

LION-TEX

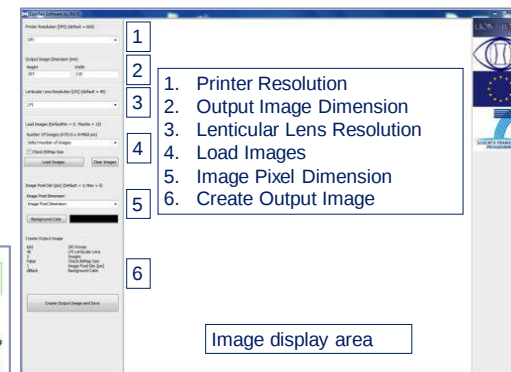
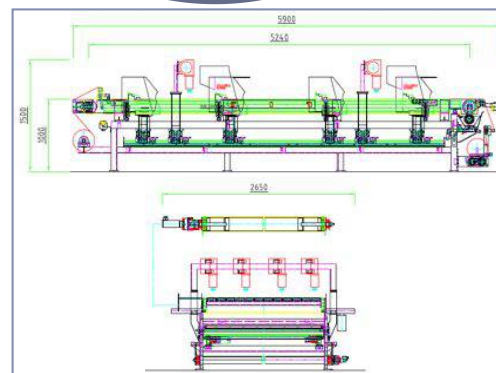
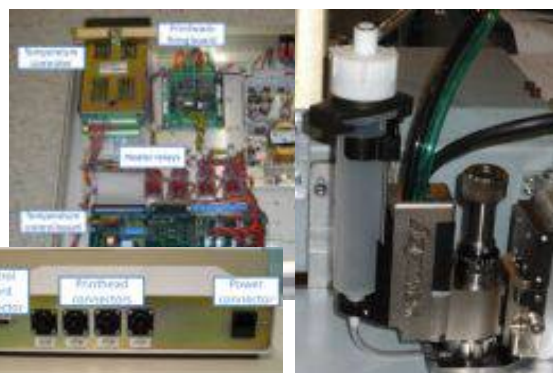
Innovative Industrial Process for printing Lenticular Images
directly On Textiles with ink-jet dispensing technology

