

IFT Analyser a better way of measuring Ink Film Thickness on Screen Rolls

By BicarBlast



Introduction

- Colour consistency is a key property on which print is judged today;
- The printed colour depends on:
 - Substrate;
 - Ink formulation;
 - Ink film thickness
- The printed colour also depends on the viewing condition e.g. light source. These can not be influenced by the printer.



Ink Film Thickness (1)

- The ink film thickness on the substrate printed depends on:
 - Shearing of the ink between printing plate and substrate;
 - Shearing of the ink between print plate and screen roll;
 - The ink film thickness available on the screen roll;
 - The ink being able to be released from the cells on the screen roll.

Ink Film Thickness (2)

- In practise the printer has very limited influence on:
 - Ink release characteristics of the ink, screen roll and print plate;
 - Ink acceptance of the substrate;
- The cleanliness of the screen roll is most likely the major factor during production influencing the ink film thickness transferred to the substrate.



Ink Film Thickness (3)

- During production it is the Ink Film Thickness variation caused by the variation in cleanliness of the screen roll that mainly effects the colour variation.

To(o) Clean Or Not To(o) Clean

- It is essential to frequently clean screen rolls in order to reduce Ink Film Thickness variation to a minimum. The smaller the interval the lower the variation;
- To record the effect of screen roll cleaning on ink film thickness variation one needs to measure frequently:
 - The ink film thickness available on the screen roll;
 - The printed colour variation.



IFT Analyzer

- We will now look at the procedure for measuring the ink film thickness on a screen roll using the IFT Analyser Software.



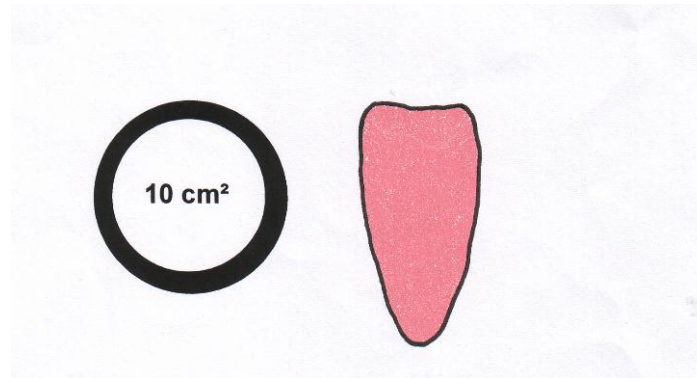
Making a “blot” to be analyzed by IFT Analyzer

- Clean surface screen roll with cleaning liquid;
- Apply with the pipette a known amount of ink on the surface of the screen (e.g. 10µl);
- Doctor the ink over the surface of the screen roll with the doctor blade;
- Blot the ink off the surface of the screen roll with paper;
- Clean ink off the surface of the screen roll.



Preparing the “blot”

- Draw a line around the blot area with the 0.5 mm fine liner;
- Stick a reference label left of the blot area;
- Place the paper on the scanner;



Start IFT Analyser on your PC

Language can be changed here

Click here for a new roll

Click here for a report on a roll

Click here for importing and exporting data

Screen Rolls

Code	Nominal IFT	Location
0001	10.00	Machine 1, Station 1
0002	10.00	Machine 1, Station 2
0003	10.00	DM1
0004	10.00	Test1
0005	11.00	Test2
0011	11.00	CelMacch Kappa St.1

IFT Measurements

Date Time	Web Pos	IFT	Location
02/08/2005 17:20:14	Not Specified	8.46	Test
02/08/2005 17:20:38	Not Specified	9.94	Test
02/08/2005 17:21:01	Not Specified	2.46	Test
02/08/2005 17:21:19	Not Specified	6.95	Test
10/08/2005 08:08:06	Not Specified	2.41	Test

Measurement: Edit, New, Delete

Data Transfer: Export, Import

Roll: New, Delete, Report



Create new screen roll or select an existing screen roll

The screenshot shows the IFT Analyser 1.3.2 software interface. It features two main tables: 'Screen Rolls' and 'IFT Measurements'. The 'Screen Rolls' table has columns for Code, Nominal IFT, and Location. The 'IFT Measurements' table has columns for Date Time, Web Pos, IFT, and Location. Below the tables are control buttons for 'New', 'Delete', and 'Report' for screen rolls, and 'Edit', 'New', 'Delete', 'Export', and 'Import' for measurements.

