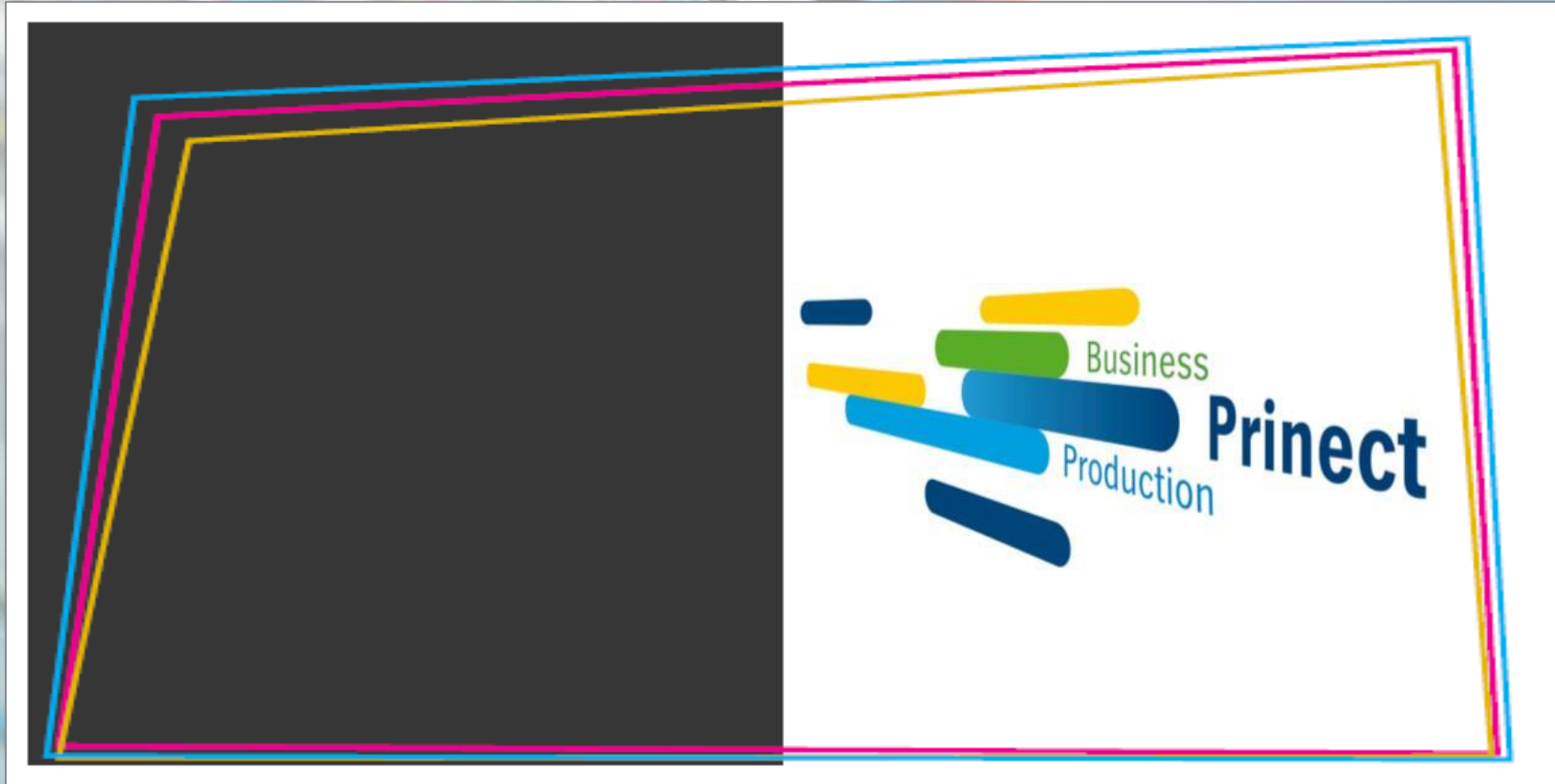




Prinect Automatic Paper Stretch Compensation

Functionality and Use Cases

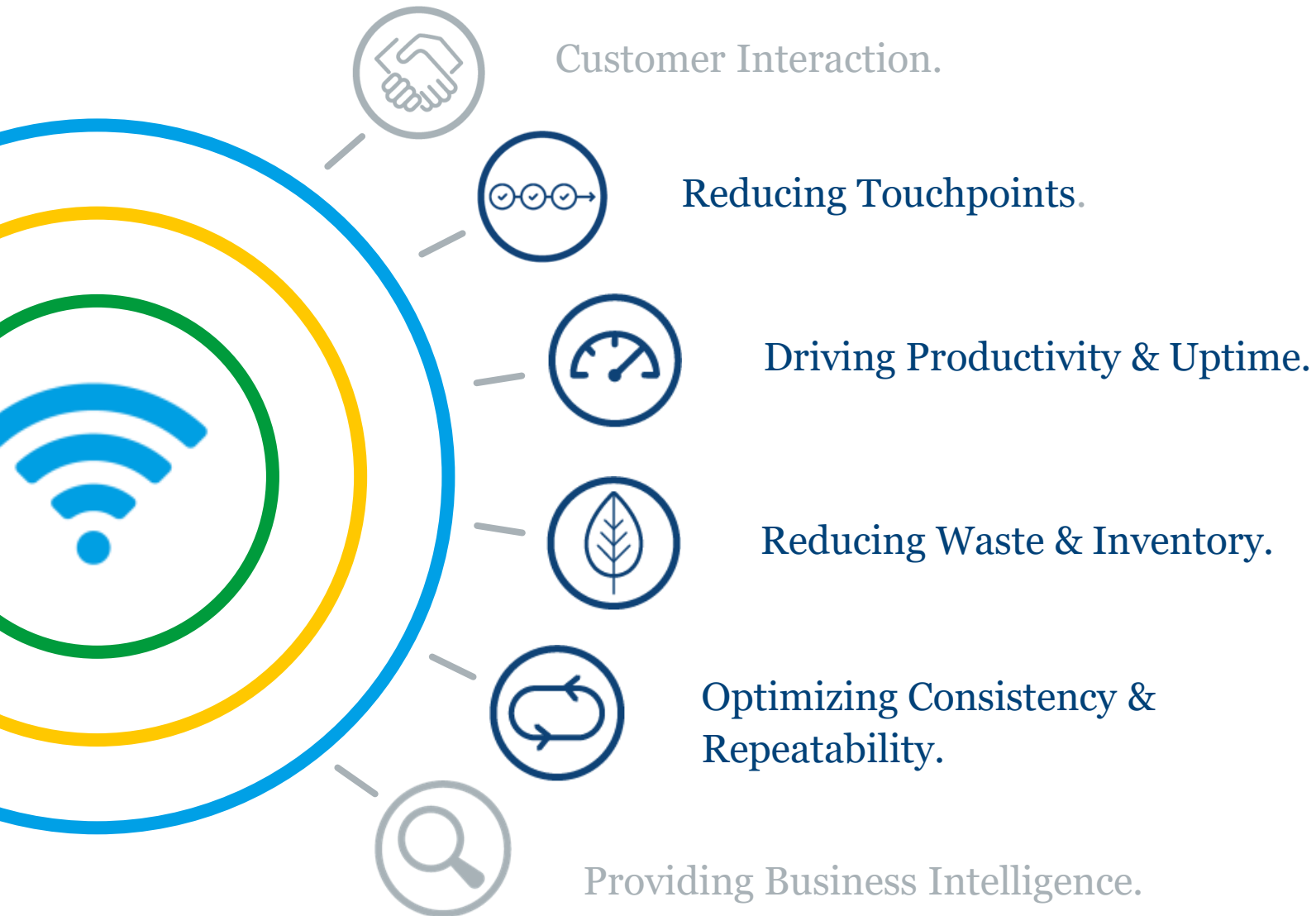
Cordula Voelker, Prinect Product Management





Prinect Automatic Paper Stretch Compensation (Prinect APSC)

1. Compensation of Paper Stretching – with Prinect APSC
2. Ease of Use – News of Version 2021
 - New Standard Curves
 - Easy Curve Adaptation
 - Quality Reports
3. Measuring Spot Colors – News of Version 2020
 - New Register Marks
 - New Camera
 - New User Guidance
4. Compensation: Automatic or Individual
5. Use Cases for Measuring Spot Colors
 - Cold Foil Application
 - Metallized Material
 - Measuring Opaque White
6. Workflow Position
7. Increase Productivity with Prinect APSC



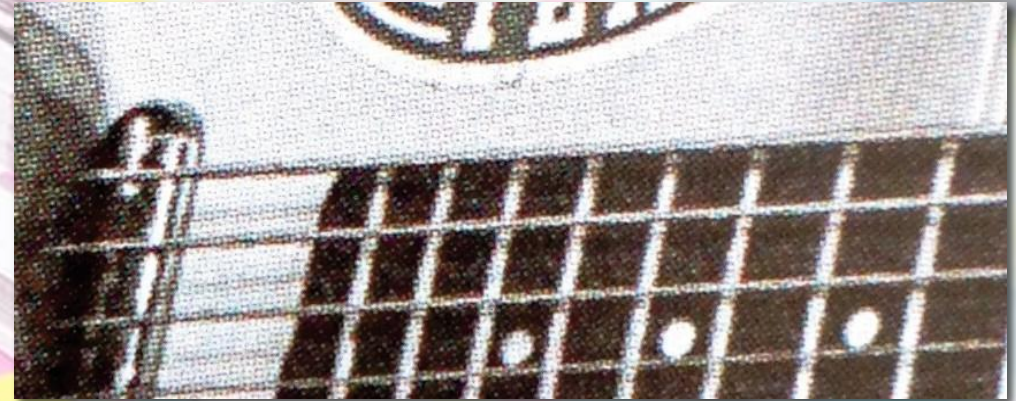
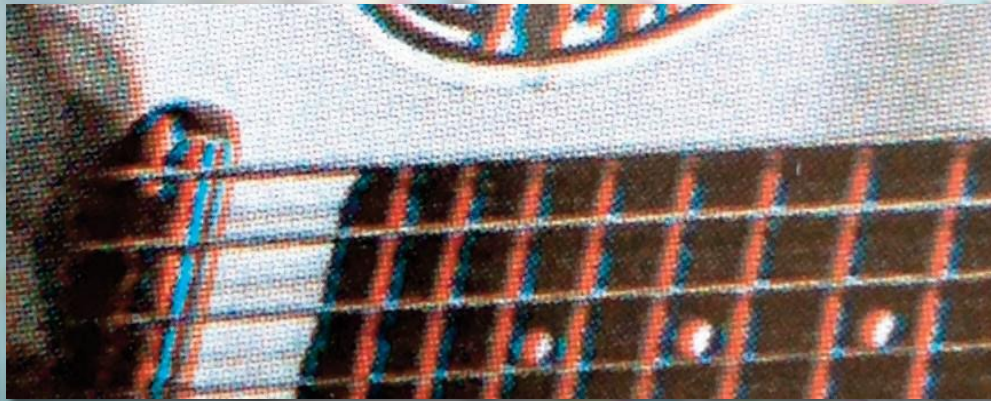
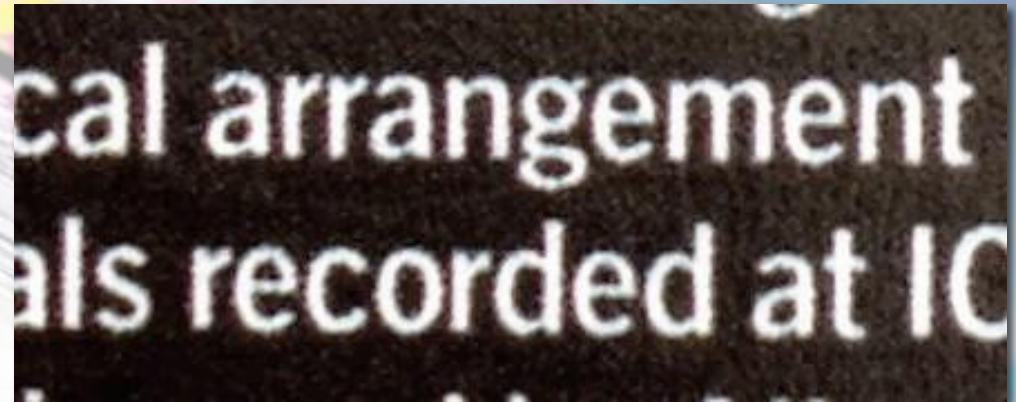


Prinect APSC –
what is it all about?





