IGT NBS Crumpling Device

Time saving test equipment

It is many years now since the American NBS (National Bureau of Standards) developed the NBS crumpling device for testing banknote paper. It is used by virtually all printers and papermakers involved in banknote printing, as well as other companies involved in e.g. hologram-security printing. Using the device, it is possible to tell beforehand whether a certain paper or banknote is suitable for the often rough and sometimes even fraudulent handing that it is likable to be subjected to. The test simulates the extreme conditions of handling of a banknote and can be executed using either wet or dry, printed and unprinted samples. The crumpled samples can be used for a number of tests to proof suitability for the purpose.

Crumpling is a very important test for banknote paper as banknotes are exposed to a lot of misuse while in circulation. They are folded, rolled up and even simply and thoughtlessly stuffed into pockets. Naturally, this sort of handling demands a lot of the paper itself and of the printing quality, holograms and security features which are also susceptible to damage through constant, daily use. All these activities interfere with the adhesion of the paper fibers and can be affected by weakening the fibers and the bonds of the paper and the security features and printing inks attached on it. The tensile strength of the paper is also reduced and the absorption increases because of these activities.

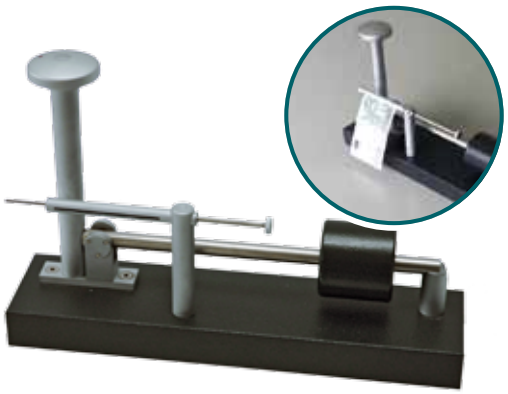
The NBS crumpling device is used in different industries

- Printing ink industry
- Printers and Security printers
- Pigment-, Resin- and Varnish industry
- Research institutes and Universities

IGT

IGT NBS Crumpling Device

Modern design, easy to operate



NBS CRUMPLING DEVICE

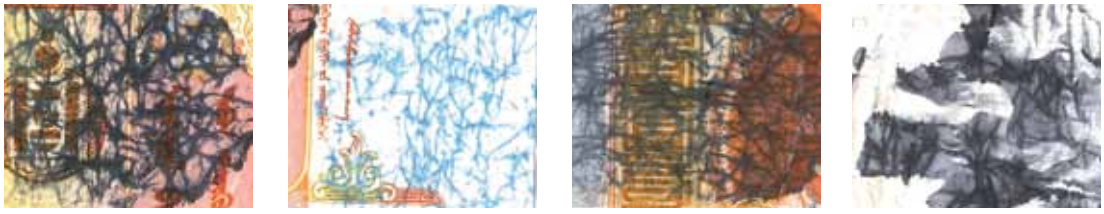
The NBS crumpling device is worldwide in use for testing banknote paper. It is used by printers and papermakers involved in banknote printing, as well as companies involved in hologram security printing. The test simulates the extreme conditions of handling of a banknote and can be executed using either wet or dry, printed or unprinted samples of paper or foil based notes.

NBS AUTOMATED PRESSURING DEVICE

IGT Testing Systems has developed a device that can eliminate the variation in applied pressure. The NBS Automated Pressuring Device ensures that the plunger is always pushed down with the same force. When the weight begins to rise it exerts a pressure of 100 N over a fixed period and so the danger of the crumpled note being pushed too far is eliminated. The crumple test produces this way more reproducible test results.

Description

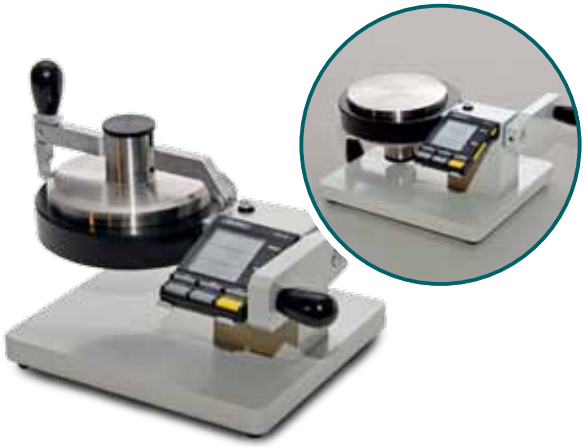
The NBS crumpling device consists of an apparatus to rol the paper sample into a tube shape and a device in which the rolled paper tube is crumpled under a fixed pressure of 100 N. When paper is crumpled the interlaced fibers are disturbed, the bonds are loosened, and the disarranged structure becomes less compact, weaker and more permeable to air and liquids.The effect of the crumpling treatment is measured by the change in air permeability, porosity, (water) absorption and/or in tensile strength. The properties of the paper are measured on identical paper samples before and after crumpling. To get a more consistent and reproducible pressure from time to time and from paper type to paper type, the NBS Pressurizing device has been developed. This device prevents the use of excess pressure on papers, which do not collapse immediately after applying the pressure by hand and for which a manual operation often gives a too high pressure after a sudden collapse of the tube of paper. The pressurizing device replaces the manual operation and applies force until the 100 N is reached, if the paper tube did not collapse under this pressure it will continue to apply pressure until collapse.



