Capture	Fingerprint SAP Levels							
	5	**10**	**20**	**30**	**40**	**45**	**50**	**60**
Acquire flat images	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquire rolled images	No	No	No	No	Optional	Optional	Optional	Optional
Minimum resolution	500 ppi ± 10 ppi	500 ppi ± 10 ppi	500 ppi ± 10 ppi	500 ppi ± 10 ppi	500 ppi ±10 ppi	500 ppi ± 5 ppi	500 ppi ± 5 ppi	500 ppi ± 5 ppi
Minimum Gray levels	256	256	256	256	256	256	256	256
Minimum Image Dimensions (wxh)	.5" x .65"	.5" x .65"	.6 "x .8"	.8 "x 1.0"	1.6 "x 1.5"	1.6 "x 1.5"	2.5" x 1.5"	3.2" x 3"
Minimum image area	.325 sq in	.325 sq in	.48 sq in	.8 sq in	2.4 sq in	2.4 sq in	3.75 sq in	9.6 sq in
Compression algorithm[3]	N/A	WSQ	WSQ	WSQ	WSQ	WSQ	WSQ	WSQ
Maximum compression ratio	N/A	10:1	10:1	10:1	15:1	15:1	15:1	15:1
Simultaneous number of fingers	1	1	1	1	1 to 2	1 to 2	1 to 3	1 to 4
Sensor certification	PIV	PIV	PIV	PIV	PIV	Appendix F	Appendix F	Appendix F
Minutiae extractor certification	PIV	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interchange								
Image / template	Minutiae	Image	Image	Image	Image	Image	Image	Image
Standard used	INCITS 378-2004	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14	ANSI/ NIST Type-4 or Type-14

Capture	ANSI/NIST Comments	Face SAP Levels		
		32	**42**	**52**
Image resolution (size)	Lower resolution may reduce accuracy	≥ 480x600	≥ 768x1024	≥ 2400x3200
Capture device sensor		Progressive scan (no interlace)	Progressive scan (no interlace)	Progressive scan (no interlace)
Capture device color space		Minimum of 24-bit RGB color space or a minimum of 8-bit monochrome color space	Minimum of 24-bit RGB color space or a minimum of 8-bit monochrome color space	Minimum of 36-bit RGB color space or a minimum of 12-bit monochrome color space
Capture device controls		Auto gain and auto shutter, optional: control loop for camera parameter (shutter speed/ flash intensity) based on face area on-board	Auto gain and auto shutter, optional: control loop for camera parameter (shutter speed/ flash intensity) based on face area on-board (requires continuous face detection)	Auto gain and auto shutter, optional: control loop for camera parameter (shutter speed/ flash intensity) based on face area on-board (requires continuous face detection)
Capture distance in mm	Lower distance may reduce accuracy	60 to 200 cm (approximately 2 to 6 feet), the longer distance is preferred	60 to 200 cm (approximately 2 to 6 feet), the longer distance is preferred	60 to 200 cm (approximately 2 to 6 feet), the longer distance is preferred
Illuminator type – optional feature		Xenon flash or LED / fill in flash	Xenon flash or LED / fill in flash	Xenon flash or LED / fill in flash
Ambient light	Minimum light level at which flash becomes required	4 lux	4 lux	4 lux
Wavelength range		Visible light, 380-780nm	Visible light, 380-780nm	Visible light, 380-780nm
Exposure time	Capability to freeze motion	≤ 1/100s (10 ms)	≤ 1/100s (10 ms)	≤ 1/100s (10 ms)
Inter-eye distance	Lower resolution may reduce accuracy	≥ 90 pixels	≥ 150 pixels	≥ 300 pixels
Frame rate	For positioning (live view)	≥ 12 fps	≥ 12 fps	≥ 12 fps
Interchange				
Format		ANSI/NIST-ITL Type-10	ANSI/NIST-ITL Type-10	ANSI/NIST-ITL Type-10

Capture	Affects	IRIS SAP Levels		
		20	**30**	**40**
Iris diameter in true, non-up-sampled pixels	Accuracy	≥140 pixel	≥170 pixel	≥210 pixel
Number of (quasi-) simultaneously captured eyes	Capture speed, search speed, accuracy	≥1	≥1	2
Exposure time	Capability to freeze motion	≤33 ms	≤15 ms	≤10 ms
Viewfinder & Image quality feedback	Rate of successful captures	External or Internal	Internal, Optical or electronic	Internal, At least electronic
Capture distance in mm	Intrusiveness, operator safety	≥100		
Capture volume per eye, minimum width / height / depth in mm	Ease of alignment	Regular devices: 11 mm / 9 mm / 20 mm for single-eye capture 19 mm / 14 mm / 20 mm for two-eye capture Device with a mechanical alignment aid: 11 mm / 9 mm / 12 mm for single-eye capture 19 mm / 14 mm / 12 mm for two-eye capture		
Imaging wavelength range and spectral spread	Dependence of accuracy on eye color	700 to 900 nm Sensitivity ≥35% the power in any 100 nm band		
Scan type	Accuracy, compressibility	Progressive		
Image margins in pixels around iris border	Accuracy	Left & right: 0.50 d Top & bottom: 0.25 d (d = iris diameter in pixels)		
Image evaluation frame rate	Time to capture and failure to acquire	≥5 frames/s		
Allowable maximum average irradiance	Relevant for eye safety	Governed by Iec 825-1 and ISO 60825-1		
Sensor signal-to-noise ratio	Recognition accuracy	≥36 db		
Interchange				
Pixel depth in 700-900 nm range	Interoperability	≥8 bits/pixel		
Format, iris	Interoperability	Raw Iso 19794-6-rectilinear ANSI/NIST-ITL Type-17		