

X9 REGISTRY FOR CHECK IMAGE TESTS

CONTROLLING SPECIFICATION: ANS X9.100-40 Parts 1 & 2

Image Test Name: IBM Dimension Mismatch
Image Test Number: 018.00
Image Test Version: 00
Image Test Status: A

Where:

A = Active (approved for use)

W = Withdrawn (not for use)

*S = Superseded (not for use -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

1	Applicant Information	
1.1	Organization Name:	IBM Corporation
1.2	Organization Address:	8501 IBM Drive MG83/202-3 Charlotte, NC 28262
1.3	Organization Web Site URL:	http://www.ibm.com

Approved by: X9 RMG for Check Image Tests March 30, 2007

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2	Image Test Description	
2.1	Image Test Name:	IBM Dimension Mismatch
2.2	Image Test XML Name:	frontbackdimensionmismatch
2.3	Image Test Definition :	A metric used to measure the size difference in hundredths of an inch between the front image of a document and the back image of the same document. Both length and height differences are tested.
2.4	Image Test Applicability: Check all that apply.	<input checked="" type="checkbox"/> <i>Front Image</i> <input type="checkbox"/> <i>Rear Image</i> <input checked="" type="checkbox"/> <i>B/W Image</i> <input checked="" type="checkbox"/> <i>Grayscale Image</i> <input type="checkbox"/> <i>Color Image</i>
2.5	Intended Use: Intended business use/ application, business context, and business impact when test fails.	This metric will report a failure if the difference in length or height of the front and back images of a document exceed a specified threshold. This metric is reported <i>only</i> for the front image of a document.
2.6	Possible Causes for Condition Being Tested:	This test will execute whenever a document is processed. This metric will be generated <i>only</i> for the front image in a document. Failures can occur if a problem occurs during the image scanning process. A failure could also occur if either image's Dots Per Inch parameter is entered incorrectly The test will fail if either the lengthdifference or heightdifference values are below the Test Threshold value.
2.7	Additional (or Repetitive) Information:	This check is performed on every image. An example of the XML output generated by IQA for this metric is shown below: <pre><frontbackdimensionmismatch compare="frontbw-backbw"> <lengthdifference> <inches>0.00</inches> <score>10.0</score> </lengthdifference> <heightdifference> <inches>0.00</inches> <score>10.0</score> </heightdifference></pre>

		<p><code></frontbackdimensionmismatch></code></p> <p>The parameters associated with this metric are used to compare the differences in length and height of an item's front and back images include thresholds that are generated by a user settable set of parameters. Details on the way in which this measurement is derived are provided in section 2.10.</p>
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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

Test Result Name: Dimension Mismatch Length

Test Result XML Name:	Data Type:	Data Units:	Data Range:	Margin of Error (in Data Units) (Where Applicable):
Lengthdifference	Numeric	Hundredths of inch		Rounding error to .005 inch
Description:	This value provides the difference in length between the front and back images of an item in units of .01 inch.			
Formula and/ or Algorithm:	This value is calculated by taking the absolute value of the difference in lengths of the front and back images of an item.			
Additional Information:				

2.8.2 Second Image Test Result

Test Result Name: Dimension Mismatch Length Score

Test Result XML Name:	Data Type:	Data Units:	Data Range:	Margin of Error (in Data Units) (Where Applicable):
score	Numeric	None	0 through 1000	

Description: This value provides the image test score for this specific item. This result is the score of the difference between the length of the front and rear images of an item when it is compared to the Length Difference threshold.

Formula and/ or Algorithm: The length of the image is processed using three user-settable values:

- Front/Back Dimension Length Mismatch LastGood
- Front/Back Dimension Length Mismatch FirstBad
- Front/Back Dimension Length Mismatch Exponent

These values used for the test are user-settable. This derived score is then compared to a user settable threshold value. If the score is below the threshold, then this test parameter measurement can cause the test to fail. If the score is greater than or equal to the threshold, then the item may pass. In order for the item to pass the document length test, the item must also pass the Dimension Mismatch Length test. Information on how the scoring is generated by IQA is shown in section 2.10.

