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## Information technology — Biometric data interchange formats —

### Part 5: Face image data

### AMENDMENT 2: XML encoding and clarification of defects

*Technologies de l'information — Formats d'échange de données  
biométriques —*

*Partie 5: Données d'image de la face*

*AMENDEMENT 2: Codage XML et précisions concernant les défauts*





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## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

Amendment 2 to ISO/IEC 19794-5:2011 was prepared by ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 37, *Biometrics*.



# Information technology — Biometric data interchange formats —

## Part 5: Face image data

### AMENDMENT 2: XML encoding and clarification of defects

#### *Page 1, Conformance*

Insert the following text as second paragraph:

An XML document conforms to this part of ISO/IEC 19794 if it satisfies the format requirements with respect to its structure, with respect to relations among its fields, and with respect to relations between its fields and the underlying input that are specified within Annex F of this part of ISO/IEC 19794.

#### *Page 2, Normative references*

Add the following URL as the last item in Clause 3:

XML Schema: <http://www.w3.org/XML/Schema.html>

#### *Page v, ISO/IEC 19794-5:2011/Amd 1:2014, Introduction*

Add the following paragraph after the last paragraph:

Additionally, this part of the ISO/IEC standard supports both binary and XML encoding, to support a spectrum of user requirement. With XML, this part will meet the requirements of modern IT architectures. With binary encoding this part will also be able to be used in bandwidth or storage constrained environments. Annex F specifies the schema that XML encoded face image records must conform to, and Annex G provides an example of a valid XML encoded face image record.

#### *Page 6, ISO/IEC 19794-5:2011/Amd 1:2014, Annex A*

Replace Table A.1 with the following (this new Table A.1 may extend over multiple pages):

Table A.1 — Normative requirements

| Req.-ID | Ref. in main body | Requirements summary                                                                                                                                                              | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                   |       |        | B                       | F | T | P |             |             |                 |              |
| R-1     | 5.1               | The ISO/IEC 19794-5:2011 BDIR format specified in this part of ISO/IEC 19794 is a format to store face representations within a biometric data record.                            | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-2     | 5.1               | Each BDIR shall pertain to a single subject.                                                                                                                                      | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-3     | 5.1               | Each BDIR shall contain at least one or more 2D image and zero or more geometric representations (range images, 3D point maps, 3D vertex representations) of a human face.        | 3C    | M      | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-4     | 5.1               | 2D image data will be encoded using JPEG, JPEG2000 or PNG.                                                                                                                        | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-5     | 5.1               | With the exception of the Format Identifier and the Version Number for the standard, which are null-terminated ASCII character strings, all data is represented in binary format. | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |
| R-6     | 5.1               | There are no record separators or field tags; fields are parsed by byte count.                                                                                                    | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |

Table A.1 (continued)

| Req-ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|--------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        | B                       | F | T | P |             |             |                 |              |
| R-7    | 5.1               | <p>The organization of the record format is as follows.</p> <ul style="list-style-type: none"> <li>— A fixed-length (17 byte) <b>General Header</b> containing information about the overall record, including the number of facial images represented and the overall record length in bytes.</li> <li>— A Representation block for each facial representation. This data consists of a Representation Header and the Representation Data.</li> </ul> <p>The Representation Header consists of</p> <ul style="list-style-type: none"> <li>— a fixed length (19 bytes) common elements defined in ISO/IEC 19794-1:2011,</li> <li>— multiple (including none) fixed length (5 byte) <b>Quality</b> blocks describing the quality of the representation,</li> <li>— a fixed length (17 byte) <b>Facial Information</b> block describing discernable characteristics of the subject such as gender,</li> <li>— multiple (including none) fixed length (8 byte) <b>Landmark Point</b> blocks describing Landmark Points in a facial image,</li> <li>— a fixed length (11 byte) <b>Image Information</b> block describing digital properties of the image such as Face Image Type and dimensions such as width and height.</li> </ul> <p>The Representation Data consists of</p> <ul style="list-style-type: none"> <li>— <b>Image data</b> consisting of a JPEG, JPEG2000 or PNG encoded data block,</li> <li>— for Face Image Types containing 3D information, a <b>3D Information</b> block (95 byte) describing properties of this data,</li> <li>— for Face Image Types containing 3D information, the <b>3D Data</b> block describing the 3D shape of the face.</li> </ul> | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |
| -8     | 5.1               | Multiple 2D/3D representations of the same biometric data subject can be described in a single record. This is accomplished by including multiple representation blocks after the General Header block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| -9     | 5.1               | Representation blocks containing 2D data can be stored together with Representation blocks also containing 3D data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |

Full document details: [ISO\\_IEC 19794-5\\_2011\\_Amd 2\\_2015](#)

