X9 REGISTRY FOR CHECK IMAGE TESTS

FSTC Folded Or Torn Document Edges #004.00

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W = Withdrawn (not for use)
S = Superseded (not for use - replaced by specified test)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:

Field/ Element	Defined Values	Recommended Value	Data Units
Image Test Name	FSTC Folded Or Torn Document Edges		
Image Test Number	004.00		
Image Test Version	00		
Image Test Results (Ref. #):			
Edge Fold/Tear Bottom Width (R1)	'0' through '255'		Tenths of inches
Edge Fold/Tear Bottom Height (R2)	0' through '255'		Tenths of inches
Edge Fold/Tear Left Width (R3)	0' through '255'		Tenths of inches
Fourth Image Test Result (R4)	0' through '255'		Tenths of inches
Edge Fold/Tear Top Width (R5)	0' through '255'		Tenths of inches
Edge Fold/Tear Top Height (R6)	0' through '255'		Tenths of inches
Edge Fold/Tear Right Width (R7)	'0' through '255'		Tenths of inches
Edge Fold/Tear Right Height (R8)	0' through '255'		Tenths of inches
Image Test Parameters (Ref #):	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Bottom Width Threshold (P1)	'0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Bottom Height Threshold (P2)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Left Width Threshold (P3)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Left Height Threshold (P4)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Top Width Threshold (P5)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Top Height Threshold (P6)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Right Width Threshold (P7)	0' through '255'		Tenths of inches
Maximum Edge Fold/Tear Right Height Threshold (P8)	0' through '255'		Tenths of inches

1.0	**Applicant Information**	
1.1	Organization Name:	**Financial Service Technology Consortium**
1.2	Organization Address:	**44 Wall St. 12th Floor New York, NY 10005**
1.3	Organization Web Site URL:	www.fstc.org

2.0	**Image Test Description**	
2.1	**Image Test Name:**	FSTC Folded Or Torn Document Edges
2.2	**Image Test XML Name:**	FoldedTornDocEdges
2.3	**Image Test Definition:**	A defect due to the edge of the source document being missing and/or folded in the document image rendition.
2.4	**Image Test Applicability:**	☒*Front Image* ☒ *Rear Image* ☒*B/W Image* ☒*Grayscale Image* ☒ *Color Image*
2.5	**Intended Use:** Intended business use/ application, business context, and business impact when test fails.	In general, the presence of a "folded/torn document edge" could cause one or more key data fields, present on the source document to be missing and/or obscured on the image rendition of the document. FSTC recommends this metric for use as part of a general system-health monitoring and image quality assurance program.
2.6	**Possible Causes for Condition Being Tested:**	Folded document edges. An image defect identified when a edge (upper left, upper right, lower left, lower right) of the source document has been folded, causing an area of the document image to be missing and obscured. Torn document edges. An image defect identified as a missing edge (upper left, upper right, lower left, lower right) in the source document, resulting in an area of the document image to be missing.
2.7	**Additional (or Repetitive) Information:**	The test is performed by independently measuring the width and height of any detected folds or tears along the edges of a check. Generally a torn or folded edge will not extend all the way to the opposite end of the check. Corner defects are measured separately. The measurement is calculated by creating the equivalent of a circumscribing rectangle encompassing the entire missing area of the edge. Results are reported for the width and height of the circumscribing rectangle. **Orientation**: The test is defined relative to the image as seen by an observer. The test is performed along all four edges, and these edges are referred to as Lower (or Bottom) Right, Lower (or Bottom) Left, Upper (or Top) Left, and Upper (or Top) Right. For a properly oriented face of check, these are as follows: Lower Right = Intersection of aligning and leading edge Lower Left = Intersection of aligning and trailing edge Upper Right = Intersection of top and leading edge Upper Left = Intersection of top and trailing edge