Il tessile da realizzare: tecnico e funzionalizzato
Dalmine 31st May 2013

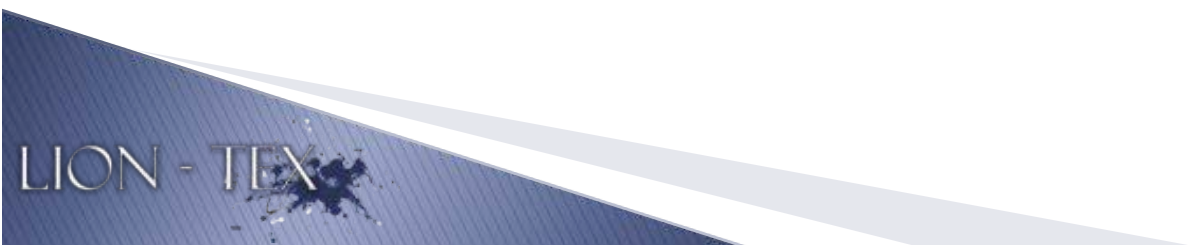


LION - TEX

Project overview



Project Main Results: Enabling Principles



Basic principles of 3D lenticular effects

Basic parameters enabling lenticular effect

- Image p
- LPI, PPI &
- Lenticula
- Lens par
- Pitch tes

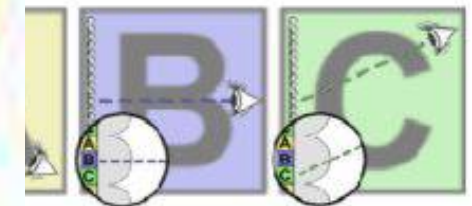
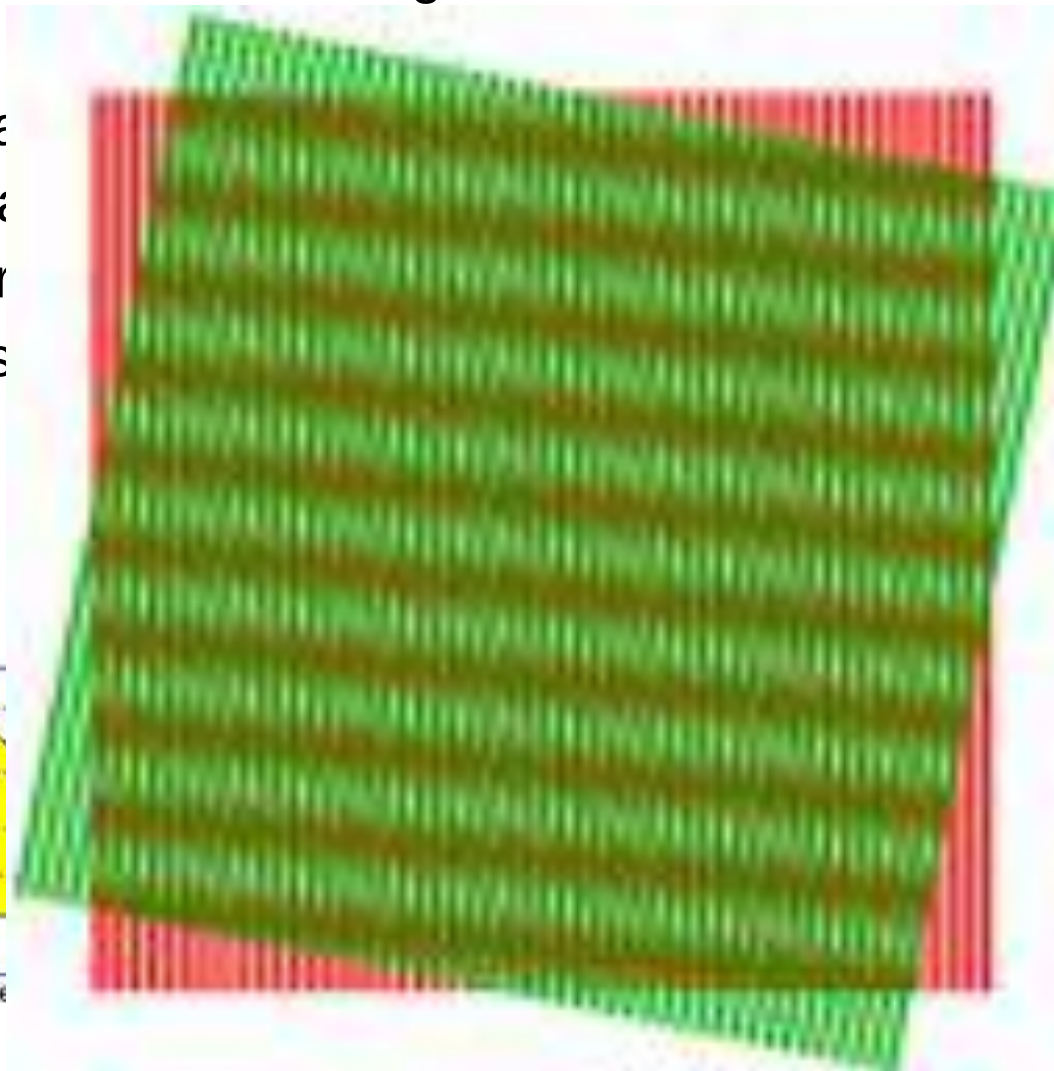


