

# Dieffenbacher Digital Printing Systems 2011

## Large format digital printing on wood based panels

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05 | 2011



**DIEFFENBACHER**  
SYSTEM-AUTOMATION

## **Agenda – Large Format Digital Printing**

- **Dieffenbacher – the company**

- **Digital printing, anything already known and said?**

  - Advantages and limits of the digital printing process

  - Market distribution Surface Finishing Worldwide

  - Summary of current digital printing systems for the wood based panel industry

- **Dieffenbacher Large Format Digital Printing**

  - Dieffenbacher system features - what makes us different?

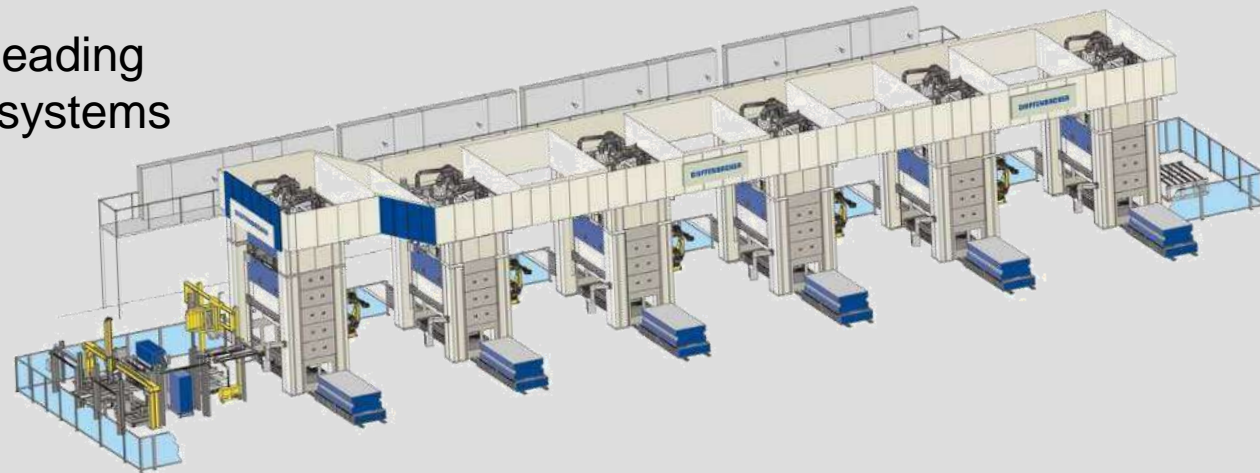
  - Functional and procedural principles

  - Complete scope of supply

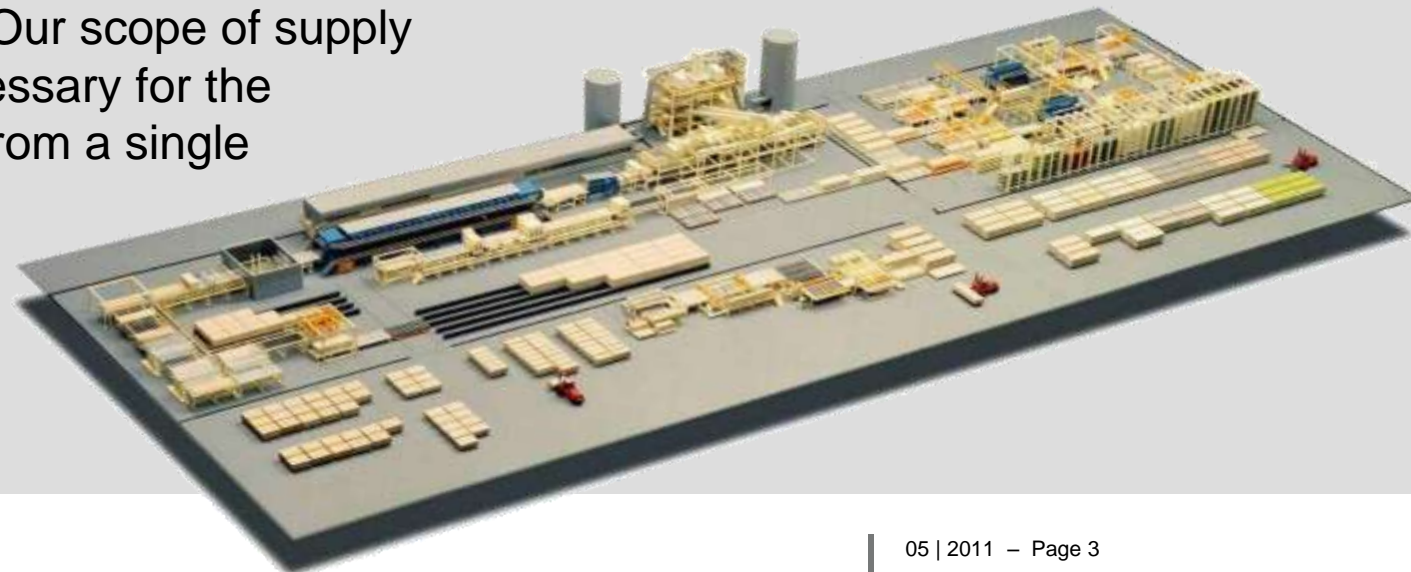
  - Workflow

## The Company

Dieffenbacher is one of the worldwide leading manufacturers of complete production systems for the wood based panel, automotive, and components industry.



We deliver **presses and more**. Our scope of supply comprises all components necessary for the production process, delivered from a single source by Dieffenbacher.



