

DIGITAL TECHNOLOGIES: a Step forward for Creative Textile

Prof. Dr. Marc Van Parys UNITEX 27.11.2014 PID Congress

NEEDS OF THE TEXTILE INDUSTRY

DEVELOPMENTS - INNOVATIONS

AN OVERALL APPROACH TO THE NEEDS OF TEXTILE INDUSTRY
DEMANDING FOR CHANGING PRODUCTION STRATEGIES

Strengthening competitiveness

- SHORTER RUN LENGTHS (OFTEN < 100 m)
- INTEGRATION OF MANUFACTURING PROCESSES – NEW BUSINESS MODELS
- CHEAPER COSTS (TOTAL COST)

Cost Efficient

- REDUCED STOCKS

Flexible

GROWING DEMAND FOR TEXTILE PRODUCED
USING SUSTAINABLE OPERATIONS AND FOR
PRODUCING PRODUCTS CLOSER TO THE MARKET

SNAILTEX

Self adhesive textile
Hard substrates
(removable, printable, re-using)


Interior Design or Creativity without Frontiers

Interior Design – Creativity without Frontiers

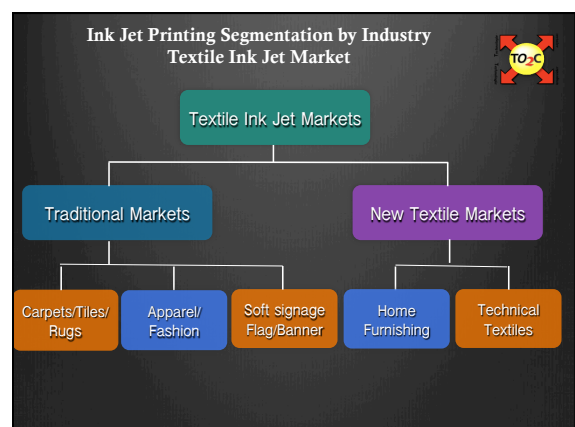
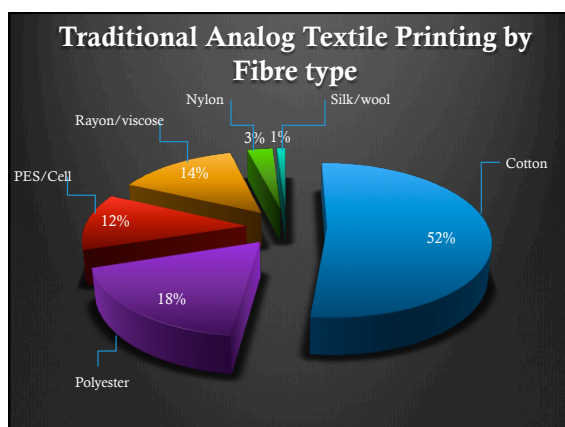
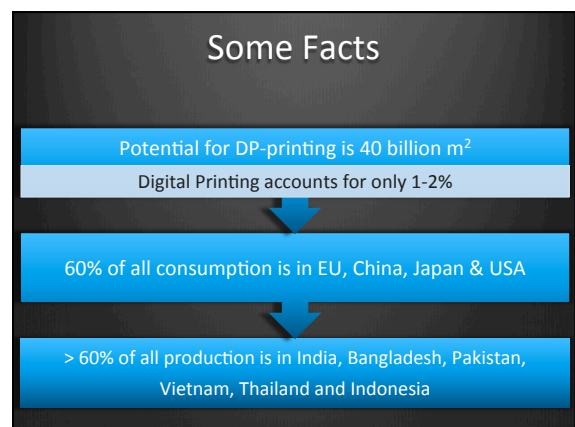
Smart Wall Covering



FACTS



- ⊗ European interior market ca. 1 billion m²
- ⊗ Number of European Screen printers is decreasing at an alarming rate
- ⊗ JAQUARD WEAVING is still the most used technology for high cost interior textile BUT
 - ⊗ Stockage of dyed yarns imposes a (too) high cost
 - ⊗ Residual stock of dyed yarns AND
 - ⊗ European yarn dyers are slowly disappearing



Why Digital Printing Interior Textile?

Creative – Designing benefits

Technical & Quality benefits (but also 'issues'!)

Economical and ecological issues

CREATIVE BENEFITS



Technical @ Quality Benefits

No issues with 'fit' (i.e. screen mis-alignment) ...
removes a major quality problem

Fewer design compromises re-overlaps & fine lines

Less 'siding' / 'edge-to-edge' shading issues

Sampling – proofing – industrial run on same
printer

ALTERNATIVE MANUFACTURING

KEY ARGUMENTS:

- Respond to individual customer requirements:

- **Mass customization**
- **On-Demand-Delivery**
- **Time-to-the-Market (FAST DECO)**

- Enable processes to be read in digitally by
linking the production process to a range of
customer networks through the internet.