What is paper stretch compensation?



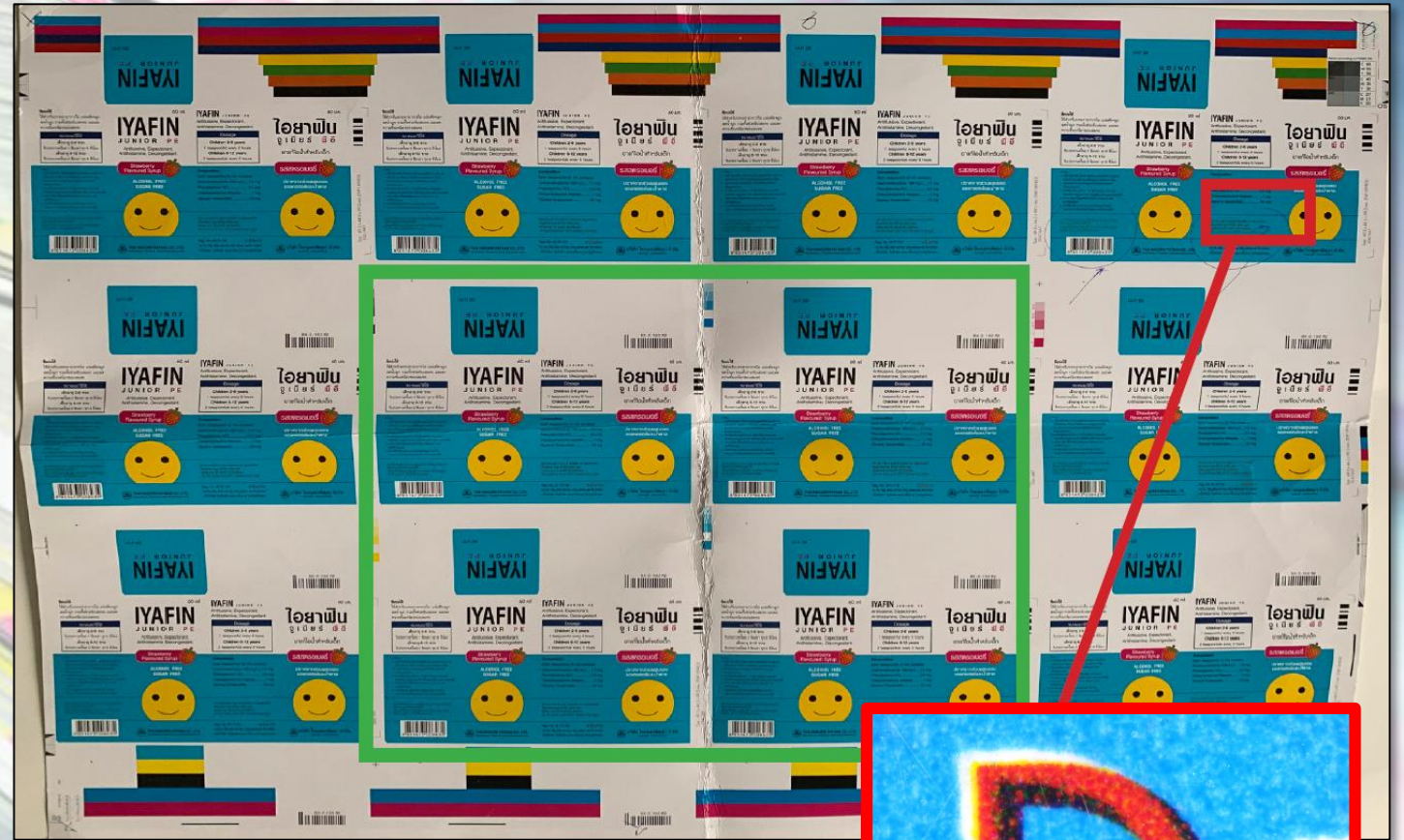
Misregistering due to paper stretching

With Automatic Paper Stretch Compensation



Effect of paper stretching on packaging job

→ Only 4 of 12 one-ups can be sold



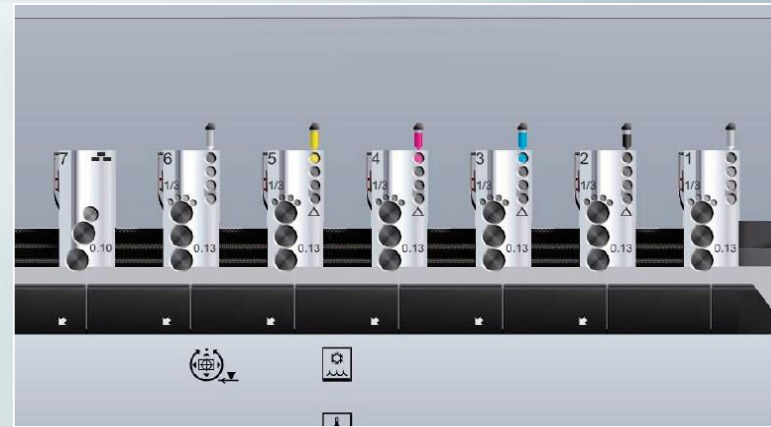
Substrate: heavy cardboard





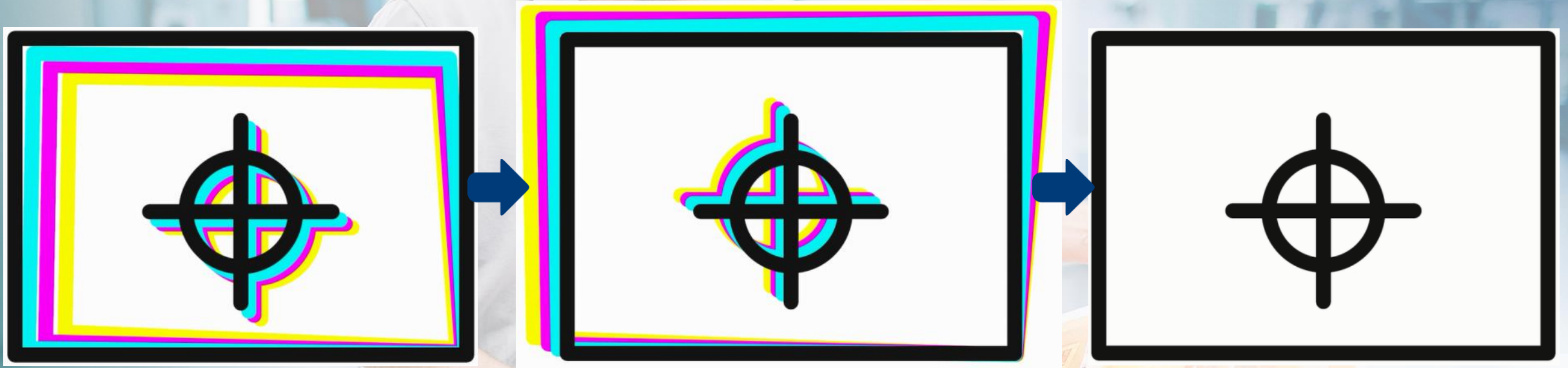
What influences paper stretching?

- Paper type, grain direction, grammage, surface
- Position of printing unit in printing press
- Type of press
- Type of ink, ink coverage
- Room temperature and humidity





The Solution with Prinect APSC: Compensating before Printing



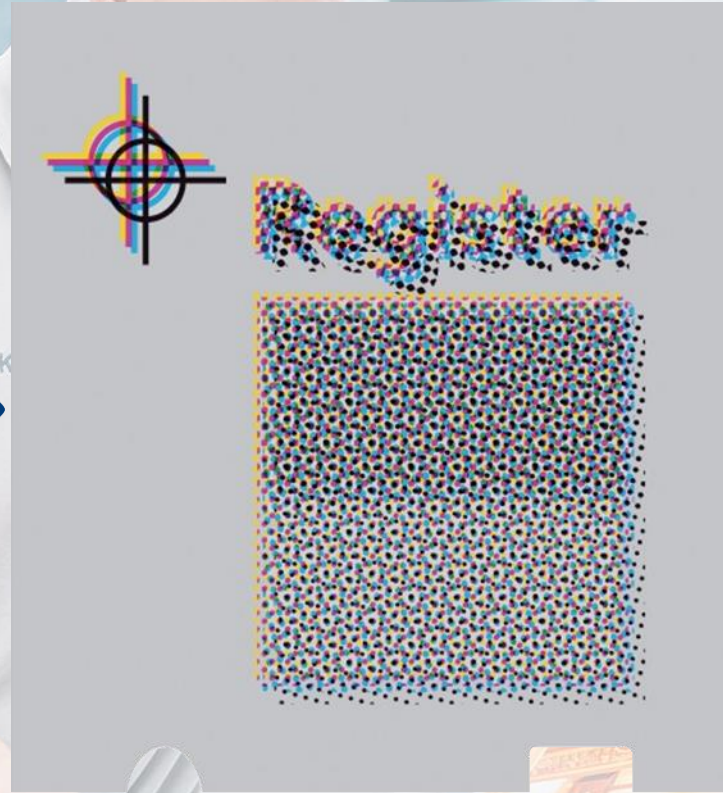
Bad register due to paper stretching

Predictive compensation

Perfect register in print without mech. intervention



How compensation is calculated.



Bad register due to paper stretching

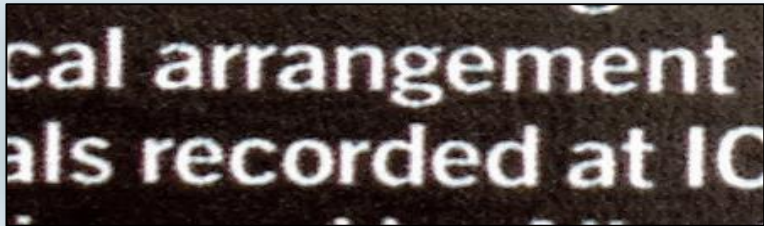
Compensated printing plates

Perfect dots and rosettes in print



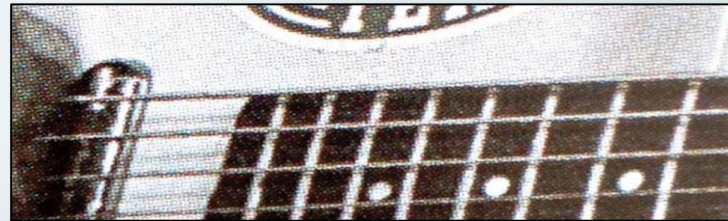
Paper Stretch Compensation solves difficult Layout Situations:

Small details and fonts



-> Perfect register

Critical gray balance



-> Color identical layout

Layouts with multiple ups



-> No color shifting



Outcome.

