


Basic Components		
Basic Components	UV-formulations	100% Waterborne
	Radiation source	Ga-, Fe- Hg doped bulbs LED EB
	Radiation conditions	Exposure Time Distance to textile ...

UV-Coating

Liquid UV-coatings



100% UV-formulation
Waterborne UV-formulation

2-systems

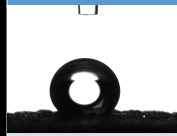
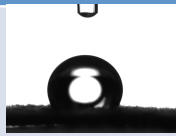
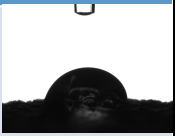
100 % UV-system


- Most important group
- Monomer diluent
- Liquid
- No solvent/water (no drying)
- Formulation (oligomer ...)
- UV-LED Fixation

Waterborne UV-system

- Waterborne dispersion
- Mainly without monomer
- Thickener (Important !)
- Water evaporation - (IR) drying
- UV-LED fixation

Hydrophobic UV-curable Coatings

Reference	Result of 1 wash process	Result of 10 wash processes
		

TEXSHIELD  Environmental friendly and Durable Oil and water repellence finish on Technical Textiles




Analog vs Digital Finishing/Coating Technologies

The Kodak moment

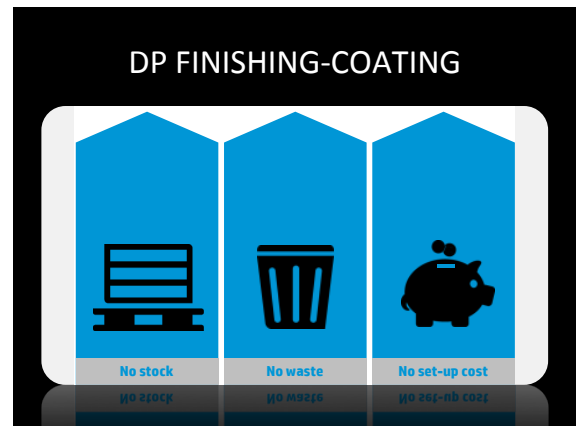
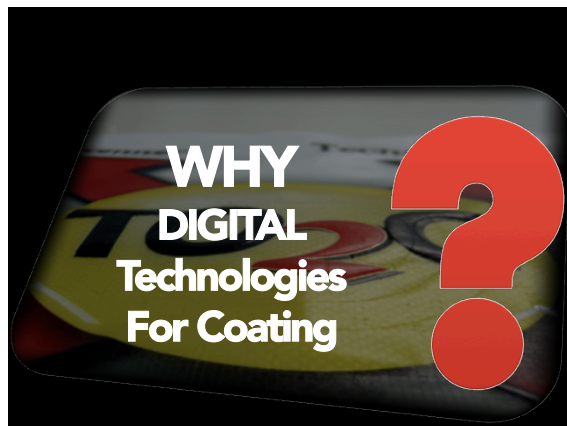
Creativity meets Innovations

DIGITAL TECHNOLOGIES IS MORE THAN PRINTING!

