

**SLOVENSKI STANDARD****SIST EN 61041-3:1999****01-april-1999**

---

**Non-broadcast videotape recorders - Methods of measurement -- Part 3: Audio characteristics for FM recording (IEC 61041-3:1993)**

Non-broadcast videotape recorders - Methods of measurement -- Part 3: Audio characteristics for FM recording

Videobandgeräte für den Gebrauch außerhalb des Rundfunks - Meßverfahren -- Teil 3: Ton-Eigenschaften bei FM-Aufzeichnung

**ITEH STANDARD PREVIEW**

**(standards.iteh.ai)**

Magnétoscopes hors radiodiffusion - Méthodes de mesure -- Partie 3: Caractéristiques audio pour l'enregistrement MF

[SIST EN 61041-3:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e503a8/sist-en-61041-3-1999>

**Ta slovenski standard je istoveten z: EN 61041-3:1995**

---

**ICS:**

33.160.40      Video sistemi      Video systems

**SIST EN 61041-3:1999**

**en**

# iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 61041-3:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e503a8/sist-en-61041-3-1999>

July 1995

ICS 33.160.40

Descriptors: Recording apparatus, video tape recorder, measurements, sound recording, frequency modulation, high fidelity systems, noise reduction, testing conditions, recording characteristics, standard measures

English version

**Non-broadcast videotape recorders  
Methods of measurement  
Part 3: Audio characteristics for FM recording  
(IEC 1041-3:1993)**

Magnétoscopes hors radiodiffusion  
Méthodes de mesure  
Partie 3: Caractéristiques audio pour  
l'enregistrement MF  
(CEI 1041-3:1993)

Videobandgeräte für den Gebrauch  
außerhalb des Rundfunks  
Meßverfahren  
Teil 3: Ton-Eigenschaften bei  
FM-Aufzeichnung  
(IEC 1041-3:1993)

This European Standard was approved by CENELEC on 1995-05-15. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, 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 the International Standard IEC 1041-3:1993, prepared by SC 60B, Video recording, of IEC TC 60, Recording, was submitted to the formal vote and was approved by CENELEC as EN 61041-3 on 1995-05-15 without any modification.

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
- latest date by which the national standards conflicting with the EN have to be withdrawn

iTeh STANDARD PREVIEW  
(standards.iteh.ai)  
(dop) 1996-07-01  
(dow) 1996-07-01

<https://standards.iteh.ai/catalog/standard/25cb72e503a79c8895868-75d482a-aef4f>  
SISTE

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 1041-3:1993 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex A, Bibliography, the following notes have to be added for the standards indicated:

IEC 268-2 NOTE: Harmonized, together with its amendment 1:1991, as HD 483.2 S2:1993 (not modified).

IEC 767 NOTE: Harmonized as HD 461 S1:1987 (not modified).

IEC 774 NOTE: Harmonized as HD 463 S1:1987, which is superseded by EN 60774-1:1994 (not modified).

IEC 1041-1 NOTE: Harmonized as EN 61041-1:1995 (not modified).

---

**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 94-3	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 61041-3:1999	
+ A2	1988		HD 311.3 S2 <sup>1)</sup>	1989
IEC 268-1	1985	Sound system equipment Part 1: General	HD 483.1 S2 <sup>2)</sup>	1989
IEC 268-3	1988	Part 3: Amplifiers	HD 483.3 S2 <sup>3)</sup>	1992
IEC 268-8	1973	Part 8: Automatic gain control devices	-	-
IEC 386	1972	Method of measurement of speed fluctuations in sound recording and reproducing equipment	-	-
IEC 574-4	1982	Audiovisual, video and television equipment and systems Part 4: Preferred matching values for the interconnection of equipment in a system	HD 369.4 S2 <sup>4)</sup> + corr. September 1993	1993
IEC 843	1987	Helical-scan video tape cassette system using 8 mm magnetic tape Video 8	HD 531 S1	1989
IEC 1053-1	1991	Helical-scan video tape cassette system using 12,65 mm (0,5 in) magnetic tape on type beta format FM audio recording - Part 1: 625 lines - 50 field systems	-	-

1) HD 311.3 S2 also includes A1:1980 to IEC 94-3.