Figure 3.1: Interlacing process

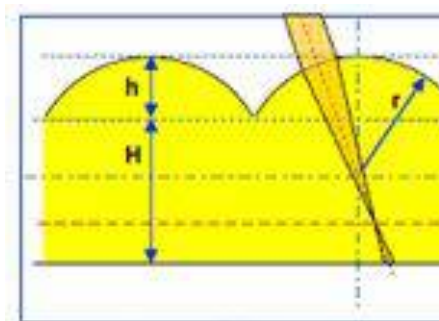


Figure 3.7: Lens parameters

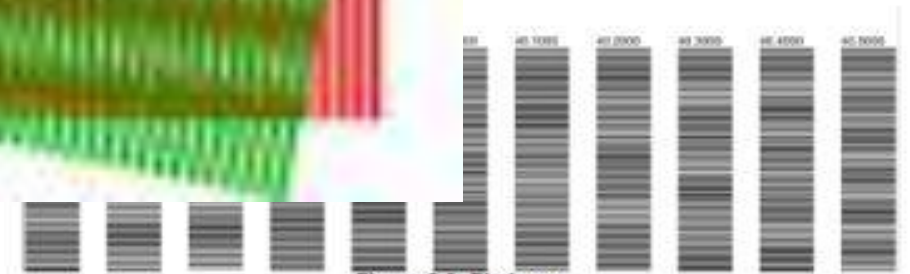
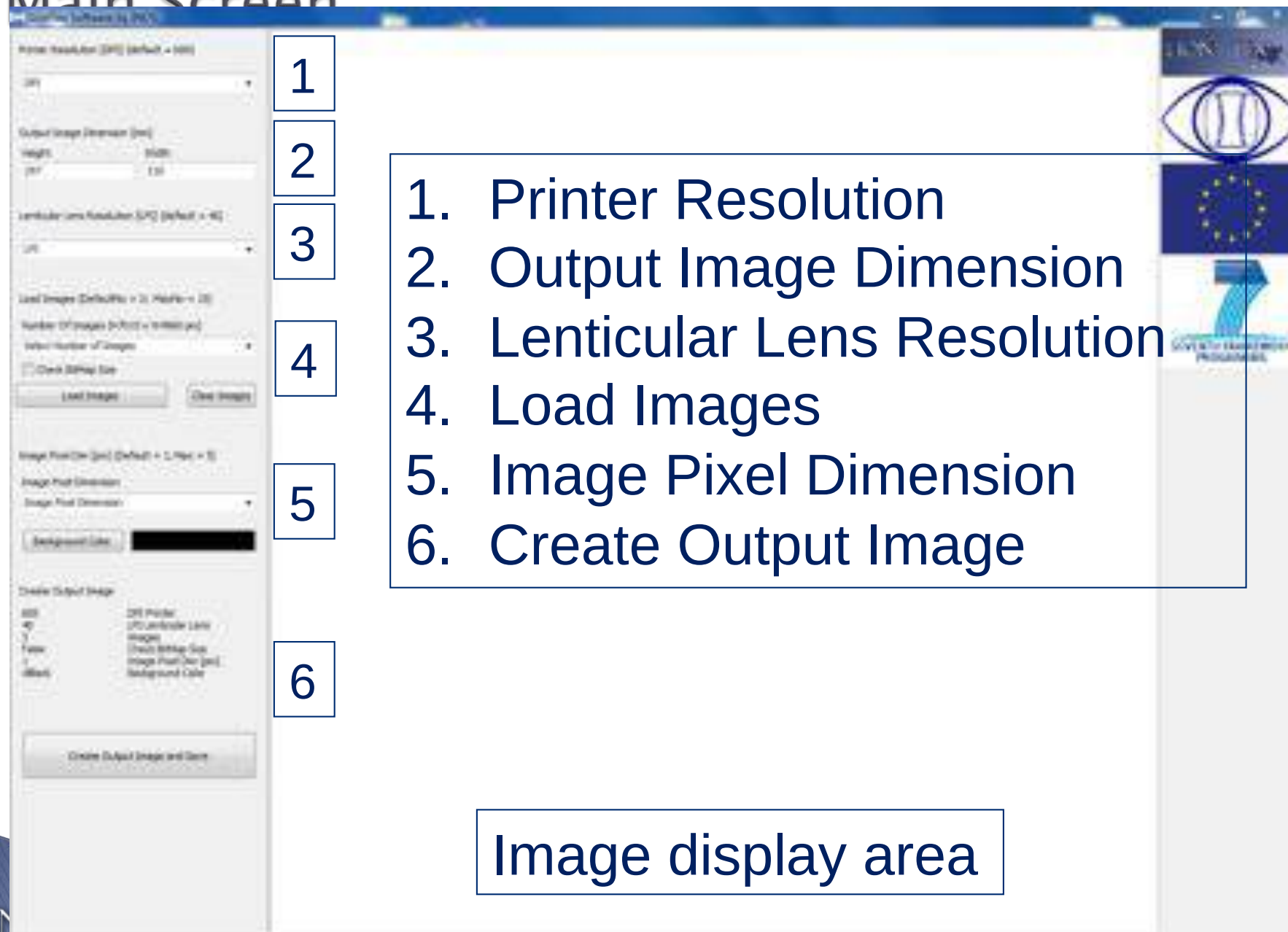


Figure 3.9: Pitch test

Main Screen



The screenshot shows the 'LION Software by PLY' main screen. On the left, there is a settings panel with several sections. Callout 1 points to the 'Printer Resolution (DPI) (default = 600)' dropdown. Callout 2 points to the 'Output Image Dimension (mm)' section, which includes 'Height' and 'Width' input fields. Callout 3 points to the 'Lenticular Lens Resolution (DPI) (default = 40)' dropdown. Callout 4 points to the 'Load Images' button. Callout 5 points to the 'Image Pixel Dimension' section, which includes a 'Background Color' dropdown. Callout 6 points to the 'Create Output Image' button. The right side of the screen is a large 'Image display area'.

