

# **X9 REGISTRY FOR CHECK IMAGE TESTS**

## **FSTC Excessive Document Skew #013.00**

### **Check Image Test Status: A**

*Where:*

*A = Active (approved for use)*

*W = Withdrawn (not for use)*

*S = Superseded (not for use - replaced by specified test)*

### **Check Image Test Summary:**

<b>Field/ Element</b>	<b>Defined Values</b>	<b>Recommended Value</b>	<b>Data Units</b>
<b>Image Test Name</b>	FSTC Excessive Document Skew		
<b>Image Test Number</b>	013.00		
<b>Image Test Version</b>	00		
<b><i>Image Test Results (Ref. #):</i></b>			
<b>Skew Angle (R1)</b>	'-900' through '900'		Tenths of a Degree
<b><i>Image Test Parameters (Ref #):</i></b>			
<b>Negative Skew Angle Threshold (P1)</b>	'-900' through '0'	Front: -30 Rear: Not Available	Tenths of a Degree
<b>Positive Skew Angle Threshold (P2)</b>	'0' through '900'	Front: 30 Rear: Not Available	Tenths of a Degree

<b>1.0</b>	<b>Applicant Information</b>	
<b>1.1</b>	Organization Name:	<b>Financial Service Technology Consortium</b>
<b>1.2</b>	Organization Address:	<b>44 Wall St. 12<sup>th</sup> Floor New York, NY 10005</b>
<b>1.3</b>	Organization Web Site URL:	<a href="http://www.fstc.org">www.fstc.org</a>

<b>2.0</b>	<b>Image Test Description</b>	
<b>2.1</b>	<b>Image Test Name:</b>	FSTC Excessive Document Skew
<b>2.2</b>	<b>Image Test XML Name:</b>	ExcessiveDocSkew
<b>2.3</b>	<b>Image Test Definition:</b>	A defect due to the document being misaligned with camera sensor. Document skew is the angle formed in the image between the lower edge of the document and the lower edge of the image.
<b>2.4</b>	<b>Image Test Applicability:</b>	<input checked="" type="checkbox"/> <i>Front Image</i> <input checked="" type="checkbox"/> <i>Rear Image</i> <input checked="" type="checkbox"/> <i>B/W Image</i> <input checked="" type="checkbox"/> <i>Grayscale Image</i> <input checked="" type="checkbox"/> <i>Color Image</i>
<b>2.5</b>	<b>Intended Use:</b> Intended business use/ application, business context, and business impact when test fails.	<p>FSTC recommends this metric for use as part of a general system-health monitoring and image quality assurance program.</p> <p>The Excessive Document Skew metric for all check images is designed to detect occurrences of images where there is a high probability that the check data may not readable due to document being misaligned with the camera sensor. The impact of this may be:</p> <ul style="list-style-type: none"> <li>• Creation of partial images of the check due to clipping or truncating if the document is rotated out of the image camera's field of view.</li> <li>• Esthetic artifacts within the document image could create issues for image statement print applications and/or customer acceptance.</li> <li>• Even small amounts of skew can seriously impact MICR and OCR. A skew angle of 2 to 3 degrees on a typical length document can move the MICR characters out of the ASC X9.13 specified band. Similar skew angles can cause degradation of CAR/LAR.</li> <li>• Inability to create complete substitute checks.</li> <li>• Financial losses due to information being eliminated in one or more fields.</li> <li>• Information missing in customer statements, CD ROM delivery, or online viewing.</li> <li>• General customer service issues and complaints.</li> </ul>
<b>2.6</b>	<b>Possible Causes for Condition Being</b>	This defect may be due to one or more of the following problems:

	<b>Tested:</b>	<ul style="list-style-type: none"> <li>• Paper handling problems in the document transport, e.g. document feeder, transport belts/rollers. Documents may not be properly aligned in the transport track, resulting in the document being skewed as it imaged by the camera subsystem.</li> <li>• Improper alignment of the document on a flatbed scanner. If the document is being imaged using a flatbed scanner, improper alignment of the document on the scanner window will result in a skewed document image.</li> </ul>
2.7	<b>Additional (or Repetitive) Information:</b>	<p><b>Sign of Angles:</b> Rotating the check clockwise creates negative skew angles. Rotating the check counter-clockwise creates positive skew angles.</p> <p>It is recognized that in many cases, the sign of the skew angle will be opposite between the front and rear image renditions of the document because a clockwise rotation of the front of the check corresponds to a counter-clockwise rotation of the rear of the check.</p> <p><b>XML Names:</b> FSTC defined XML names as needed for its project. FSTC is not submitting these XML names, and instead requests that the RMG or X9B assign appropriate XML names and data structures for the metrics.</p> <p><b>Rounding Rule:</b> All fractional values shall be rounded to the nearest whole unit of measure when rounding is required. Fractional values of exactly ½ unit shall be rounded up.</p> <p><b>Data Ranges:</b> FSTC did not establish a formal data range for most individual metrics. Any data ranges provided are based on adjusted values used during the FSTC project.</p> <p><b>Data Range Exception Handling:</b> If a result exceeds the defined data range, the preferred handling is to truncate the result at the maximum (or minimum) value. If truncation is not implemented, then the test should fail and a result of indeterminate should be returned.</p> <p><b>Margin of Error:</b> FSTC established a margin of error for use during the FSTC Image Quality and Usability Phase 2 project. This margin of error is included in the recommendations below. It was established based on the expertise of the project’s membership, the potential for various algorithms to produce slightly different results for a given metric, and the observed precision of the results submitted during accuracy testing of metric implementations.</p> <p><b>Value Reporting:</b> The value of this metric will be reported under all image quality flag conditions. If the defect condition is “not tested” or “indeterminate”, the value of the image metric(s) reported for this defect will be set to zero (0).</p>

**2.8 Test Results Reported**

*A test result is the outcome realized from executing an image test. The outcome will typically be the observed or measured value of some attribute pertaining to the image being tested.*

*Any dependency of a test result on an image side (front or rear), image rendition (B/W, Gray, Color), or other condition shall be fully defined in the Additional Information section.*

*Data types allowed are as defined in ANS X9.100-180-2006, but are typically alphabetic, numeric, alphanumeric, signed numeric (using “+” and “-“ to denote sign), etc.*

**2.8.1 First Image Test Result (R1)**

**Test Result Name: Skew Angle**

<b>Test Result XML Name:</b>	<b>Data Type:</b>	<b>Data Units:</b>	<b>Data Range:</b>	<b>Margin of Error (in Data Units) (Where Applicable):</b>
SkewAngle	Signed Numeric	Tenths of a degree	-900 to 900	5
<b>Description:</b>	Skew measurement result for the check.			
<b>Formula and/ or Algorithm:</b>				
<b>Additional Information:</b>	See section 2.7			

<b>2.9</b>	<p><b>Test Parameters</b></p> <p><i>Examples of image test parameters are threshold values used to compute a pass/fail image test flag condition, and constant values used in a formula or algorithm to compute an image test result.</i></p> <p><i>Any dependency of a test parameter on an image side (front or rear), image rendition (B/W, Gray, Color), or other condition shall be fully defined in the Additional Information section.</i></p> <p><i>Any dependency of recommended values on an image side (front or rear), image rendition (B/W, Gray, Color), or other condition shall be fully defined in the Recommended Values section.</i></p> <p><i>Data types allowed are as defined in ANS X9.100-180-2006, but are typically alphabetic, numeric, alphanumeric, signed numeric (using "+" and "-" to denote sign), etc.</i></p>
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<b>2.9.1 First Test Parameter (P1)</b>				
<b>Test Parameter Name: Negative Skew Angle Threshold</b>				
<b>Test Parameter XML Name:</b>	<b>Data Type:</b>	<b>Data Units:</b>	<b>Data Range:</b>	<b>Recommended Value(s) (Where Applicable):</b>
NegativeSkewAngleThreshold	Signed Numeric	Tenths of a degree	-900 to 0	Front: -30 Rear: Not Available
<b>Description:</b>	This threshold represents the maximum allowable amount of negative skew of the check.			
<b>Additional Information:</b>	See section 2.7			