Code	Nominal IFT	Location
0001	10.00	Machine 1, Station 1
0002	10.00	Machine 1, Station 2
0003	10.00	Test1
0004	10.00	Test1
0005	11.00	Test2
0011	11.00	CelMacch Kappa St.1

Date Time	Web Pos	IFT	Location
02/08/2005 17:20:14	Not Specified	8.46	Test
02/08/2005 17:20:38	Not Specified	9.94	Test
02/08/2005 17:21:01	Not Specified	2.46	Test
02/08/2005 17:21:19	Not Specified	6.95	Test
10/08/2005 08:08:06	Not Specified	2.41	Test

Selected screen roll

Click here for a new measurement after selecting or creating a roll



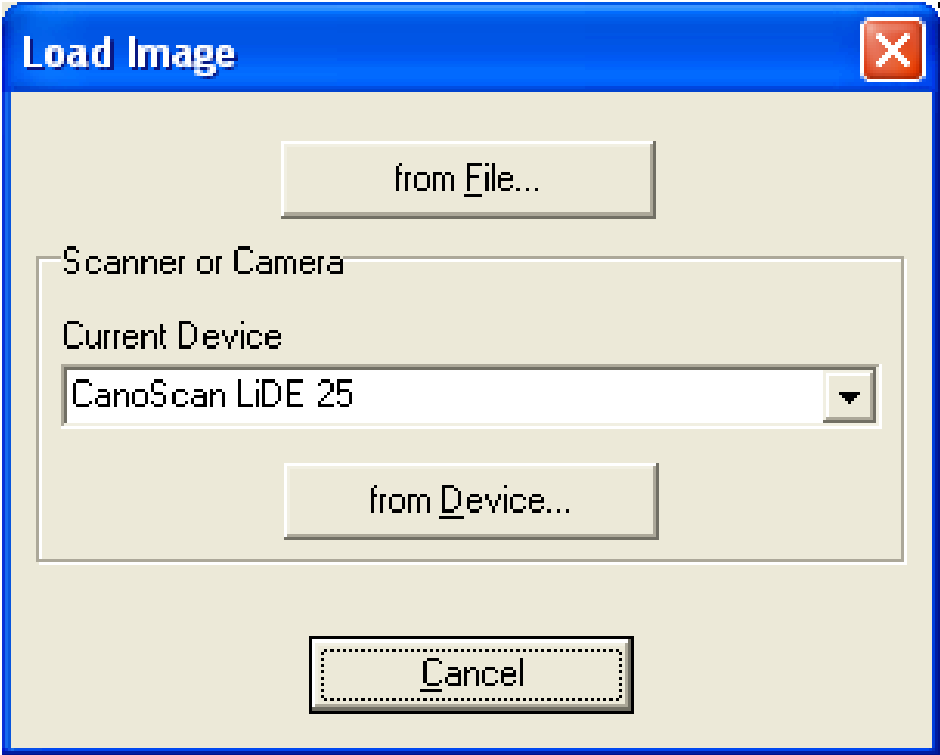
Starting the measurement by clicking on “Load image”

The screenshot shows the IFT Calculator software window. The interface includes a title bar, a menu bar with 'Blot Image' and 'Additional Images', and a main area with various input fields and buttons. Callout boxes provide instructions on how to use the software:

