

This document is an example of the criteria CGI adheres to in terms of accuracy and repeatability. Some of the tests may be changed given the Customer's desire for IFRA versus SNAP testing.

CGI ACCEPTANCE TESTING AND CRITERIA

CGI Digital Inking System

Introduction

The equipment will be accepted when it is shown to have met the stated criteria for acceptance within the procedure described in this document.

The Customer is responsible for ensuring the existing press units are in a fit condition to enable the testing of the new Equipment.

This document is sub-divided in a series of sections, each one, dealing with a particular issue:

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|------------------|--|
| Section 1 | Test Conditions |
| Section 2 | General Terms and Test Certificate |
| Section 3 | Unit Print Quality <ul style="list-style-type: none">• Ink Density tests• Litho Tests• Closed loop color registration systems |
| Section 4 | Performance Acceptance |
| Section 5 | Manufacturing Specifications |

The testing procedure and qualitative criteria generally conform to the principle of SNAP and/or IFRA Special Report 3.16.2 (Guidelines for Specifying, Commissioning and Acceptance Testing of a Newspaper Offset Rotary Press).

SECTION 1

TEST CONDITIONS

All Acceptance Tests referred to in this document are subject to the following conditions:

- 1) The Acceptance Tests conducted shall be only those specified in this document.
- 2) The Acceptance Tests shall be organized and scheduled by Seller and carried out by Seller's personnel with the assistance of Buyer's personnel and in the presence of Buyer's nominated representative.
- 3) The qualitative Criteria for Acceptance are strictly press related (CGI's schedule of supply and specifications) and the attainment **will be dependent** on quality, grammage, condition and characteristics of the newsprint, the accuracy of the printing plates processing, the quality of the **INK** and dampening solution and environmental conditions such as temperature.
- 4) All materials and products used for the conduct of any Acceptance Test shall be provided by Buyer at Buyer's cost. Such materials and products shall be subject to the Seller's reasonable approval. Buyer and Seller mutually agree to evaluate alternative materials preferably with same suppliers as presently used if currently used materials fail to meet the required test criteria.
- 5) All newsprint used for the conduct of any Acceptance Test should be the standard newsprint currently in use by the Buyer in the press operation.
- 6) To avoid any confusion between collect and straight running speeds, all speed's quoted in this document refer to printing cylinder revolutions per hour, hereafter rev /hr will be used.
- 7) Where maximum press speed is referenced, this speed is the minimum of the following speeds:
 - Contract specific Maximum press speed as indicated in contract.
 - Maximum press speed up to and including 70,000 IPH (35,000 cylinder rev./hr)
- 8) Densitometer and other measurement devices will be calibrated and validated by Buyer and Seller before any acceptance tests. Densitometer tolerances will be taken into account for the test evaluation.

SECTION 2

GENERAL TERMS AND TEST ACCEPTANCE CERTIFICATE

1. Buyer shall compile an Acceptance Test Report detailing the test results. When the Equipment has shown to have met the Criteria for Acceptance the Seller shall issue to the Buyer a Certificate that shall state the date upon which the Criteria for Acceptance was achieved, and Seller shall ask the Buyer to acknowledge its' agreement by signing said Certificate. A draft of this Certificate of Acceptance is added at the end of this Section.
2. If by reasons of difficulties encountered by the Buyer, whether or not covered by Force Majeure, other than fault of Seller, it becomes impossible or impractical to proceed with the Acceptance Tests, these shall be postponed for a period not exceeding two months from the date when the readiness for the Acceptance Tests was notified by the Seller and the following provisions shall apply:
 - a) At the appropriate time, the Buyer shall give notice in writing to the Seller stating the earliest date on which the Acceptance Tests may be carried out and requesting Seller to fix a date for such Acceptance Tests. Such date shall be within such period as is reasonable with regard to all the circumstances for the case;
 - b) The Seller may, at the cost of the Buyer, examine the Equipment before making the Acceptance Tests and make good any deterioration or deficiency therein that may have developed after the date when the Equipment was first ready for Acceptance Tests in accordance with the Contract;
 - c) If at the end of the said two months if the Acceptance Tests have not taken place, due to Buyer insufficiencies, the Equipment will be deemed to have been accepted.
3. If after the above Acceptance Tests the Buyer and the Seller cannot agree as to whether the Equipment has met any or all of the Criteria for its Acceptance, the Buyer and Seller shall promptly attempt in good faith to agree on the appointment of a mutually acceptable and qualified expert, to advise and assist them. The expert will act as an expert and not as arbitrator, to resolve their differences. The costs incurred for hiring the qualified expert shall be shared equally.