## Facts and Figures 2010

Year of foundation	1873
Headquarters	Eppingen, Germany
Shareholders	100% family-owned
Employees	1.680
Turnover in 2010	330 mill. Euro
Share in exports	85%
Locations worldwide	18



### Dieffenbacher Sites



- 1** DIEFFENBACHER GMBH + CO. KG  
Head Quarters  
Eppingen | DE ●◆
- 2** DIEFFENBACHER GMBH + CO. KG  
Pfungstadt | DE
- 3** DIEFFENBACHER MASCHINENFABRIK GMBH  
Zaisenhausen | DE ◆
- 4** B. MAIER ZERKLEINERUNGSTECHNIK GMBH  
Bielefeld | DE ◆◆
- 5** SCHENKMANN-PIEL-ENGINEERING GMBH  
Leverkusen | DE ●

- 6** KARLE + JUNG GMBH  
Otigheim | DE ◆◆
- 7** MÄRTIENS ROBOTEC GMBH  
Bruchsal | DE ●
- 8** DIEFFENBACHER SYSTEM-AUTOMATION GMBH  
Eppingen | DE ◆◆
- 9** DIEFFENBACHER – CZ S.R.O.  
Brno | CZ ◆
- 10** OOO DIEFFENBACHER  
Moscow | RU ●
- 11** DIEFFENBACHER PANELBOARD OY  
Nastola | FI ●

- 12** SUNDS MDF TECHNOLOGIES AB  
Sundsvall | SE ●
- 13** DIEFFENBACHER NORTH AMERICA, INC.  
Windsor | CA ◆◆
- 14** DIEFFENBACHER, INC.  
Atlanta | US
- 15** DIEFFENBACHER BRASIL  
Jundiaí | BR ●
- 16** DIEFFENBACHER INDIA PVT. LTD.  
Bangalore | IN
- 17** DIEFFENBACHER MACHINERY SERVICES (BEIJING) CO., LTD.  
Beijing | P.R. China ●

- 18** SHANGHAI WOOD-BASED PANEL MACHINERY, CO., LTD.  
Shanghai | P.R. China ◆◆
- 19** DIEFFENBACHER MACHINERY (CHANGZHOU) CO., LTD.  
Changzhou | P.R. China ◆
- 20** DIEFFENBACHER ASIA PACIFIC SDN. BHD.  
Kuala Lumpur | MY ●
- 21** DIEFFENBACHER AUSTRALASIA PTY LTD.  
Victoria | AUS

## **Dieffenbacher Business Units**

### **Business Unit Wood**

Complete production lines for

- Particleboards
- MDF, HDF, OSB and LVL boards
- Wood Fiber Insulation Boards
- Molded Doorskins

Innovative technologies

- Pellet Plants and
- Digital Printing Systems for wood based panel surfaces

### **Business Unit Forming**

Presses for plastics and metal forming for the automotive and automotive supplier industry

- Tryout presses
- Fully automated press lines and plants

## Business Unit Wood



Particleboards, OSB, HDF, and MDF boards



Wood Fiber Insulation Boards

## Business Unit Wood – Wood Based Panel Plants



Line for the manufacture of wood based panels



Single daylight press



Board handling

## **Business Unit Wood** – Wood Based Panel Plants



Particleboard plant by Dieffenbacher

## Digital Printing, anything already known?

### The basic idea



Individual, customer oriented solutions dominate the market.

## Digital Printing on Wood Based Panels

### New application possibilities

New thinking,  
new styles, new design worlds for

- Flooring

Even not knowing how it is printed yet!



