
FAG FLEX³PRO version 5.x

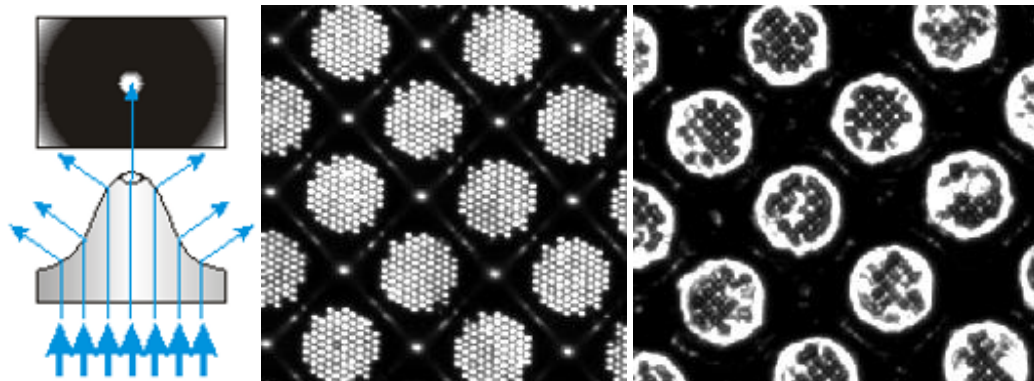
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Transmission mode measurement of dots with surface patterning

Improved Performance reading transparent Plates with surface structure

The measurement technology of the FLEX³PRO is based on the approach that a vertical light ray is scattered on non-flat surfaces such as a dot shoulder. The light ray therefore will not reach the camera and the camera pixel shows black. On horizontal flat surfaces the light ray will not be scattered at all but pass through the polymer and reach the camera pixel. The pixel will show up white.



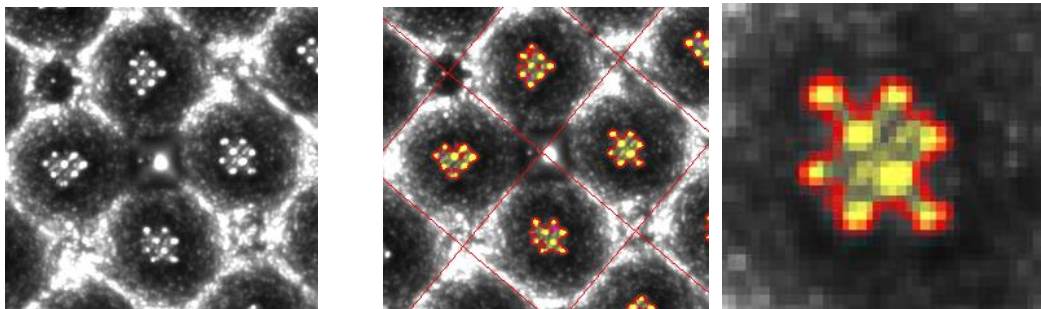
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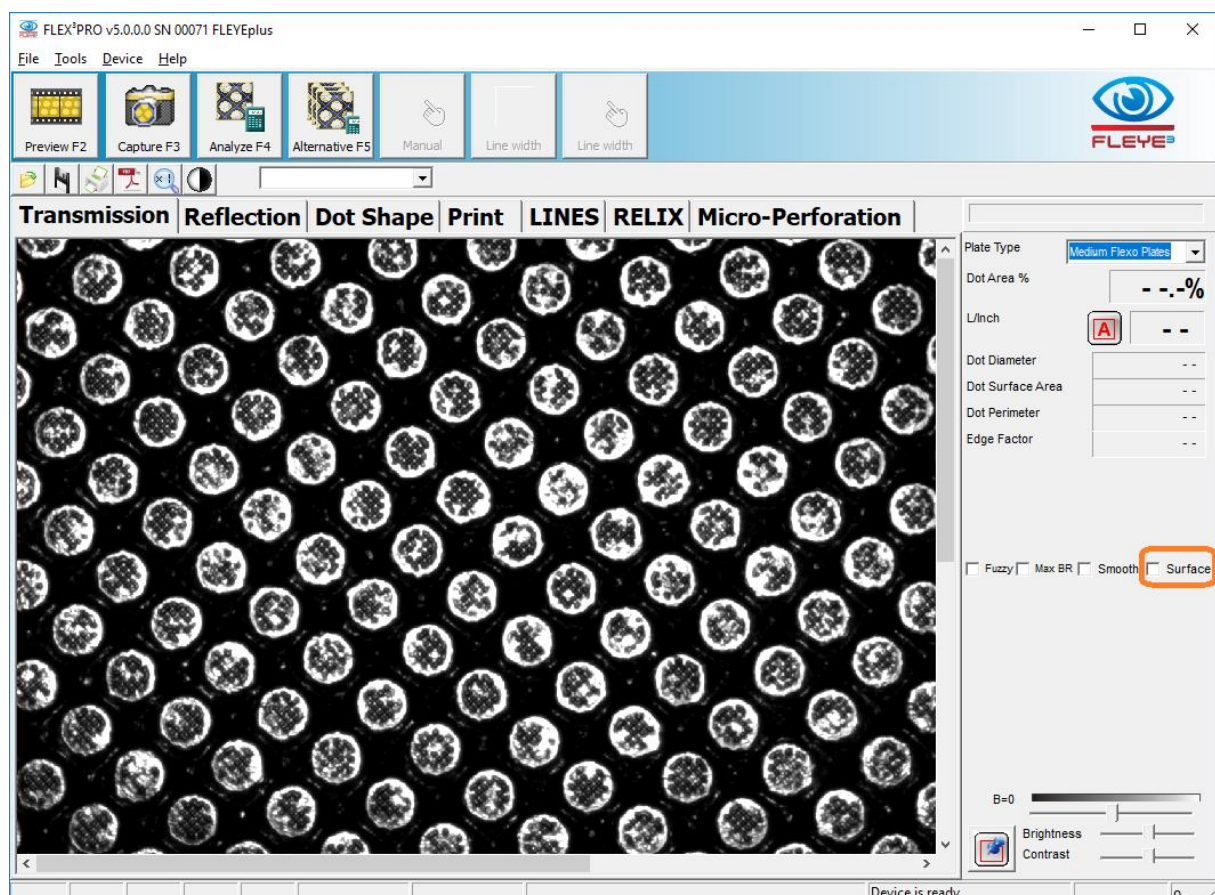
The new surface structure technologies are creating textures in the printing area of a dot. These can be seen as tiny lines or cells with gray inside the surface of a dot.