		A fold or tear is presumed to be present on both sides of the check. As a result of the test being applied to the image, the following is the mapping of a properly oriented check for the rear of the check: Lower Right = Intersection of aligning and trailing edge Lower Left = Intersection of aligning and leading edge Upper Right = Intersection of top and trailing edge Upper Left = Intersection of top and leading edge Therefore a tear on the front left edge should also be reported as occurring on the rear right edge. A tear on the front right edge should also be reported as occurring on the rear left edge. The description of the test contained within each result generally refers to the “check” under the assumption that the check is properly oriented and the measurement is relative to the side of the check being viewed/examined. The terms "aligning edge", "leading edge", and "trailing edge" are defined in ANS X9.7-1999. **XML Names**: 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. **Algorithms**: FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques. **Rounding Rule**: All fractional values shall be rounded to the nearest whole unit of measure. Fractional values of exactly ½ unit shall be rounded up. **Data Ranges**: FSTC did not establish a formal data range for individual metrics. Any data ranges provided are based on adjusted values used during the FSTC project. FSTC does not object if the RMG modifies the data ranges. **Data Range Exception Handling:** 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. **Margin of Error**: 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. **Value Reporting**: The value of the image metric(s) for this defect will be reported under all image quality flag conditions. If the defect condition is “not tested”, the value of the image metric(s) reported for this defect will be set to zero.

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: Edge Fold/Tear Bottom Width				
Test Result XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error (in Data Units) (Where Applicable):**
EdgeFoldBW	Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The width is the length of the circumscribing rectangle enclosing a tear or fold on the lower edge of the check (which would be parallel to the aligning edge in a properly oriented check)			
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.			
Additional Information:	See section 2.7.			

2.8.2 Second Image Test Result (R2)				
Test Result Name: Edge Fold/Tear Bottom Height				
Test Result XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error in Data Units (Where Applicable):**
EdgeFoldBH	Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The height is the length of the circumscribing rectangle enclosing a tear or fold on the lower edge of the check (which would be the parallel to the leading edge in a properly oriented check)			
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.			
Additional Information:	See section 2.7.			

2.8.3 Third Image Test Result (R3)				
Test Result Name: Edge Fold/Tear Left Width				
Test Result XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error (in Data Units) (Where Applicable):**
EdgeFoldLW	Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The width is the length of the circumscribing rectangle enclosing a tear or fold on the left edge of the check (which would be parallel to the aligning edge in a properly oriented check)			
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.			
Additional Information:	See section 2.7.			

2.8.4 Fourth Image Test Result (R4)					
Test Result Name: Edge Fold/Tear Left Height					
Test Result XML Name:		**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error in Data Units (Where Applicable):**
EdgeFoldLH		Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The height is the length of the circumscribing rectangle enclosing a tear or fold on the left edge of the check(which would be parallel to the trailing edge in a properly oriented check)				
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.				
Additional Information:	See section 2.7.				

2.8.5 Fifth Image Test Result (R5)					
Test Result Name: Edge Fold/Tear Top Width					
Test Result XML Name:		**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error (in Data Units) (Where Applicable):**
EdgeFoldTW		Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The width is the length of the circumscribing rectangle enclosing a tear or fold on the upper edge of the check (which would be parallel to the top edge in a properly oriented check)				
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.				
Additional Information:	See section 2.7.				

2.8.6 Sixth Image Test Result (R6)					
Test Result Name: Edge Fold/Tear Top Height					
Test Result XML Name:		**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error in Data Units (Where Applicable):**
EdgeFoldTH		Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The height is the length of the circumscribing rectangle enclosing a tear or fold on the upper edge of the check (which would be parallel to the leading edge in a properly oriented check)				
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.				
Additional Information:	See section 2.7.				

2.8.7 Seventh Image Test Result (R7)					
Test Result Name: Edge Fold/Tear Right Width					
Test Result XML Name:		**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error (in Data Units) (Where Applicable):**
EdgeFoldRW		Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The width is the length of the circumscribing rectangle enclosing a tear or fold on the right edge of the check (which would be parallel to the aligning edge in a properly oriented check)				
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.				
Additional Information:	See section 2.7.				

2.8.8 Eighth Image Test Result (R8)				
Test Result Name: Edge Fold/Tear Right Height				
Test Result XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Margin of Error in Data Units (Where Applicable):**
EdgeFoldRH	Numeric	tenths of inches	0-255	+/- 2 tenths of an inch
Description:	The height is the length of the circumscribing rectangle enclosing a tear or fold on the right edge of the check (which would be parallel to the aligning edge in a properly oriented check)			
Formula and/ or Algorithm:	FSTC does not recommend any specific algorithms. Each vendor is free to implement a metric using their own techniques.			
Additional Information:	See section 2.7.			

