Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 4: Compliance testing

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO/IEC 11172-4:2001 sisaldab Euroopa standardi EN ISO/IEC 11172-4:1996 ingliskeelset teksti. Käesolev dokument on jõustatud 18.06.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO/IEC 11172-4:2001 consists of the English text of the European standard EN ISO/IEC 11172-4:1996. This document is endorsed on 18.06.2001 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This part of ISO/IEC 11172 specifies how tests can be designed to verify whether bitstreams and decoders meet requirements specified in part 1, 2, and 3 of ISO/IEC 11172, encoders are not adressed specifically.	**Scope:** This part of ISO/IEC 11172 specifies how tests can be designed to verify whether bitstreams and decoders meet requirements specified in part 1, 2, and 3 of ISO/IEC 11172, encoders are not adressed specifically.

ICS 35.040

Võtmesõnad: audio data, coded representation, coding (data conversion), conformity tests, data processing, data storage devices, digital storage, moving pictures, video data, video recording

EUROPÄISCHE NORM
EUROPEAN STANDARD
NORME EUROPÉENNE

EN ISO/IEC 11172-4

Februar 1996

ICS 35.040

Deskriptoren:

Deutsche Fassung

Informationstechnik

Codierung von bewegten Bildern und damit verbundenen Tonsignalen für digitale Speichermedien bis 1,5 Mbit/s

Teil 4: Konformitätsprüfung
(ISO/IEC 11172-4 : 1995)

Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s – Part 4: Compliance testing (ISO/IEC 11172-4 : 1995)

Technologies de l'information – Codage de l'image animée et du son associé pour les supports de stockage numérique jusqu' à environ 1,5 Mbit/s – Partie 4: Essais de conformité (ISO/IEC 11172-4 : 1995)

Diese Europäische Norm wurde von CEN am 1996-01-25 angenommen.

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CEN

EUROPÄISCHES KOMITEE FÜR NORMUNG
European Committee for Standardization
Comité Européen de Normalisation

Zentralsekretariat: rue de Stassart 36, B-1050 Brüssel

Vorwort

Der Text der Internationalen Norm vom ISO/IEC/JTC 1 "Information Technology" der International Organization for Standardization (ISO) und der International Electrotechnical Commission (IEC) wurde als Europäische Norm durch das Technische Büro übernommen.

Diese Europäische Norm muß den Status einer nationalen Norm erhalten, entweder durch Veröffentlichung eines identischen Textes oder durch Anerkennung bis August 1996, und etwaige entgegenstehende nationale Normen müssen bis August 1996 zurückgezogen werden.

Entsprechend der CEN/CENELEC-Geschäftsordnung sind die nationalen Normungsinstitute der folgenden Länder gehalten, diese Europäische Norm zu übernehmen:

Belgien, Dänemark, Deutschland, Finnland, Frankreich, Griechenland, Irland, Island, Italien, Luxemburg, Niederlande, Norwegen, Österreich, Portugal, Schweden, Schweiz, Spanien und das Vereinigte Königreich.

Anerkennungsnotiz

Der Text der Internationalen Norm ISO/IEC 11172-4 : 1995 wurde von CEN als Europäische Norm ohne irgendeine Abänderung genehmigt.

INTERNATIONAL STANDARD

ISO/IEC 11172-4

First edition
1995-03-15

Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s —

Part 4: Compliance testing

Technologies de l'information — Codage de l'image animée et du son associé pour les supports de stockage numérique jusqu'à environ 1,5 Mbit/s —

Partie 4: Essais de conformité

Reference number
ISO/IEC 11172-4:1995(E)

Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for world-wide standardization. National Bodies that are members of ISO and IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

ISO/IEC 11172 consists of the following parts, under the general title *Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s:*

- *Part 1: Systems*
- *Part 2: Video*
- *Part 3: Audio*
- *Part 4: Compliance testing*

Annex A forms an integral part of this part of ISO/IEC 11172. Annex B is for information only.

Introduction

This International Standard was prepared by ISO/IEC JTC1/SC29/WG11 also known as MPEG (Moving Pictures Expert Group). MPEG was formed in 1988 to establish an International Standard for the coded representation of moving pictures and associated audio stored on digital storage media. Parts 1, 2 and 3 of this International Standard were unanimously approved by the participating National Bodies in November 1992.

This International Standard is published in four parts. Part 1 - Systems - specifies the system coding layer of the standard. It defines a multiplexed structure for combining audio and video data and means of representing the timing information needed to replay synchronized sequences in real-time. Part 2 - video - specifies the coded representation of video data and the decoding process required to reconstruct pictures. Part 3 - audio - specifies the coded representation of audio data and the decoding process required to reconstruct audio. Part 4 - compliance testing - specifies procedures to determine characteristics of coded bitstreams and to test compliance of bitstreams and decoders with the requirements specified in Parts 1, 2 and 3.

Parts 1, 2 and 3 of ISO/IEC 11172 specify a multiplex structure and coded representations of audiovisual information. Parts 1, 2 and 3 of ISO/IEC 11172 allow for large flexibility, achieving suitability of this International Standard for many different applications. The flexibility is obtained by including parameters in the bitstream that define the characteristics of coded bitstreams. Examples are the audio sampling frequency, picture size, picture rate and bitrate parameters.