New developments Functional inks

From Ideas to Industrial Productivity



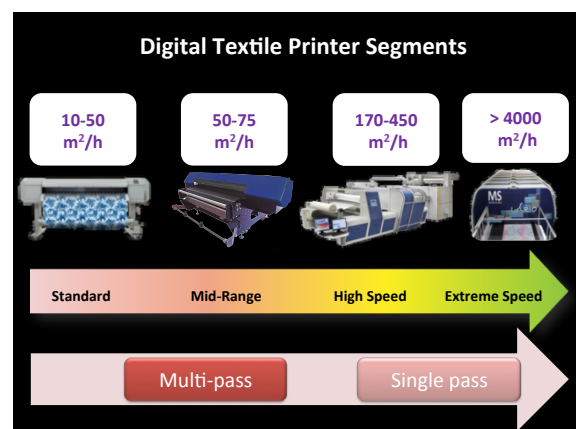


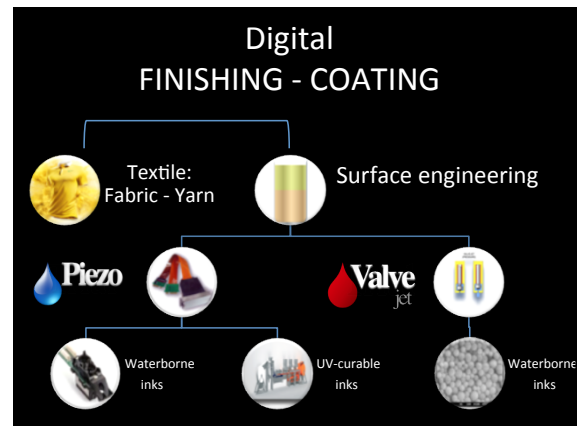
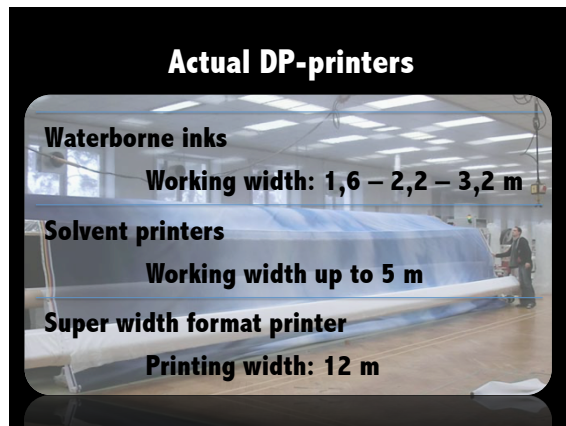
Digital micro-disposal of functional inks

- Full coverage - functionalization
- Local or patterning functionalization

Actual projects: Surface-engineering

- Superhydrophobic inks
- Antistatic inks
- AM-inks (non-migrating QUAT's)

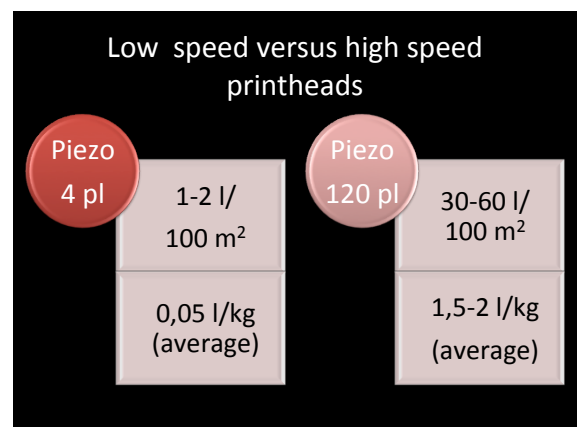




Weakness of Digital-finishing Technology

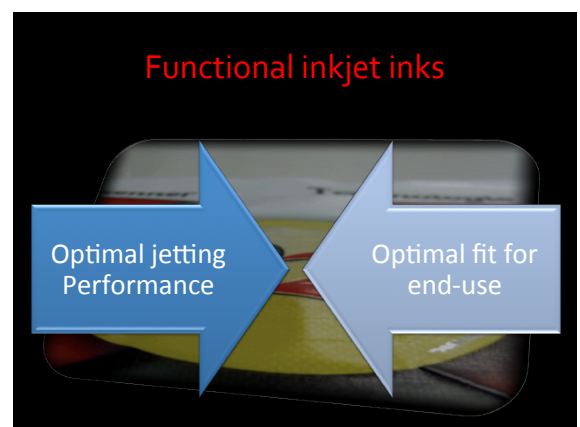
Unknow Technology
NO commercial functional inkjet inks available!