## Digital Printing on Wood Based Panels

### New application possibilities

New thinking,  
new styles, new design worlds for

- Furniture

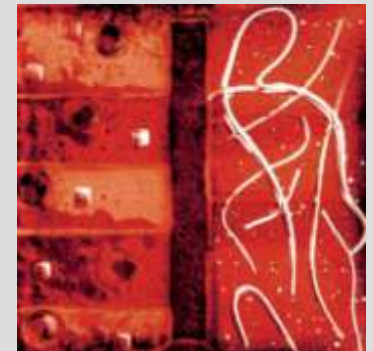


## Digital Printing on Wood Based Panels

### New application possibilities

New thinking,  
new styles, new design worlds for

- Kitchens



## Digital Printing on Other Materials

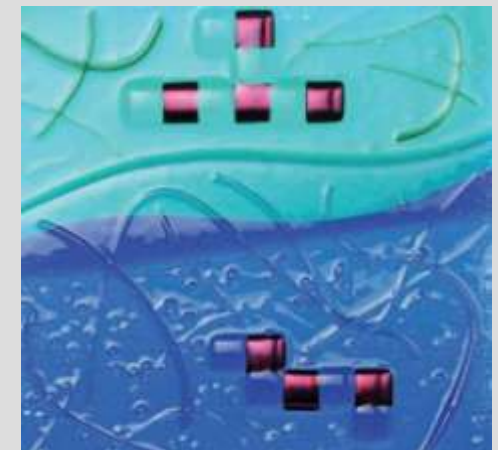
### Further market segments



■ Print on glass



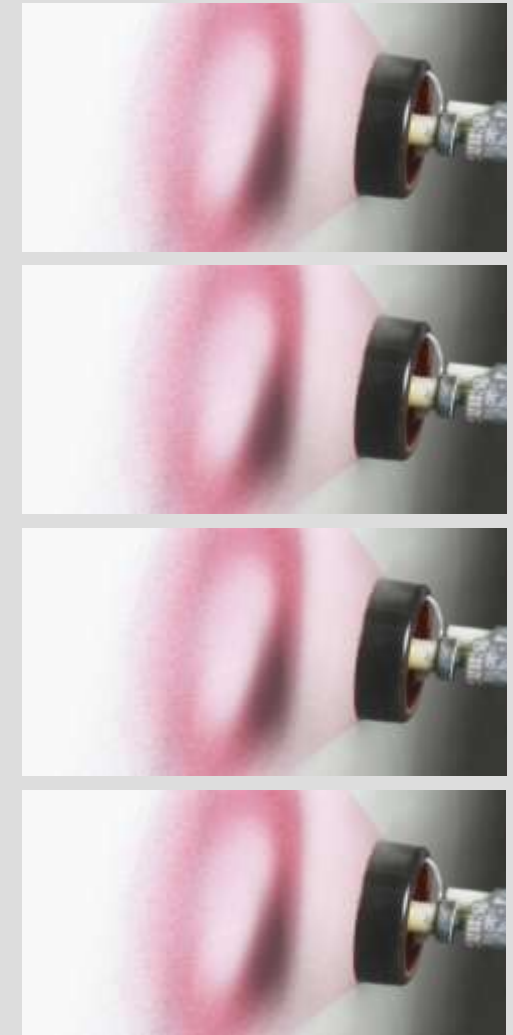
■ Print on plastics



## Digital Printing Advantages and Limits

### Advantages of the digital printing technology

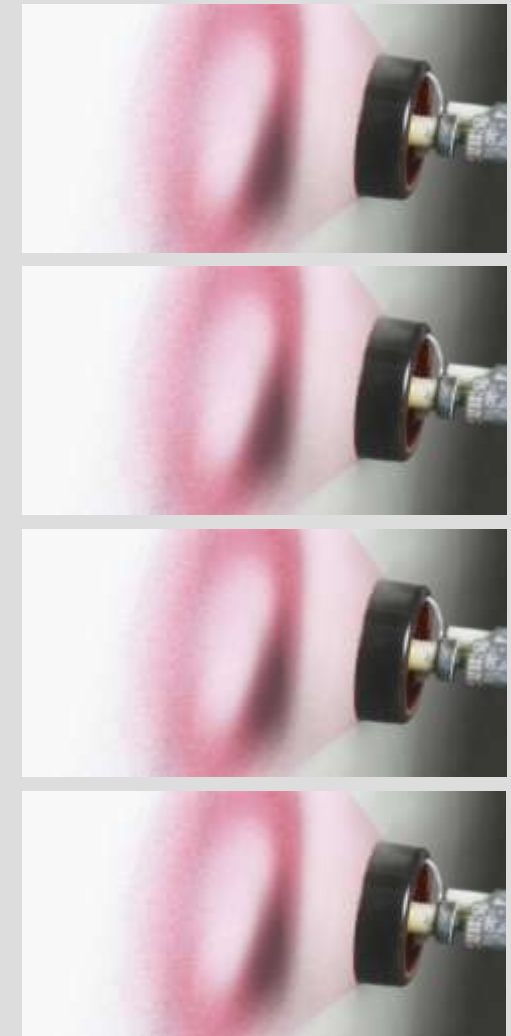
- Flexibility in design and decor
- Flexibility in production and workflow
- Integration into existing processes realizable
- Design changeover from board to board (batch size 1) possible
- Customer specific products/designs easily reproducible
- Nearly unlimited number of colors
- Just in time delivery
- No storage costs for paper rolls
- No costs for roll leftovers
- Minimum preliminary set-up times
- No line standstill to change design or colors



## Digital Printing Advantages and Limits

### Limits of conventional print technologies

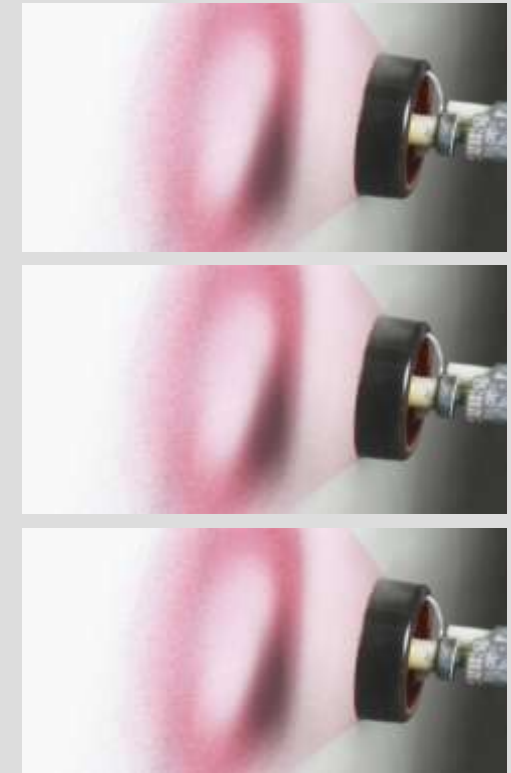
- End of evolution, processes are perfected
- Limit of cost reduction reached – no further cost savings possible
- Minimum quantities to be purchased per decor regarding decorative papers
- High investment for new print rolls for decor changes
- Lots of prototypes and dropped decors as well as B and C production charges are complex to reproduce
- Extra costs by the use of pre-impregnated paper
- Warehouse costs and paper roll storage costs
- Preproduction costs for planning and inflexibility due to 2 – 3 months flow time
- Amortization costs for short cycle presses and impregnation lines
- Maintenance costs for the equipment plus manpower