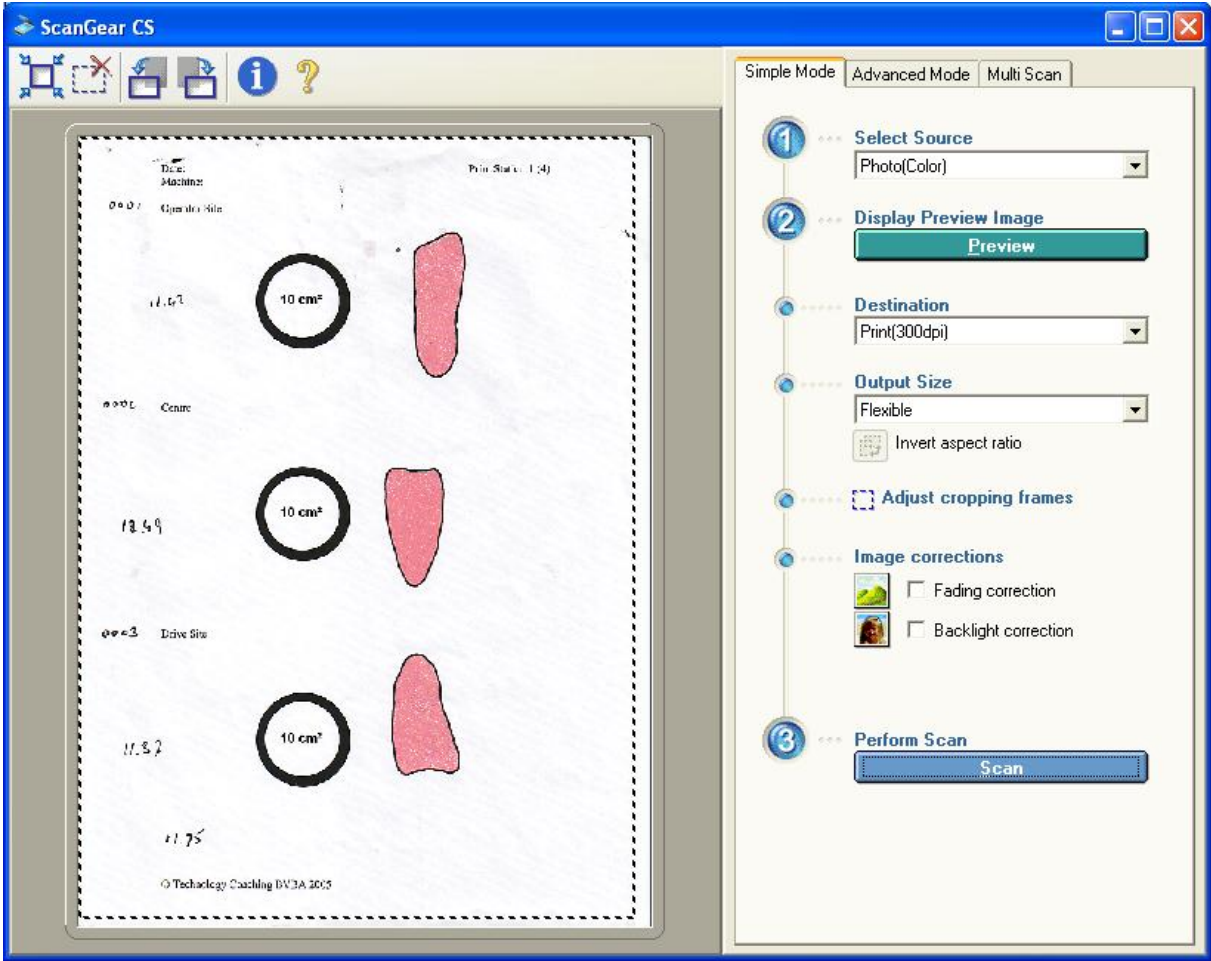
- Microscopic photos of the screen surface can be loaded here:** Points to the 'Load image...' button.
- Click here to start a measurement:** Points to the 'Show' button.
- Click here to select the position on the roll where the measurement was taken:** Points to the 'Location' field.
- Check here the if the ink volume indicate is the volume applied and the size of the reference label:** Points to the 'Ink volume' and 'Ref. area' fields.

Additional visible fields include 'Roll 0005', 'Time 25/11/2005 16:16:40', 'Web pos. Not Specified', 'Notes', 'Ink volume 10.0 μ l', 'Ref. area 10.00 cm^2 ', and 'Level 127'. Conversion factors are shown as $1 \mu\text{l} = 1 \text{mm}^2$ and $1 \mu\text{m} \text{ is } 1 \text{cm}^3/\text{m}^2$. Buttons for 'Save' and 'Cancel' are also present.