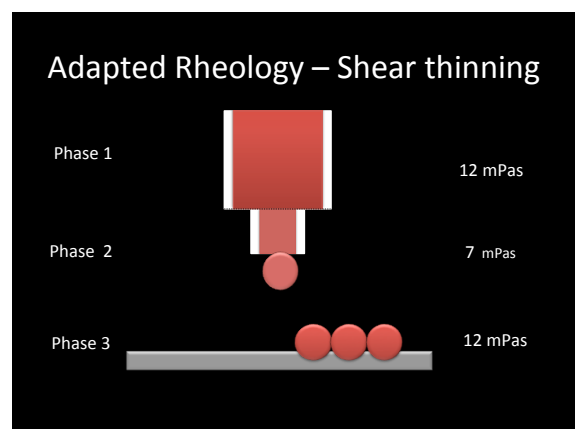
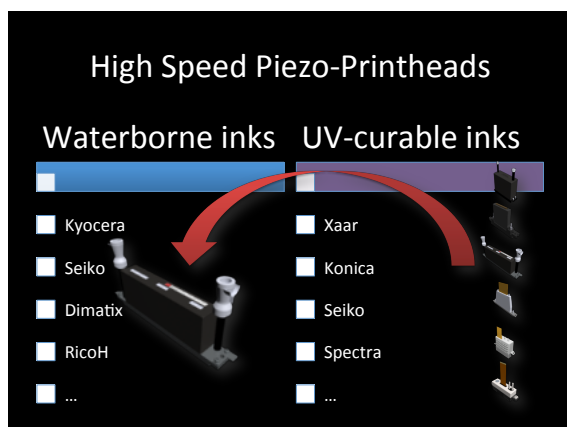
Minimal needed
The minimal amount jetted on the substrate could not be sufficient to obtain the desired, durable effects !



Digital Printing versus Digital Coating

PRINTING	Resolution (greyscale print heads...)
	Image quality
	Colour buildup
	Gamut
	Fastness (rub, wash ...) - durability properties ...
COATING	Quantity of functional product
	Full coverage – localised/patterned deposition
	Fastness – durability properties
	Target Functionality





digifun


Scanning XY ONE PASS OR TWO PASS?

One pass:


- High productivity

Two pass:

- Passing two times over the same line
- Typically 2 different nozzles print on the same line
- Deposition of **more volume (or product) !**



Development of Functional DP-inks



It all about Nano-CHEMISTRY!

DESIGNING OF DIGITAL FUNCTIONAL INKS



**NO ONE
SAID IT
WOULD
BE EASY**

Piezo

Waterborne formulation

Rheology Modifier
Thixotropic Thickener
Adjusts Viscosity


Host-system
*Functional chemical,
Humectants,
Surfactants, Water*

UV Curable - formulation

**Rheology modifier/
carrier
(Monomer)**

**Host-system
PHOTO-INITIATOR**
*Functional chemical,
O₂-inhibitor, ...*

Development of inkjet inks for Textile
(waterborne – UV-inks (100%))



Ink – media interaction

- Wetting
- Adhesion

Ink – Printhead interaction

- Jetting reliability

Ink – Curing device interaction

- Optimal curing

Digital Finishes/Coating

TOPOCHEMICAL
Engineering

H₂O- based	<ul style="list-style-type: none"> • Hydro/oleophobic • Chromic sensors • AM • Antistatic ...
UV- based	<ul style="list-style-type: none"> • Layer-on-layer • Transparent layers ...

HoGent

INCODE

Invisible Infrared Sensitive Coding

Project leader

FPL FORSCHUNGSGESELLSCHAFT
FÜR PIGMENTE UND LACKE E.V.

Scientific partners:



www.ipa.fraunhofer.de





www.icf-denkendorf.de

INVISIBLE INKS
Anticounterfeiting – Tracking - Tracing

INCODE



Or pirate products?

INCODE

IR-INVISIBLE INKS
Anticounterfeiting – Tracking - Tracing



Heating + IR-camera




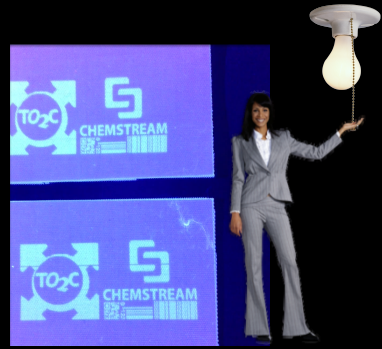
Visible light

INCODE


Invisible inks
(visible with UV)

- Waterborne
- UV-curable (100%)






You art the print, we print the art



Pictures HP





Playing with UV-inks