## Digital Printing Advantages and Limits

### Limits of digital printing

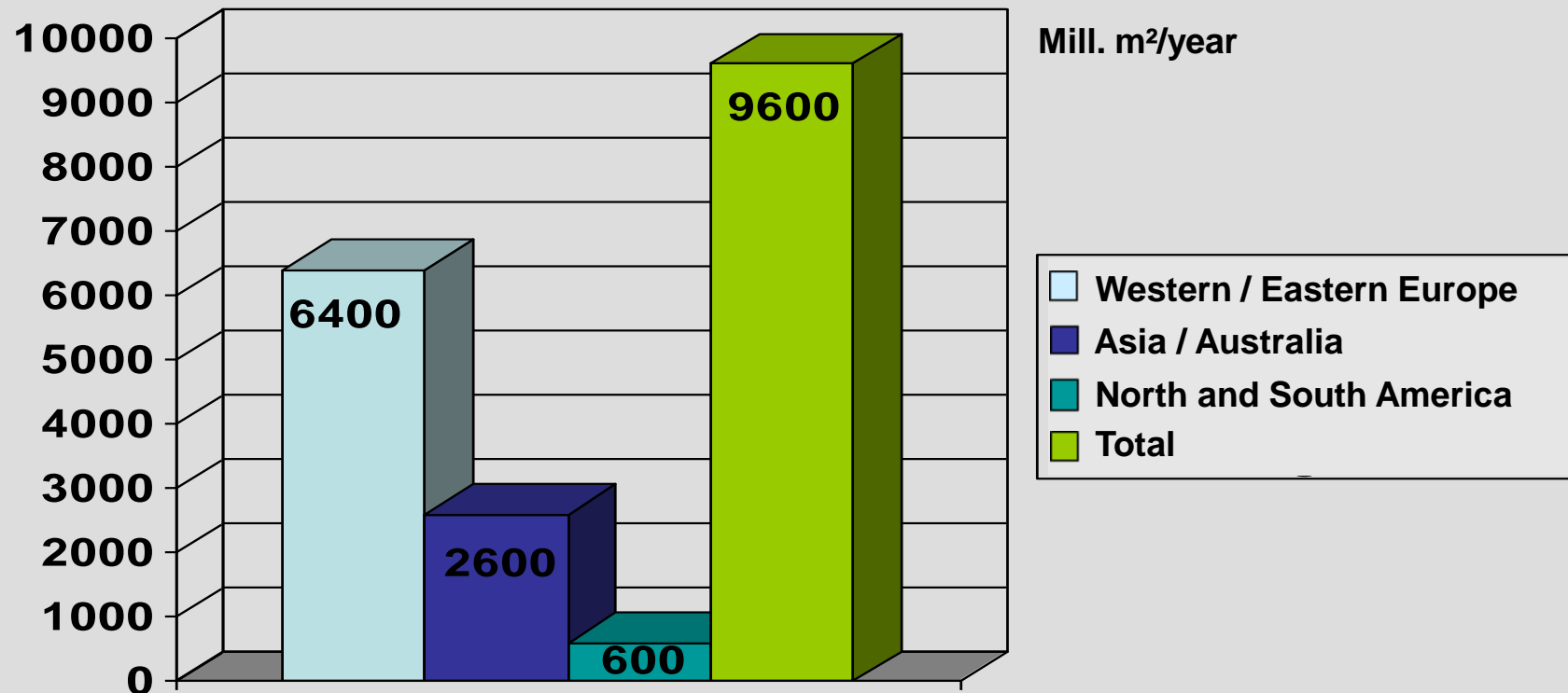
- Production of unichrome all-over decors
- Use of neon colors or metallic colors (gold, silver)
- Color space limits with UV and water-based inks
- Little output/productive capacities compared to conventional techniques
- Supposed high costs for consumables such as inks and primers



## Production capacities worldwide

as of 2009

### Material input with films, melamine and direct printing



## Surface Finishing Data and Facts

as of 2009

### Surface materials and production worldwide

Material input with films, melamine and direct printing

9,600 mill. m<sup>2</sup>

■ Annual furniture production: paper and films

7,600 mill. m<sup>2</sup>

■ Annual flooring production: paper and films

1,000 mill. m<sup>2</sup>

■ Directly printed furniture/flooring surfaces approx.

1,000 mill. m<sup>2</sup>



8,200 mill. m<sup>2</sup>



1,400 mill. m<sup>2</sup>

## Digital Printing – Summary of Systems so far

### Today's digital printing market

- Print resolution up to a maximum of 360 dpi in single pass technology  
multipass systems have a higher resolution, however, they are considerably slower
- Mostly (to exclusively) UV ink systems are in use  
expensive inks  
curing problems – difficult adhesion between ink surface and top coat
- Printing widths in one single pass process up to 948 mm maximum or clearly below  
large formats are impossible to print in one printing process or  
only reproducible in several succeeding printing steps decreasing the output
- Outputs of today's systems max. 1,000 m<sup>2</sup>/h or clearly less  
Printing speed  $v_{\text{print}} \leq 25 - 30$  m/min  
Print head widths limited to 600 mm, in particular cases slightly larger

# Dieffenbacher Large Format Digital Printing

## ■ Dieffenbacher Large Format Digital Printing

Dieffenbacher system features – what makes us different?