CERTIFICATE OF ACCEPTANCE

CONTRACT REFERENCE

DATED

This Certifies that the Acceptance Criteria relating to the Equipment supplied under the above Contract has been satisfied in the Acceptance Tests and that the Equipment is deemed Accepted as of the date hereof. On issue of this Certificate, the Buyer shall release whatever payment is due as specified in the Contract.

Issued by:

On behalf of Buyer

Date

Acknowledged by:

On behalf of Seller

Date

SECTION 3

UNIT PRINT QUALITY

Each press unit will be tested in accordance with the procedures and criteria described in this section.

To simplify the testing process, the tests are divided into two phases:

Phase 1 Ink Density Tests Comprising:

- Test 1 Ink Presetting
- Test 2 Density Repeatability
- Test 3 Density Stability on Press Acceleration
- Test 4 Density Stability of Press Deceleration
- Test 12 Ink Density Control
- Test 13 Ink Density Uniformity

Phase 2 Litho Test Comprising:

- Test 11 Dot Gain & Starvation

Description of Tests

Phase 1 Ink Density Tests

Test 1 Ink Presetting (When specified)

Test Objective	To assess the accuracy of calibration of the ink presetting system.
Test Plates	SNAP and/or IFRA Test Form No.2 at all page locations.
Test Speed	15,000 revs/hr
Test Duration	There is no time limit to this test.
Sampling	8 Consecutive Impressions.
Measured Samples	2 consecutive impressions from the 8 samples.
Measurement Positions	Four points in horizontal direction per page per color.
Evaluation	Accuracy of density profile of each individual color relative to target values. The density profiles are established from the average of two consecutive impressions.

Test 2 Density Repeatability

This test will be conducted on one unit only

Test Objective	To assess the influence on print density when ink controls are adjusted by $\pm 20\%$ then returned to original settings.
Test Plates	IFRA Test Form No.2 at all page locations
Test Speed	15,000 revs/hr
Test Duration	There is no time limit to this test
Sampling	8 consecutive impressions at each test stage
Measured Samples	2 consecutive impressions from the 8 samples at each test stage
Measurement Positions	Four points in horizontal direction per page per color
Evaluation	For each color the deviation in density profile across the web between the start values and the values when returned to original settings; with each density profile being an average of two consecutive impressions.

Tests 3 & 4 Density stability on speed change

Test 3 Density Stability on Press Acceleration

Test 4 Density Stability on Press Deceleration

Test Objective	To assess the variation in ink density following a change in press speed.
Test Plates	IFRA Test Form No.2 at all page locations
Test Speed	Test 3: From speed defined in test 1 to maximum press speed in stages of 5000 revs / hr. Test 4: From maximum press speed to speed defined in test 1, in intervals of 5000 revs /hr.
Test Duration	There is no time limit to this test
Sampling	8 consecutive impressions at each test speed.
Measured Samples	2 consecutive impressions from the 8 samples at each test speed.
Measurement Positions	Four points in horizontal direction per page per color
Evaluation	For each individual color, comparison of density profile across the web at each of the test speeds defined under tests 3 & 4. Each density profile being an average of two consecutive impressions.

Phase 2 Litho Tests

Test 11 Dot Gain/Ink Starvation

Test Objective	To establish dot gain characteristics (Tone Reproduction Curve) and ink starvation values relative to the printing materials and press settings.
Test Plates	IFRA Test Form No.1 at near side and far side page locations
Test Speed	15,000 revs/hr
Test Duration	There is no time limit to this test
Sampling	8 consecutive impressions
Measured Samples	2 consecutive impressions

Measurement Position Respective dot gain and ink starvation patches

Evaluation

Dot Gain:

Maximum dot gain from densitometer readings of the average of two consecutive impressions at the near side and far side page locations.

Dot gain must be defined as press only. Plate gain will be measured and subtracted out.

Press only dot gain (optical & mechanical) must equal current customer equipment (+/- 3%).

Ink Starvation:

Difference in densitometer reading 15 mm into starved and non-starved areas, averaged over two consecutive impressions at the near side and far side page locations. The positions for each pair of readings must be in the same ink column.