Savings with Prinect APSC.



→ Mechanical adjustment of the rear edge of the plate is no longer necessary



→ Saves make ready time of 5 minutes and more per compensated job



→ Saves waste of 80 sheets and more per compensated job



→ Improves productivity, all parts of the sheet can be sold instead of only half of it



Prinect APSC – News Version 2021



How to use Prinect APSC out of the box?



Automatic compensation needs characteristic compensation curves...

- ... for each individual press, for each paper type, for ...
- Result: A lot of curves - one for each different parameter
- Necessary: Initial effort of 3 days of printing, measuring and generating curves *
- Solution: What about providing **standard curves**?

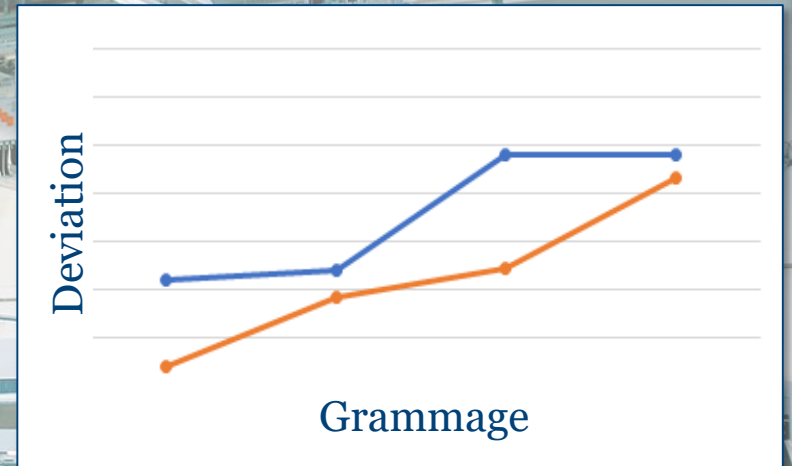
*described in chapter “Automatic compensation” see page 27

Job Group	Characteristic curve	Mach...
Default	Default_XL106_F_SB_C_F1_R4C	XL-106
Default	Default_XL106_F_BB_C_F1_R4C	XL-106
Individual	#13112019_1_FRONT	CX102-8
Individual	#319143_70_Flächendeckung_CX102_PDK+_F...	CX102-8
Individual	#A10-090_XL-1_PDK+_FRONT	XL106-1
APSC-Demo...	APSC-DemonstrationX_CX102-8_F_LG_C_F1_...	CX102-8
APSC-Demo...	APSC-Demonstration2_CX102-8_F_LG_C_F1_...	CX102-8
APSC-Demo...	APSC-Demonstration_CX102-8_F_LG_C_F1_P...	CX102-8



How to use Prinect APSC out of the box?

- Several standard curves provided!
- Ready for use.
- User can start immediately.
- No printing and measuring necessary.





3 Clicks versus 3 Days

**NEW
FEATURE
2021**



Try and improve.

Customers with Prinect Production Manager

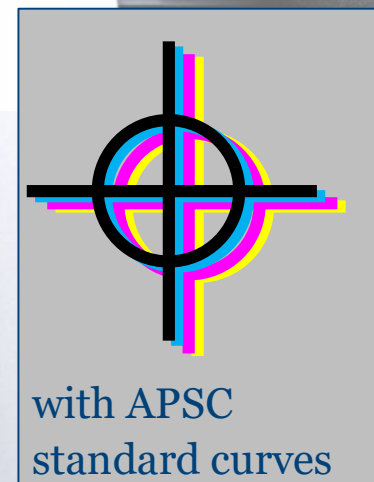
- Need only **3 clicks** to use Prinect APSC with standard curves
- Can improve standard curves by trial and error
- Not necessary: service installation and training of **3 days**



Better result.

- Standard curves increase register accuracy by at least 50 %
- Easily assign standard curves to your preferred sequence
- Or create a hot folder (in 3 quick steps)
- Let your jobs be compensated automatically

Expect 50 % better register quality



50 %

50 %



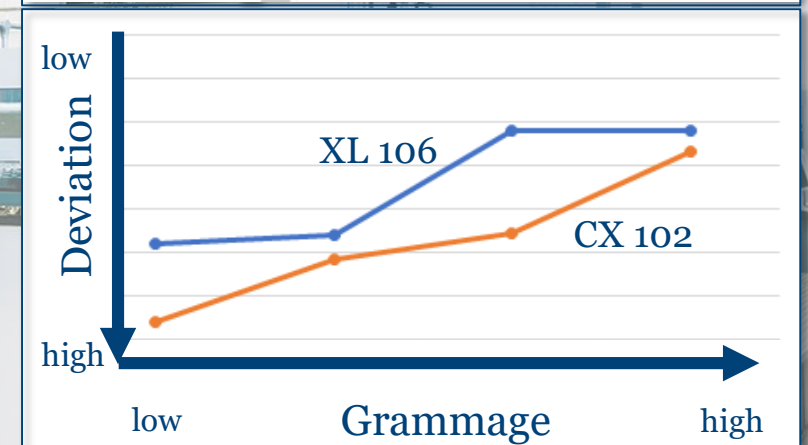
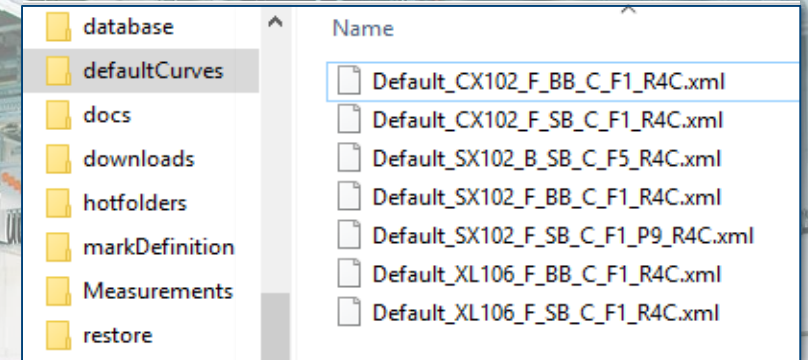
Standard Curves – How to apply.

→ The curves can be used under these conditions

- For presses XL 106, CX 102, SX 102
- Coated paper (no uncoated, not tested yet)
- Front page (no back page tested yet, curve may need further adjustment)
- Process colors with print sequence **B-C-M-Y**

→ No restrictions for

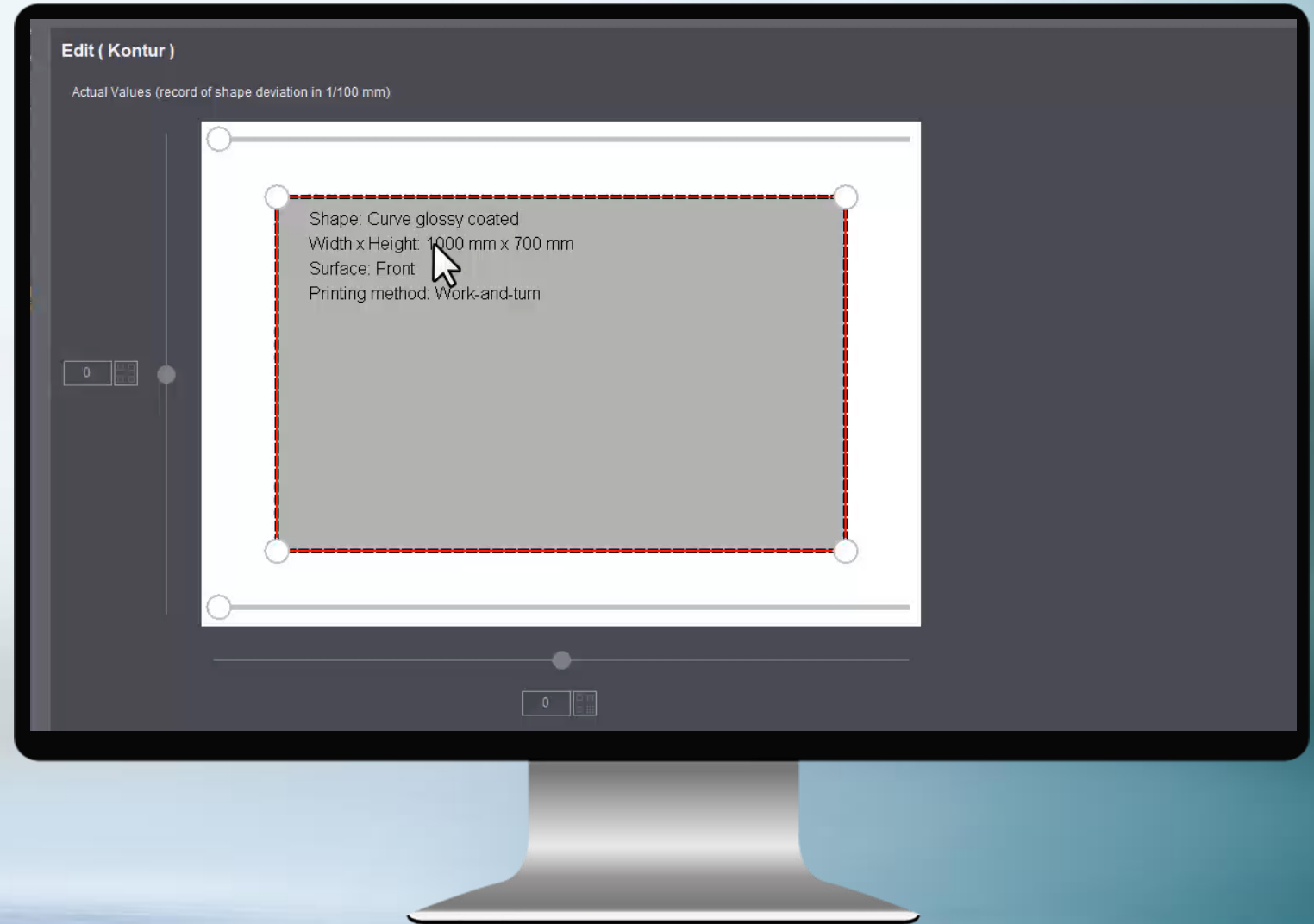
- Grain direction: long or short possible
- Ink coverage: all % possible





Sheet contour adaptation By quick clicks.