Functional and procedural principles

Complete scope of supply

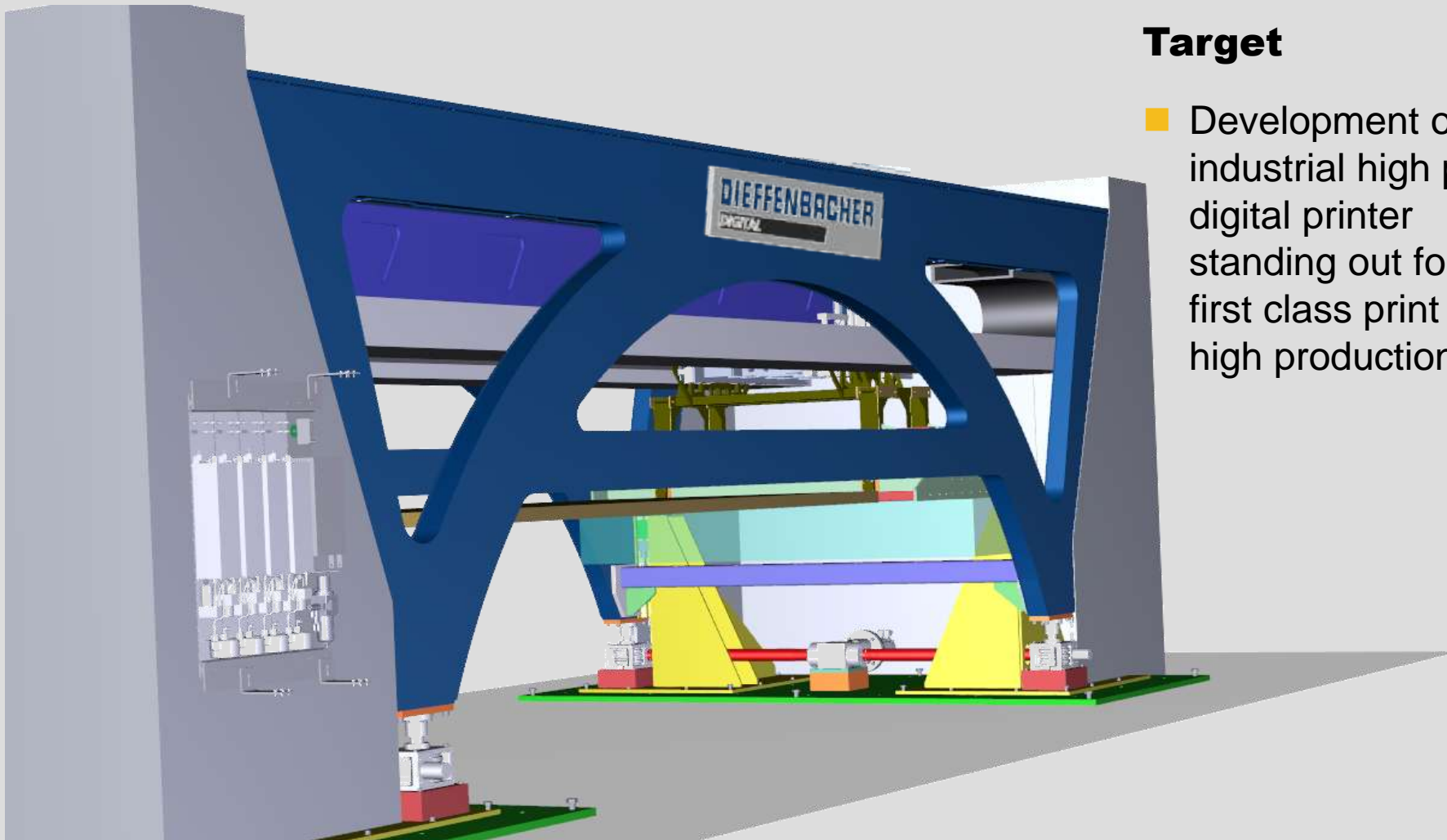
Workflow



## Dieffenbacher Large Format Digital Printing

### Target

- Development of an industrial high performance digital printer standing out for first class print quality and high production rates



## Dieffenbacher Large Format Digital Printing

### Print resolution

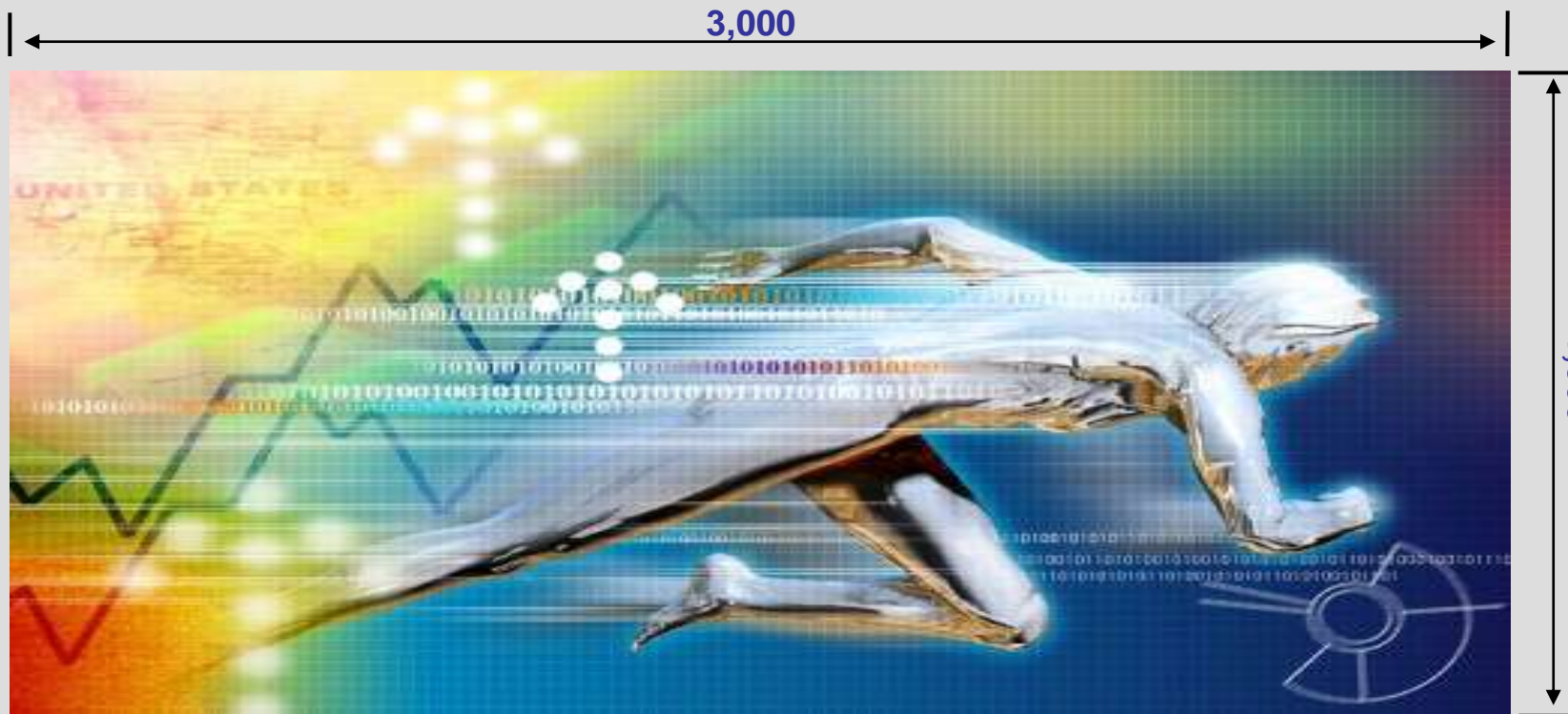
- Resolution: 600 x 600 dpi
- Optical: 1.200 dpi



