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**Information technology — Coding of  
audio-visual objects —**

Part 4:

**Conformance testing**

AMENDMENT 19: Audio lossless coding  
(ALS)

*Technologies de l'information — Codage des objets audiovisuels —*

*Partie 4: Essai de conformité*

*AMENDEMENT 19: Codage audio sans perte (ALS)*

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The main task of the joint technical committee is to prepare International Standards. 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.

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Amendment 19 to ISO/IEC 14496-4:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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# Information technology — Coding of audio-visual objects —

## Part 4: Conformance testing

### AMENDMENT 19: Audio lossless coding (ALS)

In subclause 6.5.1 File name conventions, add the following row at the end of Table 29:

**Table 29 – File name conventions**

ALS	als_<tool>_<coreSetup>	als_<tool>_<coreSetup>
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At the end of subclause 6.6 Audio Object Types, add the following subclauses:

#### 6.6.22 ALS (Audio lossless coding)

##### 6.6.22.1 Compressed data

###### 6.6.22.1.1 Characteristics

Conformant ALS compressed MPEG-4 data shall have the ALS data stored as outlined in ISO/IEC 14496-3.

###### 6.6.22.1.2 Test procedure

Each compressed data shall meet the syntactic and semantic requirements specified in ISO/IEC 14496-3. The decoded data shall also meet the requirements defined in ISO/IEC 14496-3. If a syntactic element is not listed below, no restrictions apply to that element. The **reserved** element shall be encoded with the value zero.

###### 6.6.22.1.2.1 Compressed MPEG-4 data payload

###### 6.6.22.1.2.1.1 AudioSpecificConfig

**audioObjectType:** Shall be encoded with the value 36.

**samplingFrequencyIndex:** Shall be encoded with the value 0xf.

**SamplingFrequency:** Shall be encoded with the value `samp_freq` if `samp_freq < 224`, and with the value 0 otherwise, with `samp_freq` as defined in ISO/IEC 14496-3.

**channelConfiguration:** Shall be encoded with the value 0.

###### 6.6.22.1.2.1.2 ALSSpecificConfig

**als\_id:** Shall be encoded with the value 1095521024 (0x414C5300 hex).

**file\_type:** Shall be encoded with a value in the range [0 3]. Other values are reserved.

**resolution:** Shall be encoded with a value in the range [0 3]. Other values are reserved.

**frame\_length:** Shall be encoded with a value that is divisible by  $2^{\text{levels}}$  without remainder, with levels as defined in ISO/IEC 14496-3.

**ra\_flag:** Shall be encoded with a value in the range [0 2]. The value 3 is reserved.

#### 6.6.22.1.2.1.3 block\_data

**opt\_order:** Shall be encoded with a value in the range [0 Kmax], where  $K_{\text{max}} = 2^{\text{Bits}} - 1$ , with

$$\text{Bits} = \min\{\text{ceil}[\log_2(\text{max\_order}+1)], \text{max}[\text{ceil}(\log_2((N_B \gg 3)-1)), 1]\}$$

as defined in ISO/IEC 14496-3.

### 6.6.22.2 Decoders

#### 6.6.22.2.1 Characteristics

The object type ALS has the Object Type ID 36, and the compressed MPEG-4 data syntax is defined in ISO/IEC 14496-3. The Audio Object Type ALS contains the ALS tools.

#### 6.6.22.2.2 ALS conformance test procedure

Compressed data and reference decoder output signals are provided to apply the conformance criterion using the procedure described in the following subclause.

The conformance of the ALS decoder can be checked with compressed data for the ALS object type.

For lossless compressed data the conformance criterion is bit exact reproduction of the reference decoder output, this means that all bits in the output of the test decoder are identical to the corresponding bits in the output of the reference decoder.

To be called a conforming ALS decoder, the required conformance criterion must be met for all compressed data listed in subclause 6.6.22.2.3.