- Adapt standard curves to user's situation
- Click and draw or insert values
- Easy improvement of curves



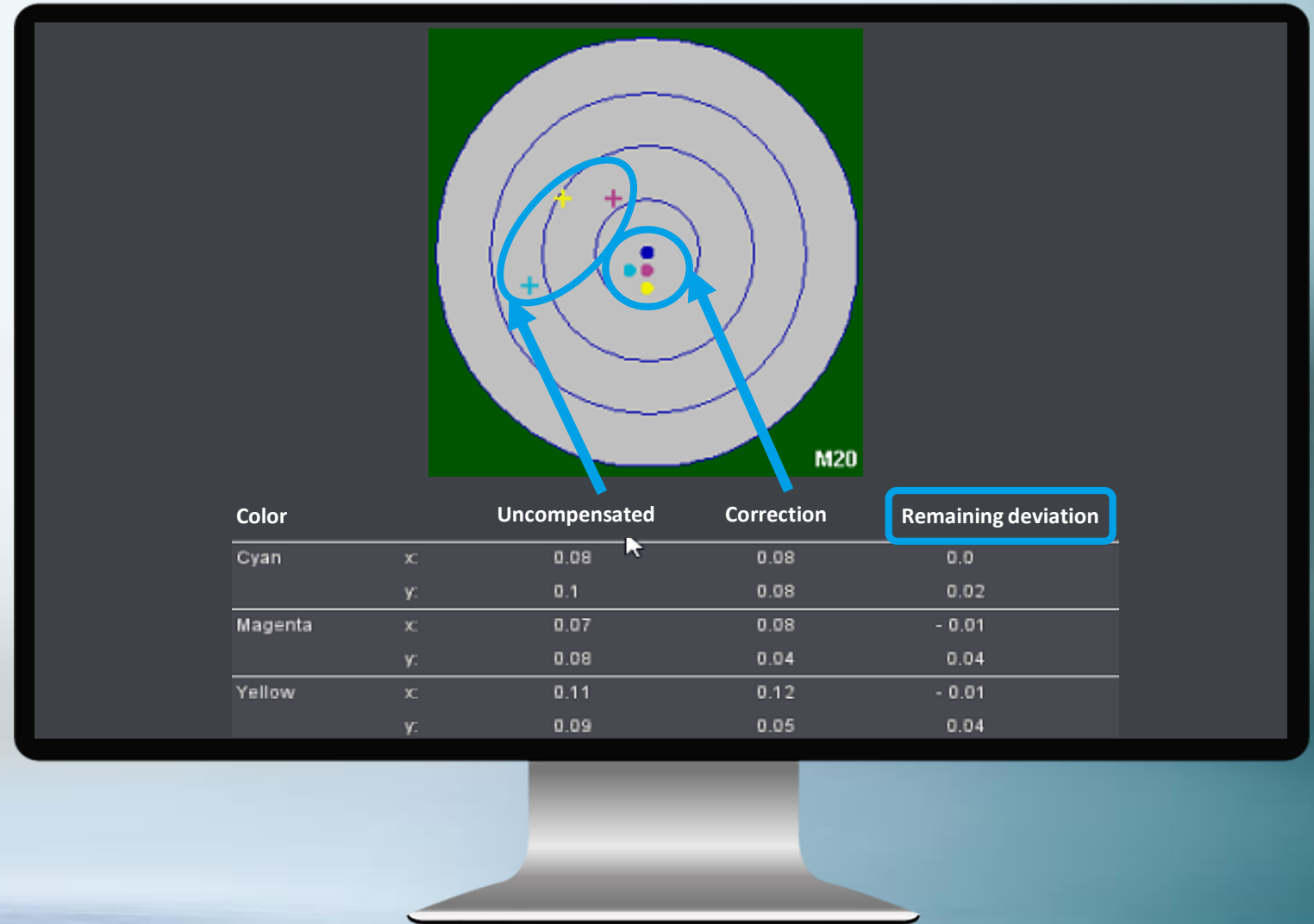


Measure the result of compensation.

See how Prinect APSC increased print quality.

→ Quality reports show improvement and remaining deviation of register

→ Reports help to decide how standard curve should be adapted



**NEW
FEATURE
2021**



Prinect APSC – News Version 2020



How to measure register deviation?

USB-microscope camera

- Camera resolution:
1280 x 1024 pixel
- With polarizing filter
- USB connectable
- Rack / mount for camera is recommended
- Illumination recommended





How to measure register deviation?

New register marks

- For up to 8 colors
- Reference color 2x
- Size: 6,4 mm

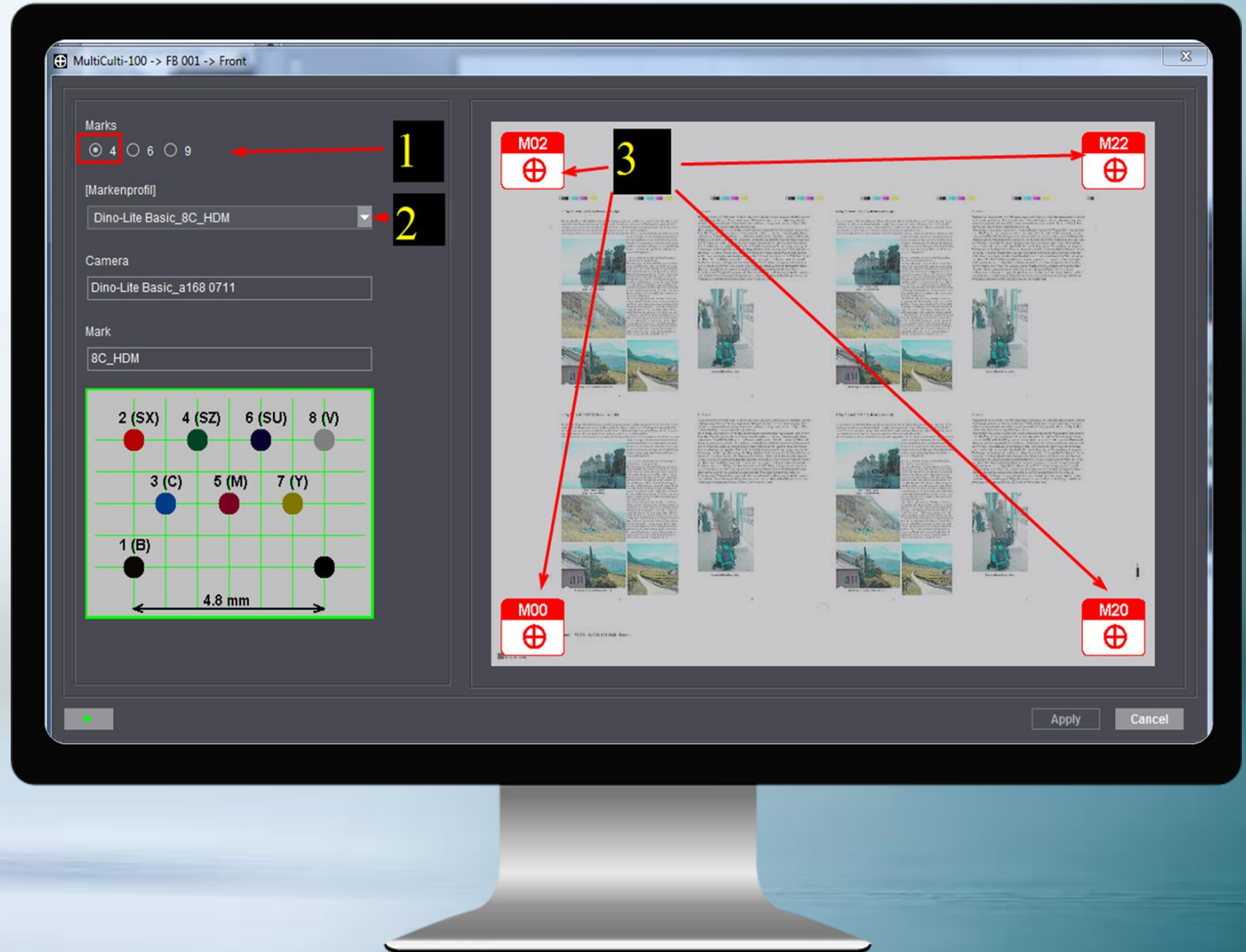




Measuring and transferring results.

Easy user guidance

- Register marks are measured
- Results are automatically transferred to Prinect APSC





Prinect APSC

- How does compensation work?





Prinect APSC –
Different modes of compensation.



Prinect APSC Version 2021

Versatile print situations – one compensation software

→ Automatic mode:

- Serial production with
 - Either **standard curves** (try and improve)
 - Or **measured characteristic curves** for paper types
- Fixed print sequence: **B-CMY- spot**
 - (or **B-V-C-G-M-O-Y** for measured curves)



→ Individual mode:

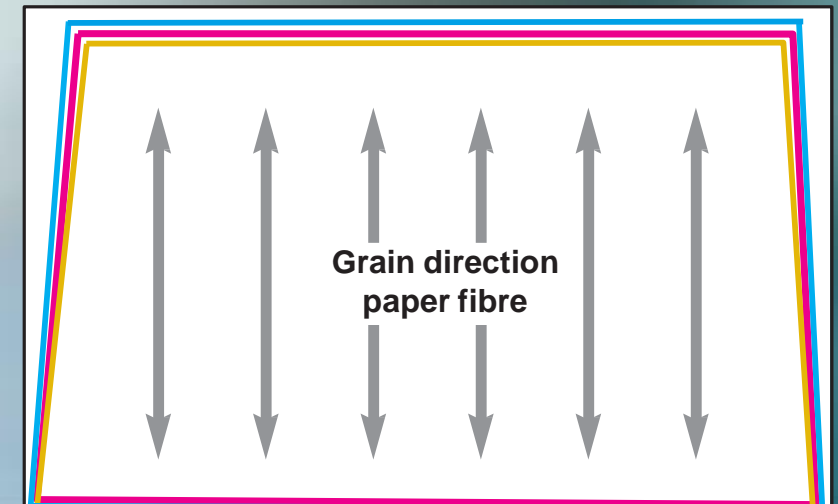
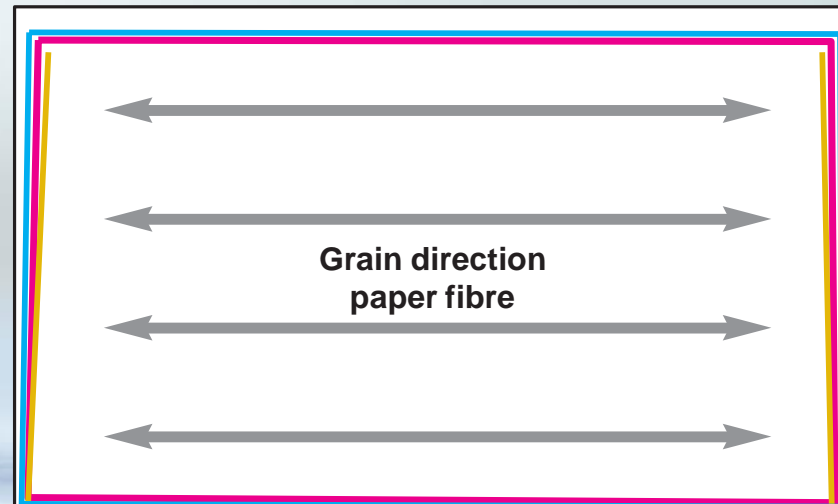
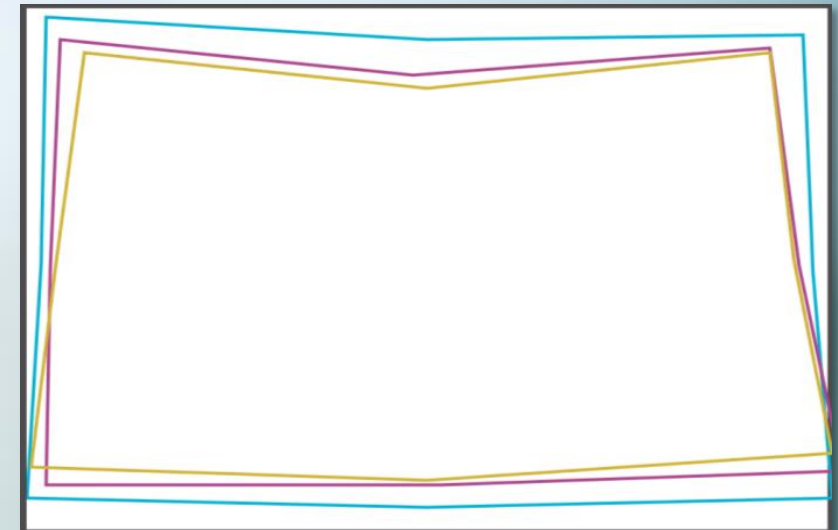
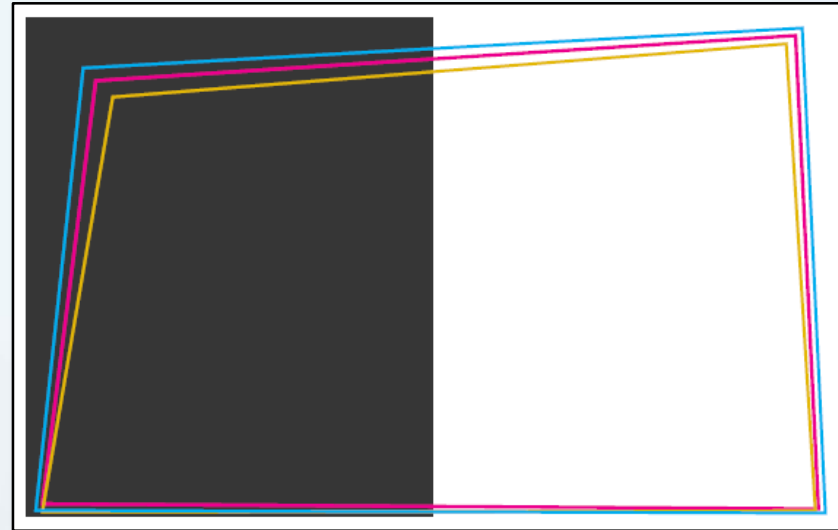
- Individual calculation per job
- All print sequences and/or spot colors
- 2 sets of plates necessary





Prinect APSC –
Automatic Compensation.