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Table A.1 (continued)

| Req.-ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                    | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                         |       |        | B                       | F | T | P |             |             |                 |              |
| R-19    | 5.3.3             | This version number shall consist of three ASCII numerals followed by a zero byte as a NULL string terminator.<br>The first and second character will represent the major version number and the third character will represent the minor revision number. The Version Number of ISO/IEC 19794-5:2011 shall be 30333000 <sub>HEX</sub> : "030" – Version 3, Revision 0. | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-20    | 5.3.4             | The length (in bytes) of the entire BDIR shall be recorded in four bytes.                                                                                                                                                                                                                                                                                               | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-21    | 5.3.4             | This count shall be the total length of the BDIR including the general record header and one or more representation records.                                                                                                                                                                                                                                            | 2     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-22    | 5.3.5             | The total number of representation records contained in the BDIR shall be recorded in two bytes.                                                                                                                                                                                                                                                                        | 1, 2  | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-23    | 5.3.5             | A minimum of one representation is required.                                                                                                                                                                                                                                                                                                                            | 1     | M      | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-24    | 5.3.6             | <b>Certification Flag</b><br>The value shall be 00 <sub>HEX</sub> .                                                                                                                                                                                                                                                                                                     | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-25    | 5.3.7             | <b>Temporal Semantics</b><br>This two byte (2 byte) field shall be assigned according to Table 3.                                                                                                                                                                                                                                                                       | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-26    | 5.3.7             | This supports storage of multiple representations: from a single session (e.g. from a photo shoot); from distinct sessions (e.g. from cash dispenser transactions); and from a temporal sequence (e.g. a video sequence of equally time-spaced representations).                                                                                                        | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |
| R-27    | 5.4.1             | <b>The Representation Header Structure</b><br>The Representation Header is intended to describe discrete properties of the individual discernable from the image, one is included for each facial representation included in the record.                                                                                                                                | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                  | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |        | B                       | F | T | P |             |             |                 |              |
| R-28    | 5.4.1             | The Representation Header consists of the Representation Length, the Capture Date and Time, the Capture Device Technology Identifier, the Capture Device Vendor Identifier. These are followed by the Number of Quality Blocks field and the related number of Quality blocks. Finally the Representation Header contains the Facial Information block, the optional multiple Landmark Point blocks, and the Image Information block. | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |
| R-29    | 5.4.2             | <b>Representation Length</b><br>The (4 byte) Representation Length field denotes the length in bytes of the representation including the representation header fields.                                                                                                                                                                                                                                                                | 1, 2  | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-30    | 5.4.2             | The minimum value of the Representation Length is 51 bytes, consisting of a minimum 47 bytes for the Representation Header plus the size of the Representation Data, i.e. minimum 4 bytes for the Length of Image Data Block field assuming 0 bytes for the variable data.                                                                                                                                                            | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-31    | 5.4.3             | <b>Capture Date and Time</b><br>The capture date and time field shall indicate when the capture of this representation started in Coordinated Universal Time (UTC).                                                                                                                                                                                                                                                                   | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-32    | 5.4.3             | The capture date and time field shall consist of 9 bytes.                                                                                                                                                                                                                                                                                                                                                                             | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-33    | 5.4.3             | Its value shall be encoded in the form given in ISO/IEC 19794-1.                                                                                                                                                                                                                                                                                                                                                                      | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-34    | 5.4.4             | <b>Capture Device Technology Identifier</b><br>Capture device technology Identifier shall be encoded in one byte.                                                                                                                                                                                                                                                                                                                     | 1     | M      | Y                       | Y | Y | Y | N           |             |                 |              |
| R-35    | 5.4.4             | This field shall indicate the class of device technology used to acquire the captured biometric sample.                                                                                                                                                                                                                                                                                                                               | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-36    | 5.4.4             | Many different types of capture devices work in the visible spectrum or in near infrared (NIR). To indicate that the capture device operates in NIR the highest bit in the Capture Device Technology Identifier field shall be set to 1.                                                                                                                                                                                              | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |

Table A.1 (continued)