Version 4.x measures the dots with surface structures using the following approach: (1) slightly overexpose the plate such as the surface structure becomes almost invisible. (2) add black cells to the surface area if they are totally surrounded by a flat surface ring.

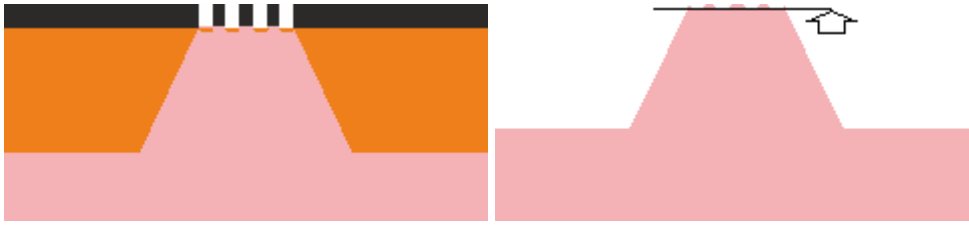
Version 5.x implements an improved algorithm that detects the surface structure lines and cells and includes the structures and the space between them as part of the printing dot area.



The dot area is the total area inside the OUTERMOST red boundary enclosing all spots as this is the area intended to transfer ink.

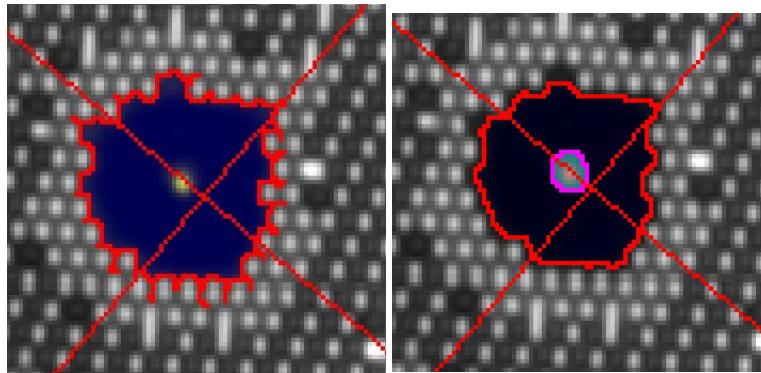


The expert mode gives access to the Surface Structure algorithm. If the Surface flag is checked, surface area is measured slightly below the maximum height of the dot such as all micro cells and micro lines on the interior of the dot are included in the measurement result.