1. Printer Resolution
2. Output Image Dimension
3. Lenticular Lens Resolution
4. Load Images
5. Image Pixel Dimension
6. Create Output Image

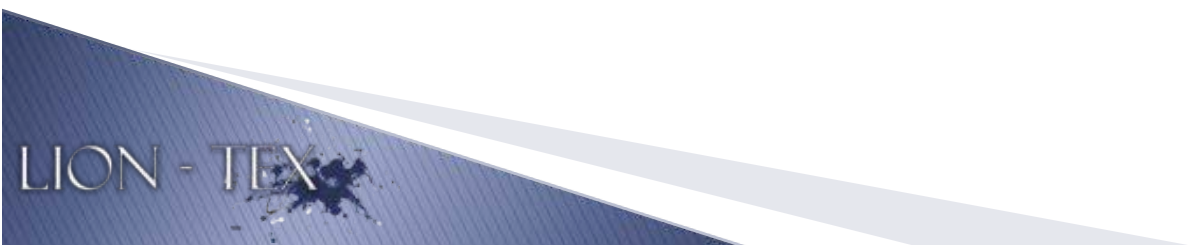
Image display area







Project Main Results: The Lenticular Resins



UV-Curable resin

► Expected characteristics

- Reactivity
- Gloss
- Adhesion
- Chemical resistance
- Scratch resistance
- Abrasion resistance
- Non yellowing

► Resin Chemical Classes

- Epoxy acrylates
- Urethane acrylates
- Polyester acrylates
- Polyether acrylates
- Amine modified polyether acrylates
- Acrylic acrylates
- Miscellaneous acrylate oligomers

Characteristics of resin tested

- ▶ Modified acrylic resin
- ▶ Viscosity @25°C cPs 6000 – 6500
- ▶ Transparent /Yellow

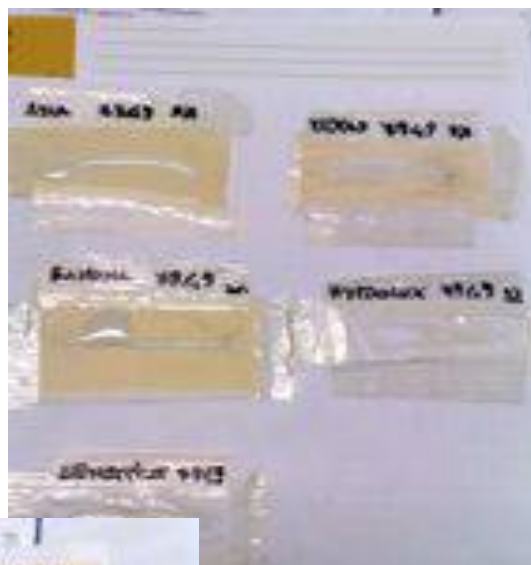
Characteristics of cross linked material

- ▶ High hardness (50 - 55 shore D @25°C)
- ▶ Water absorption @ 20°C/72h 0,13%
- ▶ Resistance to thermal shock 0°C to 90°C
- ▶ Alkali resistance Excellent
- ▶ Solvent resistance Poor

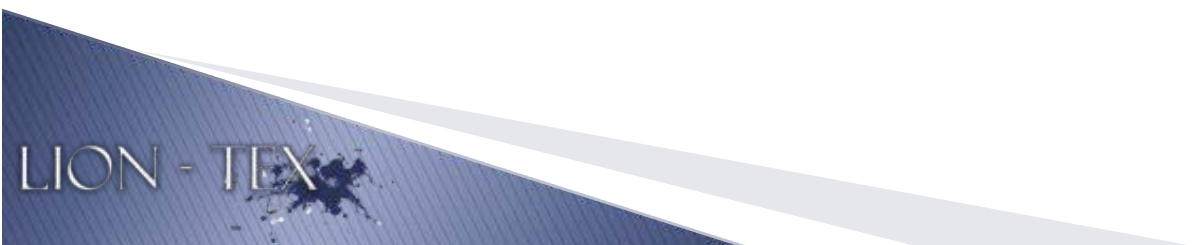
Conclusions

- ▶ From results reported we can conclude that either resin type oil urethane acrylate or epoxy acrylate combine characteristics of adhesion, reactivity, transparency that indicate as candidate for the application
- ▶ Both synthesis process can be scaled up and are reliable
- ▶ For the oil urethane acrylate, 50% of raw material comes from renewable source
- ▶ Some yellowing was observed on TEXAS, RAMONA and ASIA fabrics