| Req-ID | Ref. in main body | Requirements summary                                                                                                                                                                           | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|--------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
|        |                   |                                                                                                                                                                                                |       |        | B                       | F | T | P |                 |             |                 |              |
| R-37   | 5.4.4             | See the following table for the enumerated list of possible values.                                                                                                                            | 1     | M      | Y                       | Y | Y | Y | Y <sup>3)</sup> |             |                 |              |
|        |                   | <b>Description</b>                                                                                                                                                                             |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Unknown or Unspecified                                                                                                                                                                         |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Static photograph from an unknown source                                                                                                                                                       |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Static photograph from a digital still-image camera                                                                                                                                            |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Static photograph from a scanner                                                                                                                                                               |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Video frame(s) from an unknown source                                                                                                                                                          |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Video frame(s) from an analogue video camera                                                                                                                                                   |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Video frame(s) from a digital video camera                                                                                                                                                     |       |        |                         |   |   |   |                 |             |                 |              |
| R-38   | 5.4.5             | <b>Capture Device Vendor Identifier</b><br>The (2 byte) Capture Device Vendor Identifier shall identify the biometric organisation that owns the product that created the BDIR.                | 1     | M      | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
|        |                   |                                                                                                                                                                                                |       |        |                         |   |   |   |                 |             |                 |              |
| R-39   | 5.4.5             | The capture device algorithm vendor identifier shall be encoded in two bytes carrying a CBEFF biometric organization identifier (registered by IBIA or other approved registration authority). | 3C    | O-1    | Y                       | Y | Y | Y | N               |             |                 |              |
| R-40   | 5.4.5             | A value of all zeros shall indicate that the capture device vendor is unreported.                                                                                                              | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-41   | 5.4.6             | <b>Capture Device Type Identifier</b><br>The (2 byte) Capture Device Type Identifier shall identify the product type that created the BDIR.                                                    | 1     | M      | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
| R-42   | 5.4.6             | It shall be assigned by the registered product owner or other approved registration authority.                                                                                                 | 3C    | M      | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-43   | 5.4.6             | A value of all zeros shall indicate that the capture device type is unreported.                                                                                                                | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                      | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|---------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                           |       |        | B                       | F | T | P |                 |             |                 |              |
| R-44    | 5.4.6             | If the capture device vendor identifier is 0000 <sub>HEX</sub> , then also the capture device type identifier shall be 0000 <sub>HEX</sub>                                                                                                                | 2     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-45    | 5.4.7             | <b>Number of Quality Blocks</b><br>This field is followed by the number of 5 byte Quality blocks reflected by its value.                                                                                                                                  | 2     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-46    | 5.4.7             | A value of zero (0) means that no attempt was made to assign a quality score. In this case, no Quality blocks are present.                                                                                                                                | 2     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-47    | 5.4.8             | <b>Quality Score</b><br>The (1 byte) Quality Score, as defined in ISO/IEC 29794-1, shall be a quantitative expression of the predicted verification performance of the biometric sample.                                                                  | 1, 3C | M      | Y                       | Y | Y | Y | Y <sup>2)</sup> |             |                 |              |
| R-48    | 5.4.8             | Valid values for Quality Score are integers between 0 and 100, where higher values indicate better quality.                                                                                                                                               | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-49    | 5.4.8             | A value of 255 is to handle a special case.                                                                                                                                                                                                               | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-50    | 5.4.8             | An entry of 255 shall indicate a failed attempt to calculate a quality score.                                                                                                                                                                             | 3C    | O-1    | Y                       | Y | Y | Y | N               |             |                 |              |
| R-51    | 5.4.9             | <b>Quality Algorithm Vendor Identifier</b><br>To enable the recipient of the quality score to differentiate between quality scores generated by different algorithms, the provider of quality scores shall be uniquely identified by this two-byte field. | 1     | M      | Y                       | Y | Y | Y | Y <sup>2)</sup> |             |                 |              |
| R-52    | 5.4.9             | This is registered with the IBIA or other approved registration authority.                                                                                                                                                                                | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-53    | 5.4.10            | <b>Quality Algorithm Identifier</b><br>The (2 byte) Quality Algorithm Identifier specifies an integer product code assigned by the vendor of the quality algorithm.                                                                                       | 1     | M      | Y                       | Y | Y | Y | Y <sup>2)</sup> |             |                 |              |
| R-54    | 5.4.10            | It indicates which of the vendor's algorithms (and version) was used in the calculation of the quality score and should be within the range 1 to 65 535.                                                                                                  | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                     | Level | Status | Subformat applicability |   |   |   | XML support       | IUT support | Supported range | Test results |
|---------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                          |       |        | B                       | F | T | P |                   |             |                 |              |
| R-55    | 5.4.10            | Table A.2 summarizes the quality field. All values are fixed-length unsigned integer quantities represented in Big-Endian format.                                                                                                                                                        | 1, 3C | M      | Y                       | Y | Y | Y | N <sup>2)</sup>   |             |                 |              |
| R-56    | 5.5.1             | <b>The Facial Information Block Structure</b><br>The Facial Information Block consists of the Number of Landmark Points, the Gender, the Eye Colour, the Hair Colour, the Subject Height, the Property Mask, the Expression Mask, the Pose Angle, and the Pose Angle Uncertainty fields. | 3C    | O-1    | Y                       | Y | Y | Y | N                 |             |                 |              |
| R-57    | 5.5.2             | <b>Number of Landmark Points</b><br>The (2 byte) Number of Landmark Points field shall be the number of Landmark Point blocks that follow the Facial Information block.                                                                                                                  | 1, 2  | M      | Y                       | Y | Y | Y | N                 |             |                 |              |
| R-58    | 5.5.3             | <b>Gender</b><br>The (1 byte) Gender field shall represent the gender of the subject according to the following table.                                                                                                                                                                   | 1, 3C | M      | Y                       | Y | Y | Y | Y <sup>1)3)</sup> |             |                 |              |

| Description | Value             |
|-------------|-------------------|
| Unspecified | 00 <sub>HEX</sub> |
| Male        | 01 <sub>HEX</sub> |
| Female      | 02 <sub>HEX</sub> |
| Unknown     | FF <sub>HEX</sub> |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|---------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|----------------------------------------|-------|-------------|-------------------|-------|-------------------|------|-------------------|-------|-------------------|------|-------------------|-------|-------------------|----------------|-------------------|------|-------------------|----------------------------------|----------------------------------------|---------------------------------------------------------------------------|-------------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        | B                       | F | T | P |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
| R-59    | 5.5.4             | <b>Eye Colour</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1, 3C | M      | Y                       | Y | Y | Y | Y(1)3)      |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | The (1 byte) Eye Colour field shall represent the colour of irises of the eyes according to the following table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | <table><tr><th>Descript</th><th>Value</th></tr><tr><td>Unspecified</td><td>00<sub>HEX</sub></td></tr><tr><td>Black</td><td>01<sub>HEX</sub></td></tr><tr><td>Blue</td><td>02<sub>HEX</sub></td></tr><tr><td>Brown</td><td>03<sub>HEX</sub></td></tr><tr><td>Gray</td><td>04<sub>HEX</sub></td></tr><tr><td>Green</td><td>05<sub>HEX</sub></td></tr><tr><td>Multi-Coloured</td><td>06<sub>HEX</sub></td></tr><tr><td>Pink</td><td>07<sub>HEX</sub></td></tr><tr><td>Reserved by SC 37 for future use</td><td>08<sub>HEX</sub> to FE<sub>HEX</sub></td></tr><tr><td>Other or Unknown (e.g. cannot be determined from image, monochrome image)</td><td>FF<sub>HEX</sub></td></tr></table> |       |        |                         |   |   |   |             |             |                 |              | Descript                               | Value | Unspecified | 00 <sub>HEX</sub> | Black | 01 <sub>HEX</sub> | Blue | 02 <sub>HEX</sub> | Brown | 03 <sub>HEX</sub> | Gray | 04 <sub>HEX</sub> | Green | 05 <sub>HEX</sub> | Multi-Coloured | 06 <sub>HEX</sub> | Pink | 07 <sub>HEX</sub> | Reserved by SC 37 for future use | 08 <sub>HEX</sub> to FE <sub>HEX</sub> | Other or Unknown (e.g. cannot be determined from image, monochrome image) | FF <sub>HEX</sub> |
|         |                   | Descript                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |        |                         |   |   |   |             |             |                 |              | Value                                  |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Unspecified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |        |                         |   |   |   |             |             |                 |              | 00 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |        |                         |   |   |   |             |             |                 |              | 01 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Blue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |             |             |                 |              | 02 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Brown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |        |                         |   |   |   |             |             |                 |              | 03 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Gray                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |             |             |                 |              | 04 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Green                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |        |                         |   |   |   |             |             |                 |              | 05 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Multi-Coloured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |        |                         |   |   |   |             |             |                 |              | 06 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Pink                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |             |             |                 |              | 07 <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Reserved by SC 37 for future use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |        |                         |   |   |   |             |             |                 |              | 08 <sub>HEX</sub> to FE <sub>HEX</sub> |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   | Other or Unknown (e.g. cannot be determined from image, monochrome image)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |                         |   |   |   |             |             |                 |              | FF <sub>HEX</sub>                      |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |             |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |
| R-60    | 5.5.4             | If the eyes are different colours, then the right eye colour is to be encoded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |                                        |       |             |                   |       |                   |      |                   |       |                   |      |                   |       |                   |                |                   |      |                   |                                  |                                        |                                                                           |                   |