The Surface flag is saved with the customized plate types in the FLEYEplus page of the Settings Window.

Because the dot surface area is structured, there are shoulders inside the dot surface and also on the dot circumference edge. This shoulder is added to the printing 'Dot Area %' such that a measurement with Surface Structure ON will result in higher percentages compared to a measurement with Surface Structure OFF.



Standard

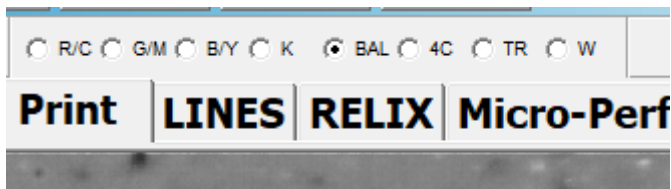
Surface

The examples above are showing an extreme situation. The standard algorithm excludes the initial shoulder portion of the dot from the printing area, resulting in a printing surface (gray area) edge with lot of structure. The image on the right is the edge of the printing area (gray area) that will most probably transfer ink. The rule designating the "edge of the dot is marked..." is unchanged.

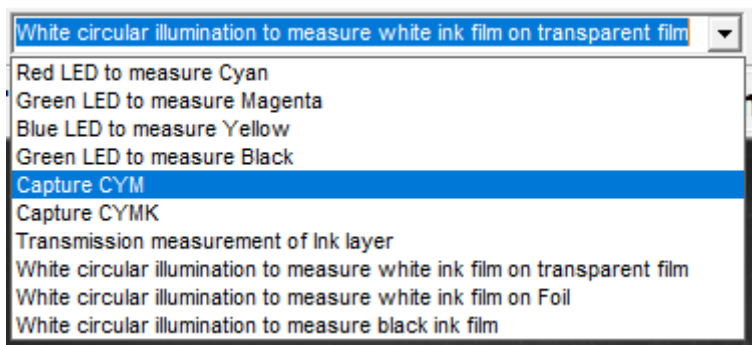
PRINT Mode Analysis

The illumination and capture selections have been enhanced. For better understanding, the radio-button selection method has been replaced by a drop-down list with explanatory text.

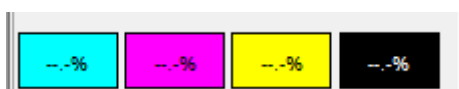
Version 4.x



Version 5.x

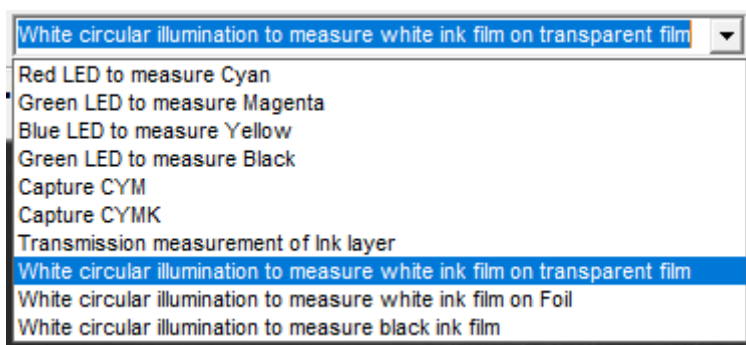


In order to quickly pre-select a primary color (CMYK), click inside the corresponding color patch.

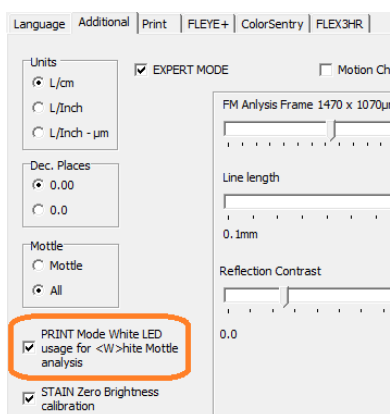


Improved Performance of white ink film Mottle function on transparent film

The option can be used with white circular illumination.