How can paper stretching look like?


→ Examples of deviations caused by paper stretching



Automatic compensation – Paper behaviour

Paper stretching is different for:

- Grain direction
- Surface
- Grammage
- Ink coverage
- Position in press

- 1.
 - 2.
 - 3.
 - 4.
 5. Fixed print sequence **B-CMY-** ...
- Different test sheets
- 

Substrate's behavior needs to be learned

- 1 single compensation curve for each paper type
- Ink coverage is considered automatically
- Environmental conditions have to be stable



Compensation curve generates a repeatable print result.

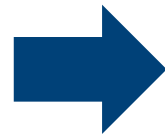




How Prinect APSC works: Automatic Compensation.

Step 1: Paper behaviour

Test forms are printed at least for all grain directions and paper classes.



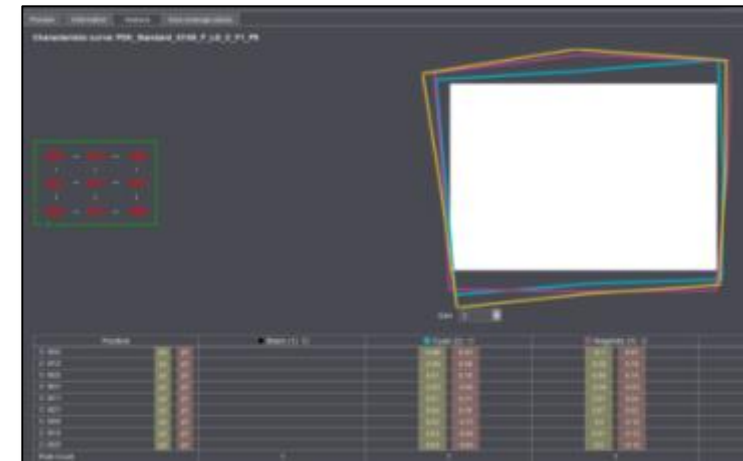
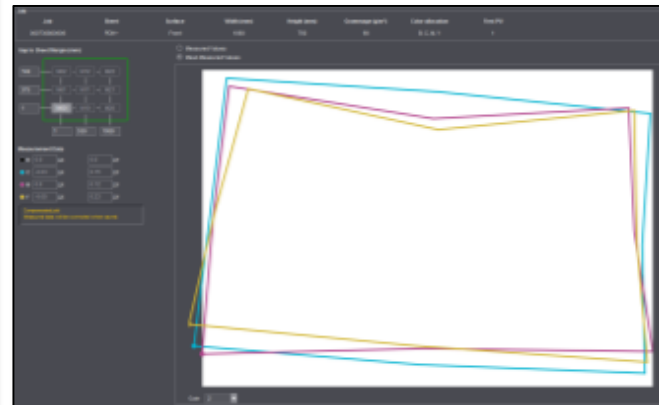
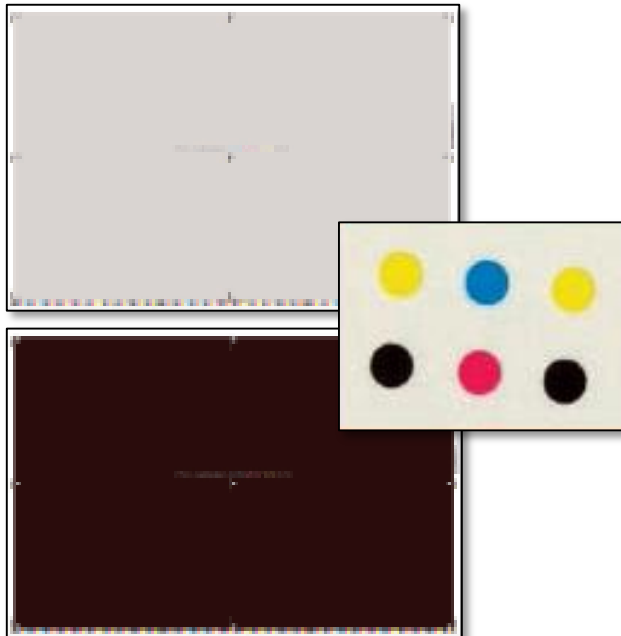
Step 2: Basic preparation

The register of the printed sheets is measured by a USB microscope camera and automatically transferred to Prinect APSC.



Step 3: Standardization

The characteristic curve for each defined paper type is created.





Your benefit of automatic compensation:

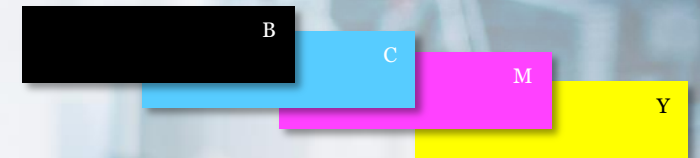
- No touch points during production
- Standardization

Conditions

- For frequently used paper types
- Given print sequence
- Stable print conditions



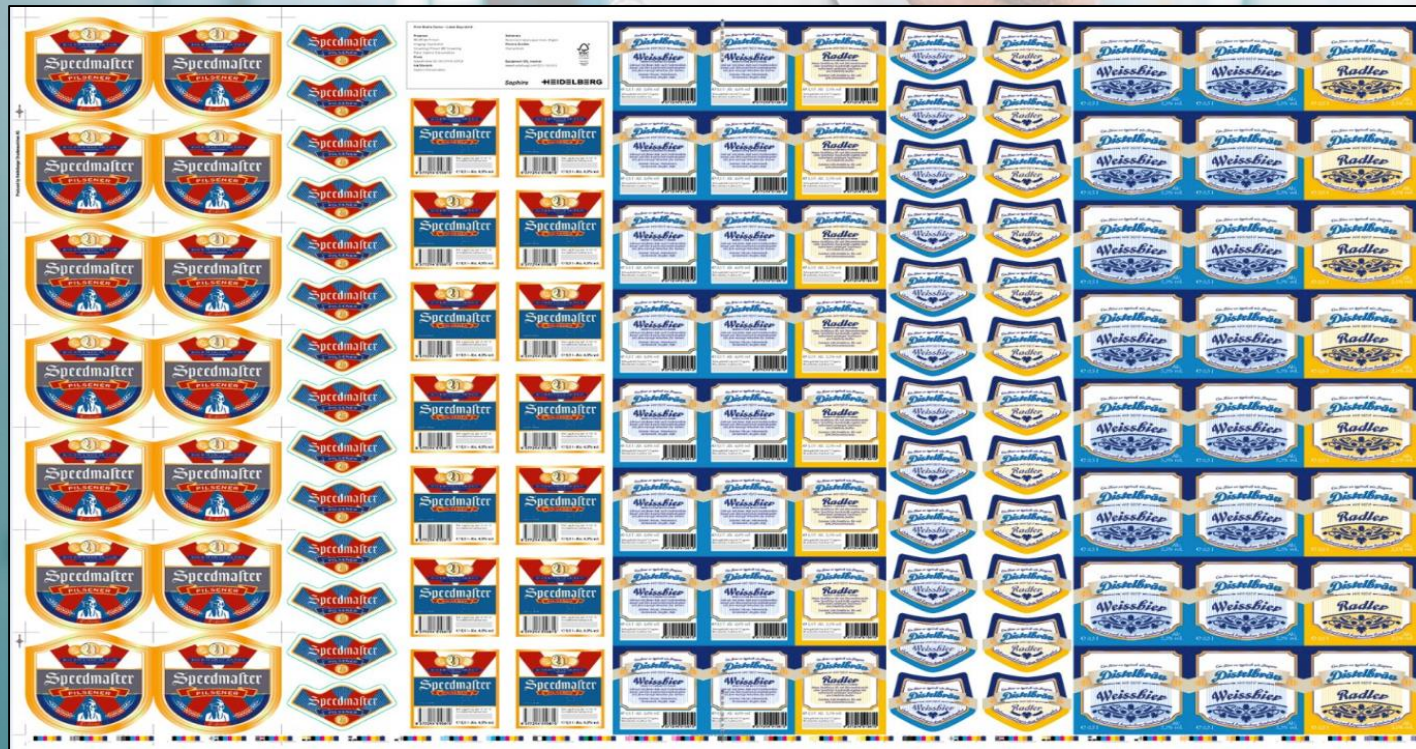
Automatic compensation.
Use Case: Commercial job with process colors.



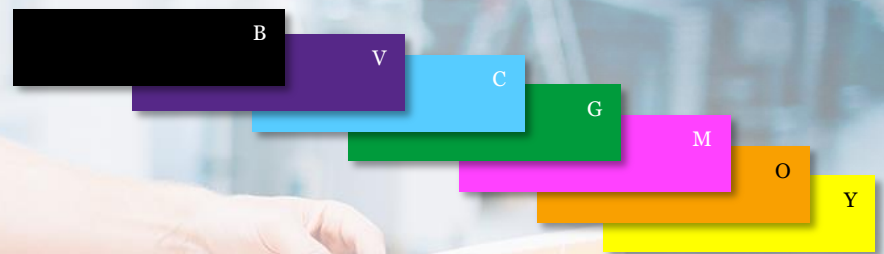


Automatic compensation.

Use Case: Label/ Packaging jobs with process colors & spot colors.



Automatic compensation. Use Case: Jobs with multicolor.





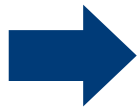
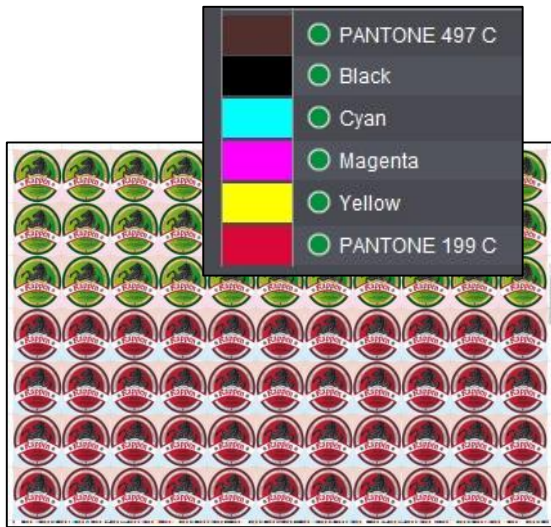
Prinect APSC –
Individual Compensation.