Table A.1 (continued)

| Req-ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Level | Status | Subformat applicability |   |   |   | XML support       | IUT support | Supported range | Test results |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|--------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------------|-------------|-----------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|----------------------|----------------------------------------|-------|-------------------|--------|-------------------|-------|-------------------|------|-------------------|-------|-------------------|-----|-------------------|----------------------------------|----------------------------------------|------------------|-------------------|
|        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |        | B                       | F | T | P |                   |             |                 |              |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
| R-61   | 5.5.5             | <b>Hair Colour</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1, 3C | M      | Y                       | Y | Y | Y | Y <sup>1)3)</sup> |             |                 |              |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | The (1 byte) Hair Colour field shall represent the colour of the hair according to the following table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |        |                         |   |   |   |                   |             |                 |              |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | <table><tr><th>Description</th><th>Value</th></tr><tr><td>Unspecified</td><td>00<sub>HEX</sub></td></tr><tr><td>Bald</td><td>01<sub>HEX</sub></td></tr><tr><td>Black</td><td>02<sub>HEX</sub></td></tr><tr><td>Blonde</td><td>03<sub>HEX</sub></td></tr><tr><td>Brown</td><td>04<sub>HEX</sub></td></tr><tr><td>Gray</td><td>05<sub>HEX</sub></td></tr><tr><td>White</td><td>06<sub>HEX</sub></td></tr><tr><td>Red</td><td>07<sub>HEX</sub></td></tr><tr><td>Reserved by SC 37 for future use</td><td>08<sub>HEX</sub> to FF<sub>HEX</sub></td></tr><tr><td>Unknown or Other</td><td>FF<sub>HEX</sub></td></tr></table> |       |        |                         |   |   |   |                   |             |                 |              | Description                            | Value                                                                                                                                                                                        | Unspecified | 00 <sub>HEX</sub> | Bald                 | 01 <sub>HEX</sub>                      | Black | 02 <sub>HEX</sub> | Blonde | 03 <sub>HEX</sub> | Brown | 04 <sub>HEX</sub> | Gray | 05 <sub>HEX</sub> | White | 06 <sub>HEX</sub> | Red | 07 <sub>HEX</sub> | Reserved by SC 37 for future use | 08 <sub>HEX</sub> to FF <sub>HEX</sub> | Unknown or Other | FF <sub>HEX</sub> |
|        |                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                         |   |   |   |                   |             |                 |              | Value                                  |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Unspecified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                         |   |   |   |                   |             |                 |              | 00 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Bald                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |        |                         |   |   |   |                   |             |                 |              | 01 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |                   |             |                 |              | 02 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Blonde                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |        |                         |   |   |   |                   |             |                 |              | 03 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Brown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |                   |             |                 |              | 04 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Gray                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |        |                         |   |   |   |                   |             |                 |              | 05 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | White                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |        |                         |   |   |   |                   |             |                 |              | 06 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Red                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |        |                         |   |   |   |                   |             |                 |              | 07 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Reserved by SC 37 for future use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |                   |             |                 |              | 08 <sub>HEX</sub> to FF <sub>HEX</sub> |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Unknown or Other                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        |                         |   |   |   |                   |             |                 |              | FF <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
| R-62   | 5.5.6             | <b>Subject Height</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1, 3C | M      | Y                       | Y | Y | Y | Y <sup>3)</sup>   |             |                 |              |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | The (1 byte) Subject Height field shall represent the height of the subject according to the following table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |        |                         |   |   |   |                   |             |                 |              |                                        |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | <table><tr><th>Description</th><th>Value</th></tr><tr><td>Unspecified</td><td>00<sub>HEX</sub></td></tr><tr><td>Subject Height in cm</td><td>01<sub>HEX</sub> to FF<sub>HEX</sub></td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                     |       |        |                         |   |   |   |                   |             |                 |              | Description                            | Value                                                                                                                                                                                        | Unspecified | 00 <sub>HEX</sub> | Subject Height in cm | 01 <sub>HEX</sub> to FF <sub>HEX</sub> |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                         |   |   |   |                   |             |                 |              | Value                                  |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Unspecified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                         |   |   |   |                   |             |                 |              | 00 <sub>HEX</sub>                      |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | Subject Height in cm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |        |                         |   |   |   |                   |             |                 |              | 01 <sub>HEX</sub> to FF <sub>HEX</sub> |                                                                                                                                                                                              |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   | R-63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |        |                         |   |   |   |                   |             |                 |              | 5.5.7                                  | <b>Property Mask</b>                                                                                                                                                                         | 1           | M                 | Y                    | Y                                      | Y     | Y                 | N      |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |
|        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |        |                         |   |   |   |                   |             |                 |              |                                        | The (3 byte) Property Mask is a bit mask of 3 bytes and each bit of the mask position listed in Table 10 shall be set to 1 if the corresponding property is present, and set to 0 if absent. |             |                   |                      |                                        |       |                   |        |                   |       |                   |      |                   |       |                   |     |                   |                                  |                                        |                  |                   |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                  | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|---------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                       |       |        | B                       | F | T | P |                 |             |                 |              |
| R-64    | 5.5.7             | The mask position starts from 0 at the lowest bit.                                                                                                                                                                                                                                                                    | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-65    | 5.5.7             | The lowest bit set to 0 shall indicate that properties are not specified (and all bits shall be zero);                                                                                                                                                                                                                | 3C    | O-1    | Y                       | Y | Y | Y | N               |             |                 |              |
| R-66    | 5.5.7             | The lowest bit set to 1 shall indicate that all listed properties have been considered and that a zero value of any property bit indicates an absence of that property.                                                                                                                                               | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-67    | 5.5.7             | All reserved bits shall be zero.                                                                                                                                                                                                                                                                                      | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-68    | 5.5.7             | A "Pupil or iris not visible" flag set to "1" shall indicate non-compliance with the Frontal, Full Frontal, and Token image types.                                                                                                                                                                                    | 2     | M      | Y                       |   |   | Y | N               |             |                 |              |