This part of ISO/IEC 11172 specifies how tests can be designed to verify whether bitstreams and decoders meet the requirements as specified in parts 1, 2 and 3 of ISO/IEC 11172. These tests can be used for various purposes such as:

- manufacturers of encoders, and their customers, can use the tests to verify whether the encoder produces valid bitstreams.

- manufacturers of decoders and their customers can use the tests to verify whether the decoder meets the requirements specified in parts 1, 2 and 3 of ISO/IEC 11172 for the claimed decoder capabilities.

- applications can use the tests to verify whether the characteristics of a given bitstream meet the application requirements, for example whether the size of the coded picture does not exceed the maximum value allowed for the application.

Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s —

Part 4:
Compliance testing

Section 1: General

1.1 Scope

This part of ISO/IEC 11172 specifies how tests can be designed to verify whether bitstreams and decoders meet requirements specified in parts 1, 2 and 3 of ISO/IEC 11172. In this part of ISO/IEC 11172, encoders are not addressed specifically. An encoder is entitled to be an ISO/IEC 11172 encoder if it generates bitstreams compliant with the syntactic and semantic bitstream requirements specified in parts 1, 2 and 3 of ISO/IEC 11172.

Characteristics of coded bitstreams and decoders are defined for parts 1, 2 and 3 of ISO/IEC 11172. The characteristics of a bitstream define the subset of the standard that is exploited in the bitstream. Examples are the applied values or range of the picture size and bitrate parameters. Decoder characteristics define the properties and capabilities of the applied decoding process. An example of a property is the applied arithmetic accuracy. The capabilities of a decoder specify which coded bitstreams the decoder can decode and reconstruct, by defining the subset of the standard that may be exploited in decodable bitstreams. A bitstream can be decoded by a decoder if the characteristics of the coded bitstream are within the subset of the standard specified by the decoder capabilities.

Procedures are descibed for testing compliance of bitstreams and decoders to the requirements defined in parts 1, 2 and 3 of ISO/IEC 11172. Given the set of characteristics claimed, the requirements that must be met are fully determined by parts 1, 2 and 3 of ISO/IEC 11172. This part of ISO/IEC 11172 summarizes the requirements, cross references them to characteristics, and defines how compliance with them can be tested. Guidelines are given how to construct tests and determine their outcome. Some actual tests are defined only for audio.

1.2 Normative references

The following International Standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 11172. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 11172 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11172-1:1993 *Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 1: Systems.*

ISO/IEC 11172-2:1993 *Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 2: Video.*

ISO/IEC 11172-3:1993 *Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 3: Audio.*

CCIR Recommendation 601-2 *Encoding parameters of digital television for studios.*

CCIR Report 624-4 *Characteristics of systems for monochrome and colour television.*

CCIR Recommendation 648 *Recording of audio signals.*

CCIR Report 955-2 *Sound broadcasting by satellite for portable and mobile receivers, including Annex IV Summary description of Advanced Digital System II.*

CCITT Recommendation J.17 *Pre-emphasis used on Sound-Programme Circuits.*

IEEE Draft Standard P1180/D2 1990 *Specification for the implementation of 8x8 inverse discrete cosine transform".*

IEC publication 908:1987 *CD Digital Audio System.*

Section 2: Technical elements

2.1 Definitions

For the purposes of this part of ISO/IEC 11172, the following definitions apply. If the definition is specific to a part, this is noted in square brackets.

2.1.1 ac coefficient [video]: Any DCT coefficient for which the frequency in one or both dimensions is non-zero.

2.1.2 access unit [system]: In the case of compressed audio an access unit is an audio access unit. In the case of compressed video an access unit is the coded representation of a picture.

2.1.3 adaptive segmentation [audio]: A subdivision of the digital representation of an audio signal in variable segments of time.

2.1.4 adaptive bit allocation [audio]: The assignment of bits to subbands in a time and frequency varying fashion according to a psychoacoustic model.

2.1.5 adaptive noise allocation [audio]: The assignment of coding noise to frequency bands in a time and frequency varying fashion according to a psychoacoustic model.

2.1.6 alias [audio]: Mirrored signal component resulting from sub-Nyquist sampling.

2.1.7 analysis filterbank [audio]: Filterbank in the encoder that transforms a broadband PCM audio signal into a set of subsampled subband samples.

2.1.8 audio access unit [audio]: For Layers I and II an audio access unit is defined as the smallest part of the encoded bitstream which can be decoded by itself, where decoded means "fully reconstructed sound". For Layer III an audio access unit is part of the bitstream that is decodable with the use of previously acquired main information.

2.1.9 audio buffer [audio]: A buffer in the system target decoder for storage of compressed audio data.

2.1.10 audio sequence [audio]: A non-interrupted series of audio frames in which the following parameters are not changed:

- ID
- Layer
- Sampling Frequency
- For Layer I and II: Bitrate index

2.1.11 backward motion vector [video]: A motion vector that is used for motion compensation from a reference picture at a later time in display order.