In order to use this, set the proper flag in the Settings Window. This function can be used to control the white ink layer printed on transparent film.



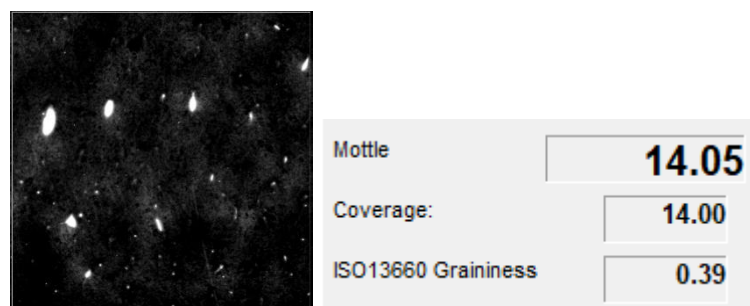
Version 5.x enables the ZERO function. ZERO on the transparent film with NO support behind the sample and the transmission lens aperture. The White LED power will be adjusted. The LED Power setting is saved in the .INI file and will be used until ZERO is performed again.



Improved Performance of Mottle function in Transmission

The new capture algorithm in PRINT mode with TR (transmission illumination) selected will capture a series of images and create a high dynamic range image. This will produce a wider range of density information such that Mottle, Coverage, and ISO Graininess can be calculated with higher accuracy and in a more repeatable manner.

Small spots, that are invisible to the human eye, are ignored when calculating the Coverage Value.



CAUTION: Measurements in Transmission Mode are not comparable to measurements in Reflection Mode! Always use the same approach if you need to compare results.

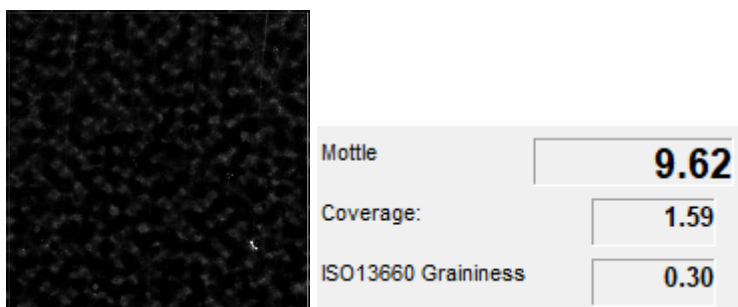
Mottle Function to measure white ink film on aluminum foil

An additional selection has been added to the drop-down list in PRINT mode. Zero on unprinted aluminum foil. The Software will automatically adjust the LED brightness of the white circular illumination. The LED brightness will be saved to the .INI file and used until Zero is performed again.



Mottle Function to measure Black Ink with white circular illumination

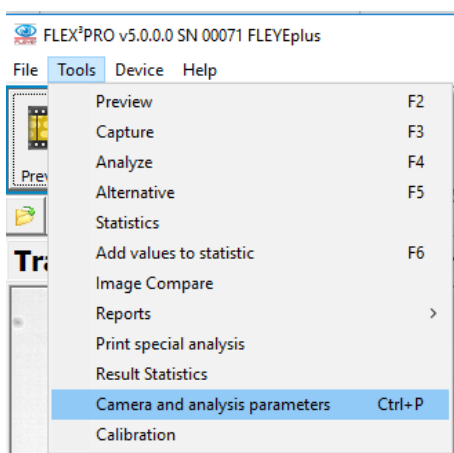
The ZERO feature is active in this mode. The ZERO function will detect the optimal LED brightness for the measurement of the Black Ink film using the white circular LED illumination. ZERO on the white substrate. The brightness will be saved in the .INI file.