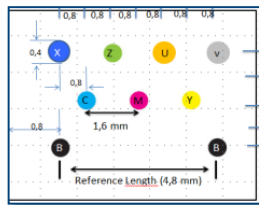


How Prinect APSC works: Individual mode for compensation.

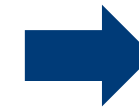
Step 1:
Individual job is printed.



Step 2:
Register deviations are measured by USB microscope camera (also spot colors) and automatically transferred to Prinect APSC.



Step 3:
Prinect APSC calculates the individual compensation for this job.



Step 4:
Plates are imaged.





Your benefit of individual compensation:

- 100 % accurate register
- Higher productivity
- Spontaneous compensation possible

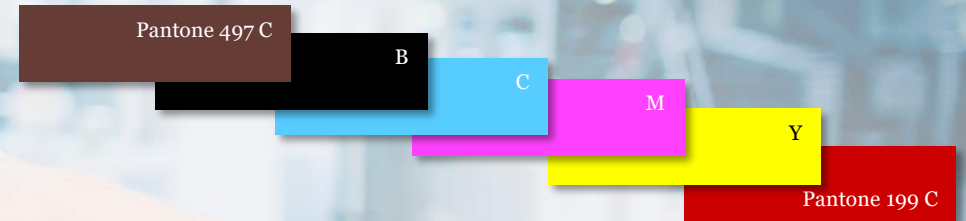
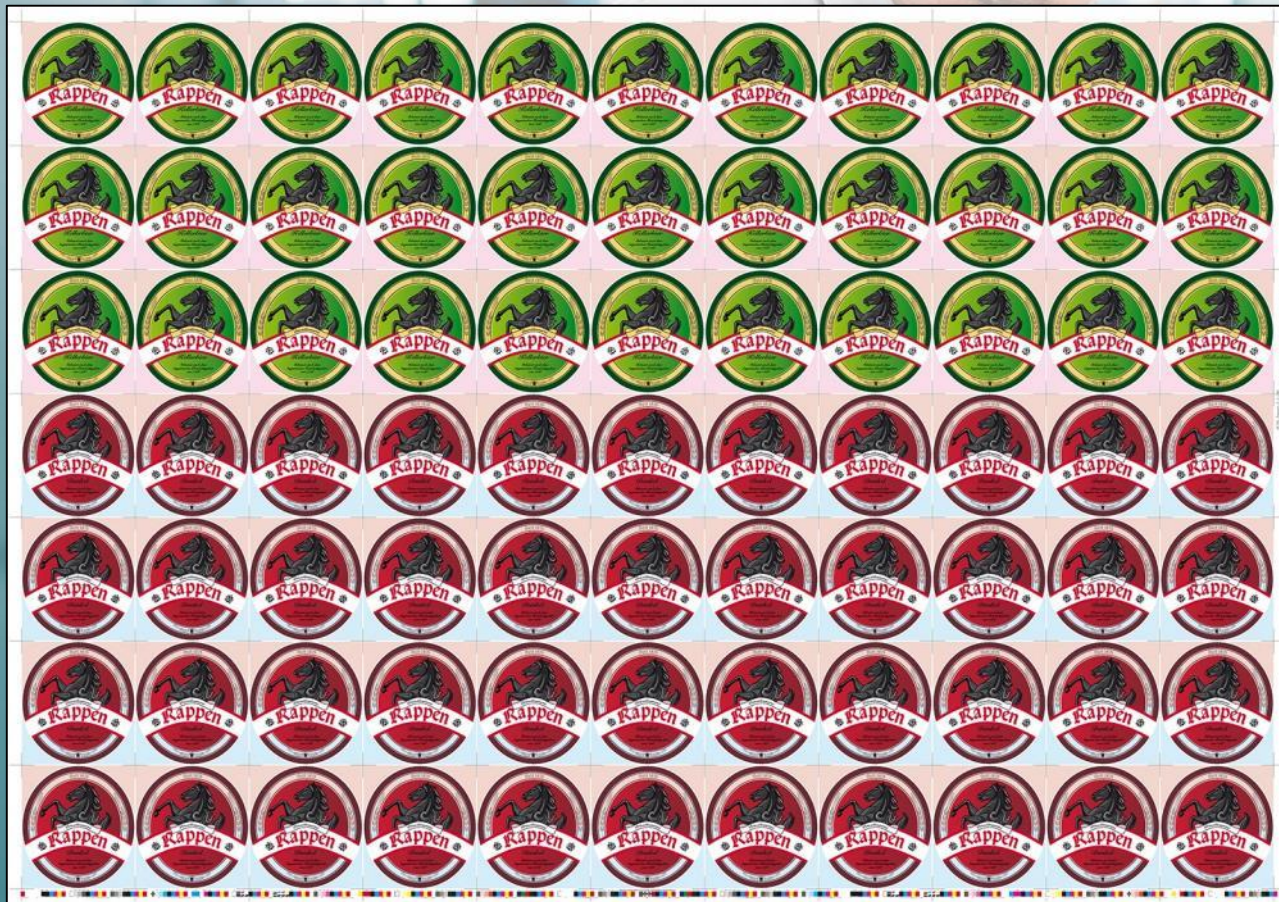
Conditions

- 2nd set of plates



Individual compensation.

Use Case: Jobs with spot colors / special print sequences.





Individual compensation.
Use Case: Special print sequence as repeat job.



The stored compensation is reused without a 2nd set of plates.



Prinect APSC individual compensation

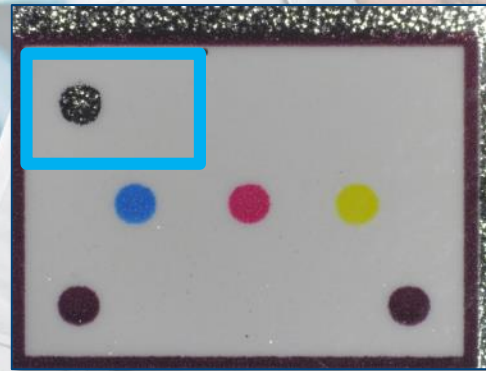
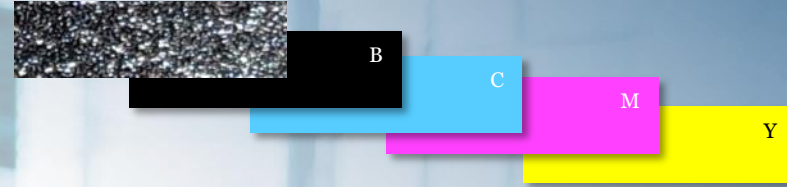
-Further use cases





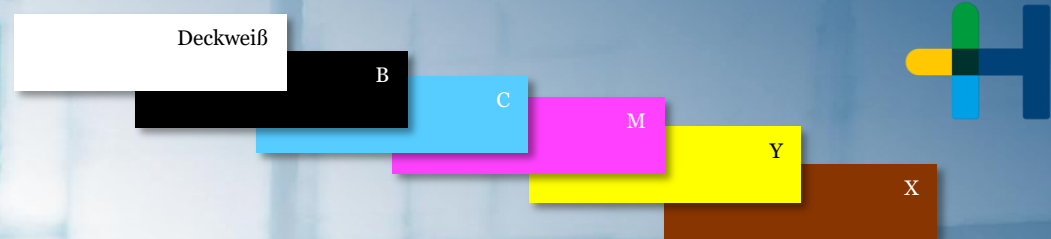
Individual compensation.

Use Case: Jobs with cold foil application



- The deviation of the cold foil plate is captured via the measuring dot.
- The deviation between 1st printing unit with cold foil application and 2nd printing unit with reference color is compensated inversely.

Individual compensation. Use Case: Jobs on metallized substrate



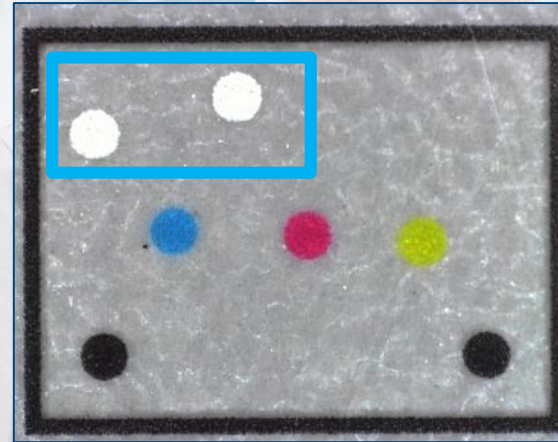
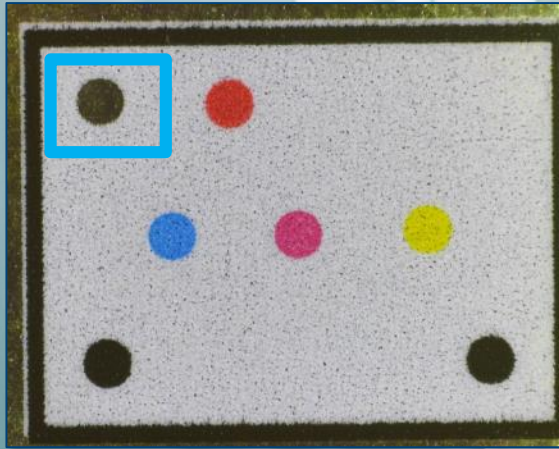
The measuring mark is printed on opaque white then the camera can capture the dots despite substrate reflexions.



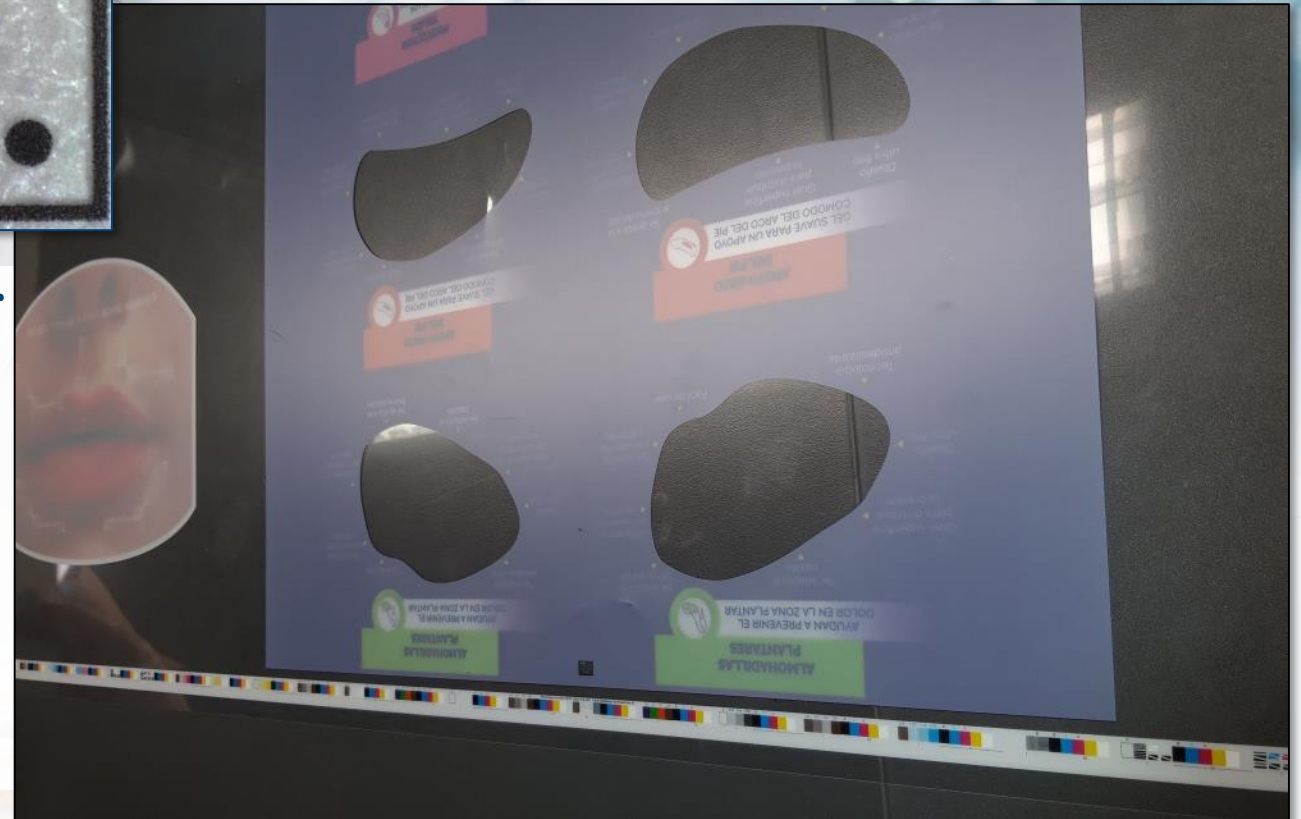


Individual compensation.

