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**Iridian Technologies Technical Contribution to M1.3 –  
Report on Potential Defects in Iris Image-Based Data Interchange Format  
Standards**

**Submitted by:**

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## 1 Purpose

This report provides descriptions of potential defects in the original clauses of Iris Image-based Data Interchange Format standards – Iris Image Interchange Format Standard (ANSI/INCITS 379-2004) and Biometric data interchange formats – Part 6: Iris image data (ISO/IEC 19794-6:2005). The report provides Iridian recommendations on possible resolution of these defects.

## 2 Iris Image Interchange Format (ANSI/INCITS 379-2004)

Potential defects in ANSI/INCITS 379-2004 are detailed in Table 1.

Table 1 Defect Report – ANSI/INCITS 379-2004

Item	Section	Part	Description	Recommended Changed
1	Introduction	1 <sup>st</sup> Para.	“a sample record”	To “several sample records”
2	2	3 <sup>rd</sup> sentence	Quality should not be interpreted by the standard as three different levels, but expressed as a continuum from 1 to 100.	Replace sentence with “Quality is specified as a value from 1 to 100.”
3	3	Reference to JPEG-LS	Availability of lossless JPEG renders JPEG-LS superfluous	Delete reference and later citations.
4	4.8	JPEG-LS definition	See preceding comment	Delete.
5	5.2.3		Refers to JPEG-LS	Change to “If lossless compression is used, the image data shall be compressed in accordance with JPEG2000 lossless compression specified in ISO/IEC 15444.”
6	5.3.2.6	4 <sup>th</sup> sentence	Describes resampling method that is not an industry standard	Change to “The intensity of each polar image sample $p(r,\theta)$ shall be computed using nearest-neighbor resampling or other industry-standard method.” Delete 5 <sup>th</sup> sentence.
7	5.3.2.6		Definition of the standard transformation method is not clear.	Add text to describe the meaning of the “Image transformation” entry in Table 2, the “standard transformation”, and the allowed use of

				“nonstandard” polar transformations.
8	5	Table 2, B.1, B.3, B.5	No interpretation of header version is provided	Add text indicating that first 2 digits signify major version and 3 <sup>rd</sup> digit is minor version, and that the value at time of publication is 010. Correct hex value is 0x30313000.
9	5	Table 4	Image length ranges from 0 - 4294967295	Zero length image is not allowed. Change to 1 – 4294967295 or 1 to $(2^{32}-1)$
10	5.6.2		Specifies interpretation of different ranges of quality value. This is inappropriate.	Delete section.
11	A.1	Text following A.1 heading	Hanging paragraph	Insert header A.1.1 with title “General”. Renumber following subsections
12	A.1.1, A.1.2, A.1.3		Specific definition of quality in terms of pixel resolution and expected iris diameter is not appropriate or supported.	Replace with more general text that suggests interpretation of the quality score and indicates that the provider of the data is responsible for generating a score that is predictive of match performance when used with that vendor’s matching algorithms.

### 3 Biometric data interchange formats – Part 6: Iris image data (ISO/IEC 19794-6:2005)

Potential defects in ISO/IEC 19794-6:2005 are detailed in Table 2.

Table 2 Defect Report – ISO/IEC 19794-6

Item	Section	Part	Description	Recommended Changed
1	Introduction	1 <sup>st</sup> Para.	“a sample record”	To “several sample records”
2	2	3 <sup>rd</sup> sentence	Quality should not be interpreted by the standard as four different levels, but expressed as a continuum from 1 to 100.	Replace phrase “four different levels of image quality are” with “a range of image quality values from 1 to 100 is”
3	3	Reference to ISO/IEC 14495	Availability of lossless JPEG renders JPEG-LS superfluous	Delete reference and later citations.
4	5.3	JPEG-LS definition	See preceding comment	Delete.
5	6.2.3		Refers to JPEG-LS	Change to “If lossless

				compression is used, the image data shall be compressed in accordance with JPEG2000 lossless compression specified in ISO/IEC 15444.”
6	6.3.2.3		Explicit description of the means of encoding boundary extraction options in the record header is missing.	Add to end of paragraph: “Use of this format is indicated by presence of the value IRBNDY_UNDEF in bit 9 of the Iris Image Properties Bitfield in Table 2.”
7	6.3.2.4		Explicit description of the means of encoding assignment options for occlusions in the record header is missing.	Add to end of paragraph: “Assignment of a reserved value is indicated by presence of the value IROCC_PROCESSED in bit 7 of the Iris Image Properties Bitfield in Table 2. Lack of such assignment is indicated by the value IROCC_UNDEF in this position.
8	6.3.2.5		Clarification of encoding of scan type is required.	Change second sentence to “If such corrections are applied, the scan type entry in bits 5-6 of the image properties bitfield in Table 2 shall be set to SCAN_TYPE_CORRECTED.”
9	6.3.2.7		Definition of the standard transformation method is not clear.	Add to end of section: “Use of this polar conversion method shall be indicated by presence of the value TRANS_STD in the Image Transformation field in Table 2. Use of an alternative polar conversion method shall be indicated by presence of the value TRANS_UNDEF in the Image Transformation field in Table 2.”
10	6.5	Table 2, B.1, B.3, B.5	No interpretation of header version is provided	Add text indicating that first 2 digits signify major version and 3 <sup>rd</sup> digit is minor version, and that the value at time of publication is 010. Correct hex value is 0x30313000.
11	6.5	Table 4	Image length ranges from 0 - 4294967295	Zero-length image is not allowed. Change to 1 – 4294967295 or 1 to (2 <sup>32</sup> -1)
12	6.5.4	Description of IRBNDY_UNDEF	Reference to 5.3.2.2 should be 6.3.2.3	Change to 6.3.2.3
13	6.5.4	Description of	Boundary processing	Change description to “the

		IRBNDY_PROCESSED	should not require use of circular models	inner and outer iris boundaries have been determined.”
14	A.1	Text following A.1 heading	Hanging paragraph	Insert header A.1.1 with title “General”. Renumber following subsections
15	A.1.1, A.1.2, A.1.3		Specific definition of quality in terms of pixel resolution and expected iris diameter is not appropriate or supported.	Replace with more general text that suggests interpretation of the quality score and indicates that the provider of the data is responsible for generating a score that is predictive of match performance when used with that vendor’s matching algorithms.
16	B.3	Table B.5	Image property bitfield value in bytes 18-19 should be 01 C5	Change to correct value.

## 4 References

1. ANSI/INCITS 279-2004 Iris Image Interchange Format (May 13, 2004)
2. ISO/IEC 19794-6 Information technology – Biometric data interchange formats – Part 6: Iris image data (June 1, 2005)