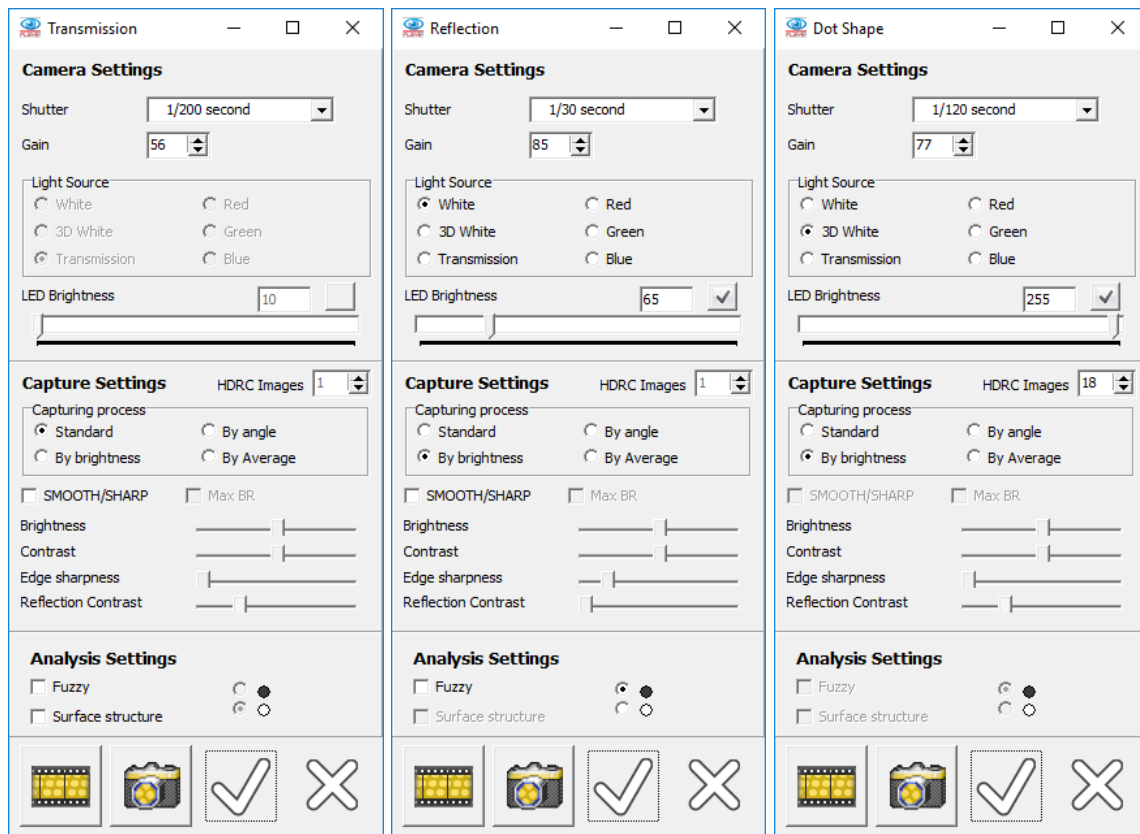
Customized plate types and substrate types

There are various parameters that can be used to define a special plate type. Plate measurement now has the ability to test the best camera settings, the optimum capture and image filter settings, and the analysis parameters. Earlier Software versions required settings to be changed in various locations of the Software, and some settings couldn't be modified at all. Version v5.x now makes the definition of customized plates significantly easier and more flexible.

Select Camera and analysis parameters from the Tools menu or press Ctrl+P on your Keyboard.

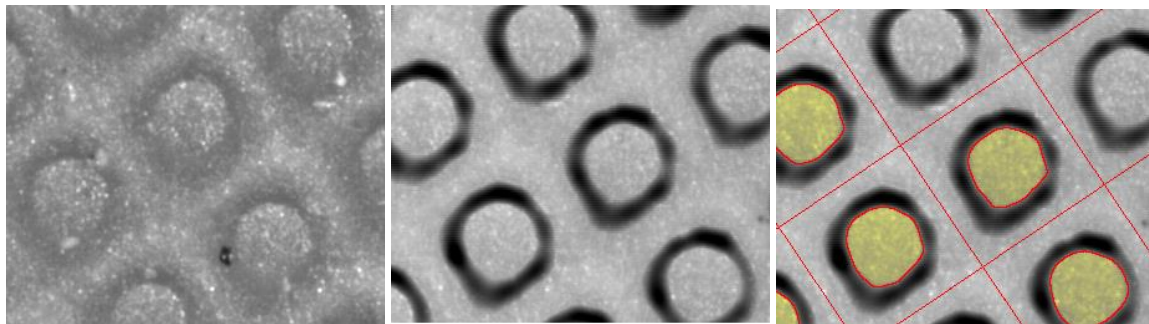


A secondary Window will open giving access to all parameters that can be changed for a special measurement mode: TRANSMISSION, REFLECTION, and DOTSHAPE.