Samples

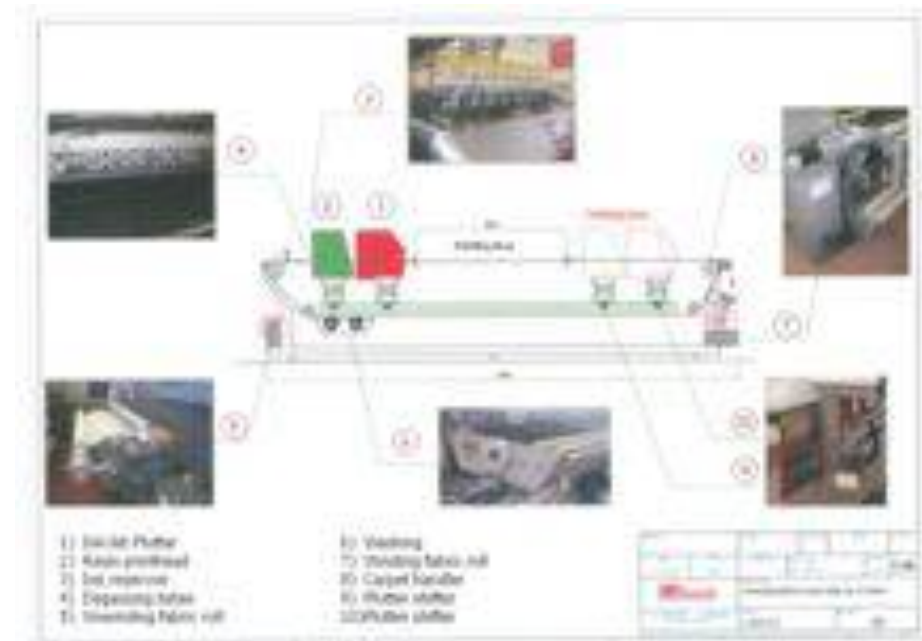


Project Main Results: The Lenticular Plotter



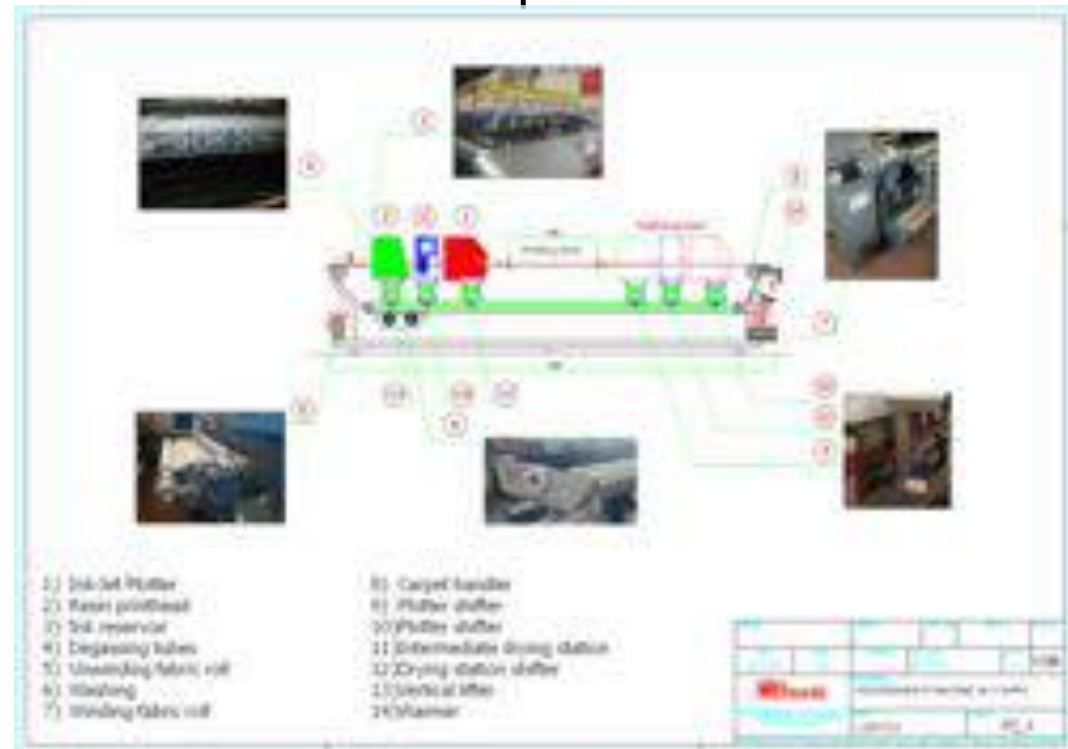
Conceptual design of the machinery

- ▶ Conceptual design of the machine:
 - Two independent machines
 - One machine, with a continuous mobile carpet
 - One machine, with two carpets, moving at different speeds
 - **One machine, with discontinuous mobile carpet**

