lüscher

Imaging Technologies

Lüscher future-proof CtP for plate Production

Colin Price

Lüscher

Plan:

- Lüscher Info
- Imaging Technologies in Graphic Arts
- Lüscher Flex Solution
- Lüscher Multi-DX
- Summary

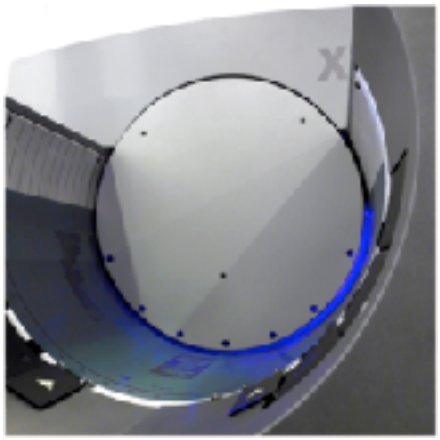
Lüscher: Company Profile

- Originally a Family business, founded in 1946
- Head office in Gretzenbach, Switzerland
  - New production plant opened
  - Software Development team
  - Sell world-wide either Direct or through partners
- Purchased Jan 2007 by PAInvest
- Focus on precision engineering & reliability

Global Presence

Lüscher: Company Profile

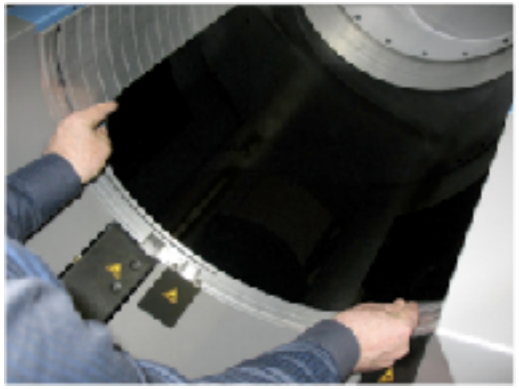
- **Successful products over more than 60 years**



Offset Printing

XPose! thermal
XPose! UV conventional

Over 2000 worldwide



Flexo and Hybrid

Flex *new
T-Flex *new
UV-Flex *new

Hybrid machine for different plate options

CT....X

Multi-DX

X= many applications

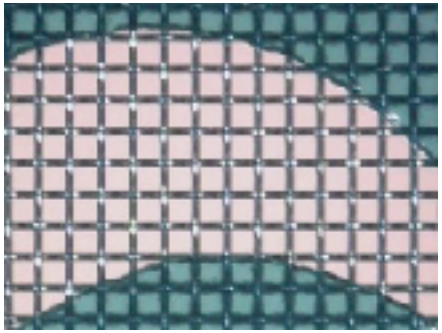
Imaging Technologies in Graphic Arts

Materials & Lasers:

- Most graphic Arts materials were developed for UV light
  - Polymer flexo plates
  - Polymer letterpress plates (dry offset)
  - Liquid polymers
  - Screens
  - Offset plates
  - Etching plates with a photo-resist
- No lasers existed that could expose these materials, so CtP had to find another way. Thermal lasers were available since late 80's and many materials were developed / adapted, often with a compromise in performance. Flexo used the ablation mask.
- Around 1995, UV Lasers started to become available, so CtP with conventional materials started to become theoretically viable

In non-flexo print:

- UV lasers are now being used to expose many 2D conventional materials:
  - Offset plates, Pad plates, Hot foil di
    Framed screens, rotary screens
  - Any type of plate with a photo-resi