The performance power of the ink train to manage side-by-side vertical/horizontal T Bar image density comparisons. The density between the vertical and adjacent horizontal reading must not exceed but should maintain similar density within .20.

There should be no evidence of ghosting or latent images transferring from roller or blankets on to printed page.

Test 12 Ink Density Control

Test Objective To assess minimum ink capability of digital inkers during consistent operating conditions (constant press speed of 55,000 iph).

Evaluation A small black grid pattern containing ¼” solid color squares will be used to determine minimum density control within standard SNAP specification. Densities of the solid color squares must be achieved by +/- .05 of the standard densities (c, m, y = 0.9, k = 1.05).

Test 13 Ink Density Uniformity

Test Objective To assess uniformity of circumferential in-line column density from trail edge to head of the page during consistent operating conditions (constant press speed of 55,000 iph).

Evaluation Text only content shall maintain a maximum +/- .05 density difference. Solids combined with text shall maintain a maximum +/- .05 density difference.

Test Procedures

The print quality tests will be conducted in accordance with the following procedures as depicted in diagrams 1 and 2.

PHASE 1 INK DENSITY TESTS

Preparation The Master Ink and Dampener Controls and all couple and page trims to be set to zero position.

Set folder to collect mode of operation

Enter product data into Press Control System and download preset values relative to ink, dampener, sidelay and circumferential register and cut-off register. (if specified)

Ensure a full reel of newsprint is loaded in the reelstand.

Install IFRA No.2. plates at all page locations

TEST 1 Run the press at the speed defined in the test description.

Allow 3 minutes to stabilize and take 4 consecutive copies.

Mark copies 1.1

TEST 2

At constant speed (defined in test description), adjust (if necessary) all ink keys across the printing couple to the same value to achieve an average density value within the range.

Cyan	0.85 - 0.95
Magenta	0.85 - 0.95
Yellow	0.80 - 0.90
Black	1.00 - 1.10

Allow 3 minutes after final adjustment for stabilization and take 4 consecutive copies.

Mark Copies 2.1

Adjust ink key values by +20% using full-page control for each page location
Allow 3 minutes after final adjustment for stabilization and take 4 consecutive copies.

Mark Copies 2.2

Adjust ink key values by -40% using full-page control for each page location
Allow 3 minutes after final adjustment for stabilization and take 4 consecutive copies.

Mark Copies 2.3

Adjust ink key values by +20% to original settings using full-page control for each page location

Allow 3 minutes after final adjustment for stabilization and take 4 consecutive copies.

Mark Copies 2.4

TEST 3

Increase press speed by 5000 revs/hr as defined in test description.

Adjust ink keys if necessary to achieve even density across the web to within previous stated values.

Allow 3 minutes for stabilization and take 4 consecutive copies.

Mark Copies 3.1

No further ink adjustments are permitted

Increase press speed in stages as defined in test description, until maximum press speed.

Allow 1 minute for stabilization at the first two stages then take 4 consecutive copies. These are copies for reference only.

Mark Copies 3.2, 3.3

Allow 3 minutes for stabilization at maximum press speed then take 4 consecutive copies.

Mark Copies 3.4

TEST 4 Take a further 4 consecutive copies at maximum press speed.

Mark Copies 4.1

Decrease press speed in stages as defined in test description.

Allow 1 minute for stabilization at each stage, then take 4 consecutive copies.

These copies are for reference only.

Mark Copies 4.2, 4.3

Allow 3 minutes for stabilization at 15,000 revs/hr of maximum speed then take 4 consecutive copies.

Mark Copies 4.4

Stop the press and remove printing plates.

