

Introduction:

When inks are used on a two-colour offset printing press the second ink film is printed over the first ink film while it is still completely wet. For multi colour presses the same can be said for the other colours. In order to do so the inks have to be trapped on tack and/or viscosity. The systems for measuring tack and/or viscosity measure these ones as it is in the tin, without the influence of absorption by the paper.

On the printing press, as soon as the ink is printed on the paper the low viscosity components of the ink will penetrate into the paper and the viscosity and tack of the ink will increase rapidly.

The longer the ink is on the paper, the bigger this increase of viscosity and tack will be. The time interval between individual prints differs considerably in various types of presses. In practice these interval times are between about 0.03 and 3 s. For proper adjustment of ink for wet-on-wet printing a printability tester is essential, operating from very short time intervals upwards.

Although in practice water is used and an emulsion is formed, this method gives very good results for testing wet-on-wet printing. The method can be used to test inks and paper as well.

There are 2 methods:

W46 for a printing form with coated rubber of 85 Shore A for smooth papers.

W69 for a printing form with coated rubber of 65 Shore A for smooth and rather rough papers (described in this leaflet).

Principle:

A set of two colours of offset inks is printed on each other on paper in both the colour sequences and with different interval times. The results are observed visually or with the help of a densitometer. The best print quality and the best ink transfer show the right colour sequence.

Also for a four colour series of offset inks the inks always must be tested in sets of two colours.

With the AIC2-5T2000 the tests are carried out with 2 interval times on one strip.

With the Global Standard Tester it is possible to make the trials with 2, 4 or 10 different interval times on one test strip. With the settings for 2 interval times it is possible to work with the very short interval times. In most of the cases the short interval times of 0.1, 1 and/or 3 s will be used. This can be realized in the mode of 2 fields at 1 m/s.

If the test is used to test inks, it is advised to use the art paper, IGT code Ka APCO II/II.

Method of operation:

- It is recommended to execute the test in the standard atmosphere; to most standards it is 23.0 ± 1.0 °C (73.4 ± 1.8 °F) and $50 \pm 2\%$ rh.
- For the operation of the AIC2-5T2000, Global Standard Tester, High Speed Inking Unit 4 and ink pipette follow the instructions of the manuals, IGT information leaflet W100 and the displays accurately.
- Handle the samples carefully.

Preparation

- 1) Condition the papers, inks and equipment during >6 hours in the standard atmosphere.
- 2) If necessary cut the paper strips (preferable 55 x 320 mm, 4 - 6 strips per set of inks) and mark them with top and/or bottom side, machine and/or cross direction and a code for the type of paper.
- 3) For AIC2-5T2000 only:
 - 1) Adjust the printing force for both printing disc shafts to 625 N and pay attention for the right backlash for both shafts. See W100. NOTE: This type of printing disc (ø 66 mm) is not the standard type for the AIC2-5T2000; for that reason the backlash must be adjusted.
- 3.1 Adjust the printing speed to 1 m/s in the constant speed mode (□).
- 3.2 Adjust the desired interval time.

IGT Information leaflet W69 WET ON WET PRINTING (rubber 65 Shore A) IGT AIC2-5T2000, Global Standard Tester 2

Version : July 2006

Materials / testing conditions

| | | |
|----------------------------------|---|--------------------------------|
| 1 | IGT AIC2-5T2000 or IGT Global Standard Tester 2 | 710.000.000 412.000.000 |
| 2 | IGT High Speed Inking Unit 4 | 466.000.710 (466.003.003) |
| 3 | (Top roller with 4 segments for conventional inks) | |
| 4 | IGT ink pipette (2x) | 408.000.200 |
| 5 | Printing disc with coated rubber, 65 Shore A, 50 mm, ø 66 mm (2x) | 402.087 |
| 6 | Strips of art paper, code Ka, 55 mm | 404.009.025 |
| 7 | If necessary strips of paper to be tested (55 x 340 mm, 4-6 strips per set of inks) | |
| 8 | Inks to be tested | |
| 9 | Densitometer (if required) | |
| 10 | Lint free rags | |
| 11 | Cleaning naphtha | |
| Printing force | | 625 N |
| Printing speed | | Constant, 0.2 or 1m/s |
| Interval times between 2 colours | | at choice |
| Ink film thickness (volume) | | 2.4 µm (0.10 cm ³) |

- The numbers 1 thru 6 are available at IGT Testing Systems.
- The numbers 5 thru 6 can be obtained as Wet-on-wet Printing Set for AIC2-5T2000 and GST2, article number 485.000.710.069.
- *This leaflet contains article numbers per January 1st, 2006* ◀

4. For GST 2 only:
 - 4.1. Select the menu "Wet-on-wet" in the display.
 - 4.2. Select the submenu for 2, 4 or 10 fields:
 - "2 fields" for a test strip with 2 different interval times (printing speed 1 m/s)
 - "4 fields" for a test strip with 4 different interval times (printing speed 1 or 0.2 m/s)
 - "10 fields" for a test strip with 10 different interval times (printing speed 0.2 m/s)
 - 4.3 Adjust the desired interval time. See W100.
 - 4.4 For the menu 4 interval times only: Set the printing speed on 0.2 or 1 m/s. NOTE: To compare to the results of the menu with 2 interval times the speed must be 1 m/s and to compare with the menu with 10 interval times 0.2 m/s.
 - 4.5 For the menu 4 and 10 interval times only: take off the brush from the tester to prevent contact of the brush with the printed ink film on the substrate.