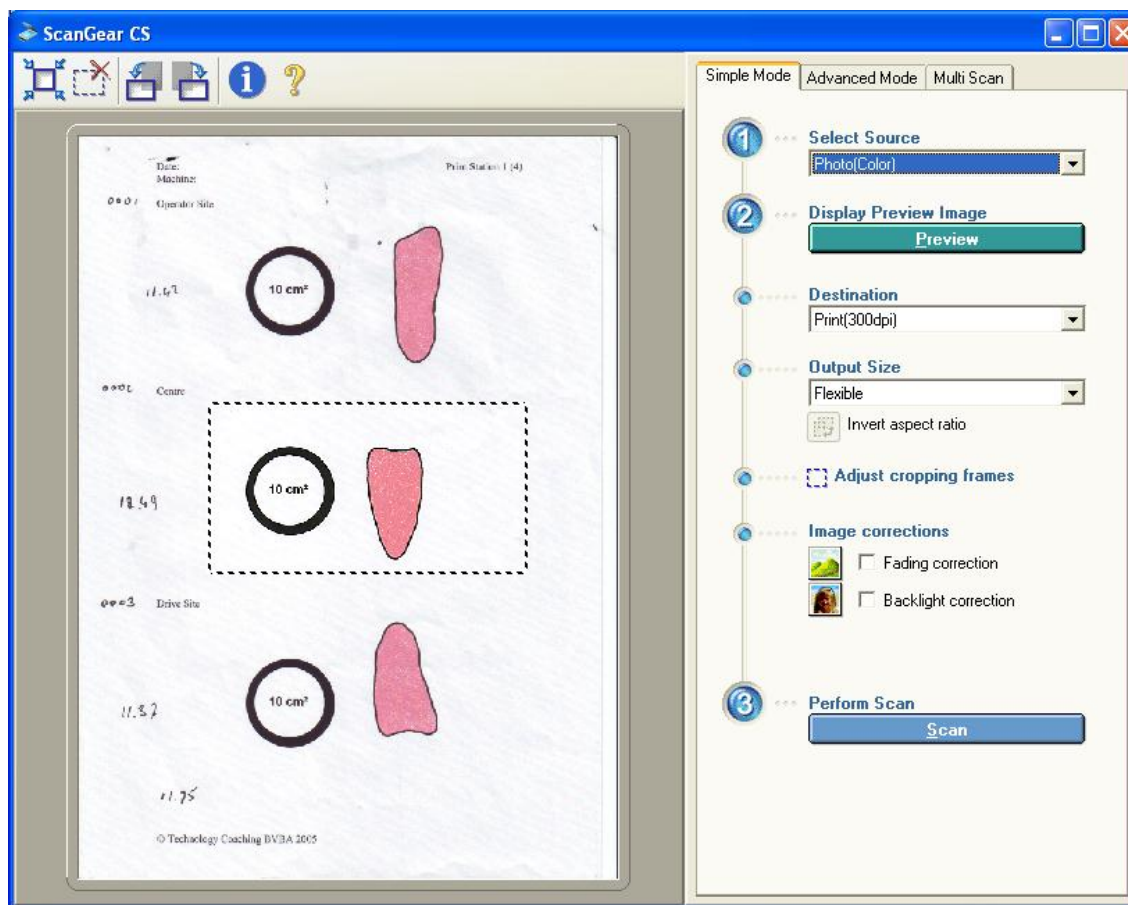
Select device and click on “from Device”