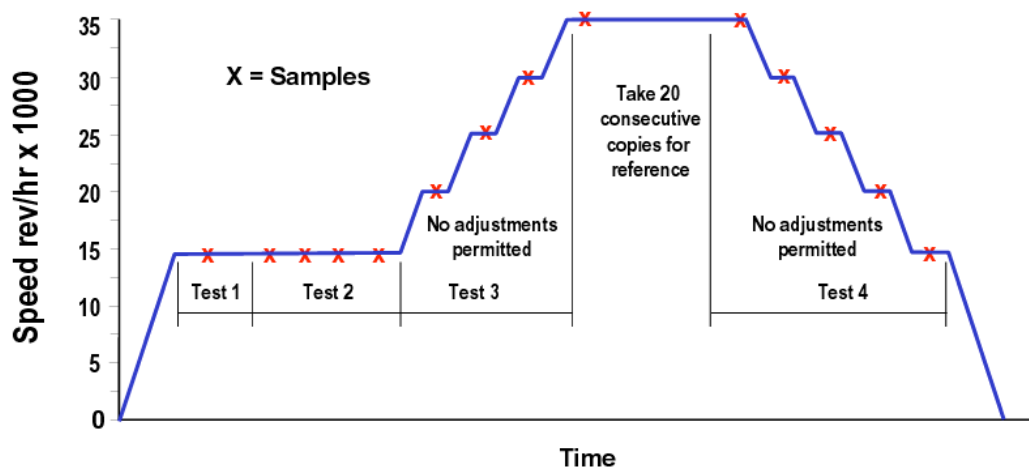


DIAGRAM 1 PHASE I INK DENSITY TESTS

PHASE 3 LITHO TESTS

Preparation Install IFRA Test Form No.1 plates at the near side and far side page locations.

TEST 11 Run the press at a constant speed of 15,000 revs / hr.

Adjust ink key values at near side and far side page locations to achieve an even density across each page to within the following values

Cyan	0.85 - 0.95 ODU
Magenta	0.85 - 0.95 ODU
Yellow	0.80 - 0.90 ODU
Black	1.00 - 1.10 ODU

Special attention is to be given to the density values at the 100% dot gain patches.

Take 4 consecutive copies.

Mark Copies 11.1

Stop the press and remove all plates.

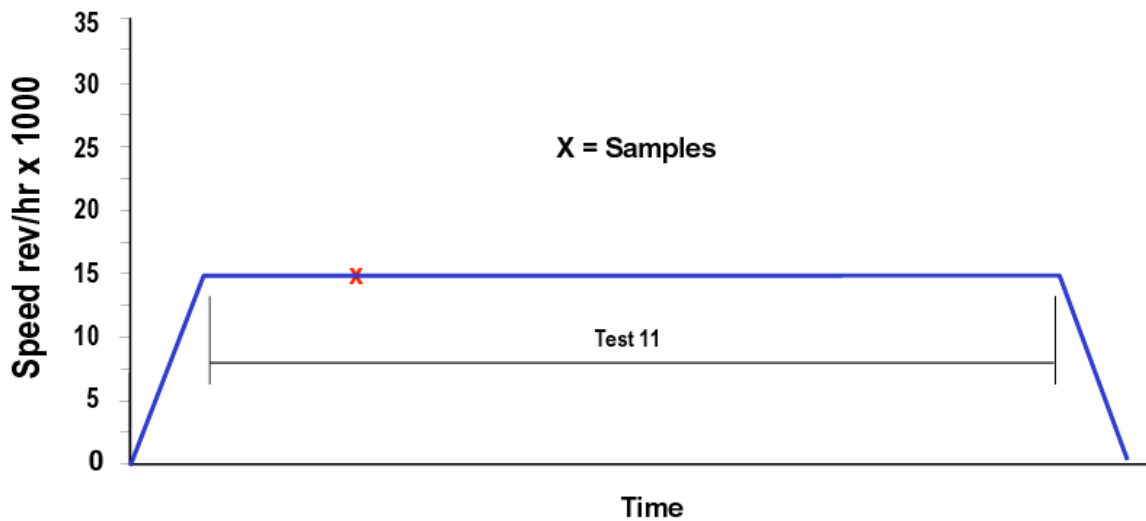


DIAGRAM 2 - PHASE 2 LITHO TESTS

UNIT ACCEPTANCE CRITERIA

Each printing unit shall be acceptable in terms of print quality when it can be shown to have complied with the criteria stated in this document.

Inking system acceptance with digital ink packs

TEST 1 INK PRESETTING

Accuracy of mean density profile across the web	$\pm 0.10D$
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TEST 2 DENSITY REPEATABILITY

Deviation in density profile not to exceed	0.10D
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TEST 3 DENSITY STABILITY ON PRESS ACCELERATION

Deviation in density profile not to exceed	$\pm 0.10D$
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TEST 4 DENSITY STABILITY ON PRESS DECELERATION

Deviation in density profile not to exceed	$\pm 0.10D$
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TEST 11 LITHO TESTS

Maximum Dot Gain (100 lpi Screen) (Murray Davies formula with N Factor = 1.00) Ink Starvation shall not exceed	27% \pm 3% Press only 0.20 ODU
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TEST 6 COLOR REGISTER REPEATABILITY - with closed loop register control