| R-69    | 5.5.8             | <b>Expression</b><br>The (2 byte) Expression Mask is a bit mask of 2 bytes and each bit of the mask position listed in Table 11 shall be set to 1 if the corresponding expression is present, and set to 0 if absent.                                                                                                 | 1, 3C | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-70    | 5.5.8             | The mask position starts from 0 at the lowest bit.                                                                                                                                                                                                                                                                    | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-71    | 5.5.8             | The lowest bit set to 0 shall indicate that properties are not specified (and all bits shall be zero);                                                                                                                                                                                                                | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-72    | 5.5.8             | The lowest bit set to 1 shall indicate that all listed properties have been considered and that a zero value of any property bit indicates an absence of that expression.                                                                                                                                             | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-73    | 5.5.8             | All reserved bits shall be zero.                                                                                                                                                                                                                                                                                      | 1     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-74    | 5.5.9             | <b>Pose Angle</b><br>The (3 multibyte) Pose Angle field (B <sub>y</sub> , B <sub>p</sub> , B <sub>r</sub> ) shall represent the estimate or measure pose of the subject in the image.                                                                                                                                 | 3C    | O-1    | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
| R-75    | 5.5.9             | Each byte in the field respectively represents pose angles of yaw, pitch and roll in that order.                                                                                                                                                                                                                      | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-76    | 5.5.9             | The angles are defined relative to the frontal pose of the subject, which has angles (0,0,0) as shown in Figure 5. The frontal pose is defined by the Frankfurt Horizon FH (see Annex E) as the xz plane and the vertical symmetry plane as the yz plane with the z axis oriented in the direction of the face sight. | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                       | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                            |       |        | B                       | F | T | P |             |             |                 |              |
| R-77    | 5.5.9             | As order of the successive rotation around the different axes does matter, the encoded rotation angle shall correspond to an order of execution starting from the frontal view. This order shall be given by Roll (about the front axis), then Pitch (about the horizontal axis) and finally Yaw (about the vertical axis). The (first executed) Roll transformation will therefore always be in the image (x,y) plane.    | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-78    | 5.5.9             | From the point of view of executing a transformation from the observed view to a frontal view, the transformation order will therefore be Yaw, Pitch, and then Roll. Note however that the encoded angle is from the frontal view to the observed view.                                                                                                                                                                    | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-79    | 5.5.9.1           | <b>Pose Angle — Yaw</b><br>The yaw angle Y is the rotation in degrees about the y-axis (vertical axis) shown in Figure 5.                                                                                                                                                                                                                                                                                                  | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-80    | 5.5.9.1           | Frontal poses have a yaw angle of 0 degrees.                                                                                                                                                                                                                                                                                                                                                                               | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-81    | 5.5.9.1           | Positive angles represent faces looking to their left (a counter-clockwise rotation around the y-axis).                                                                                                                                                                                                                                                                                                                    | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-82    | 5.5.9.1           | The encoded value, $B_Y$ , shall be stored in 1 byte with values 0 to 180 computed from a real-valued yaw angle estimate, $-180 \leq Y < 180$ , as follows:<br>If $180 \geq Y \geq 0$ then $B_Y = Y/2+1$ . The remainder is discarded.<br>If $-180 \leq Y < 0$ then $B_Y = 181+Y/2$ . The remainder is discarded.<br>The maximum value of $B_Y$ is 180. If the pose angle is not specified, the value of $B_Y$ shall be 0. | 1     | M      | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-83    | 5.5.9.2           | <b>Pose Angle — Pitch</b><br>The pitch angle P is the rotation in degrees about the x-axis (horizontal axis) shown in Figure 5.                                                                                                                                                                                                                                                                                            | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-84    | 5.5.9.2           | Frontal poses have a pitch angle of 0 degrees.                                                                                                                                                                                                                                                                                                                                                                             | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-85    | 5.5.9.2           | Positive angles represent faces looking down (a counter-clockwise rotation around the x-axis).                                                                                                                                                                                                                                                                                                                             | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                          | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                               |       |        | B                       | F | T | P |             |             |                 |              |
| R-86    | 5.5.9.2           | The encoded value, $B_P$ , shall be stored in 1 byte with values 0 to 180 computed from a real-valued pitch angle estimate, $-180 \leq P < 180$ , as follows:<br>If $180 \geq P \geq 0$ then $B_P = P/2+1$ . The remainder is discarded.<br>If $-180 \leq P < 0$ then $B_P = 181+P/2$ . The remainder is discarded.<br>The maximum value of $B_P$ is 180. If the pitch angle is not specified, the value of $B_P$ shall be 0. | 1     | M      | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-87    | 5.5.9.3           | <b>Pose Angle — Roll</b><br>The roll angle $R$ is the rotation in degrees about the z-axis (the horizontal axis from front to back) shown in Figure 5. Frontal poses have a roll angle of 0 degrees.                                                                                                                                                                                                                          | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-88    | 5.5.9.3           | Positive angles represent faces tilted toward their right shoulder (counter-clockwise rotation around the z-axis).                                                                                                                                                                                                                                                                                                            | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-89    | 5.5.9.3           | A roll angle of 0 degrees denotes that the left and right eye centres have identical Y coordinates.                                                                                                                                                                                                                                                                                                                           | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-90    | 5.5.9.3           | The encoded value, $B_R$ , shall be stored in 1 byte with values 0 to 180 computed from a real-valued roll angle estimate, $-180 \leq R < 180$ , as follows:<br>If $180 \geq R \geq 0$ then $B_R = R/2+1$ . The remainder is discarded.<br>If $-180 \leq R < 0$ then $B_R = 181+R/2$ . The remainder is discarded.<br>The maximum value of $B_R$ is 180. If the roll angle is not specified, the value of $B_R$ shall be 0.   | 1     | M      | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-91    | 5.5.10            | <b>Pose Angle Uncertainty</b><br>The (3 multibyte) Pose Angle Uncertainty ( $U_Y, U_P, U_R$ ) represents the expected degree of uncertainty of the pose angle yaw, pitch, and roll. Each byte in the field respectively represents the uncertainty of yaw, pitch and roll in that order. The uncertainty is allowed to represent experimental uncertainty specified by each vendor.                                           | 3C    | O-1    | Y                       | Y | Y | Y | N           |             |                 |              |