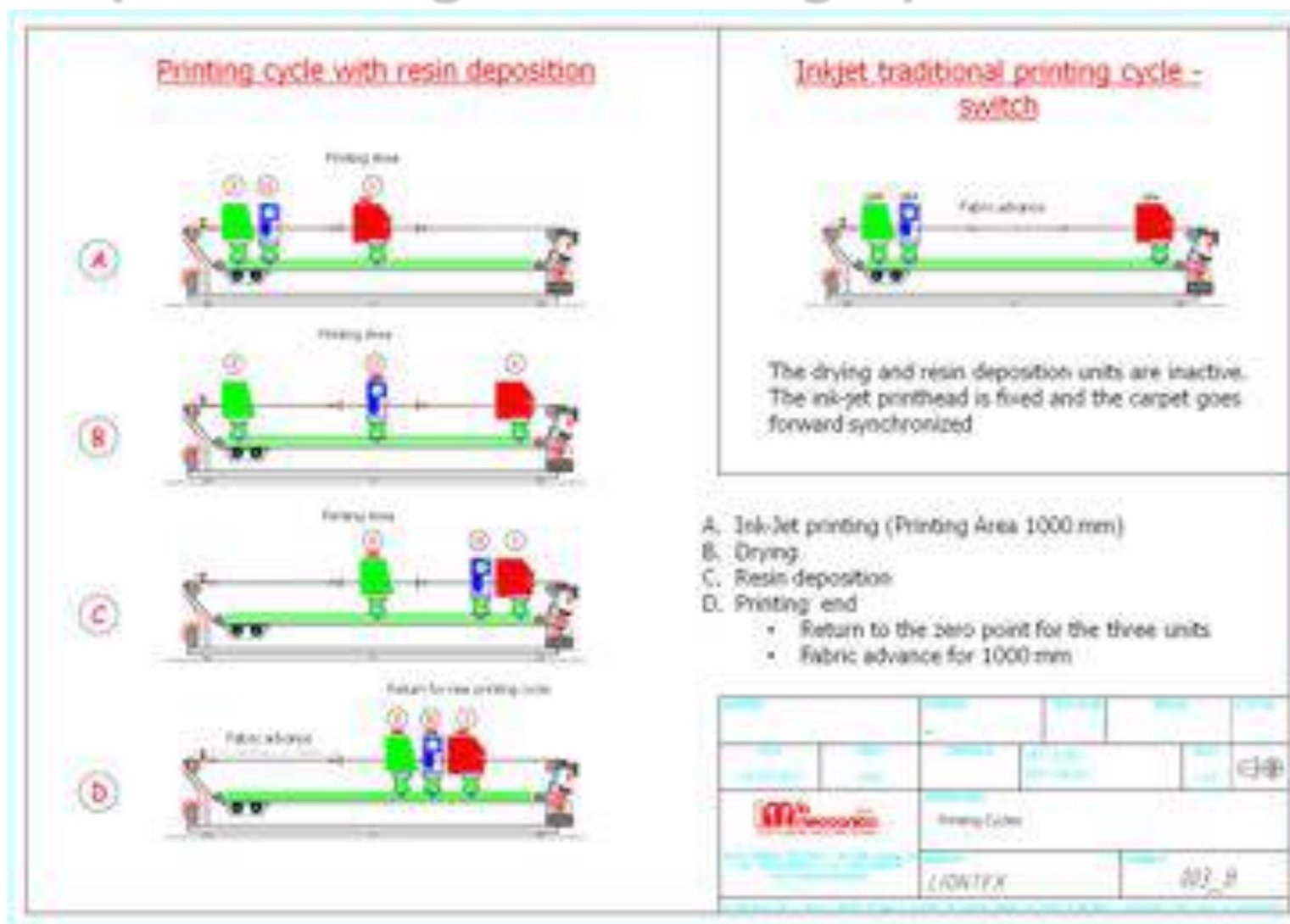


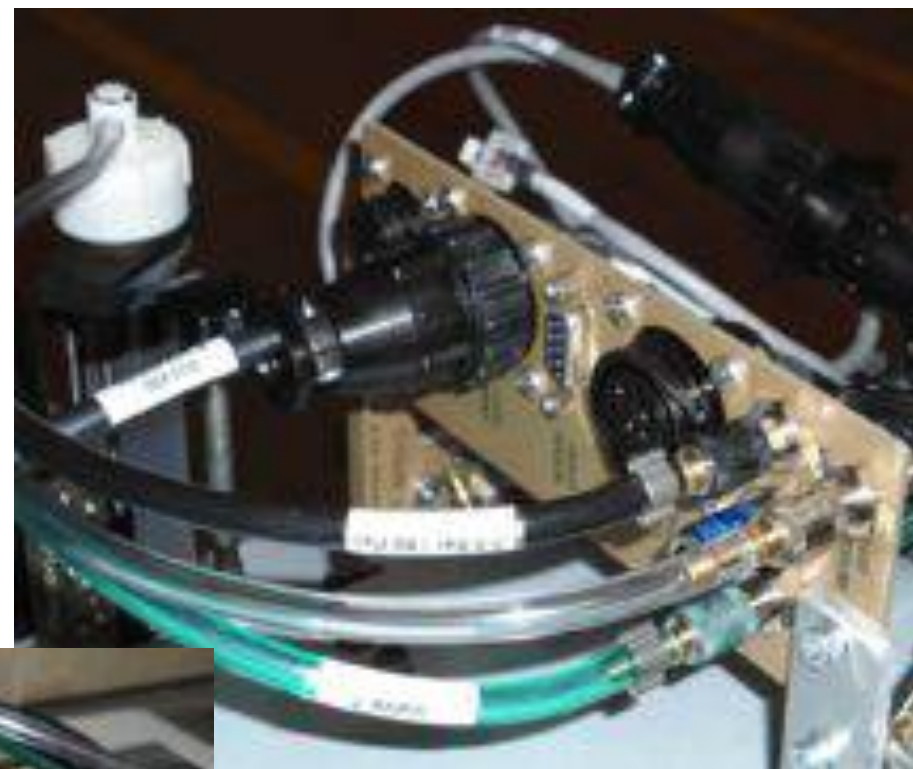
Conceptual design of the machinery

- ▶ The last solution has been finally considered as much promising for the Lion-Text application
- ▶ A list of modification have been foreseen, to be evaluated when the prototype will be realized:
 - An optional intermediate ink drying step, in order to better fix the color on the fabric before resin deposition
 - A system of pistons for macro regulation of the distance of the plotter from the substrate, to use the machine also on thick surfaces

