

Introduction

Many times paper is printed on both sides. The ink penetrates into the paper from the one side to the other side. When the ink penetration into the paper is very strong the ink can be visible at the other side and reading the printed matter at the other side can be disturbed. In this case we speak about striking through. This phenomenon can be tested with the print through or striking through test.

The leaflet describes two methods:

- W43: Printing disc with rubber of 85 Shore A.
- W68: Printing disc with rubber of 65 Shore A.

Principle

Paper is printed at one side. The ink penetrates into the paper. After a certain time the ink does not penetrate any more. The whiteness at the back of the print and at the paper without the ink is measured. The print through is calculated as a percentage of the original whiteness of the paper.

Method of operation

- It is recommended to execute the test in the standard atmosphere; to most standards it is $23,0 \pm 1,0$ °C and $50 \pm 2\%$ rh.
- For the operation of the AIC2-5T2000, Global Standard Tester, Inking Unit 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, the ink and the equipment during >6 hours in the standard atmosphere.
2. Cut the paper strips 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:
 - 3.1. Adjust the printing force of the top printing disc shaft to 625 N and pay attention for the right backlash. See W100.
 - 3.2. Adjust the printing speed to 0,2 m/s in the constant speed mode (□).
4. For GST 2/3H only:
 - 4.1. Select the menu "Print through" in the display.
5. Fill the ink pipette with the set off ink.
6. For High Speed Inking Unit 4 only:

Adjust the High Speed Inking Unit 4 with the following settings:

 - Water bath: 23,0 °C
 - Top roller: 4-segmented, rubber for conventional inks
 - Mode: 2
 - Startup time: 10 s
 - Distribution time: 20 s
 - Distribution speed: 0,5 m/s
 - Inking time printing discs: 15 s
7. For inking unit AE FOUR only: see manual or W100.

Execution

1. Apply 0,35 cm³ of ink to a segment of the inking unit and distribute the ink during the preset or desired time.
 NOTE: It is not advised to add some ink after a test.
2. Place the printing disc on the printing disc shaft of the inking unit and ink the disc during the preset or desired time.
3. Attach a test strip into the front clamp of the sector.
4. Remove the disc from the inking unit and place it on the top printing disc shaft of the printability tester.
5. Make a print. See W100.
6. Take the printing disc from the tester and clean with rags and naphtha and let it dry.
7. Take the printed strip from the sector and store at a safe place for at least 5 hours.
8. Clean the rollers of the inking unit or use the next segment for the following test.
9. Repeat the points 1 thru 8 for the next test. It is recommended to perform the test at least three times.
10. After finishing the tests clean and store all parts as described in the manuals.
11. Check the test result after 5 hours as pointed out in the chapter "Assessment".
12. Make an accurate record of the conditions and the results of the test and refer to the printing disc used:
 - 12.1. W43: Printing disc with rubber 85 Shore A.
 - 12.2. W68: Printing disc with rubber 65 Shore A.

| Materials / Testing conditions | | |
|--|--|---|
| 1 | IGT AIC2-5T2000 or IGT Global Standard Tester 2 or IGT Global Standard Tester 3H | 710.000.000 412.000.000 467.000.000 |
| 2 | IGT High Speed Inking Unit 4 or IGT inking unit AE FOUR | 466.000.710 465.000.710 |
| 3 | Top roller with 4 segments for conventional inks | 466.003.003 |
| 4 | IGT ink pipette | 408.000.200 |
| 5 | Printing disc, rubber, 85 Shore A, 50 mm (<u>W43</u>) or Printing disc, rubber, 65 Shore A, 50 mm (<u>W68</u>) | 402.634 402.687 |
| 6 | IGT Set off ink | 404.520.068 |
| Strips of paper to be tested, preferable 55*340 mm ² , 3 strips per sample Lint free rags and cleaning naphtha Whiteness tester | | |
| Printing force | | 625 N |
| Printing speed | | Constant, 0,2 m/s |
| Ink film thickness (volume) | | 8 µm (0,35 cm ³) |
| ▶ The numbers 1 thru 6 are available at IGT Testing Systems. | | |

Assessment

1. Measure the whiteness on the back of the blank paper on a stack of 1, 2, 3 and more sheets of this paper until the whiteness does not change any longer. The number of sheets of this paper forms the backing to use to measure the whiteness in the next points.
2. Measure the whiteness at the back of the paper strip on the place where the paper has been printed (L^*_b) and on the place where the paper has not been printed (L^*_{\cdot}). Use the backing as developed in point 1.
3. Calculate the print through as:

$$\text{Print through} = (L^*_b : L^*_{\cdot}) \times 100\%$$

4. Repeat the points 1, 2 and 3 for every strip.
5. Calculate the average and if desired, the standard deviation. Sometimes it can be useful to mention the highest and lowest values as well.

Notes:

1. The storage life of the ink in the original packing is 3 years maximum; in an opened packing 1 year.

- ▶ 2006: In comparison to older IGT leaflets, this leaflet is valid for the AIC2-5T2000 and Global Standard Testers as mentioned.
- ▶ 2012: This leaflet is valid for the AMSTERDAM and AE FOUR as well and contains some small text corrections.
- ▶ 2017: The leaflet is valid for the AIC2-5T2000 and GST 2/3H only and contains some small text corrections.