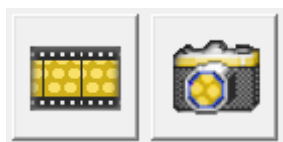


This feature makes it possible to measure plates that cannot be measured with standard plate settings.

Using customized plates enhances the range of plate types that can be measured with the FLEX³PRO.



Use the Preview and Capture buttons of the camera settings Window to perform a test using the settings of the camera settings Window.



Once the settings are properly defined, click the check icon ✓ to save and add the new plate setting to the plate list. Use the X icon to close the window.



Camera Settings

There could exist a plate type, where the [Medium Flexo Plate] preset results in dark images and the [Medium Dark Flexo Plate] preset results in excessively bright images. A setting between these two would give the best measurements. In this case the Camera Setting can be used to find the proper settings.

Camera Settings

Shutter: 1/200 second

Gain: 52

Light Source:

- ☐ White
- ☐ 3D White
- ☒ Transmission
- ☐ Red
- ☐ Green
- ☐ Blue

LED Brightness: 10

A short Shutter speed will result in darker images; a longer shutter will result in brighter images. A low Gain number will result in dark images; a high Gain value will result in brighter images. The LED Power itself can also be adjusted for all Light sources except the transmission light source which is fixed.

Capture Settings

The capture of the image can be configured by the capturing process and filters that are going to be applied to the image after the capturing process is finished.

Capture Settings

Capturing process:

- ☒ Standard
- ☐ By angle
- ☐ By brightness
- ☐ By Average

☐ SMOOTH/SHARP ☐ Max BR

Brightness: [Slider]

Contrast: [Slider]

Edge sharpness: [Slider]

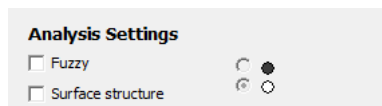
Reflection Contrast: [Slider]

The Capturing process can be Standard, whereby one single image is captured with the current brightness settings. The capturing process [By brightness] will capture a series of images with different brightness settings and calculate a HDRC [High Dynamic Range Capture] image based on the image sequence. The [By angle] will capture images with illumination at different angles and calculate the resulting image based on that. Finally, the [By Average] will capture a series of images by varying the camera settings and calculate the average image based on that.

The Filters that can be applied are the same as the filters on the main Window.

Analysis Settings

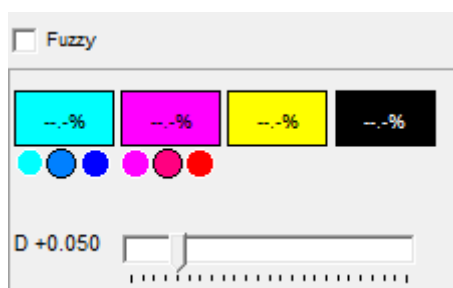
The same Analysis parameters that appear on the main Window can be selected and stored along with the customized plate setting.



PRINT mode customized substrate types

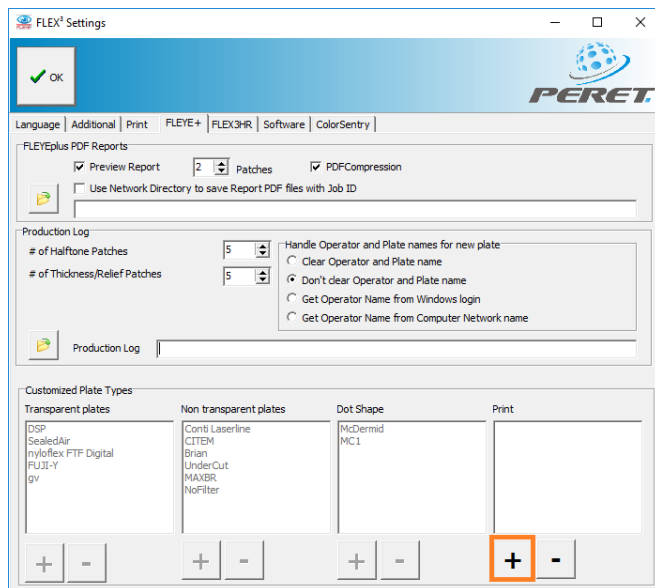
V5.x now supports the creation of customized substrate types if the FLEYEplus option is installed. The settings Window now contains a list of customized print substrates.