Fig. 2: wet-on-wet printing on GST2

5. Check the functioning of the tester following the instructions in the chapter "Execution".
6. Fill the ink pipettes with the inks to be tested.
7. Adjust the High Speed Inking Unit with the following settings:
 - Water bath: 23.0° C (73.4° F)
 - Top roller: 4-segmented, rubber for conventional inks
 - Mode: 2
 - Starting time: 5 s
 - Distribution time: 10 s
 - Distribution speed: 1.2 m/s
 - Inking time printing discs: 5 s
8. Check the functioning of the High Speed Inking Unit.

Execution

1. Adjust the interval time(s) in the display. See W100.
2. Attach a test strip on the sector.
3. For GST2 (4 and 10 interval times) only: fasten the end of the test strip on the sector with tape.
4. Apply 0.10 cm³ of both inks to two separate segments of the top roller of the inking unit and distribute the inks. NOTE: This volume is an indication if art paper IGT code Ka APCO II/II) is used. NOTE: It is not advised to add some ink after a test.
5. Place the printing discs on the printing disc shafts of the inking unit and ink the discs during the preset time.
6. Take the discs from the inking unit and place them on the printing disc shafts of the tester: the 1st colour at the top shaft and the 2nd colour at the bottom shaft.
7. Make a print. See W100. NOTE: if the menus for 4 or 10 interval times of the GST2 are used, a print of the single colours must be made as well.
8. Take off the printed paper strip from the sector.
9. Remove the printing discs from the tester and clean them with the rags and naphtha.
10. Clean the rollers of the inking unit or use the next segments for the following test.
11. Repeat the points 2 thru 10 for the next test strip in the opposite colour sequence.
12. Examine or measure the results as pointed out in the chapter "Assessment".
13. If desired, repeat the points 1 thru 12 for other interval times.
14. Repeat the points 1 thru 13 for the other types of ink or paper.
15. After having finished the tests, clean and store all parts as described in the manuals.
16. Make an accurate record of the conditions and the results of the test.



Fig. 2: wet-in-wet prints with 2, 4 and 10 fields

Assessment

See figure 3.

1. VISUALLY
Judge the differences between the prints for different interval times of both colour sequences.
The colour sequence with the smallest difference between the prints of different interval times is the best colour sequence.

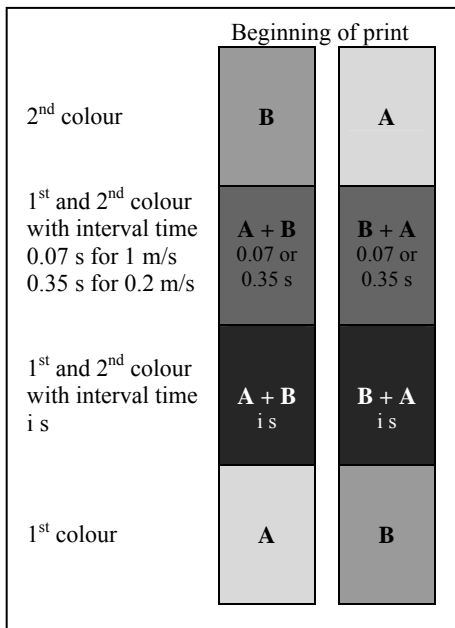


Fig. 3 Wet-on-wet printing with 2 fields

2. DENSITOMETRICALLY

- 2.1. After > 4 hours after making the print measure the contrast density of all parts (both single colours and both colours) of the strips with the densitometer set for the 2nd colour.
NOTE: Calculate the average of the measured densities per part.
- 2.2. Calculate the % of ink transfer with the formula:

$$F = \frac{D_{(1+2)} - D_1}{D_2} \times 100 \%$$

In which: D₍₁₊₂₎ = density of both colours together
 D₁ = density of 1st colour
 D₂ = density of 2nd colour
- 2.3. The highest % of ink transfer is the best colour sequence.

Notes:

1. The test results of the AIC2-5T2000, AIC2-5 and Global Standard Tester 2 compare well with one another on the condition that the tests have been carried out under the same testing conditions.

► In comparison to older IGT leaflets, this leaflet is valid for the AIC2-5T2000 and Global Standard Testers as mentioned

This information leaflet has been compiled with the utmost care. However, may you find any inadequacies or if there are any comments, we kindly request you to send these to IGT Testing Systems, Sales Department.