Digital vs Analog: The Economics

Economics

Lower design origination costs versus
higher running costs

Digital design collection

DP is still a 'Niche' BUT Gap is closing fast !

Unique designs justify sales price

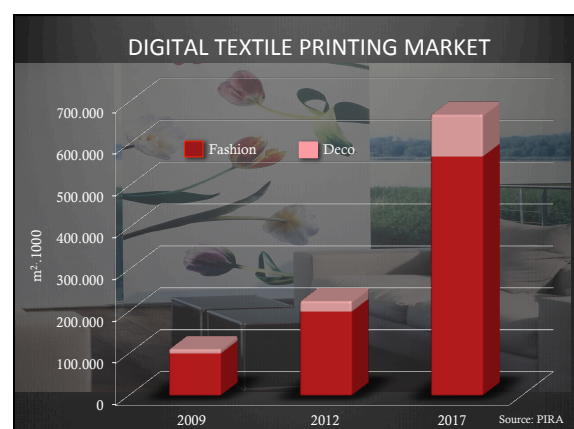
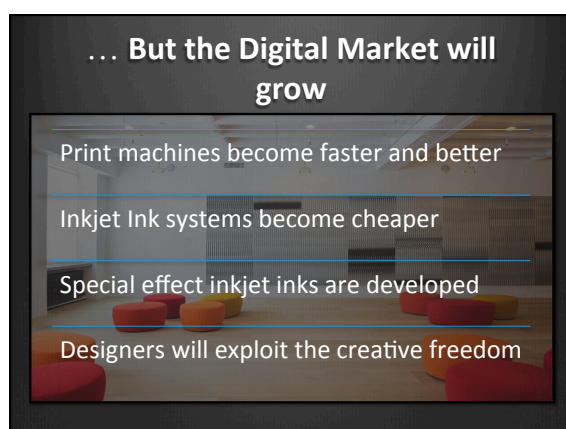
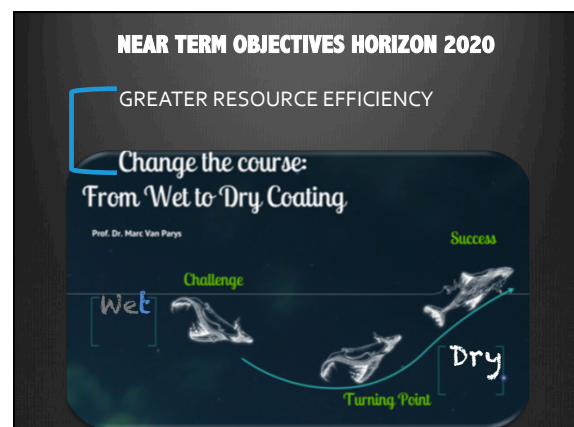
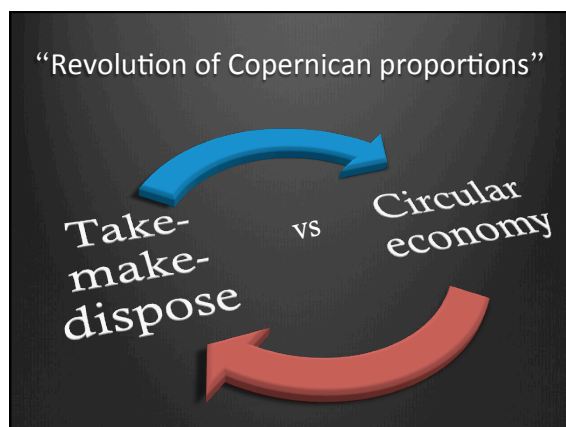
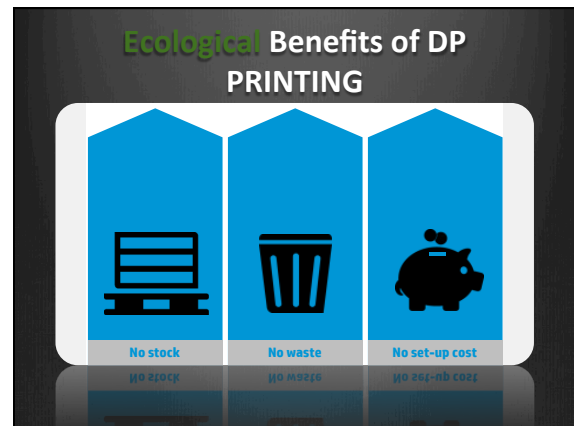
No engraving costs