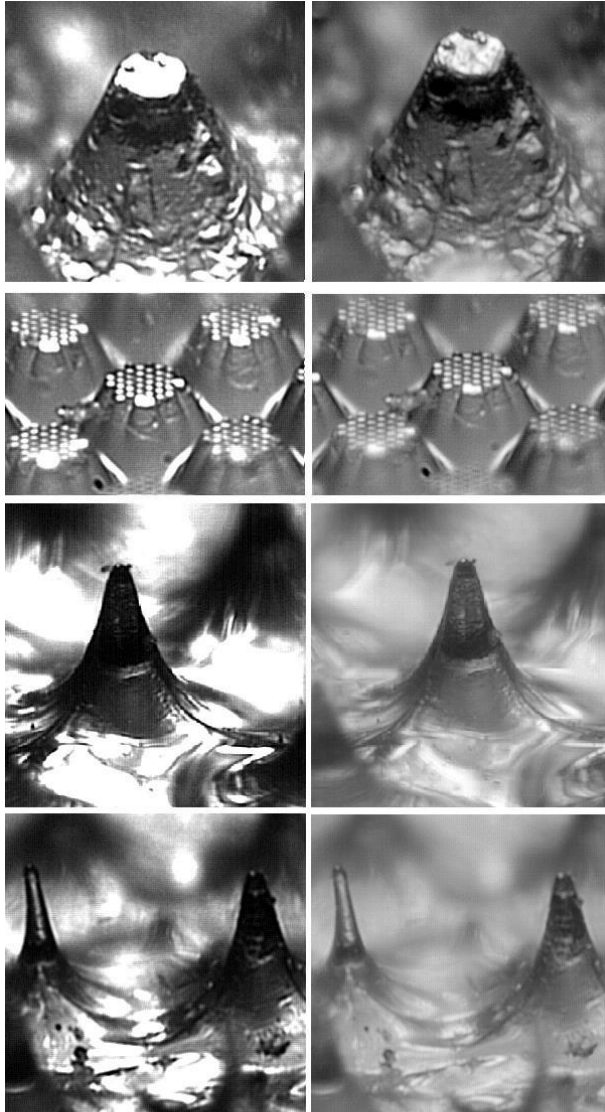
Test a substrate including zeroing and calculation parameters using the PRINT page in the main Window.



Open the File/Settings Window and select the FLEYEplus page. Click the [+] Icon and create a new Substrate name as shown below. The new substrate will be added to the Substrate drop down list. The settings will be saved and reloaded with the corresponding zero image settings.

Click the [-] Icon to remove a preset substrate type.





STANDARD

HDRC

The printing dot is the critical link required to transfer image information from digital data to printed products. The FLEXO dot is a three-dimensional object, that needs to be created by the FLEXO plate making process in a constant and repeatable manner such as it will be stable enough to face the challenge of the printing process. In the printing press the dot will be exposed to extreme stress being squeezed, dragged, and abraded, while it has to transfer ink from the Anilox to the plastic film or paper in a highly precise and repeatable manner.

Many innovations have been introduced into the flexo plate making process in recent years. The Flexo Dot now can be shaped using various technologies. We can produce flat dots, contour the shoulder of the dot, and introduce micro structures inside the dot surface aimed to provide the most repeatable ink transfer and the highest possible print quality.

This makes the quality control process of the flexo dot indispensable, especially for highlight dots. Little details in the dot shape can differentiate between a high-quality printing product, or a printing product with pin holes, missing dots, high dot gain and other critical problems.

FAG has developed a new HDRC (High Dynamic Range Capture) algorithm and implemented it in

The new HDRC function automatically captures a series of images with different illumination and camera parameters, extracting any detail from every single image and combining it to one single result image. Select the HDRC Flag and start the capturing process as usual. No additional mechanical settings on the device are necessary. After a few seconds the high -dynamic range image is displayed. As you can see in Figure 1 every tiny detail of the dot shape, the polymer smoothness, the surface structure, the quality of shoulder etc. can now be seen easily.

The FAG FLEX³PRO Software version 5.x with HDRC is the ideal tool to verify that the dot structure and stability, will last for the entire run of the job.