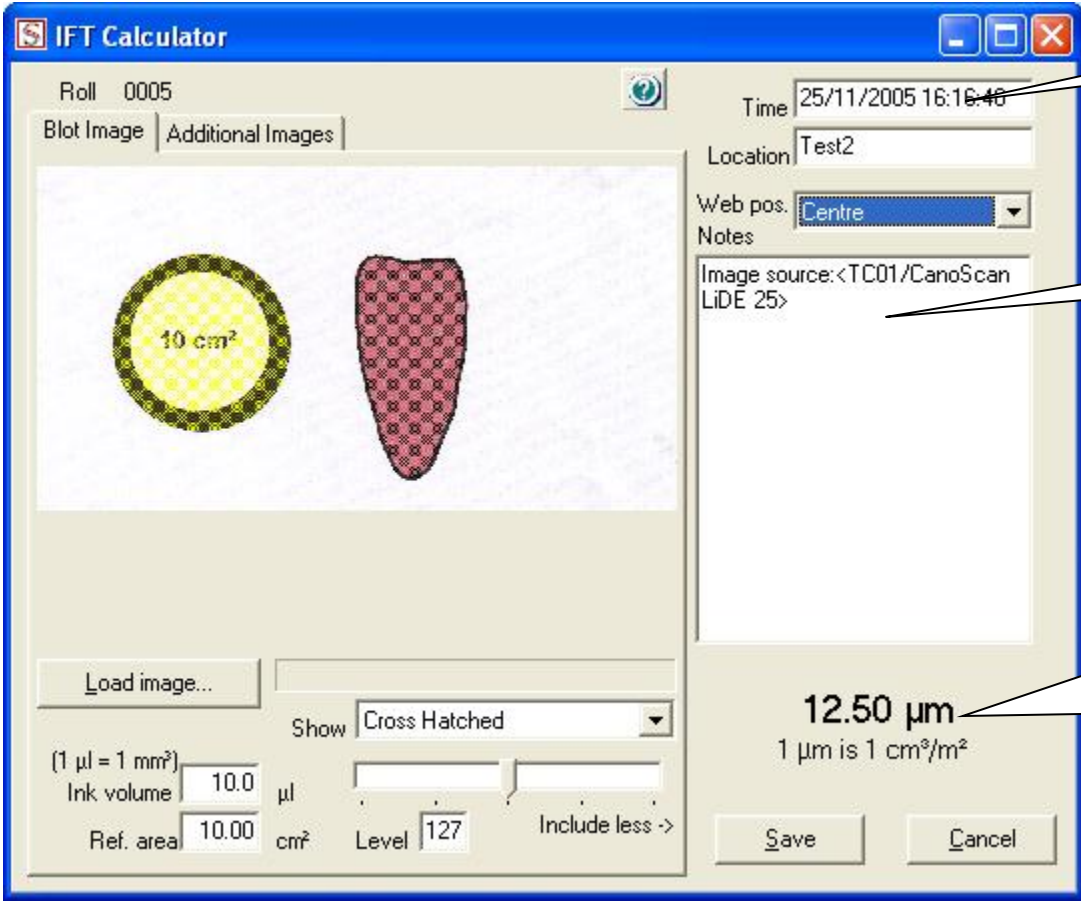
Scan preview (This is depending on the scanner used)



Crop area to be scanned (dirt spots will be ignored) and press “Scan”