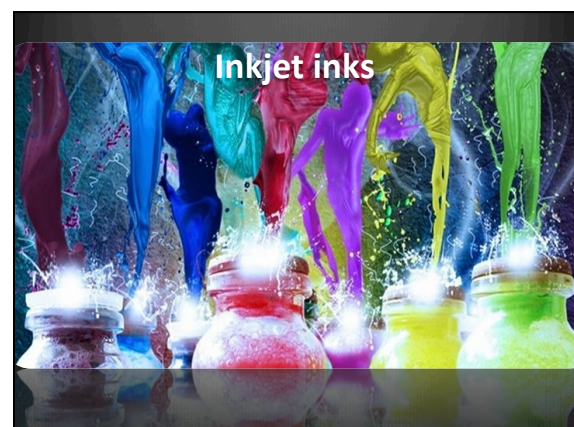
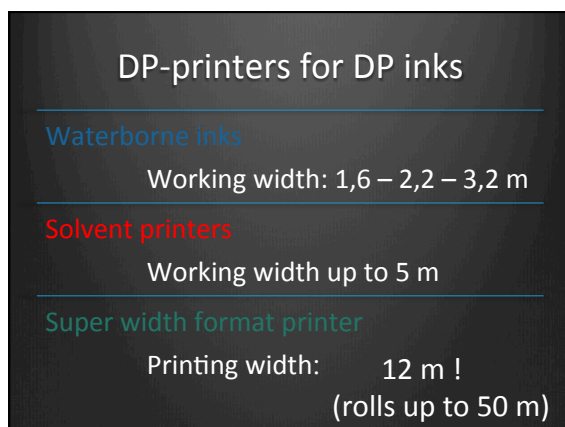
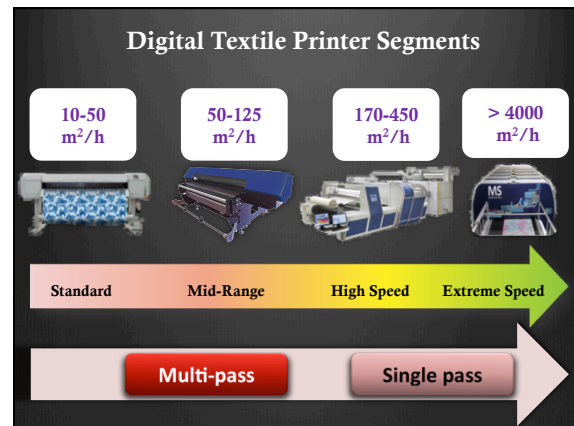
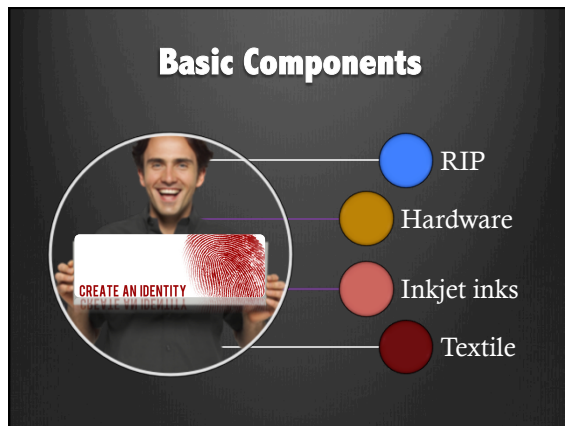
Digital printing cheaper for short-runs &
high colour work

Screen printing cheaper for longer runs &
simpler designs

The change is clear:
from analog to digital





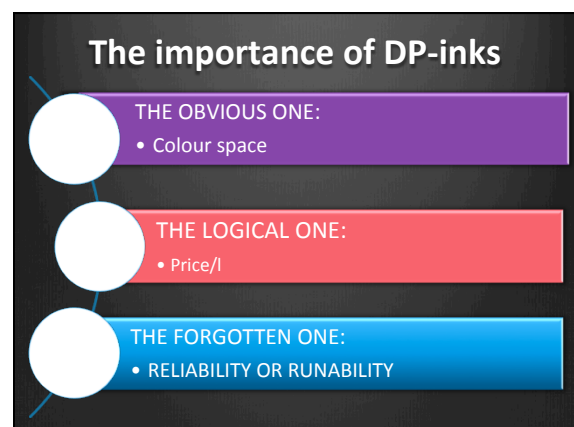


Ink jet fabric requirements for Direct DP (H₂O-based inks)

