

Introduction:

The printability of paper in gravure printing is depending on a number of properties of the paper, such as the condition of the surface, the dynamic compressibility, the wet ability and porosity of the paper. Measurement of only one of these physical characteristics does not permit prediction of the printability with certainty. With the Heliotest, which integrates all these parameters, the forecasting of printability is possible, even for papers with similar properties. The Heliotest, developed by CTP at Grenoble, France, can be used for all grades of paper for gravure printing.

In France the method is standardized in NF Q 61-002.

Principle:

The Heliotest attachment consists of an engraved printing disc, a doctoring system and a special, not quick drying gravure ink. Some drops of the ink are put on the printing disc, the surplus of ink is wiped off and a print is made on the substrate, which has been attached to the sector.

The disc contains three types of engraving:

- A variable halftone screen area. In this area the distance from the beginning of the print till the twentieth missing dot is measured. The longer the distance, the smoother the paper. This part of the disc is the most important part.
- A conventional screen area. This part is used for visual assessment and is of low importance.
- Four lines of dots. In these lines the total number of missing dots is counted. This is done in case the distance measured in the variable halftone screen area is too small, that is when the paper is very rough. The more missing dots, the rougher the paper.

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 AIC2-5 follow the instructions of the manual, IGT information leaflet W100 and the display 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 (preferable 55 x 340 mm, 5 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. Remove the brush.
4. Place the spacer ring on the thick shaft of the adapting device and place the adapting device with the thick shaft into the top.accessory hole.



Fig. 1: Heliotest accessory

Materials / testing conditions		
1	IGT AIC2-5 from type AA	414
	Heliotest mounting set	467
2	Heliotest disc A30	402.350
3	Heliotest ink (red)	404.003.006
	or Heliotest ink (black)	404.003.008
4	Packing, rubber, 55 mm	404.001.006
5	Astralon strip, 55 mm	404.009.013
6	Heliotest doctor blade	450.010
		361.000
7	Strips of paper to be tested, preferable 55 x 340 mm, 5 strips per sample	
8	Ruler	
9	Magnifying glass	
10	Lint free rags	
11	Velvet	
12	Ethanol or ethyl acetate	
Printing force		450 N or 300 or 600 N
Printing speed		1 m/s, constant speed
The numbers 1 thru 6 are available at IGT Testing systems. The numbers 2 thru 7 can be obtained as Heliotest Set for AIC2-5 from type AA, article number xxxx.		

5. Remove the screw from the adapting device and place the positioning templet on the adapting device (see fig ...).
6. Turn the adapting device so that the positioning templet is in contact with the bare sector and secure the adapting device with the set screw in the tester.
7. Carefully remove the templet.
8. Mount the brush into the brush hole.
9. Check and if necessary adjust the distance between the bottom of the weight and the blade holder to 25 mm.
10. Mount the doctor blade into the doctor blade holder (see W100).
11. Slide the doctor blade holder with the blade downward and pointing to the right on the mounting shaft, turn it anticlockwise until stop and replace the screw in the adapting device to prevent sliding off the doctor blade holder from the shaft.
12. Mount the rubber packing with the Astralon strip on it on the sector. See W100.
13. Place the heliotest disc on the top shaft and adjust the printing force of the upper printing disc shaft to 450 N (or if desired 300 or 600 N).
14. Adjust the back lash to a minimum to avoid "jumping" of the doctor blade at the end of the printing cycle. See W100.
15. Adjust the speed to constant (□), speed 1.0 m/s.
16. Check and if needed, move the slide in front of the sector into the constant speed mode (□).
17. Take off the paper strip from the sector.
18. Shake the bottle with heliotest ink well and fill a (disposable) pipette.
19. Clean the Heliotest disc and blade with velvet and ethanol.
20. Place the Heliotest disc on the (top) shaft of the tester.
21. Check the functioning of the Heliotest system following the instructions in the chapter "Execution".

Execution:

1. Attach a test strip on the sector.
2. Turn the sector into starting position.
3. If necessary, put a few drops of heliotest ink on the printing disc with the help of the (disposable)ink pipette. See note 3.
4. Carefully lower the doctor blade on the heliotest disc.
5. Turn the heliotest disc a few times CLOCKWISE so that the ink is distributed evenly on the disc.

W41 for IGT Global Standard Tester 2 and 3H

- Turn the disc **CLOCKWISE** into the required starting position: for a print of the variable screen/dotted lines area place the doctor blade in the gap between the conventional screen area and the variable screen area.
- Press one of the side buttons to start the motor.
- Move the printing disc into printing position against the test strip.
- Press the other side button as well to make a print.
- After the sector has stopped, release the side buttons.
- Remove the printing disc out of printing position
- Remove the test strip from the sector.
- Measure the test result as described in the chapter "Assessment".
- Repeat the points 1 through 13 for every strip. It is advised to carry out the test at least 5 times for every sample.
- After having finished the tests clean and store all parts as described in the manual.
- Make an accurate record of the conditions and the results of the test.

Assessment:

- Starting from the side with the largest dots in the variable screen area count the missing dots until the 20th one.
- Measure the distance in mm from the 20th missing dot to the beginning of the variable screen area.
- In the case the distance in point 2 is very small (only some mm's) count the total number of missing dots in the four dotted lines on both sides of the variable half tone.
- Repeat points 1 and 2 or 3 for each test strip.
- Calculate the average and if required the standard deviation. In some cases it may be useful to mention the highest and lowest value as well.
- If needed assess the printing quality visually in the conventional screen area.

Notes:

- The test results of the AIC2-5 and the Global Standard Testers 2, 3H compare well with another on the condition that the tests have been carried out under the same testing conditions. However, the test is very sensitive for very small variations in the equipment, printing discs and doctor blades, so for a comparison a standard paper has to be tested as well.
- The original colour of the Heliotest ink is red. To make the assessment easier a black ink for a higher contrast has been developed. The results of the tests, carried out with both the inks is exactly the same. The article number for the red ink is 404.003.006 and for the black ink 404.003.008.
- With one charge of a few drops of Heliotest ink a number of prints can be made. After this a number of drops may be added without cleaning the disc and doctor blade.

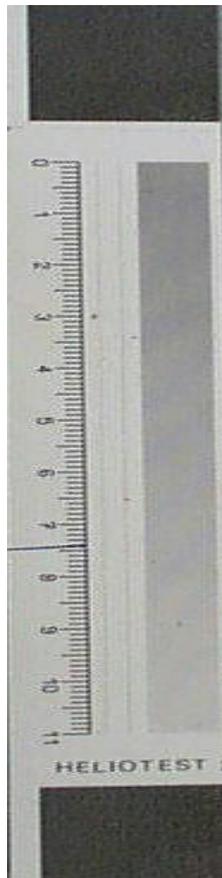


Fig. 2: Print result

- No dried ink may remain in the cells of the disc. It is recommended to clean the disc with regular intervals during the tests, using a wad of cotton and/or velvet saturated with ethanol or ethyl acetate. After a completion of a series of tests the disc must be cleaned thoroughly. In the case there is dried ink in the cells clean the disc with velvet saturated with ethanol or ethyl acetate. Another method is to leave the disc overnight in ethyl acetate and afterwards cleaning with a velvet saturated with ethanol or ethyl acetate.
- The maximum storage life of the Heliotest ink in the original packing is 1 year.
- It is strongly recommended to use the Heliotest doctor blades to avoid damaging of the Heliotest disc.

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.