Additional Information:

2.8.3 Third Image Test Result

Test Result Name: Dimension Mismatch Height

Test Result XML Name:	Data Type:	Data Units:	Data Range:	Margin of Error (in Data Units) (Where Applicable):
Height	Numeric	Hundredths of inch		Rounding error to .005 inch
Description:	This value provides the difference in height between the front and back images of an item in units of .01 inch.			
Formula and/ or Algorithm:	This value is calculated by taking the absolute value of the difference in heights of the front and back images of an item.			
Additional Information:				

2.8.4 Fourth Image Test Result

Test Result Name: Dimension Mismatch Height Score

Test Result XML Name:	Data Type:	Data Units:	Data Range:	Margin of Error (in Data Units) (Where Applicable):
score	Numeric	None	0 through 1000	
Description:	This value provides the image test score for this specific item. This result is the score of the difference between the height of the front and rear images of an item when it is compared to the Height Difference threshold.			
Formula and/ or Algorithm:	<p>The height of the image is processed using three user-settable values:</p> <ul style="list-style-type: none"> • Front/Back Dimension Height Mismatch LastGood • Front/Back Dimension Height Mismatch FirstBad • Front/Back Dimension Height Mismatch Exponent <p>These values used for the test are user-settable. This derived score is then compared to a user settable threshold value. If the score is below the threshold, then this test parameter measurement can cause the test to fail. If the score is greater than or equal to the threshold, then the item may pass. In order for the item to pass the document height test, the item must also pass the Dimension Mismatch Height test. Information on how the scoring is generated by IQA is shown in section 2.10.</p>			
Additional Information:	<p>This test also provides user data that informs the user of which items were tested. The possible values of this user data are:</p> <ul style="list-style-type: none"> • frontbw-backbw When the test was performed and both images were Black/White • frontbw-backgs When the test was performed on a front Black/White image and a back Grayscale image • frontgs-backgs When the test was performed with two Grayscale images • frontgs-backbw When the test was performed on a front Grayscale image and a back Black/White image 			

2.9	<p>Test Parameters Reported</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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2.9.1 First Test Parameter				
Test Parameter Name: Test Threshold				
Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	None	0-1000	
Description:	This reported parameter is the threshold used to make the pass/fail decision. This value is settable by the user. If the calculated "score" is greater than or equal to the threshold, the test passes. If the "score" is lower than the threshold, the test fails.			
Additional Information:	This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution. The value may be set to any floating point value between 0 and 10.0 by the user. In reporting this parameter, the value is multiplied by 100 and converted to an integer.			

2.9.2 Second Test Parameter

Test Parameter Name: Front/Back Dimension Length Mismatch Last Good

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	.01 inches		

Description: This is the Last Good value utilized in the evaluation ("*scoring*") of the difference in length of an item's front and back images.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution.

2.9.3 Third Test Parameter

Test Parameter Name: Front/Back Dimension Length Mismatch First Bad

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	.01 inches		

Description: This is the First Bad value utilized in the evaluation ("*scoring*") of the difference in length of an item's front and back images.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution.

2.9.4 Fourth Test Parameter

Test Parameter Name: Front/Back Dimension Length Mismatch Exponent

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	None		

Description: This is the value that controls the shape of the “line” between the **Front/Back Dimension Mismatch First Bad** and **Front/Back Dimension Mismatch Last Good** parameters. The IBM IQA product stores this value internally as a floating point number. In reporting this parameter, the value is multiplied by 10 and converted to an integer. See section 2.10 for further descriptions.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution. The value may be set to any floating point value between 0 and 10.0 by the user. In reporting the value for this parameter, the value used internally is multiplied by 10 and converted to an integer.

2.9.5 Fifth Test Parameter

Test Parameter Name: Front/Back Dimension Height Mismatch LastGood

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	.01 inches		

Description: This is the Last Good value utilized in the evaluation (“scoring”) of the difference in height of an item’s front and back images.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution.

2.9.6 Sixth Test Parameter

Test Parameter Name: Front/Back Dimension Height Mismatch First Bad

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	.01 inches		

Description: This is the First Bad value utilized in the evaluation (“scoring”) of the difference in height of an item’s front and back images.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution.