Table A.1 (continued)

| Req-ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                           | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|--------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
|        |                   |                                                                                                                                                                                                                                                                |       |        | B                       | F | T | P |                 |             |                 |              |
| R-92   | 5.5.10            | The encoding of Pose Angle Uncertainty is given by three bytes ( $U_Y$ , $U_P$ , $U_R$ ) where each byte $U_K$ in the field ( $k=Y,P,R$ ) represents 1 degree of uncertainty with minimum and maximum values of 1 and 181 where $U_K=(\text{uncertainty}+1)$ . | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-93   | 5.5.10            | The more uncertain, the value of the uncertainty $U_K$ shall become larger.                                                                                                                                                                                    | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-94   | 5.5.10            | If the uncertainty is not specified, then the values of $U_Y$ , $U_P$ and $U_R$ shall be set to zero (0).                                                                                                                                                      | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-95   | 5.6.1             | <b>The Landmark Point Block Structure</b><br>The optional (8 byte) Landmark Point block specifies the type, code and position of a Landmark Point in the facial image.                                                                                         | 2     | M      | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
| R-96   | 5.6.1             | The number of Landmark Point blocks shall be specified in the Number of Landmark Points field of the Facial Information block.                                                                                                                                 | 2     | M      | Y                       | Y | Y | Y | N               |             |                 |              |
| R-97   | 5.6.2             | <b>Landmark Point Type</b><br>The (1 byte) Landmark Point Type field represents the type of the Landmark Point stored in the Landmark Point block.                                                                                                             | 1     | M      | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
| R-98   | 5.6.2             | This field shall be set to 01 <sub>HEX</sub> to denote that landmark point is an MPEG-4 Feature Point as given in ISO/IEC 14496-2:2004, Annex C and is represented by the 2D image coordinates.                                                                | 1     | M      | Y                       | Y | Y | Y | Y <sup>3)</sup> |             |                 |              |
| R-99   | 5.6.2             | The field shall be set to 02 <sub>HEX</sub> to denote that the landmark point is an Anthropometric 2D landmark and is represented by the 2D image coordinates.                                                                                                 | 1     | M      | Y                       | Y | Y | Y | Y <sup>3)</sup> |             |                 |              |
| R-100  | 5.6.2             | Finally, the field shall be set to 03 <sub>HEX</sub> to denote that the Landmark Point is an anthropometric 3D landmark and is represented by its 3D coordinates.                                                                                              | 1     | M      | Y                       | Y | Y | Y | Y <sup>3)</sup> |             |                 |              |
| R-101  | 5.6.2             | All other field values are reserved by SC 37 for future definition of Landmark Point Types.                                                                                                                                                                    | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-102  | 5.6.3             | <b>Landmark Point Code</b><br>The (1 byte) Landmark Point Code field shall specify the Landmark Point that is stored in the Landmark Point block.                                                                                                              | 1     | M      | Y                       | Y | Y | Y | Y               |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |        | B                       | F | T | P |             |             |                 |              |
| R-103   | 5.6.3             | For the Landmark Point Type 01 <sub>HEX</sub> the codes of the Landmark Points in 5.6.4, taken from ISO/IEC 14496-2:2004, Annex C and defined as MPEG-4 Feature Points, or the additional eye and nostril Landmark Points in 5.6.5 shall be stored in this block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-104   | 5.6.3             | If the Landmark Point Type is 02 <sub>HEX</sub> or 03 <sub>HEX</sub> , i.e. anthropometric 2D landmark or anthropometric 3D landmark, the codes of the Landmark Points defined in 5.6.6 shall be stored in this block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-105   | 5.6.3             | The horizontal and vertical positions of Landmark Points are either texture image coordinates or in the Cartesian coordinate system (see 5.10.2.2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-106   | 5.6.4             | <b>MPEG-4 Landmark Points</b><br>The normative Figure 7 denotes the Landmark Point codes associated with Feature Points as given in ISO/IEC 14496-2:2004, Annex C. Each Landmark Point Code is represented by a notation A.B using a major (A) and a minor (B) value. The encoding of the Landmark Point Code is given by the (1 byte) value of A*16 + B.                                                                                                                                                                                                                                                                                                                                                                                  | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-107   | 5.6.5             | <b>Eye and nostril centre Landmark Points</b><br>The eye centre Landmark Points 12.1 (left) and 12.2 (right) are defined to be the horizontal and vertical midpoints of the eye corners (3.7, 3.11) and (3.8, 3.12) respectively. The left nostril centre Landmark Point 12.3 is defined to be the midpoint of the nose Landmark Points (9.1, 9.15) in the horizontal direction and (9.3, 9.15) in the vertical direction. Similarly, the right nostril centre Landmark Point 12.4 is defined to be the midpoint of the nose Landmark Points (9.2, 9.15) in the horizontal direction and (9.3, 9.15) in the vertical direction. Both the eye centre and nostril centre Landmark Points are shown in Figure 8 and values given in Table 14. | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |

Table A.1 (continued)

| Req.-ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Level | Status | Subformat applicability |   |   |   | XML support | IUT support | Supported range | Test results |
|---------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |        | B                       | F | T | P |             |             |                 |              |
| R-108   | 5.6.6             | <p><b>Anthropometric Landmarks</b></p> <p>Anthropometric landmarks extend the MPEG-4 feature model with new points that are used in forensics and anthropology for person identification via two facial images or image and skull over a long time. They also allow specification of points that are in use by criminal experts and anthropologists[10]. Figure 9 and Table 15 show the definition of the anthropometric landmarks. The set of points represents the craniofacial landmark points of the head and face. The latter are used in forensics for “Face to face” and “Skull to face” identification. Some of these points have MPEG 4 counterparts, others not.</p> <p>The anthropometric landmark code has the format: A.B. A specifies the global landmark of the face to which this landmark belongs such as nose, mouth, etc. B specifies the particular point. In case a Landmark Point has two symmetrical entities (left and right) the right entity always has a greater and even minor code value.</p> <p>Hence, all Landmark Points from the left part of the face have odd minor codes, and from the right part — even minor codes. Both A and B are in the range from 1 to 15. Hence, the code A*16 + B is written to the 1 byte Landmark Point Code field.</p> | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-109   | 5.6.7             | <p><b>Anthropometric 3D landmark</b></p> <p>The error of an anthropometric 3D landmark point location should be no greater than 3 mm. The point shall withstand from the nearest point on the surface no further than 3 mm. The point on the surface is a vertex, or a point on an edge, or a point on a face of the surface.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3C    | O-1    | Y                       | Y | Y | Y | Y           |             |                 |              |
| R-110   | 5.6.8             | <p><b>Z coordinate</b></p> <p>This field is not used if the Landmark Point Type is equal to MPEG-4 feature or anthropometric 2D landmark.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2     | M      | Y                       | Y | Y | Y | Y           |             |                 |              |

Table A.1 (continued)

| Req. ID | Ref. in main body | Requirements summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|---------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
|         |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |        | B                       | F | T | P |                 |             |                 |              |
| R-111   | 5.6.8             | In case the Landmark Point Type equals anthropometric 3D landmark this field along with the horizontal and vertical positions denotes the coordinates of the landmark point in the 3D Cartesian coordinate system. The metric coordinates of 3D landmarks shall be obtained by multiplying the X, Y, and Z coordinates by a fixed scale of 0,02 mm. Note, that the Landmark Point Type field codes the type of the Landmark Point and determines the interpretation of the Z coordinate. | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |
| R-112   | 5.7.1             | <b>The Image Information Block</b><br><b>Data Structure</b><br>The (11 byte) Image Information block is intended to describe digital properties of the facial image, one is included for each facial image included in the record.                                                                                                                                                                                                                                                       | 3C    | O-1    | Y                       | Y | Y | Y | Y <sup>1)</sup> |             |                 |              |
| R-113   | 5.7.1             | One Representation data block shall follow this block.                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3C    | O-1    | Y                       | Y | Y | Y | Y               |             |                 |              |