The results of porometric test and blue ink test after NBS crumpling test under different test conditions

IGT NBS Crumpling Device

Pre-programmed test conditions



IGT COBB TESTERS (Cobb-Unger principle)

The IGT Cobb tester is an absorbency-tester to determine the absorption of liquids, like water, aqueous solutions, oils, varnishes and others, by paper, paperboard and corrugated board within an accurately set time, in accordance with ISO 535, Scan P-37:77 Scan P12, Tappi 441 and Fefco nr. 7. There are different types available:

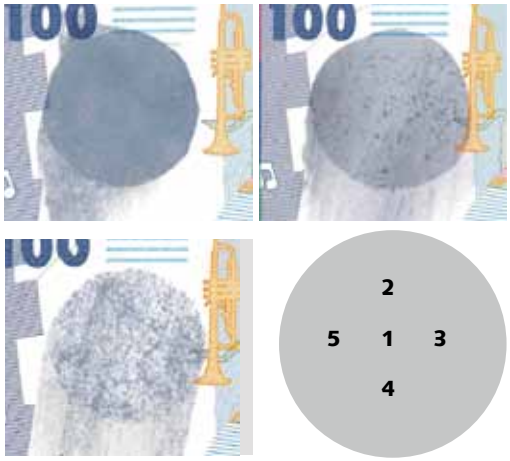
- For thin substrates like paper and light paper board
- For light structured papers (e.g. tissue)
- For substrates up to 15 mm thickness, like massive board or corrugated board.
- For plaster board construction panels and wood panels up to 22 mm thickness.

Different inserts are available for smaller substrate samples, down to 25 mm diameter. The 25 cm² insert is standard for Cobb tests on NBS crumpled banknotes. Different containers are available from stainless steel and aluminum, for normal use or for use with aggressive liquids.

Cobb Tester plate-roler

POROMETRIC-WEIGHT

For a quick and dirty absorption test of porometric ink on crumpled banknotes there is a standard weight available. The weight has a specific weight and footprint to provide a fixed pressure on the applied ink on the sample.



Porometric test and measuring-positions on test area

Measuring water absorption according to Cobb

A total of five samples are used in the crumple test. Before the test begins, ten samples are taken from the same batch. Five of them are used for the Cobb reference measurements; the other five are crumpled and thereafter also measured according to Cobb. As the samples are smaller than on common Cobb testers, a special Cobb tester insert must be used. In order to obtain optimal results here as well, it is advisable to use the IGT Cobb tester with a 25 cm² test area. The IGT Cobb tester has the advantage over the common testers of having a tilting mechanism with an automatic start and stop system for the timer. The fluid container is made from stainless steel so that it can be used for a wide range of fluids, optionally an aluminum version is also available.

IGT NBS Crumpling Device

Excellent reproducibility

TECHNICAL DATA

NBS crumpling device

Weight:	3 kg
Width:	300 mm
Height:	200 mm
Depth:	100 mm

NBS Automated Pressuring Device

Weight:	5 kg
Width:	300 mm
Height:	250 mm
Depth:	200 mm

Electrical ratings

90 – 245 V / 50 – 60 Hz / 30 VA

IGT Cobb Testers (Cobb-Unger principle)

Weight:	6 kg+ roller 10 kg
Width:	200 mm
Height:	250 mm
Depth:	200 mm

Porometric-weight

Weight:	0,475 kg
Width:	Ø 24 mm
Height:	130 mm

Agent

Luhne Messtechnik
Dipl.Ing.(FH) Stefan Luhne
Kölnerstrasse 167
D-41199 Mönchengladbach
Tel.: +49 (0)2166 / 68 18 88
Fax: +49 (0)2166 / 146 51 70
info@luhne-messtechnik.de
www.luhne-messtechnik.de

IGT Testing Systems

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

IGT Testing Systems
P.O. Box 22022
1302 CA Almere
The Netherlands
Phone : +31 20 409 9300
Fax : +31 20 409 9339
E-mail : info@igt.nl
Internet: www.igt.nl

IGT Testing Systems, Inc.
Arlington Center
543 West Golf Road
Arlington Heights IL 60005
USA
Phone : +1 847 952 2448
Fax : +1 847 952 2449
E-mail : usa@igt.nl

IGT Testing Systems Pte. Ltd.
Print Media Hub
61 Tai Seng Ave #05-14
Singapore 534167
Phone : +65 6481 8993
Fax : +65 6481 9685
E-mail : singapore@igt.nl
Internet : www.igt.com.sg

IGT Testing Systems KK
1229-1, Mawatashi
Sakura-shi
Chiba-ken 285-0804
Japan
Phone : +81 (0)43 308 7302
Fax : +81 (0)43 308 7304
E-mail : japan@igt.nl