2) HD 483.1 S2 includes A1:1988 to IEC 268-1.

3) HD 483.3 S2 includes A1:1990 + A2:1991 to IEC 268-3.

4) HD 369.4 S2 includes A1:1991 to IEC 574-4.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 1053-2	1991	Part 2: 525 lines - 60 field systems	-	-
IEC 1054	1991	Helical-scan video tape cassette system using 12,65 mm (0,5 in) magnetic tape on type VHS FM audio recording	EN 61054	1993

**iTeh STANDARD REVIEW  
(standards.iteh.ai)**

SIST EN 61041-3:1999

<https://standards.iteh.ai/catalog/standards/sist/9cc895868-75d0-482a-aec4f25cb72e503a8/sist-en-61041-3-1999>

**NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD**

**CEI  
IEC**

**61041-3**

Première édition  
First edition  
1993-12

**Magnétoscopes hors radiodiffusion –  
Méthodes de mesure**

**Partie 3:  
Caractéristiques audio pour l'enregistrement MF  
iTeh STANDARD PREVIEW  
(standards.iteh.ai)  
Non-broadcast video tape recorders –  
Methods of measurement**

SIST EN 61041-3:1999

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-5cb72e503a8/sist-en-61041-3-1999>

**Part 2:  
Audio characteristics for FM recording**

© IEC 1993 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

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  
Telefax: +41 22 919 0300

3, rue de Varembé Geneva, Switzerland  
e-mail: [inmail@iec.ch](mailto:inmail@iec.ch)  
IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

CODE PRIX  
PRICE CODE

T

*Pour prix, voir catalogue en vigueur  
For price, see current catalogue*

## CONTENTS

	Page
<b>FOREWORD .....</b>	<b>7</b>
<b>Clause</b>	
<b>SECTION 1: GENERAL</b>	
1.1 Scope .....	9
1.2 Normative references .....	9
1.3 Test conditions .....	11
<b>SECTION 2: AUDIO CHARACTERISTICS</b>	
2.1 Amplitude/frequency response .....	13
2.2 Signal-to-noise ratio (AGC off) .....	13
2.3 Signal-to-noise ratio (AGC on) .....	15
2.4 Dynamic range (AGC off) .....	17
2.5 Dynamic range (AGC on) .....	17
2.6 Harmonic distortion .....	19
2.7 Channel crosstalk..... SIST EN 61041-3:1999 <a href="https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e509a8/sist-en-61041-3-1999">https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e509a8/sist-en-61041-3-1999</a>	19
2.8 Channel separation .....	21
2.9 AGC operation and attack/recovery time .....	25
2.10 Switching noise .....	25
2.11 Wow and flutter .....	27
<b>SECTION 3: CALIBRATION TAPE</b>	
3.1 General .....	27
3.2 Magnetic tape .....	27
3.3 Recording audio signal .....	27
3.4 Recording video signal .....	29
3.5 Presentation .....	31
<b>Figures</b>	
1 Circuit arrangement: Amplitude/frequency response .....	33
2 Circuit arrangement: Signal-to-noise ratio AGC off; Dynamic range .....	33
3 Circuit arrangement: Signal-to-noise ratio AGC on .....	35
4 Circuit arrangement: Harmonic distortion .....	37

Clause	Page
5 Circuit arrangement: Channel crosstalk AGC off; Channel separation AGC off .....	37
6 Circuit arrangement: Channel crosstalk AGC on; Channel separation AGC on .....	37
7 Crosstalk of channel L from channel R .....	39
8 Crosstalk of channel R from channel L .....	39
9 Circuit arrangement: AGC operation; Hold time .....	41
10 Gain curve (out/in response) .....	41
11 Test signal for attack/recovery time measurement .....	43
12 Output signal (attack transient) .....	43
13 Circuit arrangement: Switching noise .....	45
14 Low-pass filter characteristics .....	45
15 Input level and audio FM deviation (modulation) depth for various VTR systems .....	47
Annex A – Bibliography .....	49

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 61041-3:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e503a8/sist-en-61041-3-1999>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**NON-BROADCAST VIDEOTAPE RECORDERS –  
METHODS OF MEASUREMENT –****Part 3: Audio characteristics for  
FM recording****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 cooperation 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, prepared by 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.
- 3) They have the form of recommendations for international use published in the form of standards, 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.