View result and save data



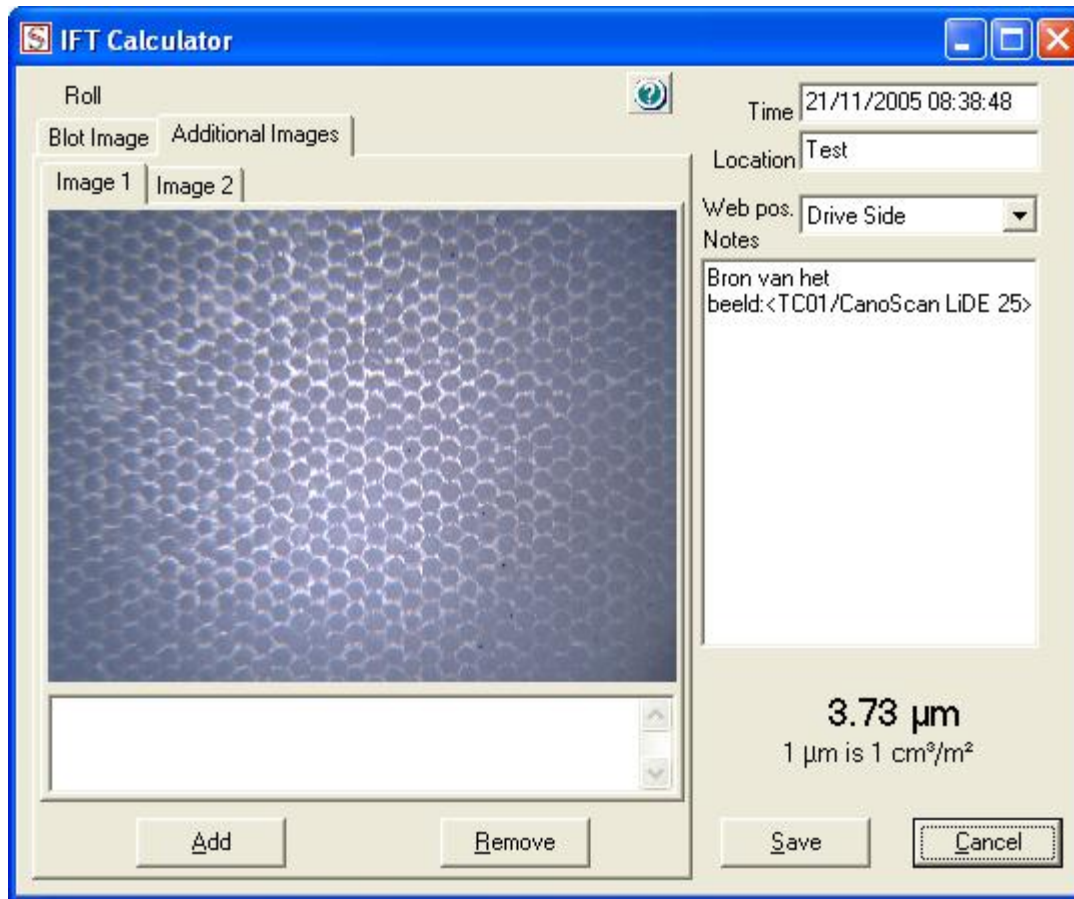
Date time of scan

Date Source

The ink film thickness calculated on the surface of the screen roll



Add Image's of the screen roll surface



Screen Roll Report (1)

Roll Report Parameters

Report on Roll: 0005

Measurements in location: Test A

Measurements of web position: <Any Position>

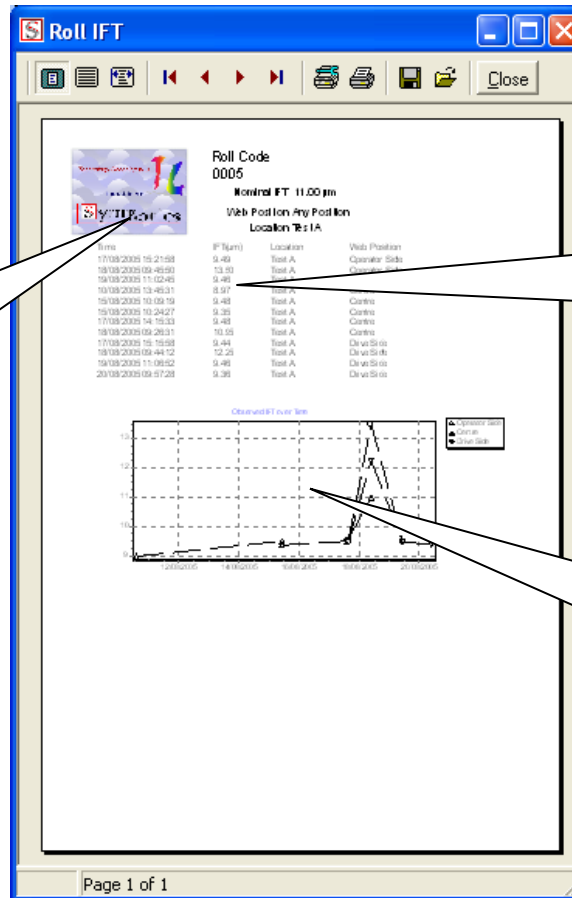
Graph web positions separately

Print Preview Cancel

Select measuring location

Select measuring position

Screen Roll Report (2)



Any logo can be applied

Measuring data included in the graph

Graph of measured data over time

Conclusion

- IFT Analyser is a practical tool for measuring and analysing your screen roll Ink Film Thickness data over time;
- You can exchange data and images with your customer/supplier and discuss cleaning procedures and roll condition.