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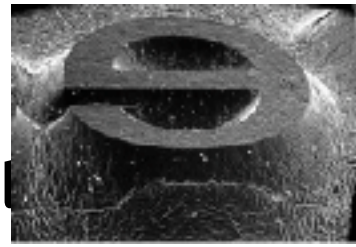
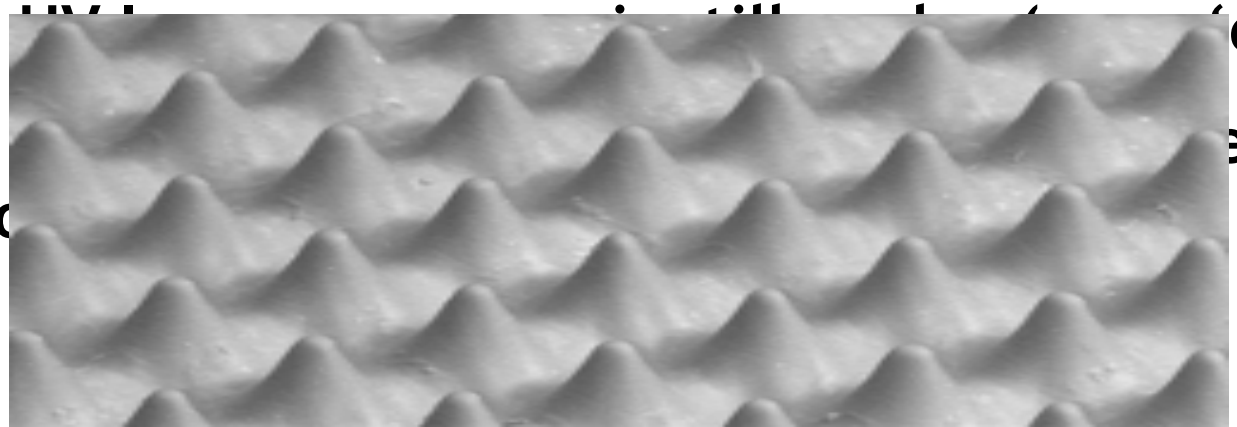
In Flexo and Letterpress (polymers):



- CtP increases quality (using ‘digital’ polymer pl
- The image is still created with an intermediary mask:
  - Black mask ‘ablation’ using CtP for ‘digital’ polymer plates
  - Film for conventional flexo plates and liquid polymers
- High resolution film & further steps (lamination) can do similar
- digital’ plates)
- e required 3D



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Lüscher has been working on directly exposing conventional polymers, using UV lasers, with 3D control over dot structure

… polymerisation
… polymerization

Status…..

