IGT Testing Systems

Research, development and production of testing equipment for the printing and allied industries

IGT Information leaflet W77
PRINTING SMOOTHNESS
IGT AIC2-5T2000, Global Standard Tester 2, 3, 3H

Version : July 2006

Introduction:

There are several principles to measure the roughness of paper. Many of them are based on air leakage. In the IGT Information leaflet W28 a method is described which is based on filling irregularities of the surface of paper with coloured water. The method described in this information leaflet W77 is based on printing the surface of the paper with a smooth printing form and a thin ink film under a low printing force. In this case only the tops of the paper surface are printed. Dependent to the roughness of the paper there will be more or less white spots in the print: the rougher the paper the more white spots.

Principle:

The paper strip to be tested is printed with a standard ink with the help of an IGT printability tester. The printing form is an aluminium one and the printing force is low. Only the tops of the surface of the paper are printed. The rougher the paper the more white spots are visible in the print. The results are compared to a self made scale or are compared with the results of other (standard) papers.

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 ± 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, the ink and equipment during > 6 hours in the standard atmosphere.
2 Cut the paper strips (preferable 55 x 340 mm, 3 strips per sample) 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 Mount the paper packing on the sector. See W100.
  3.2 Adjust the printing force for the (top) printing disc shaft to 500 N and pay attention for the right backlash for both shafts. See W100.
  3.3 Adjust the printing speed to 0.2 m/s in the constant speed mode (□).
4 **For GST only:**
  4.1 If not present, mount the sector with clamps. See W100.
  4.2 Mount the paper packing on the sector. See W100.
  4.3 Select the menu "Printing smoothness" in the display.
5 Check the functioning of the tester following the instructions in the chapter "Execution".
6 Fill the ink pipette with the ink for density tests.
7 Adjust the High Speed Inking Unit with the following settings:
  Water bath: 23.0º C (73.4º 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 disc: 5 s
8 Check the functioning of the High Speed Inking Unit.

Execution

1. If desired, set the printing force to 250 or 750 N. NOTE: If the differences between the papers are not big enough, it can be necessary to change the printing force to a higher or lower value instead of the standard 500 N. This has to be mentioned in the records of the test.

Materials / testing conditions		
1	IGT AIC2-5T2000	710.000.000
	or Global Standard Tester 2	412.000.000
	or IGT Global Standard Tester 3	416.000.000
	or IGT Global Standard Tester 3H	467.000.000
2	IGT High Speed Inking Unit 4	466.000.710
3	(Top roller with 4 segments for conventional inks)	(466.003.003)
4	IGT ink pipette	408.000.200
5	Printing disc, aluminium 50 mm, ø 65 mm	402.331
6	Packing, paper, 55 mm	404.001.005
7	Ink for density tests	404.003.001
8	Strips of paper to be tested, preferable 55 x 340 mm, 3 strips per sample	
9	Lint free rags	
10	Cleaning naphtha	

Printing force	500 N; if desired 250 or 750 N
Printing speed	Constant, 0.2 m/s
Ink film thickness (volume)	0.8 µm (0.3 $cm^{3)}$

► The numbers 1 thru 7 are available at IGT Testing Systems.
►*This leaflet contains article numbers per January 1st, 2006*◄.

2. Apply 0.03 cm^3 (0.8 µm) of ink to the inking unit and distribute the ink. It is not advised to add some ink after a test.
3. Place the printing disc on the printing disc shaft of the inking unit and ink the disc during the preset time.
4. Mount a test strip on the sector of the printability tester.
5. Remove the disc from the inking unit and place it on the (top) shaft of the printability tester.
6. Make a print. See W100.
7. Take off the printed strip from the sector.
8. Check the test result as pointed out in the chapter "Assessment".
9. Remove the printing disc from the tester and clean it with the rags and naphtha.
10. Clean the rollers of the inking unit or use the next segment for the following test.
11. Repeat the points 1 thru 10 for the next test. It is recommended to perform the test at least three times.
12. After finishing the tests clean and store all parts as described in the manuals.
13. Make an accurate record of the conditions and the results of the test.

Assessment

1. Observe the printing result with a self made scale or with other (standard) papers.
2. 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 test results of the AIC2-5T2000, AIC2-5 and Global Standard Testers 2, 3 and 3H compare well with one another on the condition that the tests have been carried out under the same testing conditions.

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

► *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.

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