2.9.7 Seventh Test Parameter

Test Parameter Name: Front/Back Dimension Height Mismatch Exponent

Test Parameter XML Name:	Data Type:	Data Units:	Data Range:	Recommended Value(s) (Where Applicable):
	Numeric	None		

Description: This is the value that controls the shape of the “line” between the **Front/Back Dimension Height Mismatch First Bad** and **Front/Back Dimension Height Mismatch Last Good** parameters. The IBM IQA product stores this value internally as a floating point number. In reporting this parameter, the value is multiplied by 10 and converted to an integer. See section 2.10 for further descriptions.

Additional Information: This value corresponds to the value that the user sets in the IBM IQA profile that is active for this test execution. The value may be set to any floating point value between 0 and 10.0 by the user. In reporting the value for this parameter, the value used internally is multiplied by 10 and converted to an integer.

2.10 Image Test Flag Pass/Fail Criteria:

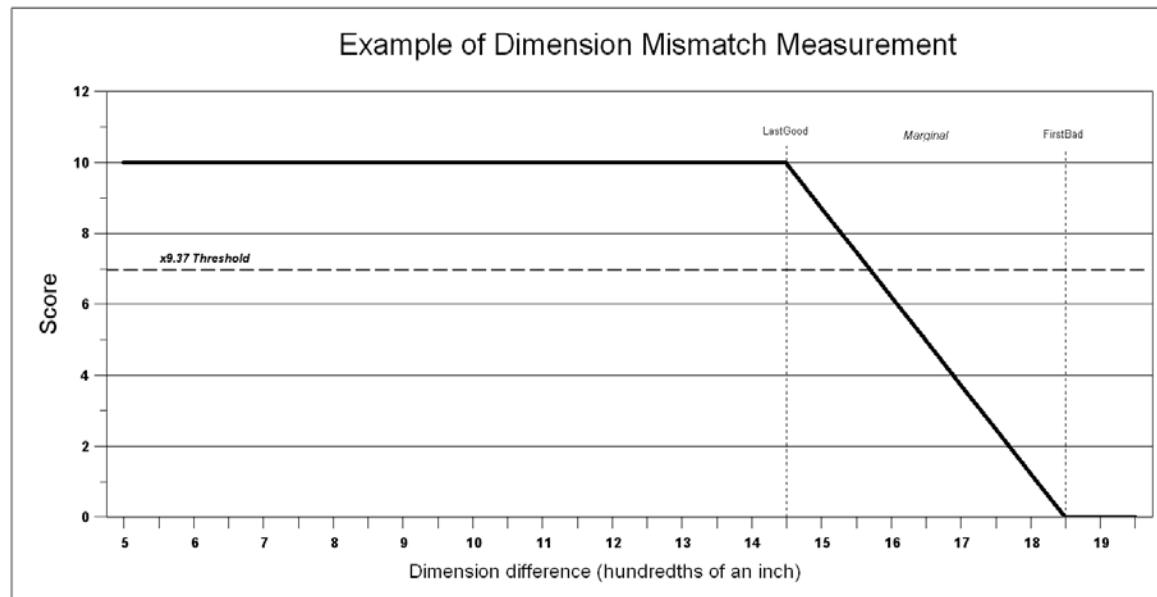
The Image Test Flag (see ANS X9.100-40-1-2006 for details) will convey one of the following four test conditions:

- Condition not tested
- Condition tested and result = fail
- Condition tested and result = pass
- Condition tested and result=indeterminate

The software will *always* report this result. There will be two possible results:

- *Condition tested and result = fail*
This test will **fail** when the size of the image being tested is outside the range of previously determined good values. The values are variable and are settable by the user.
- *Condition tested and result = pass*
This test will **pass** when the size of the image being tested is within the range of previously determined good values

The chart below shows the way in which the test score is derived.



In the chart above, the items that the user can set are:

- X9.37 threshold (set to 7.0 in this example)
- LastGood (set to 14.5 in this example)
- FirstBad (set to 18.5 in this example)
- The Exponent in this case (which controls the shape of the line between the LastGood and FirstBad parameters) is set to '1'.
- Any item that has a height of between 3.85 inches and 7.80 inches will pass the test with the given parameters. The test will be scored as a "pass" whenever the image size is within the passing region.

