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**Information technology — Multimedia  
application format (MPEG-A) —**

**Part 22:  
Multi-image application format (MIAF)**

**AMENDMENT 1: Reference software  
and conformance for multi-image  
application format**

*Technologies de l'information — Format pour application multimédia  
(MPEG-A) —*

*Partie 22: Format pour application à images multiples (MIAF)*

*AMENDEMENT 1: Logiciel de référence et conformité pour le format  
pour application à images multiples*

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This document 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 — Multimedia application format (MPEG-A) —**

## **Part 22: Multi-image application format (MIAF)**

**AMENDMENT 1: Reference software and conformance for  
multi-image application format**

### *Clause 5*

Add a new paragraph after paragraph 6 as follows:

Annex B provides reference software and conformance.

### *Annex A*

Add a new annex after Annex A as follows:

## Annex B (informative)

### Reference software and conformance

#### B.1 General

The multi-image application format (MIAF) is based on HEIF. HEIF has conformance and reference software. MIAF introduces additional restrictions to HEIF and defines other profiles. Hence the MIAF reference software serves as a validation tool for MIAF products.

There are three conformant types of “products” in the MIAF specification:

- “MIAF files”: given a file, it should be possible to indicate if it is valid according to MIAF or not, i.e. if the ‘shall’ statements are respected.
- “MIAF reader”: given a reader, it should be possible to verify if the associated ‘shall’ statements are respected.
- “MIAF renderer”: given a renderer, it should be possible to verify if they are respected.

This annex provides reference software for the first product.

The software includes a parser for MIAF files, a rule checker and test streams which serve as a non-regression test suite for rules. The separation between the validation engine and an external set of rules offers opportunities to leverage this effort for other relating standards.

The reference and conformance software is available at: <https://standards.iso.org/iso-iec/23000/-22/ed-1/en/amd/1/>.

#### B.2 Tool description

The tool is named “compliance warden” (abbreviated ‘cw’).

The tool is a CLI (command-line interface):

```
$ bin/cw.exe
Usage: cw.exe <spec> <list|input.mp4>
```

Example output:

```
[Rule #22] Composition times for trackId=1 different from alpha plane trackId=2
1 error(s).
```

or

```
[Rule #1] The HandlerBox shall be the first contained box within the MetaBox
[Rule #3] MetaBox shall not contain a XMLBox
[Rule #3] MetaBox shall not contain a BinaryXMLBox
[Rule #4] 'hdlr' not found in MetaBox
4 error(s).
```

The tool allows the choice of standard to check conformance against. The tool is extensible to any set of rules, allowing possible extensions to CMAF or any other MPEG standards.

The tool is coded with modern C++ and is portable to any system. The code is unit tested.