## Dieffenbacher Large Format Digital Printing

### Printing speed and printing format

- Printing speed: 75 m/min
- Printing format: length 3,000 mm, width 1,300 mm (proposed up to 2,440 mm)



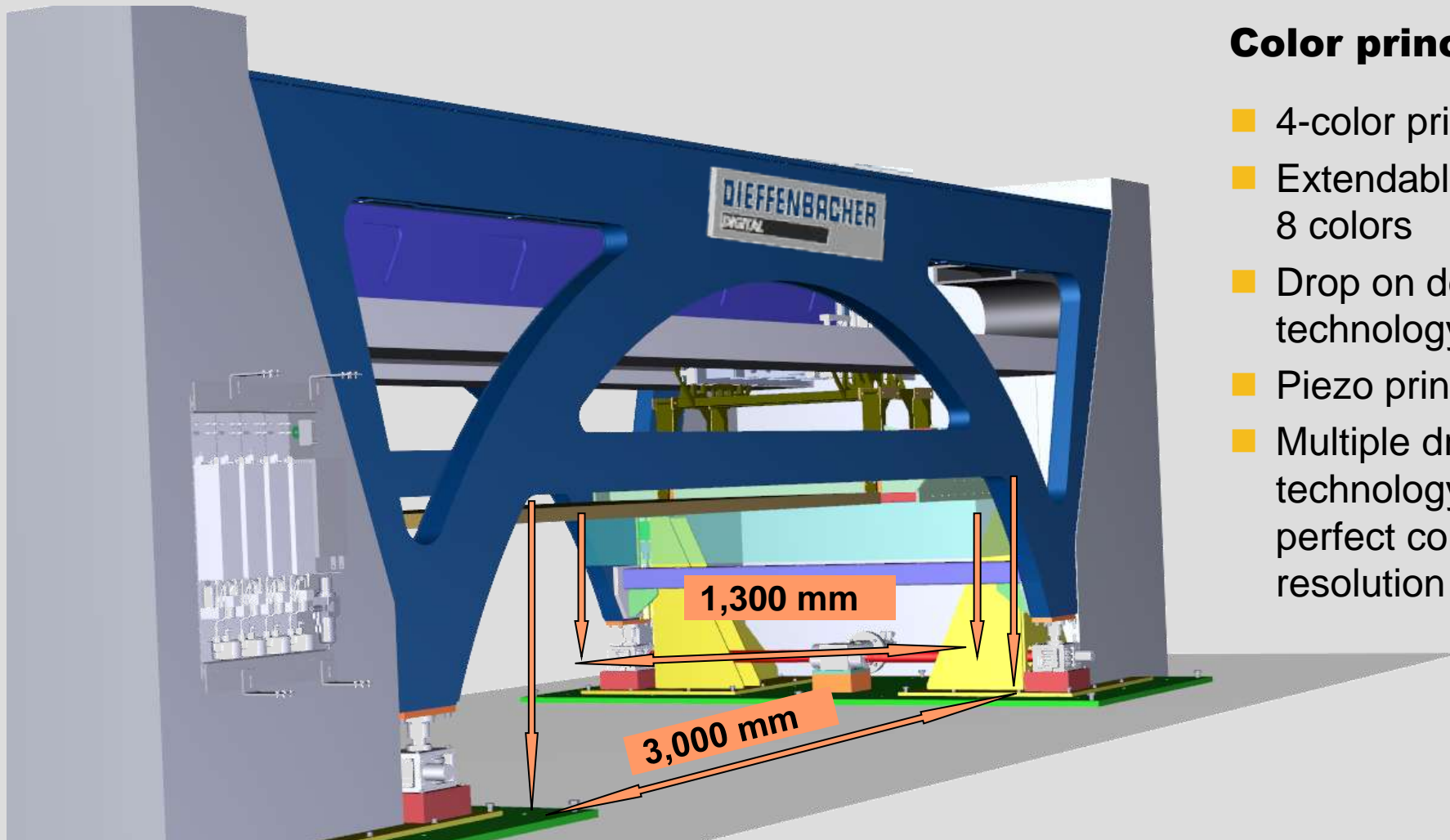
## Dieffenbacher Large Format Digital Printing



### Printing capacity

- 3.9 m<sup>2</sup> per print
- 9 boards per minute
- 550 boards per hour
- 2,150 m<sup>2</sup> per hour

## Dieffenbacher Large Format Digital Printing



### Color principle YCMK

- 4-color print YCMK
- Extendable to up to 8 colors
- Drop on demand technology
- Piezo print heads
- Multiple drop size technology for perfect contrast and resolution