Use Case: Jobs with opaque white



- Measuring the opaque white itself in order to compensate it: Measuring dot for opaque white is realized as empty space (on metallized or transparent substrate)
- With 2x opaque white on transparent foil: transparent measuring mark on dark measuring table





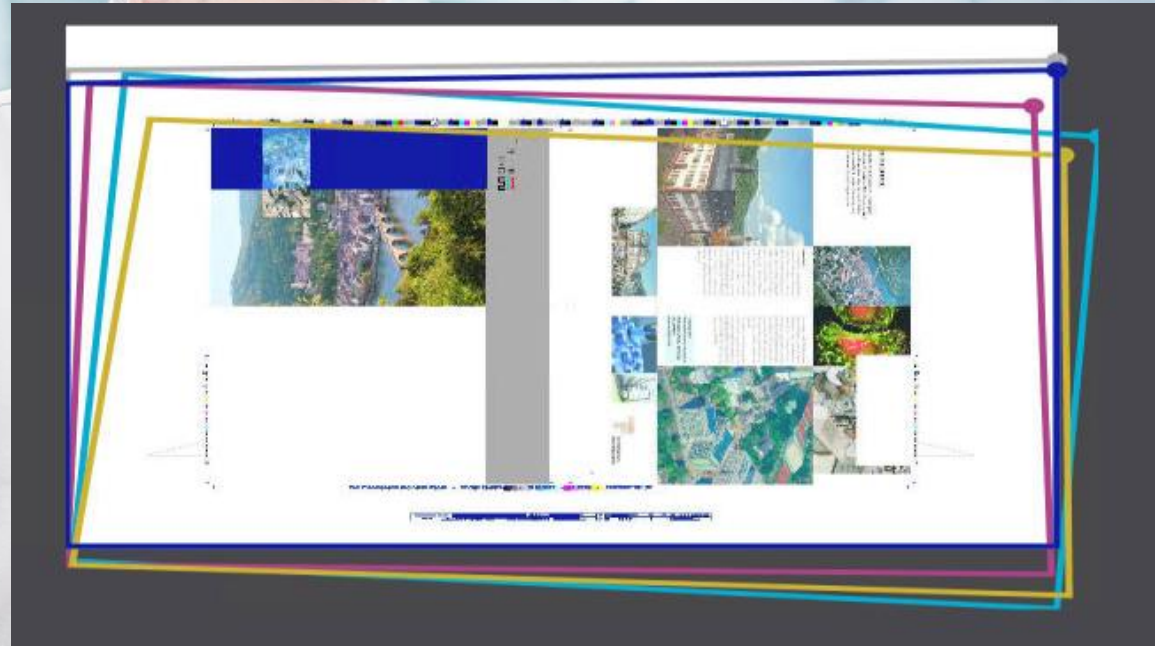
Prinect APSC –
Combination of Automatic and Individual Compensation.



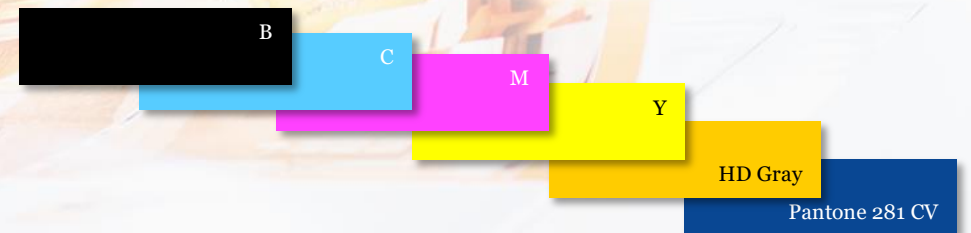


Use Case: Job with process and spot colors.

- Automatic compensation as first step
- Individual compensation for spot colors in order to get 100% register accuracy

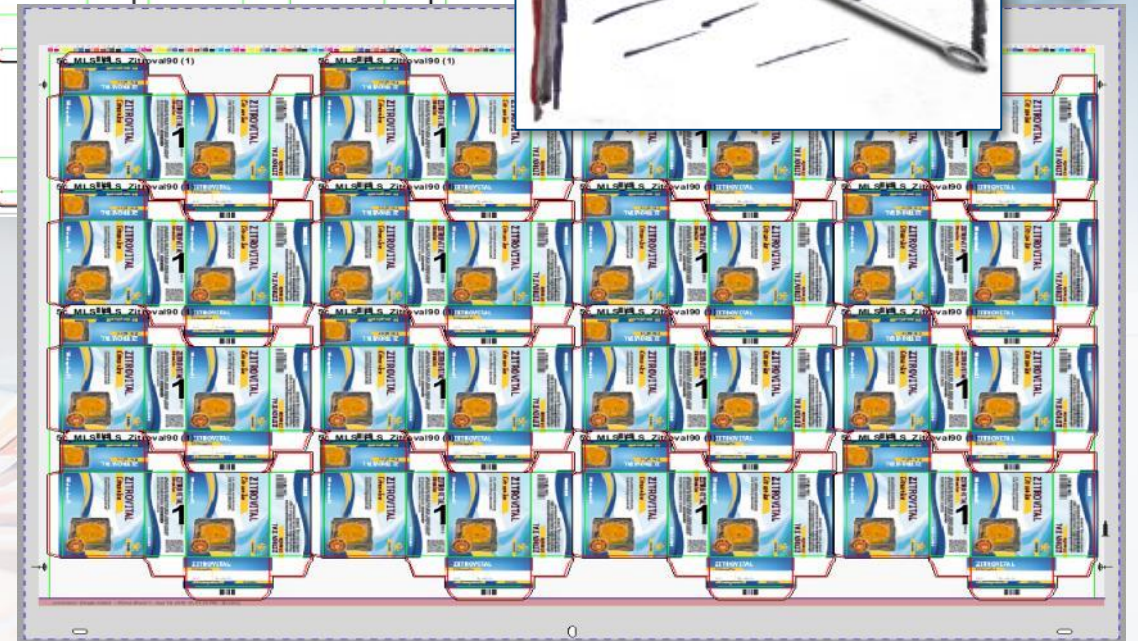
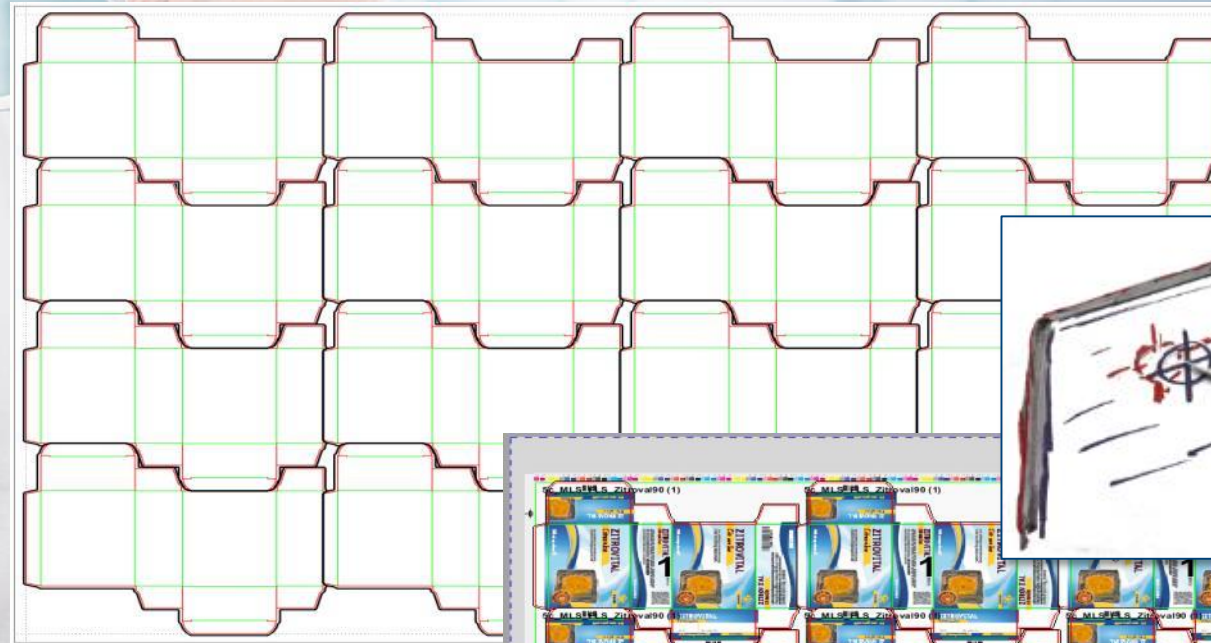


ΔX	0.0	ΔY	0.0	■ Black
ΔX	0.07	ΔY	-0.25	● Cyan
ΔX	-0.04	ΔY	-0.18	● Magenta
ΔX	0.01	ΔY	-0.29	● Yellow
ΔX	0.0	ΔY	-0.08	● HD Gray
ΔX	0.0	ΔY	-0.1	● PANTONE 281 CV



Use Case: Correct register by puncture and pre-distortion.