2.9	**Test Parameters Reported** *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.* *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.* *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.* *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.*

2.9.1 First Test Parameter (P1)				
Test Parameter Name: Maximum Edge Fold/Tear Bottom Width Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**

MaxEdgeFoldBWThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			
Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.			

2.9.2 Second Test Parameter (P2)				
Test Parameter Name: Maximum Edge Fold/Tear Bottom Height Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldBHThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			
Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.			

2.9.3 Third Test Parameter (P3)				
Test Parameter Name: Maximum Edge Fold/Tear Left Width Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldLWThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			

Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. As a result, the same edge measurement occurs on opposite sides of the image when viewing the front and rear images in proper orientation. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.

2.9.4 Fourth Test Parameter (P4)				
Test Parameter Name: Maximum Edge Fold/Tear Left Height Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldLHThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			
Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. As a result, the same edge measurement occurs on opposite sides of the image when viewing the front and rear images in proper orientation. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.			

2.9.5 Fifth Test Parameter (P5)				
Test Parameter Name: Maximum Edge Fold/Tear Top Width Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldTWThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			

Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.

2.9.6 Sixth Test Parameter (P6)				
Test Parameter Name: Maximum Edge Fold/Tear Top Height Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldTHThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			
Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.			

2.9.7 Seventh Test Parameter (P7)				
Test Parameter Name: Maximum Edge Fold/Tear Right Width Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldRWThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			
Additional Information:	The parameter is defined relative to the actual edge of the face of a right-side up document. As a result, the same edge measurement occurs on opposite sides of the image when viewing the front and rear images in proper orientation. The FSTC Image Quality and Usability Phase 2 project test with Viewpointe did not provide sufficient quantities of edge defects upon which to establish a reliable recommended default threshold.			

2.9.8 Eighth Test Parameter (P8)				
Test Parameter Name: Maximum Edge Fold/Tear Right Height Threshold				
Test Parameter XML Name:	**Data Type:**	**Data Units:**	**Data Range:**	**Recommended Value(s) (Where Applicable):**
MaxEdgeFoldRHThreshold	Numeric	tenths of inches	0-255	Front: Not Available Rear: Not Available
Description:	This number is used to compare against measurements to determine if a defect is present. See 2.10			

2.10	**Image Test Flag Pass/Fail Criteria:** *The Image Test Flag (see ANS X9.100-40-1-2006 for details) will convey one of the following four test conditions:* • *Condition not tested* • *Condition tested and result = fail* • *Condition tested and result = pass* • *Condition tested and result=indeterminate*	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. Key: B = Bottom R = Right L = Left T = Top W = Width H = Height If condition not tested then flag=**not tested** If condition tested then **flag = fail** if any of the following conditions is present: (Torn Edge Bottom Width > Maximum Edge Fold/Tear BW Threshold **and** Torn Edge Bottom Height > Maximum Edge Fold/Tear BH Threshold) **or** (Torn Edge Left Width > Maximum Edge Fold/Tear LW Threshold **and** Torn Edge Left Height > Maximum Edge Fold/Tear LH Threshold) **or** (Torn Edge Top Width > Maximum Edge Fold/Tear TW Threshold **and** Torn Edge Top Height > Maximum Edge Fold/Tear TH Threshold) **or** (Torn Edge Right Width > Maximum Edge Fold/Tear RW Threshold **and** Torn Edge Right Height > Maximum Edge Fold/Tear RH Threshold) If condition tested and none of the fail conditions is present then flag=**pass** If condition tested but could not determine pass or fail for any reason then flag=**indeterminate** Refer to specific Image Test Results and their respective thresholds (Image Test Parameters) if it is important to determine which edge or edges failed the test.

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.)?	☒ No ☐ Yes - *please provide details:*
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?	☒ No ☐ Yes – *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:*
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?	☒ No ☐ Yes – *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:*

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.*