## Dieffenbacher Large Format Digital Printing

**Ink technology** for drop on demand

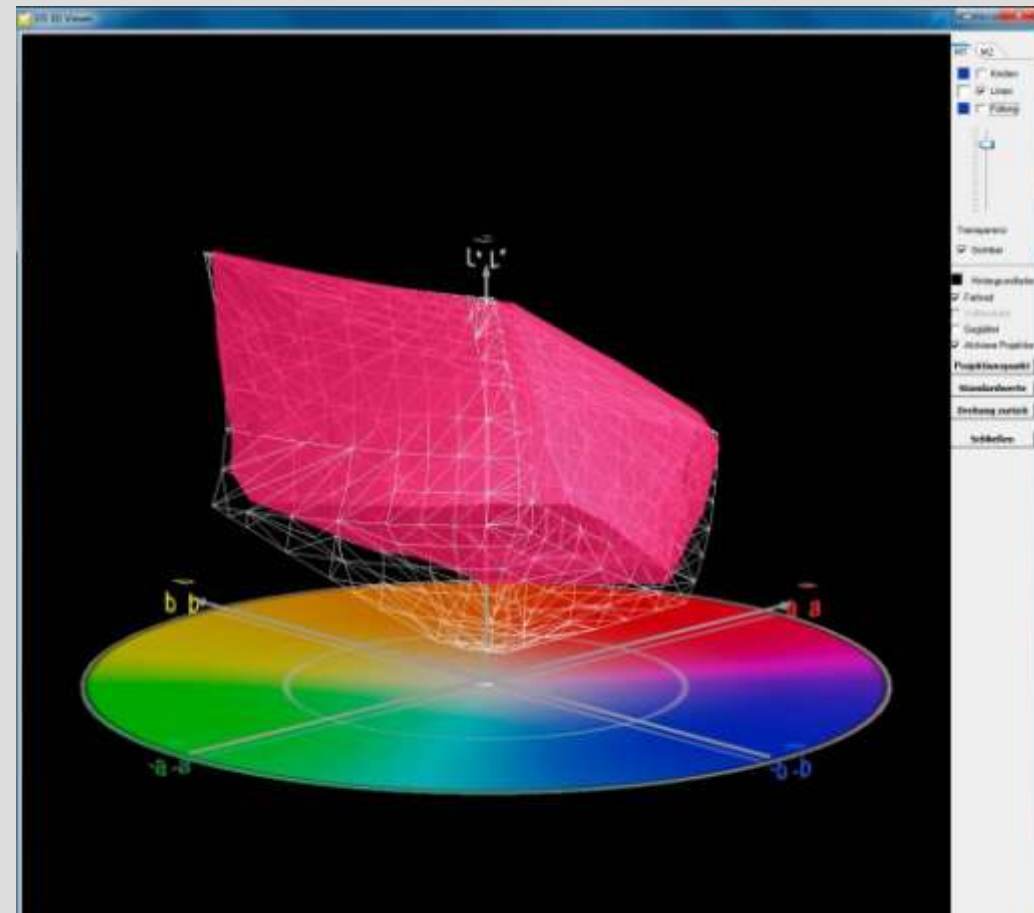
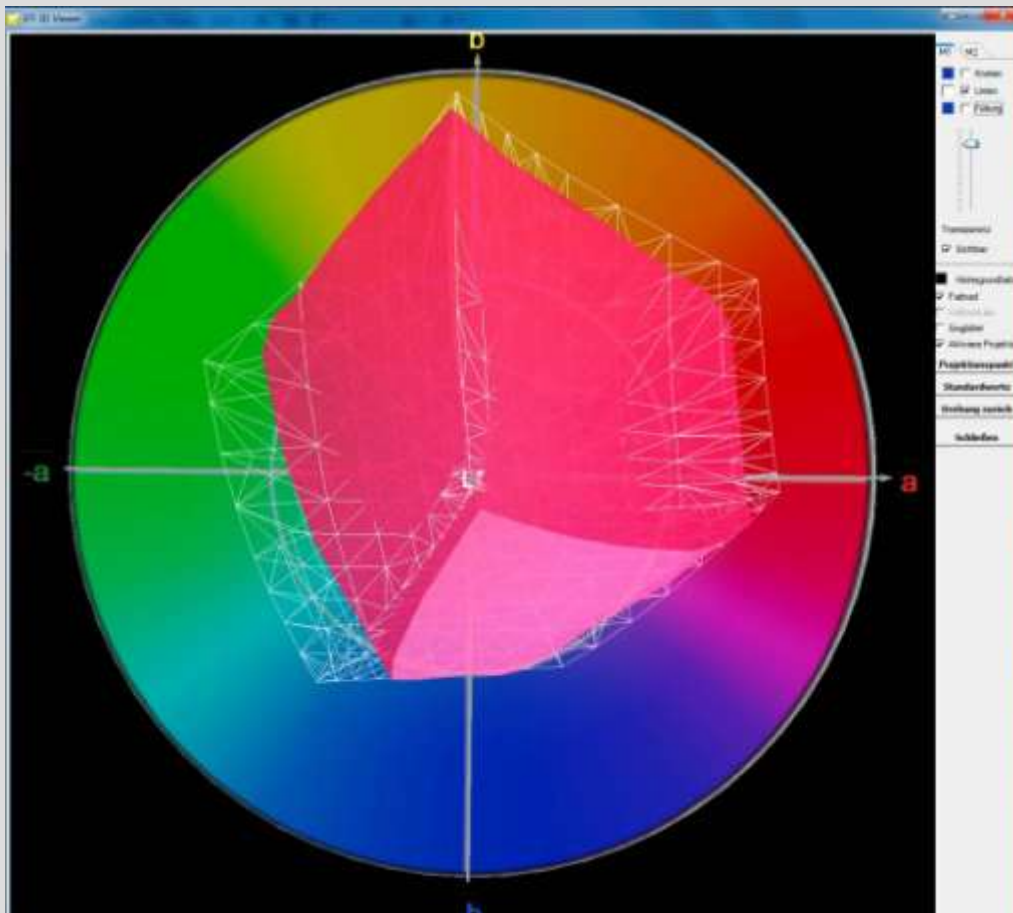
- Pigmented H<sub>2</sub>O ink (water-based ink)
- Pigmented UV ink