Table A.1 (continued)

| Req-ID | Ref. in main body | Requirements summary                                                                                                                                                                 | Level | Status | Subformat applicability |   |   |   | XML support     | IUT support | Supported range | Test results |
|--------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------------------|---|---|---|-----------------|-------------|-----------------|--------------|
| R-114  | 5.7.2             | <b>Face Image Type</b>                                                                                                                                                               | 1     | M      | Y                       | Y | Y | Y | Y <sup>3)</sup> |             |                 |              |
|        |                   | The Face Image Type field shall represent the type of the facial image stored in the Image Information block and, if applicable, the 3D Data block according to the following table. |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   | Note that all Frontal Image Types are either Full Frontal, Token Frontal, Post-processed Frontal or one of the respective 3D Full Frontal or Token Frontal Image Types.              |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |
|        |                   |                                                                                                                                                                                      |       |        |                         |   |   |   |                 |             |                 |              |

Table A.1 (continued)

| Req. ID                          | Ref. in main body                      | Requirements summary                                                                                                                                                                                                                                                                                                                                                         | Level                                  | Status | Subformat applicability |                   |                |                   | XML support        | IUT support       | Supported range | Test results      |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------|-------------------------|-------------------|----------------|-------------------|--------------------|-------------------|-----------------|-------------------|----------------------------------|----------------------------------------|--|--|--|--|--|--|--|--|--|--|
|                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        | B                       | F                 | T              | P                 |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| R-115                            | 5.7.3                                  | <b>Image Data Type</b>                                                                                                                                                                                                                                                                                                                                                       | 1                                      | O-1    | Y                       | Y                 | Y              | Y                 | Y <sup>(1)3)</sup> |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | The (1 byte) Image Data Type field denotes the encoding type of the Image Data block. Either JPEG (ISO/IEC 10918-1 and ITU-T Rec. T.81 <sup>[18]</sup> ) or JPEG2000 (ISO/IEC 15444-1) or PNG (ISO/IEC 15948:2003) shall be specified as given in the following table.                                                                                                       |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | Description                                                                                                                                                                                                                                                                                                                                                                  |                                        |        | Value                   |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | JPEG                                                                                                                                                                                                                                                                                                                                                                         |                                        |        | 00 <sub>HEX</sub>       |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | JPEG2000 lossy                                                                                                                                                                                                                                                                                                                                                               |                                        |        | 01 <sub>HEX</sub>       |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | JPEG 2000 lossless                                                                                                                                                                                                                                                                                                                                                           |                                        |        | 02 <sub>HEX</sub>       |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | PNG                                                                                                                                                                                                                                                                                                                                                                          |                                        |        | 03 <sub>HEX</sub>       |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | Reserved by SC 37 for future use                                                                                                                                                                                                                                                                                                                                             | 04 <sub>HEX</sub> to FF <sub>HEX</sub> |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| R-116                            | 5.7.3                                  | For lossless compression PNG or JPEG2000 lossless shall be used.                                                                                                                                                                                                                                                                                                             | 3C                                     | O-1    | Y                       | Y                 | Y              | Y                 | Y <sup>3)</sup>    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| R-117                            | 5.7.3                                  | For lossless representation of images using more than 8 bits per channel PNG or JPEG2000 lossless shall be used.                                                                                                                                                                                                                                                             | 3C                                     | O-1    | Y                       | Y                 | Y              | Y                 | Y <sup>3)</sup>    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| R-118                            | 5.7.3                                  | For lossy representation of images using more than 8 bits per channel JPEG2000 shall be used.                                                                                                                                                                                                                                                                                | 3C                                     | O-1    | Y                       | Y                 | Y              | Y                 | Y                  |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| R-119                            | 5.7.3                                  | See the following table for the list of possible image data type values.                                                                                                                                                                                                                                                                                                     | 1                                      | M      | Y                       | Y                 | Y              | Y                 | Y <sup>3)</sup>    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
|                                  |                                        | <table><tr><th>Description</th><th>Value</th></tr><tr><td>JPEG</td><td>00<sub>HEX</sub></td></tr><tr><td>JPEG2000 lossy</td><td>01<sub>HEX</sub></td></tr><tr><td>JPEG 2000 lossless</td><td>02<sub>HEX</sub></td></tr><tr><td>PNG</td><td>03<sub>HEX</sub></td></tr><tr><td>Reserved by SC 37 for future use</td><td>04<sub>HEX</sub> to FF<sub>HEX</sub></td></tr></table> | Description                            | Value  | JPEG                    | 00 <sub>HEX</sub> | JPEG2000 lossy | 01 <sub>HEX</sub> | JPEG 2000 lossless | 02 <sub>HEX</sub> | PNG             | 03 <sub>HEX</sub> | Reserved by SC 37 for future use | 04 <sub>HEX</sub> to FF <sub>HEX</sub> |  |  |  |  |  |  |  |  |  |  |
| Description                      | Value                                  |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| JPEG                             | 00 <sub>HEX</sub>                      |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| JPEG2000 lossy                   | 01 <sub>HEX</sub>                      |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| JPEG 2000 lossless               | 02 <sub>HEX</sub>                      |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| PNG                              | 03 <sub>HEX</sub>                      |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |
| Reserved by SC 37 for future use | 04 <sub>HEX</sub> to FF <sub>HEX</sub> |                                                                                                                                                                                                                                                                                                                                                                              |                                        |        |                         |                   |                |                   |                    |                   |                 |                   |                                  |                                        |  |  |  |  |  |  |  |  |  |  |