**iTECH STANDARD REVIEW**

**(standards.iteh.ai)**

SISTEN 61041-3-1999

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-23b2502014-61041-3-1999>

International Standard IEC 1041-3 has been prepared by sub-committee 60B: Video recording, of IEC technical committee 60: Recording.

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

DIS	Report on voting	Amendment to DIS	Report on voting
60B(CO)128	60B(CO)141A	60B(CO)145	60B(CO)153

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

## NON-BROADCAST VIDEOTAPE RECORDERS – METHODS OF MEASUREMENT –

### Part 3: Audio characteristics for FM recording

#### Section 1: General

##### 1.1 Scope

This part of IEC 1041 concerns the measurement of overall characteristics of the FM audio recorded using slanted tracks similar to those used for recording of the video information.

The main characteristics of such a recording system are: two channels, high fidelity and the use of companders for noise reduction.

##### 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 1041. 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 1041 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

SIST EN 61041-3:1999

<https://standards.iteh.ai/catalog/standards/sist/9c895868-75d0-482a-ae4f-25cb72e503a8/sist-en-61041-3-1999>

IEC 94-3: 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*  
Amendment No. 2 (1988)

IEC 268-1: 1985, *Sound system equipment – Part 1: General*

IEC 268-3: 1988, *Sound system equipment – Part 3: Amplifiers*

IEC 268-8: 1973, *Sound system equipment – Part 8: Automatic gain control devices*

IEC 386: 1972, *Method of measurement of speed fluctuations in sound recording and reproducing equipment*

IEC 574-4: 1982, *Audio-visual, video and television equipment and systems – Part 4: Preferred matching values for the interconnection of equipment in a system*

IEC 843: 1987, *Helical-scan video tape cassette system using 8 mm magnetic tape – Video 8*

IEC 1053-1: 1991, *Helical-scan video tape cassette system using 12,65 mm (0,5 in) magnetic tape on type beta format – FM audio recording – Part 1: 625 lines – 50 field systems*

IEC 1053-2: 1991, *Helical-scan video tape cassette system using 12,65 mm (0,5 in) magnetic tape on type beta format – FM audio recording – Part 2: 525 lines – 60 field systems*

IEC 1054: 1991, *Helical-scan video tape cassette system using 12,65 mm (0,5 in) magnetic tape on type VHS – FM audio recording*

### 1.3 Test conditions

1.3.1 The FM audio signal and the video FM signal shall be recorded simultaneously.

1.3.2 The video signal applied to the videotape recorder shall be a 100/0/75/0 colour bars one with an amplitude of 1 Vpp.

1.3.3 For the determination of the reference input level a specified calibration tape (see 3.1) is required, a section on which a sine wave of 400 Hz is recorded using a frequency deviation as defined in the relevant standard for the VTR system to which the equipment under test belongs (see note below). The reference recording frequency deviation shall be determined by the following procedures

## 1.3.3.1 ~~Method of determining the reference recording frequency deviation~~

### (standards item a)

1.3.3.1 If adjustable record gain controls are provided on the equipment, they shall be adjusted at preset middle position. The input level applied to the VTR shall be adjusted so that the output voltages  $V_o$  derived from recording and reproducing are the same as the output voltages  $V_c$  derived from reproducing a section of the specified calibration tape described above.

25cb72e503a8/sist-en-61041-3-1999

1.3.3.2 If adjustable record gain controls are not provided on the equipment, the input level shall be adjusted so that the output voltages  $V_o$  derived from recording and reproducing are the same as the output voltages  $V_c$  derived from reproducing a section of the specified calibration tape described above.

1.3.4 The peak recording level corresponds to 100 % modulation depth (frequency deviation according to the relevant specification).

1.3.5 The input level required for the 0 VU indication is different for each VTR system.

1.3.6 The audio characteristics shall be measured at each tape speed specified for the VTR under test.

NOTE – The reference input level corresponds to the following modulation depth:

- 33 % for beta and VHS systems according to IEC 1053-1, 1053-2 and 1054.
- 60 % for 8 mm video system according to IEC 843.

Figure 15 shows the above-mentioned parameters in comparison.