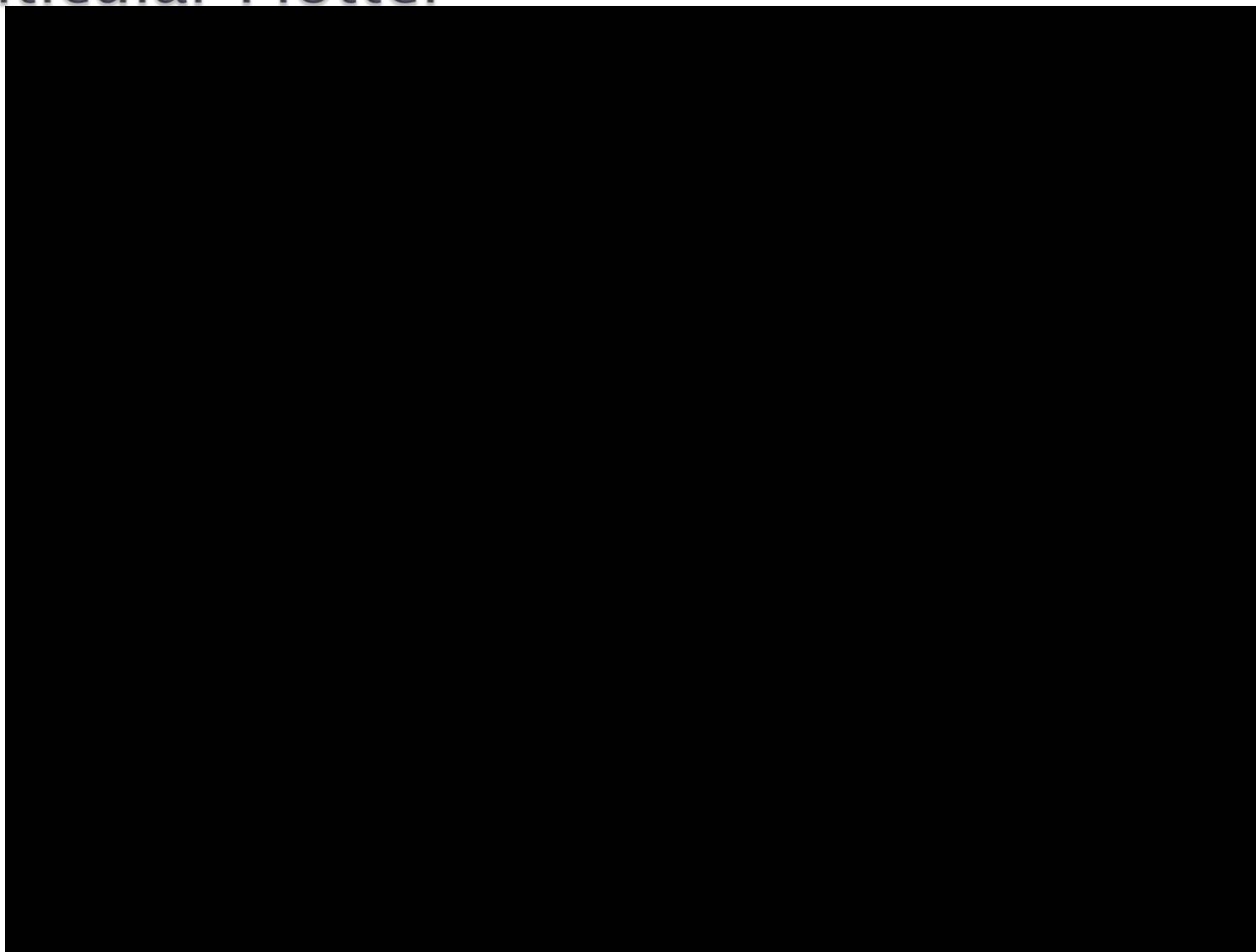


Conceptual design – Printing cycle

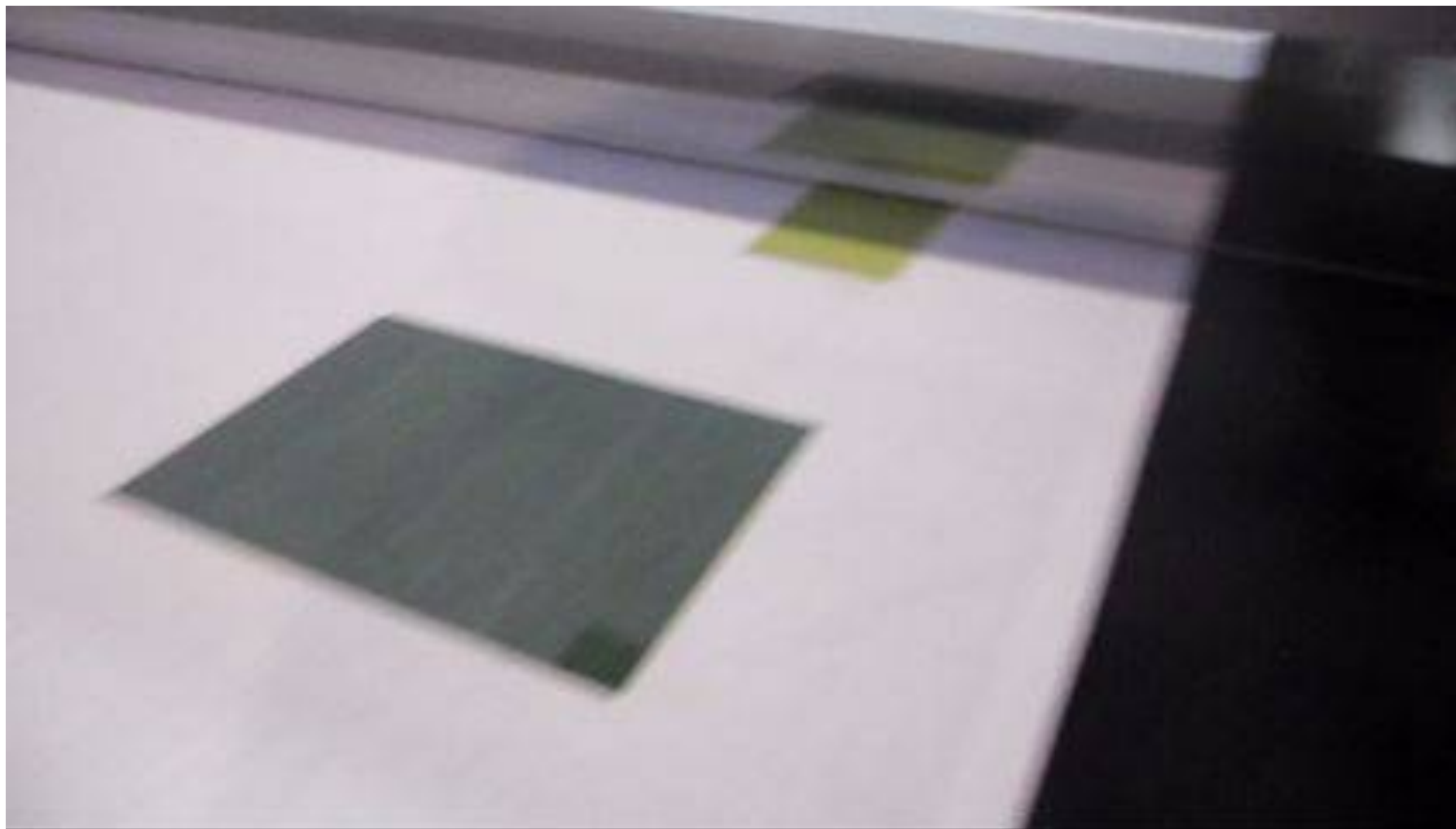




Lenticular Plotter



Lenticular Textile



Thank you for
your attention

dirstyle@voguesesa.com

andrea.pestarino@dappolonia.it