Accuracy of repeatability	Circumferential	± 0.10 mm (± 0.004 ")
	Sidelay	± 0.10 mm (± 0.004 ")

TEST 7 REGISTER STABILITY - PRESS ACCELERATION with closed loop register control

Maximum movement of magenta/Yellow or Black relative to Cyan shall not exceed	Circumferential	± 0.15 mm (± 0.006 ")
	Sidelay	± 0.10 mm (± 0.004 ")

TEST 8 COLOR REGISTER ACCURACY - MAXIMUM PRESS SPEED with closed loop register control

Maximum error of Magenta, Yellow or Black relative to Cyan, shall not exceed	Circumferential	± 0.15 mm (± 0.006 ")
	Sidelay	± 0.10 mm (± 0.004 ")

TEST 9 COLOR REGISTER STABILITY - MAXIMUM PRESS SPEED with closed loop register control

Maximum movement of Magenta, Yellow or Black relative to Cyan shall not exceed	Circumferential	± 0.10 mm (± 0.004 ")
	Sidelay	± 0.10 mm (± 0.004 ")

TEST 10 REGISTER STABILITY - PRESS DECELERATION with closed loop register control

Maximum movement of Magenta, Yellow or Black relative to Cyan shall not exceed	Circumferential	± 0.15 mm (± 0.006 ")
	Sidelay	± 0.10 mm (± 0.004 ")

ACCEPTANCE TEST FORMS FOR UNITS

The Print Quality testing procedure utilizes three test forms identified as:

Ifra Test Form No.1	This test form is used to establish the litho characteristics of the press and test materials (Test 11).
Ifra Test Form No.2	This test form is used for all ink density tests (Tests 1-4)
Ifra Test Form No.1	This test form is used for all color registration (with vernier scales) tests (Tests 5-10)

The following is a brief description of the elements on each test form:

TEST FORM NO.1

Element 1	Located at the side of the test form, The Slur and Dot-doubling element has a 1001 pi screen ruling and a line width of 40%. It is meant as a quality control check for the printing of the test form. When printed without filling-in, without excessive gain and with an even density, confirms the mechanical settings of the press equipment are correct.
Element 2	A solid Vertical Color Bar is provided for each color. The purpose of these bars is to provide a measurement point at the top for comparison with the respective horizontal color bar. Poor ink distribution or ink replenishment will produce a marked difference between the two density readings.
Element 3	A Horizontal Color Bar is provided for each color. These bars are for the purpose of measuring ink starvation in combination with the respective vertical color bar.
Element 4	For each printing color, a calibrated stop wedge is provided for the purpose of measuring Dot Gains.
Elements 5 & 6	The Vernier Scale target is a means of quantifying the degree of mis-register between any two colors. In the four color printing process, the relative register position between the four colors is achieved by analyzing three colors individually against a color common to all three (Cyan). Vernier Scale targets are provided for the circumferential and sidelay directions.
Elements 7 & 8	The Fold Register Guides are a millimeter scale used to monitor the relative changes in the position of the former and cylinder folds of the copy.
Element 9	The Information Box permits printed samples to be marked for identification and record purposes.

TEST FORM NO.2

Element 10	A solid Horizontal Color Bar is provided for each color and used for densitometry measurement of the evenness of density across the page.
Element 11	A Solid Area blocks are arranged to provide an even density coverage across the page for each color. These solid blocks are used as the measurement positions for all density tests.

TEST FORM NO.2 (with vernier scales)

This test form incorporates Elements 10 and 11 described under Test Form No.2 and Element 5 described under Test Form No.1

SECTION 4

PERFORMANCE ACCEPTANCE

Performance Acceptance should warrant that the equipment, when completely installed on a given press line, exceeds the performance parameters levels achieved on that press line (straight mode, double delivery mode, and collect mode) in the quarter before the installation. The performance parameters to be considered are listed below:

- Improved inking levels on presets and initial start-ups.
- Ink consistency throughout the Press Operation.
- Cold and Hot Start Printed Waste

SECTION 5

MANUFACTURING SPECIFICATIONS

Manufacturing Specifications warrant that all supplied equipment meets or exceeds CGI manufacturing specifications. CGI should supply installed equipment-manufacturing specifications.

All new equipment should exceed performance capabilities of existing inking system.