TO-C

	Textile preparation	Ink jet printing (Inks)	Fixation Washing-off	Finishing
CEL	Yes	Reactive	Yes Yes	Identical to traditional
Silk/PA/WD	Yes	Acid	Yes Yes	"
PES	Yes	Disperse	Yes Yes	"
CO, CO/PES & others	No Yes (for high quality)	Pigment	No	"

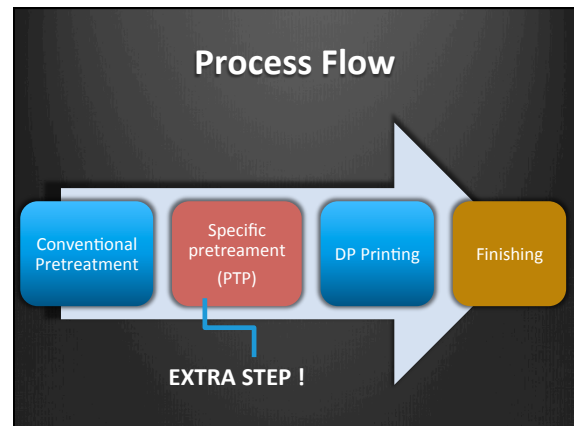
Compatible Inks/Fabrics preparation system to achieve outstanding colour performance



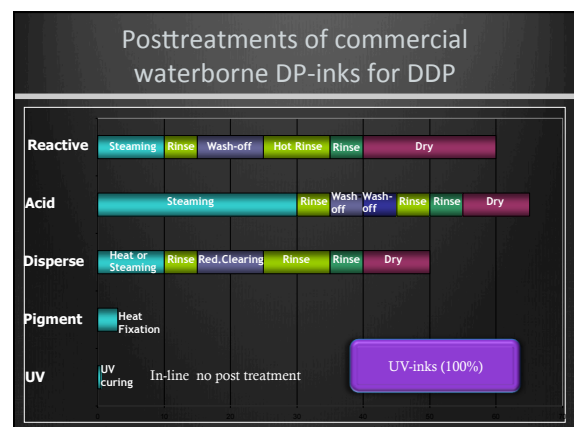
**SPECIAL
CHEMICAL PRETREATMENT**

PTP – Prepared To Print

**STILL NEEDED
IN MOST CASES
TEXTILE**



Drawbacks	
Reactive inks (cellulosic)	Light fastness problematic
	Complex and critical pre- & posttreatment of fabrics
	Reproducibility ? Hydrolysis of reactive inks !
	Proper choice of substrate needed
Disperse inks (PES)	Light fastness problematic
	Direct printing demands a special pretreatment
	Transfer printing: wash - light fastness problematic
Special effects not yet possible (metallic, mica prints) colouration more difficult & time consuming	




TREND TO PIGMENT INKS	
Screen Printing	Simple & versatile process
	Acceptable colour gamut
	Relative cheap price
	Good light fastness
Digital Printing	Specific pretreatment needed
	Smaller colour gamut
	Fastness properties (rub fastness) moderate
	Expensive

Inkjet pigment inks

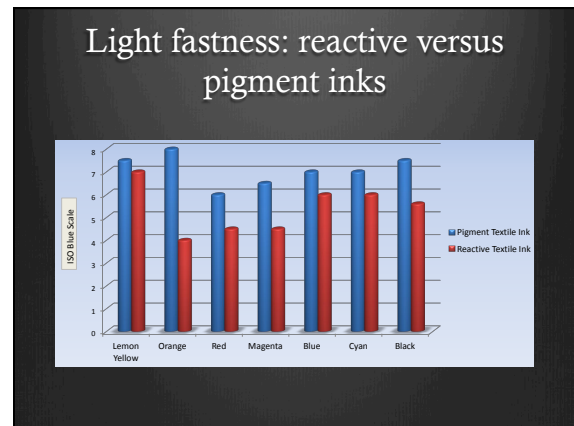
Without binder	Posttreatment with binder – extra step	Less nozzle clogging
With binder	Low pigment % high binder %	Low colour buildup Less nozzle clogging
	High pigment % Low binder %	Higher colour buildup More nozzle clogging

Pigment inks

Printing with pigments: how it works




1. Pigments for colour
2. Binder for rubbing and washing fastness
3. Pigment + Binder together in the DP inks for an easy application
4. For fixation only heating is necessary after printing
5. No need to wash



Our Research

Printing with DP-Pigments



without pretreatment

TO2Coat

Creativity meets Innovations

DIGITAL TECHNOLOGIES IS MORE THAN PRINTING!