- Individual compensation
- Correct registering between back and front page of printed image
- Correct registering of printed image to cutting die (or similar)





Prinect APSC

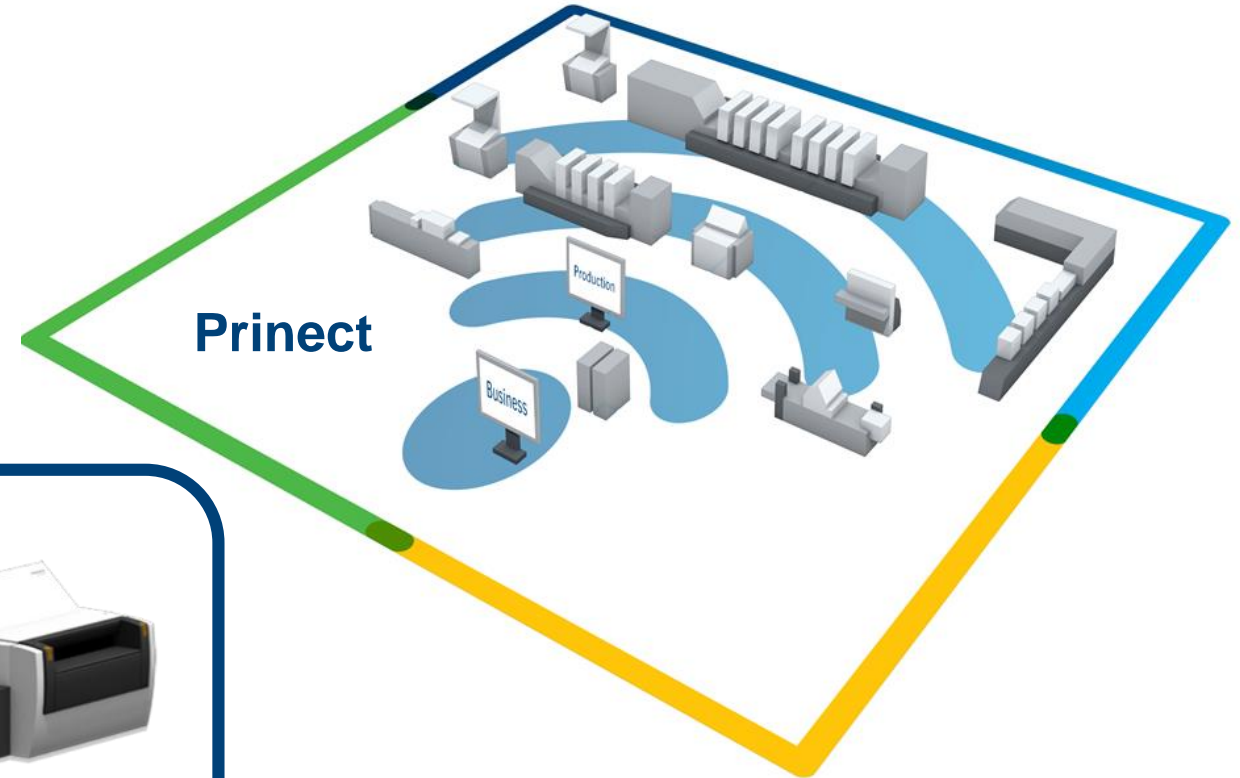
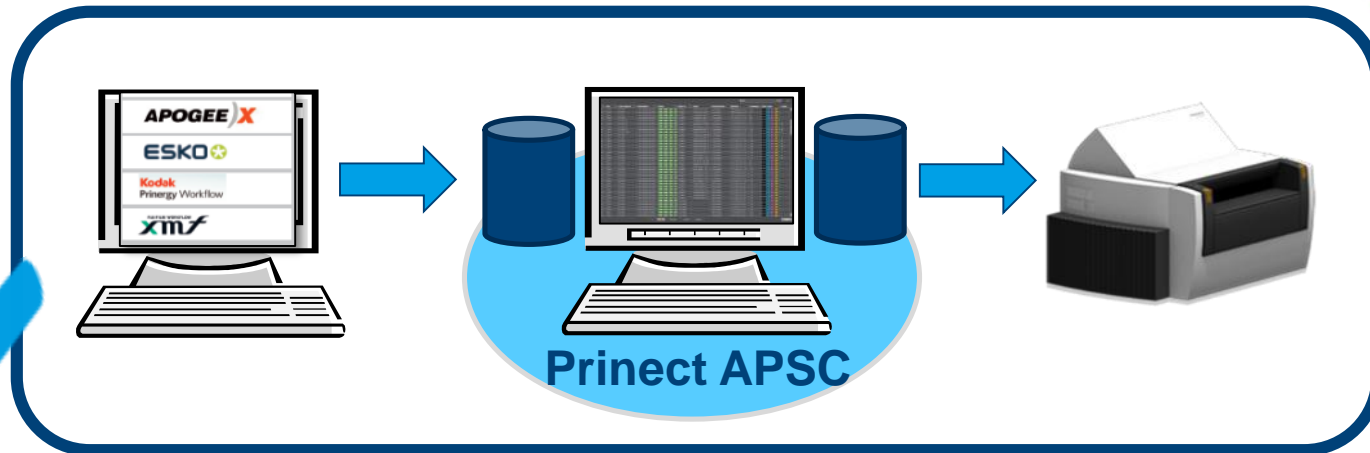
- Position in the workflow





Prinect Automatic Paper Stretch Compensation works with different Workflows

Prinect APSC can be used together with a 3rd party prepress workflow.

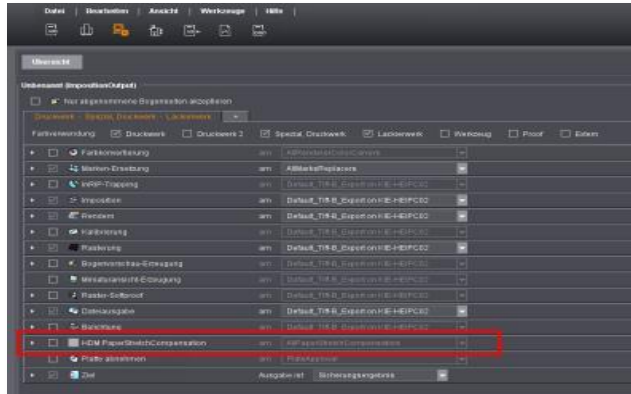


Prinect APSC is compatible with the Heidelberg Prinect Prepress workflow.



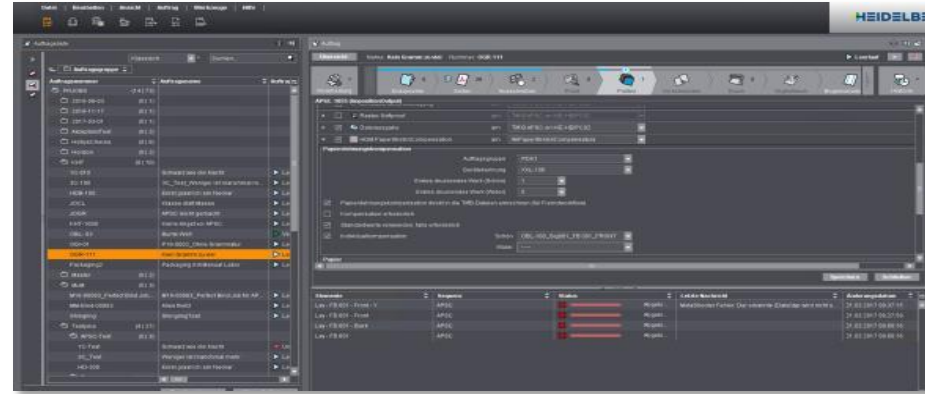
How Does Prinect APSC Work?

Serial Production: Heidelberg Prinect Workflow



Prinect Prepress Manager

Prinect Prepress Manager prepares job for rendering. Job is fitted with paper characteristics taken from paper data base



Imposition Output Sequence

- **Prinect Cockpit with Prinect APSC license**
1. The compensation step is part of the sequence
 2. Calculates compensation for paper stretching using given ink coverage
 3. Outputs TIFF-data to plate setter



Plate Setter

→ **Heidelberg Plate Setter with Prinect Renderer** produces plates that compensate paper stretching



How Does Prinect APSC Work?

Serial Production: 3rd-Party-Workflow



Prepress

sends TIFF-data to Prinect APSC

→ Prinect APSC

1. Calculates ink coverage
2. Calculates compensation for paper stretching
3. Recalculates TIFF-data using compensation parameters
4. Outputs TIFF-data to plate setter

→ Plate Setter

produces plates that compensate paper stretching



Prinect APSC –
How to increase your productivity.





Check your job's compensation potential with us!

- See the effect of Prinect APSC on your production job at home!
- How to use – see a live demonstration at our Print Media Center.
- Get certainty about your prepress capabilities by checking your 3rd party prepress TIFF files with us.

How can you increase your productivity with Prinect APSC?



Potential in quality of register.



Potential in time savings.



Potential in waste savings.



Prinect APSC for highest productivity



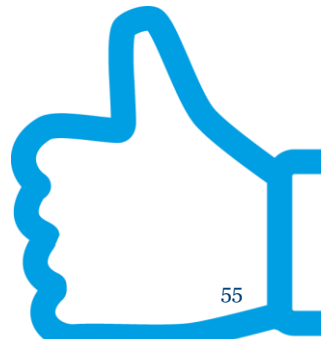
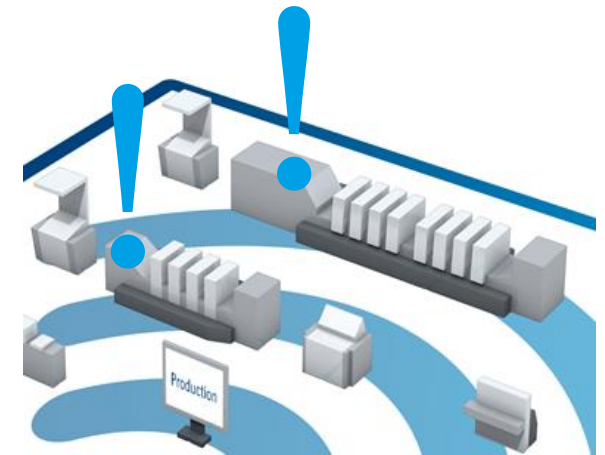
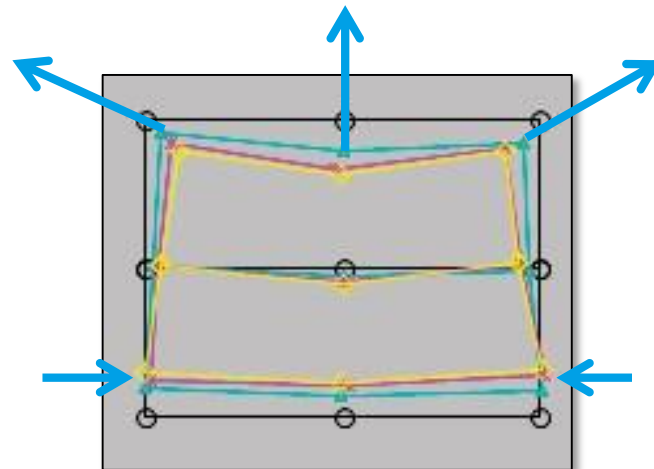
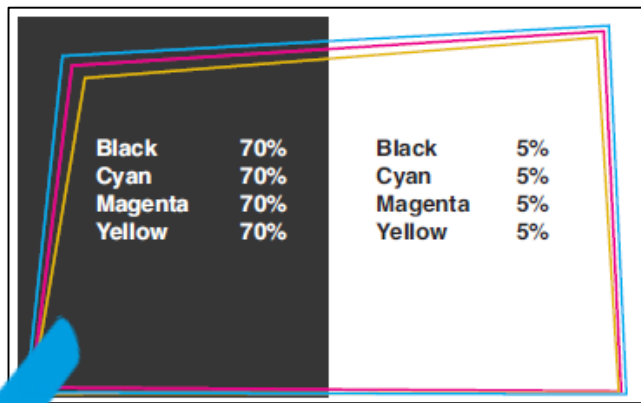
Advantages with Prinect APSC against competition

→ Always considers layout and ink coverage

→ Compensates in all directions

→ Does not wear cylinder motors

→ Applicable for the entire press room



Mr. Groth – Managing Director of Druckhaus Becker:

Prinect APSC works perfectly.

Our printers are fascinated.

We only need to load the plates in
the press and make the first pull.
Everything is just right and we can
start printing.

Prinect APSC is also a bonus point
for us when it comes to new
customer business.



Prinect APSC Version 2021
Unique solution.



patented

Unique Selling Point

Push to stop

Easy to use

Zero defect packaging

→ Compensation is **the** solution for paper stretching problems



Workflow solutions for Business and Production.
Prinect. Driving the Smart Print Shop.