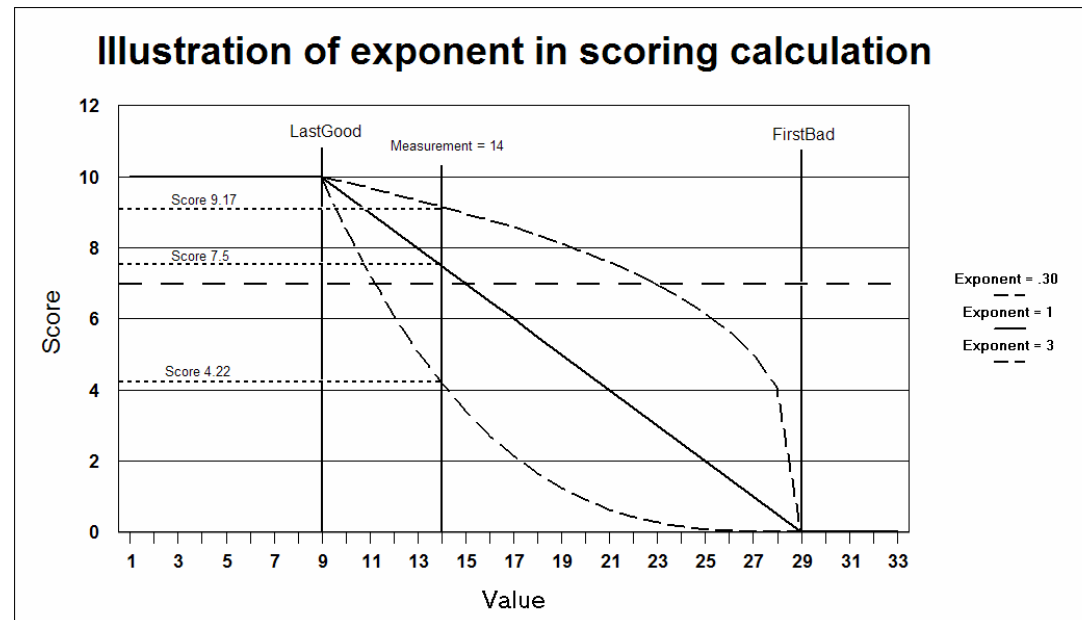
In addition to the items shown above, the shape line between the LastGood and FirstBad elements may be set by

the Exponent value.

The “Last Good” parameter is the point beyond which the judgment of the measurement results begins to decrease from a “10.0”. The “First Bad” parameter beyond which the measurement results will be a “0.0”. The “direction” from “Last Good” to “First Bad” is determined by the relative size of the two parameters. If the “LastGood” is less than “First Bad”, then the score will get worse as its measurement grows from the “LastGood” measurement point. If “FirstBad” is less than “LastGood”, then the score will get better as its measurement grows from the “FirstBad” measurement point.

The scoring of items with values that fall between the relevant “LastGood” and “FirstBad” values is performed in two steps:

- The first step generates the preliminary score, which is a linear interpolation between the LastGood and FirstBad elements. This preliminary score is normalized to a value of between 0 and 1.
- After the preliminary score is calculated, it is finalized by raising that score to the value of the Exponent and multiplied by 10 to yield the final result. This results in a curved shape of the score. An example of this scoring method is shown in the following diagram:



		<p>For this example, we have a “LastGood” value of 9 and a “FirstBad” value of 29. If the user selects an exponent value for this measurement of ‘1’, we see the linear slope between the “LastGood” point and the “FirstBad” point. If the exponent is other than 1, we see an exponential curve between the two points. For this particular example, with a measured value of 14, we score the result as 9.17 with an exponent value of .3. It scores as a 7.5 with an exponent value of 1, and it scores 4.22 with an exponent value of 3. If the score value is at or above the x9.37 Threshold value of 7, then the test is graded as a “pass”. If the score value is below the x9.37Threshold, then the test is graded as a “fail”.</p>
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3	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.