**2.9.2 Second Test Parameter (P2)**

**Test Parameter Name: Positive Skew Angle Threshold**

<b>Test Parameter XML Name:</b>	<b>Data Type:</b>	<b>Data Units:</b>	<b>Data Range:</b>	<b>Recommended Value(s) (Where Applicable):</b>
PositiveSkewAngleThreshold	Signed Numeric	Tenths of degree	0 to 900	Front: 30 Rear: Not Available
<b>Description:</b>	This threshold represents the maximum allowable amount of positive skew of the check.			
<b>Additional Information:</b>	See section 2.7			

<p><b>2.10</b></p>	<p><b>Image Test Flag Pass/Fail Criteria:</b></p> <p><i>The Image Test Flag (see ANS X9.100-40-1-2006 for details) will convey one of the following four test conditions:</i></p> <ul style="list-style-type: none"> <li>• <i>Condition not tested</i></li> <li>• <i>Condition tested and result = fail</i></li> <li>• <i>Condition tested and result = pass</i></li> <li>• <i>Condition tested and result=indeterminate</i></li> </ul>	<p>Results are reported independently for the Front and Rear image renditions. Selection of the threshold value corresponding to the image view (front or rear) is the responsibility of the implementer. The numbers in the parentheses in the formulae below refer to the section of this document where each result and parameter is defined.</p> <p>If condition not tested then <b>flag=not tested</b></p> <p>If condition tested then <b>flag = fail</b> if any of the following conditions is present:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Skew Angle (2.8.1)</td> <td style="text-align: center;">&lt;</td> <td style="text-align: center;">Negative Skew Angle Threshold (2.9.1)</td> <td style="text-align: center;"><b>OR</b></td> </tr> <tr> <td style="text-align: center;">Skew Angle (2.8.1)</td> <td style="text-align: center;">&gt;</td> <td style="text-align: center;">Positive Skew Angle Threshold (2.9.2)</td> <td></td> </tr> </table> <p>If condition tested and none of the fail conditions is present then <b>flag=pass</b></p> <p>If condition tested but could not determine pass or fail for any reason then <b>flag=indeterminate</b></p>	Skew Angle (2.8.1)	<	Negative Skew Angle Threshold (2.9.1)	<b>OR</b>	Skew Angle (2.8.1)	>	Positive Skew Angle Threshold (2.9.2)	
Skew Angle (2.8.1)	<	Negative Skew Angle Threshold (2.9.1)	<b>OR</b>							
Skew Angle (2.8.1)	>	Positive Skew Angle Threshold (2.9.2)								

3.0	Restrictions & Intellectual Property	
3.1	Are there any known restrictions in the use of the submitted check image test and related technology (technical, performance, legal, business, platform, etc.)?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - <i>please provide details:</i>
3.2	Are proprietary Intellectual Property (IP) rights in the form of Patents associated with the description and use of the submitted check image test?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – <i>Please provide patent and/or patent application numbers and indicate who owns the IP. Also provide evidence that the patent holder agrees to comply with the X9 Procedures including the X9 patent policy:</i>
3.3	Are proprietary Intellectual Property (IP) rights in the form of proprietary material and/or other intellectual property (e.g. specific to a vendor tool, device, or product) associated with the description and use of the submitted check image test?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes – <i>Please provide evidence that the owner agrees to provide the Proprietary IP Holder Statement contained in Annex B of ANS X9.100-40-2006 Part 2:</i>

**Notice:** By accepting a check image test for registration, ASC X9 is not endorsing, certifying validity, certifying performance, nor providing any warranty for the registered check image test. The organization using the test shall determine which test(s) to use based on their own business needs, perceived benefit, and validation/ assessment of any test results provided by the check image test supplier, their own testing, or a third party.