New developments Functional inks

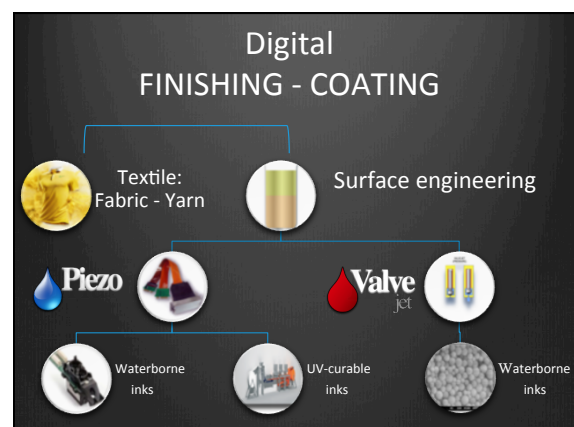
From Ideas to Industrial Productivity

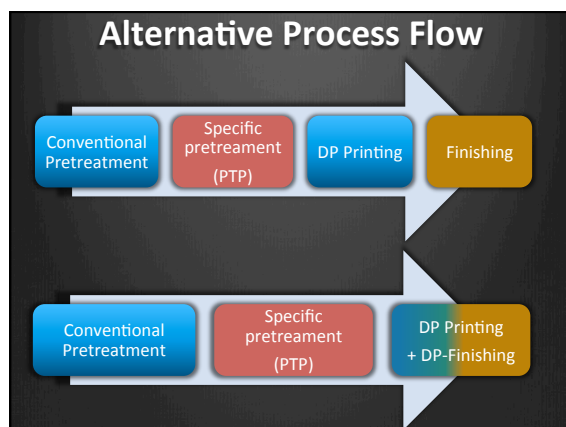
PRINTHEADS



CREATIVITY

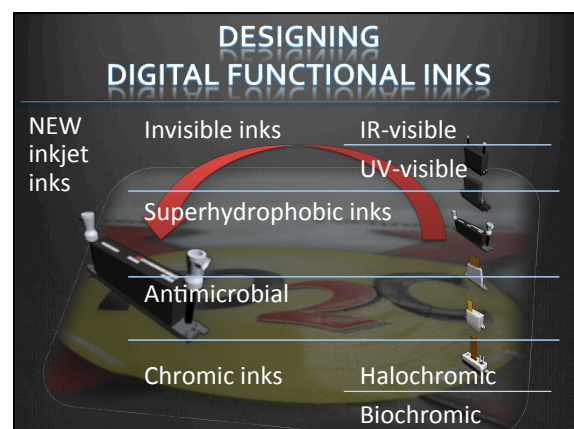
FUNCTIONALITY





Digital Printing versus Digital Finishing

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



HoGent

INCODE
Invisible Infrared Sensitive Coding

Project leader
FPL FORSCHUNGSGESELLSCHAFT
FÜR PIGMENTE UND LACKE E.V.

Scientific partners:



www.ipa.fraunhofer.de





www.icf-denkenndorf.de

IR-INVISIBLE INKS
Anticounterfeiting – Tracking - Tracing

INCODE



Or pirate products?

INCODE

IR-INVISIBLE INKS
Anticounterfeiting – Tracking - Tracing



Heating + IR-camera
light



Visible

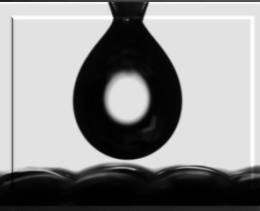
INVISIBLE
fluorescent and
phosphorescent
Inks

Two versions:
a) Waterborne
b) UV-curable inks




Textile HERE, ART


Repellent inkjet inks




Non-treated PES fabric



Digital treated PES

TEXSHIELD 

Photochromic inks



Textile HERE, ART

a) DP-printing (valve-jet) with photochromic-inks on yarns
b) Special weaving structure

interior textile – wallcovering and upholstery



Digital Coatings

Finishing/Coating

Layer-on-layer

- Flexibility/versatility -> Layer-on-layer coating
- Different thickness/add-on 1-12 g/m²
- Design Coatings – dedicated places
- Coating on thermosensitive substrates (PP, PE) possible
- Economic/ecologic advantages (no VOCs)

New Possibilities
UV-coatings

Factory of the Future

Yarn/fabric + DP coating + UV / LED = New textile

Digital Jets

UV-sources-LEDs
other curing systems

Source: DigiTex

THANKS

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