■ UV stability of inks: 6+

# Dieffenbacher Large Format Digital Printing

## Color space comparison to ISO coated V2



## **Dieffenbacher Large Format Digital Printing/Key facts**

### **Special features of the Dieffenbacher Digital Printing – Patent applied for**

- Print format 1,300 x 3,000 mm, 600 x 600 dpi, output up to 2,150 m<sup>2</sup>/h
- Printing on a fixed board (100 % controllable print process)
- Exact aligning of the boards
- No swirls of ink drops as  $v_{\text{print}} = \text{const.}$  – enhanced print quality
- No position tolerances from board to board like in board passages
- Print quality control inline on separate test strips
- Increased life of print heads – latest print head technology
- Print head purging inline – short standstills
- Integration into existing lines and systems



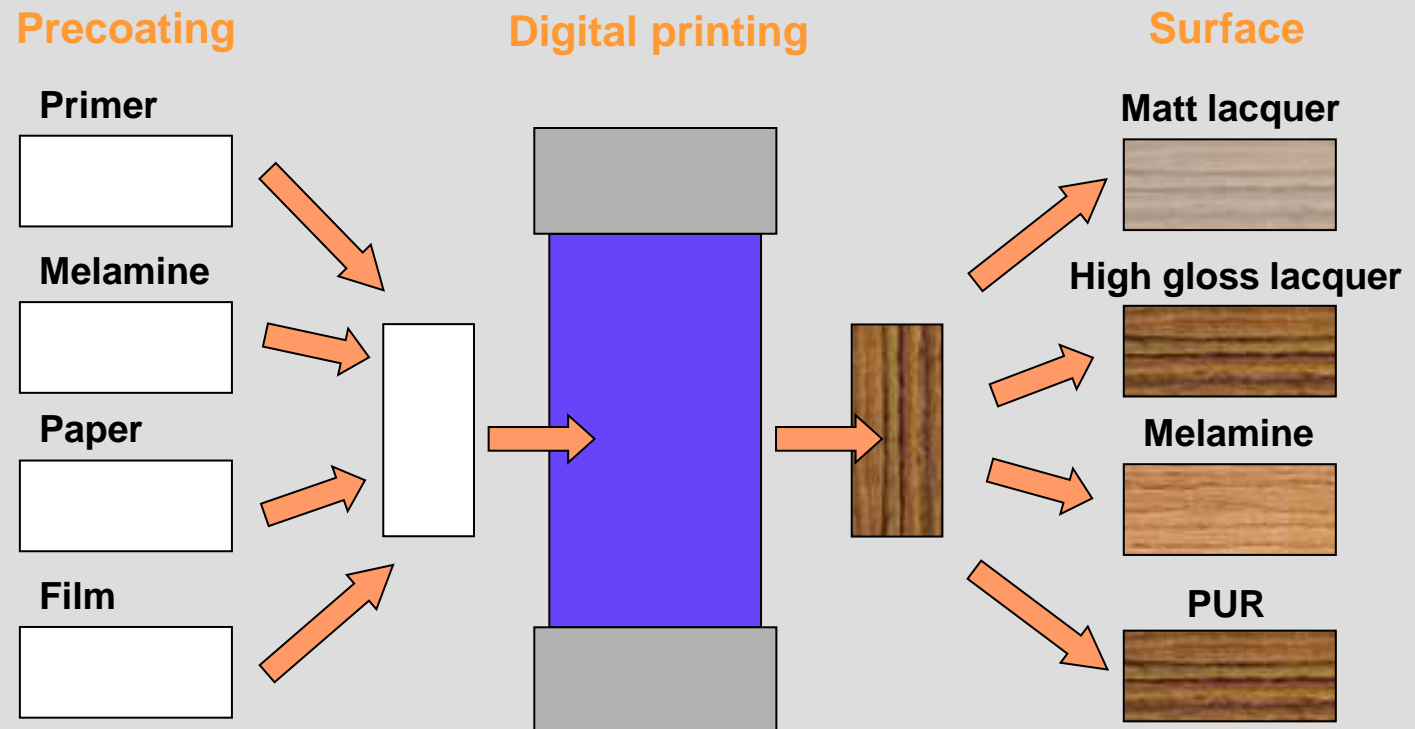
# Dieffenbacher Large Format Digital Printing

## Procedural principle

- Print always on „white“ laminated boards (wood based panels)

## Pros of the process

- **Standardization**  
Preproduction always the same
- **Individualization/Customizing**  
Individual print customer- and order-related



# Dieffenbacher Large Format Digital Printing

## Workflow/Data Management

The Dieffenbacher scope of supply comprises the complete process range

- Large format scanner
- Dieffenbacher RIP software
- Pre-press with digital image editing
- Color management
- Data and file management system
- High-performance digital printing
- Coating technology combined with excellent wood based panel know-how



## Dieffenbacher Large Format Digital Printing

### Total scope of supply

- Bypass solutions
- Single lines
- Complete lines

Integration into existing customer lines

Destacking – digital printing – PUR or melamine surfaces

Basecoat line/laminating line – digital printing – topcoat line



## **Dieffenbacher Large Format Digital Printing**

**Thank you very much for your  
attention!**