera performance only are assumed not to be affected by the recorder section. These measurements shall be made on the camera output signal only. Where no camera output is available, the measurements shall be made by recording the camera signals on the video tape and making the measurements on the playback signal.

The above-mentioned measurements shall be made when the camera is shooting the test chart appropriate to the characteristic to be measured. Each test pattern used shall be specified, together with the lighting conditions (illumination intensity, correlated colour temperature, etc.).

Automatic measurement methods are under development and consideration.

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1.3.3 Conditions of shooting

Unless otherwise stated the conditions shall be as follows.

The subject illumination of a reflective test chart shall be $2\ 000\text{ lx} \pm 5\%$. The luminance of a transparent test chart, at peak white, shall be $636\text{ cd/m}^2 \pm 5\%$. The non-uniformity of the subject illumination shall be less than 5 %. The correlated colour temperature of the light source shall be $3\ 100\text{ K} \pm 100\text{ K}$. The white balance of the unit under test shall be set manually or automatically to $3\ 100\text{ K} \pm 100\text{ K}$. The test chart shall be shot by the camera so that the frame delineated by the arrows exactly coincides with the edges of the picture displayed on the video monitor in underscan mode.

The focus control shall be in auto or manual mode with optimum focus setting. The iris control shall be in auto or manual mode. In order to obtain the desired exposure level, it may be advantageous to add an illuminated white card or a black area, and also to adjust the lens zoom, so that the measurement is not dependent on exactly filling the screen to the arrows of the test chart.

The gain control, if any, shall be set to "0 dB" gain. The optical filter, if any, shall be set to "open position".

1.3.4 Reference conditions

For the measurement of the camera performance, the reference luminance level on the camera output is assumed to be 700 mV peak-to-peak for PAL and SECAM systems, and 714 mV peak-to-peak for the NTSC system (from blanking level to peak white). In playback mode, each camera-recorder has its own individual output level; thus the audio and video output levels specified for the equipment under test are used as the reference levels. A gray scale chart and a specified audio signal shall be used to obtain a consistent reference level.