What is new in IFT Analyzer V3:

IFT Analyser 3.0.4

Screen Rolls

Code	Nominal IFT	L/cm	Wall μm	PlantName	MachineName	Location	Drawing
PP 0002	10.4			Peterson Oy	Bobst 2000	ST2	C:\Users\Public\Syn
PP 0003	12.3			Peterson Oy	Bobst 2000	ST3	C:\Users\Public\Syn
Screen Roll 01	5.0	180			DR0	Station 1	
Screen Roll 02	12.0	80			DR0	Station 3	
▶ Screen Roll 03	12.1	120			DR0	Station 5	

IFT Unit μm

Ink Film Thickness | Cell Wall Thickness

Screen Roll 03

Position

- Operator Side
- Centre
- Drive Side

Roll

New
Delete
Report
Export
Import

IFT Test Runs

Tester	Printed At	Location
▶	17/01/2008 10:22:46	Schum. Stat. 3
	17/01/2008 10:22:31	Schum. Stat. 3
	17/01/2008 10:22:15	Schum. Stat. 3
	05/12/2007 13:34:48	Schum. Stat. 3

Test Run

Edit New Delete

Default Tester
W Streefland

IFT Measurements

Web Pos	IFT	TIR μm	Roll D mm	Wall μm
▶ Operator Side	6.3			

Measurement

Edit New Delete Export



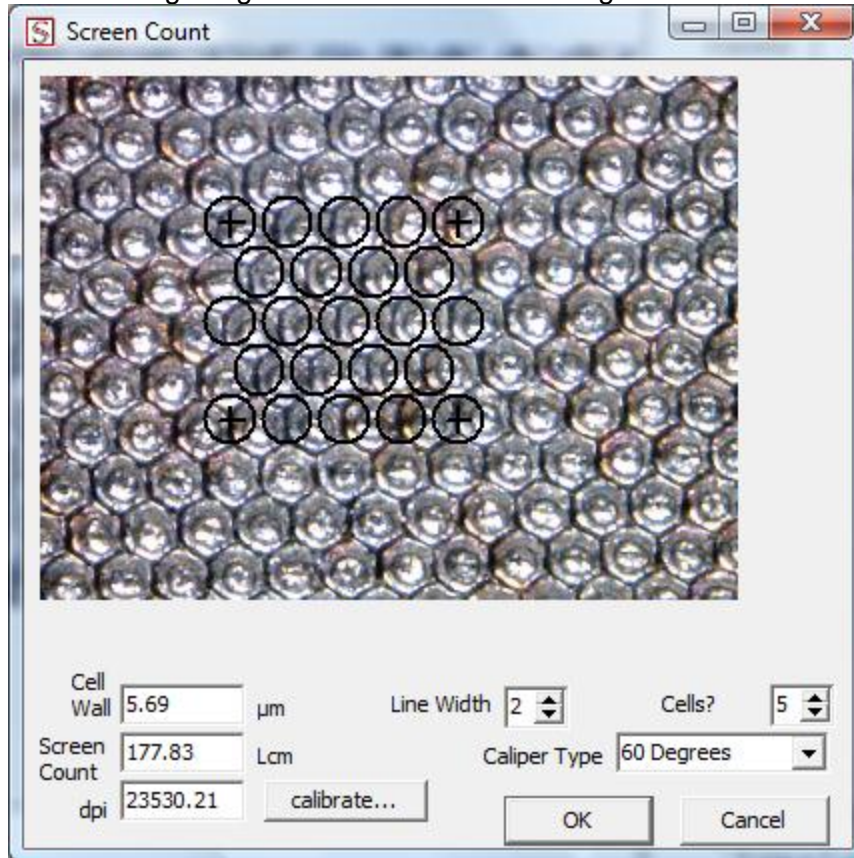
IFT Analyzer has been redesigned in order to make it even more user-friendly. At the same time we have added more functions which allow monitoring the state of your screen roll and decide if the screen roll is dirty and needs cleaning or is worn and needs replacing.

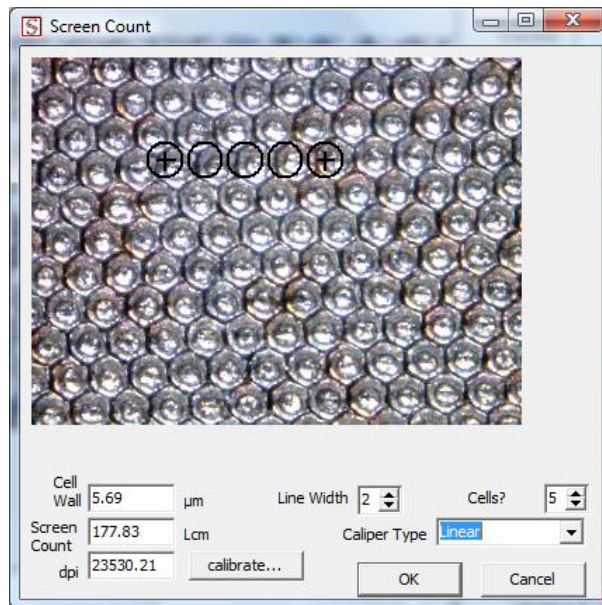
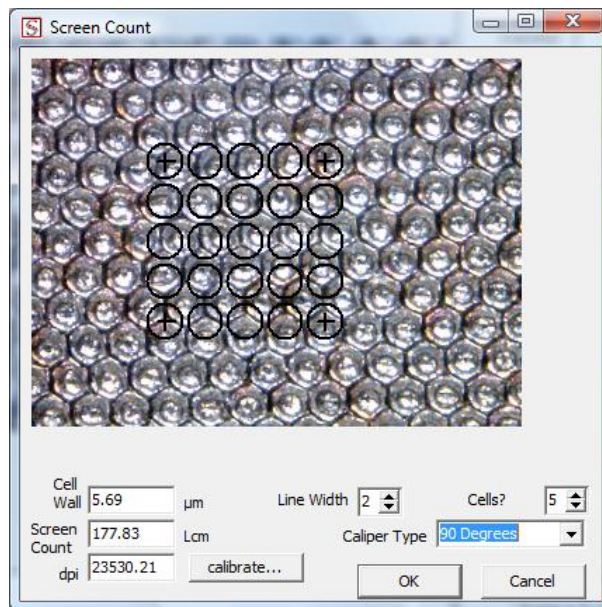
What is new in IFT Analyzer V3:

- Ability to measure the screen count;
- Measuring and monitoring of the cell wall thickness between the cells on the screen roll
- Additional history report for cell wall thickness.



Using the standard software with the USB print microscope for measuring screen line count and cell wall thickness resulted in additional steps in a separate program. We have integrated this in IFT Analyzer V3 and developed an user friendly interface for aligning a grid with the cells on the screen roll. There are 3 options for aligning the grid: depending on the cell configuration on the screen roll you can chose for a Hexagonal, Square and Liner grid. The following images are screen shots of the grid:

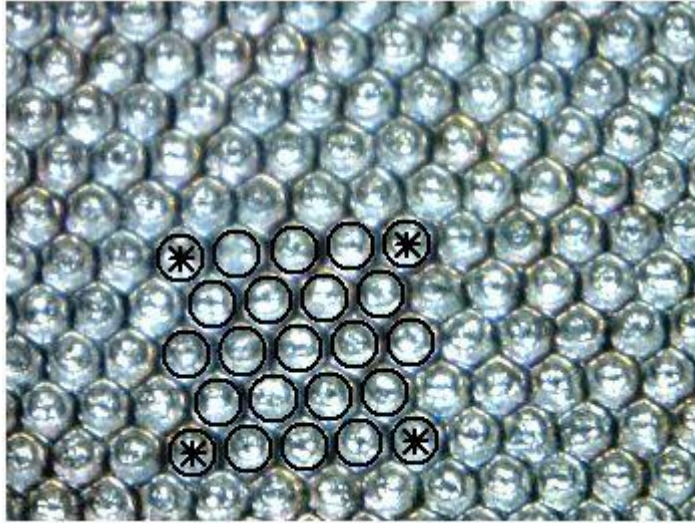




The number of cells of which the grid is build can be chosen freely. The grid can be stretched fixed and rotated by picking –up the corners with your mouse.

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Accessories:

- The high resolution Microscope with 200x magnification for collecting the blot image and the 200 times magnification for taking images of the cells.