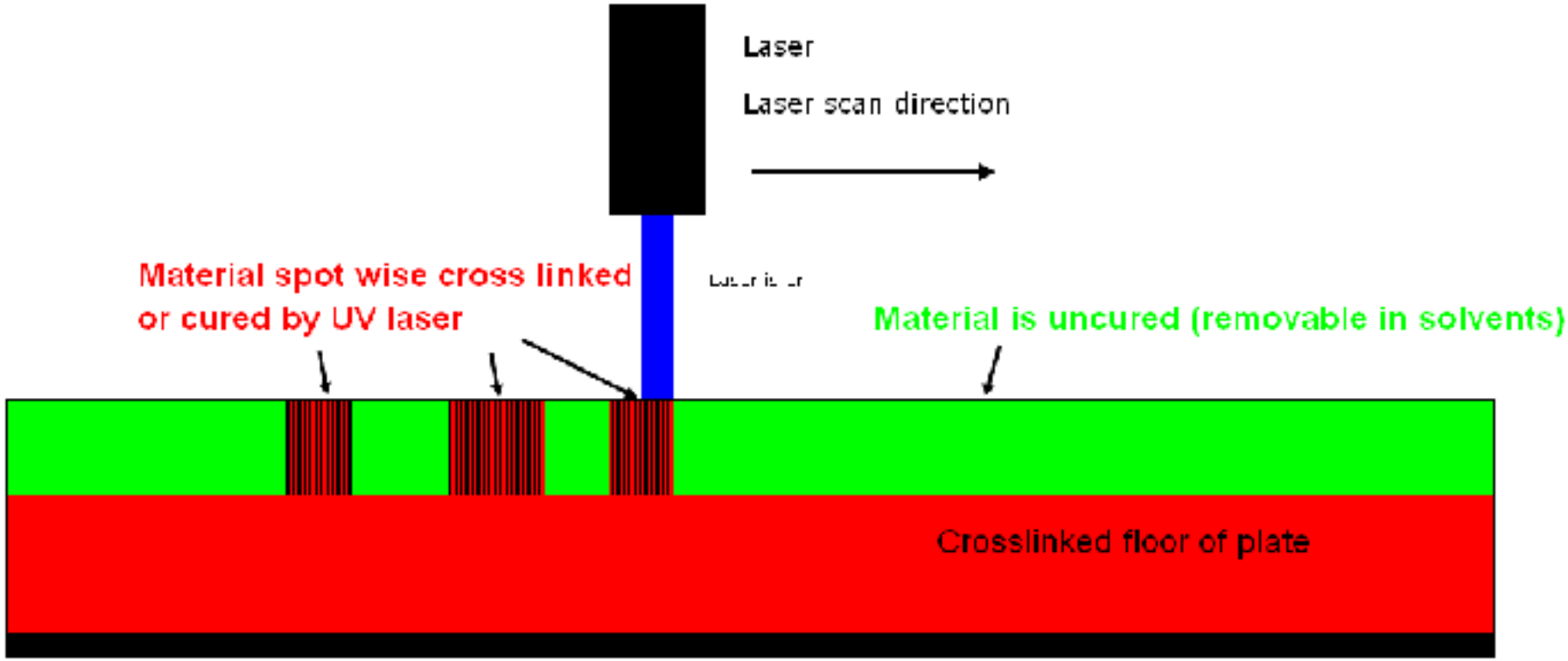
- First polymerisation product commercially released Accent coating plate, from MacDermid
- Late beta stages for conventional dry offset plates. Anticipated commercial release Q2 2013. Toray and Flint to start with, Toyobo approval will follow.
- Not yet f[illegible] but in R&D

Method	Energy requirements (typical)
Direct ablation	5 000 000 Joules / m²
Mask ablation	35 000 Joules / m²
Polymerisation	2 000 Joules / m²

Direct UV imaging (Polymerisation)

Plate making steps :

1. The polymer is directly cross linked with modulated UV Laser light
2. Wash out and drying
3. Light finishing



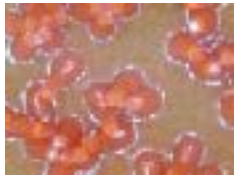
Challenges (Polymerisation)

- 3D direct imaging of Letterpress relief plates is challenging:
  - Small positive elements need shoulders in order to be in a position to be printed
  - Negative elements must remain “open” with deep reverses

- Lüscher has developed X!Direct software that solves this equation:
  - Small positive elements get optimized shoulders
  - Mid tones and shadows have deep relief
  - Reverses are open

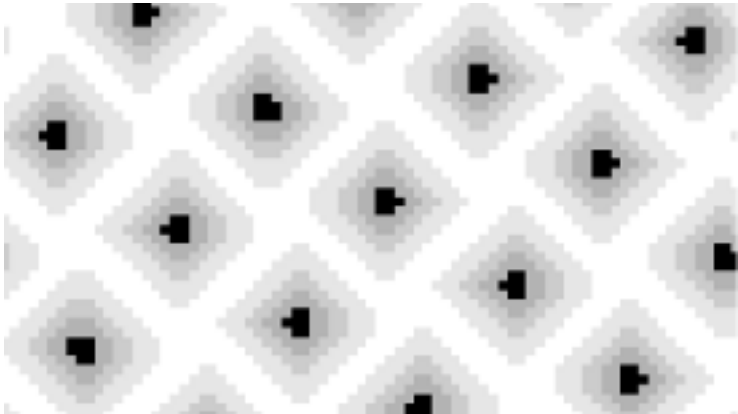
- A whole set of independent imaging parameters can be called on for achieving this result

The single points are sticking together



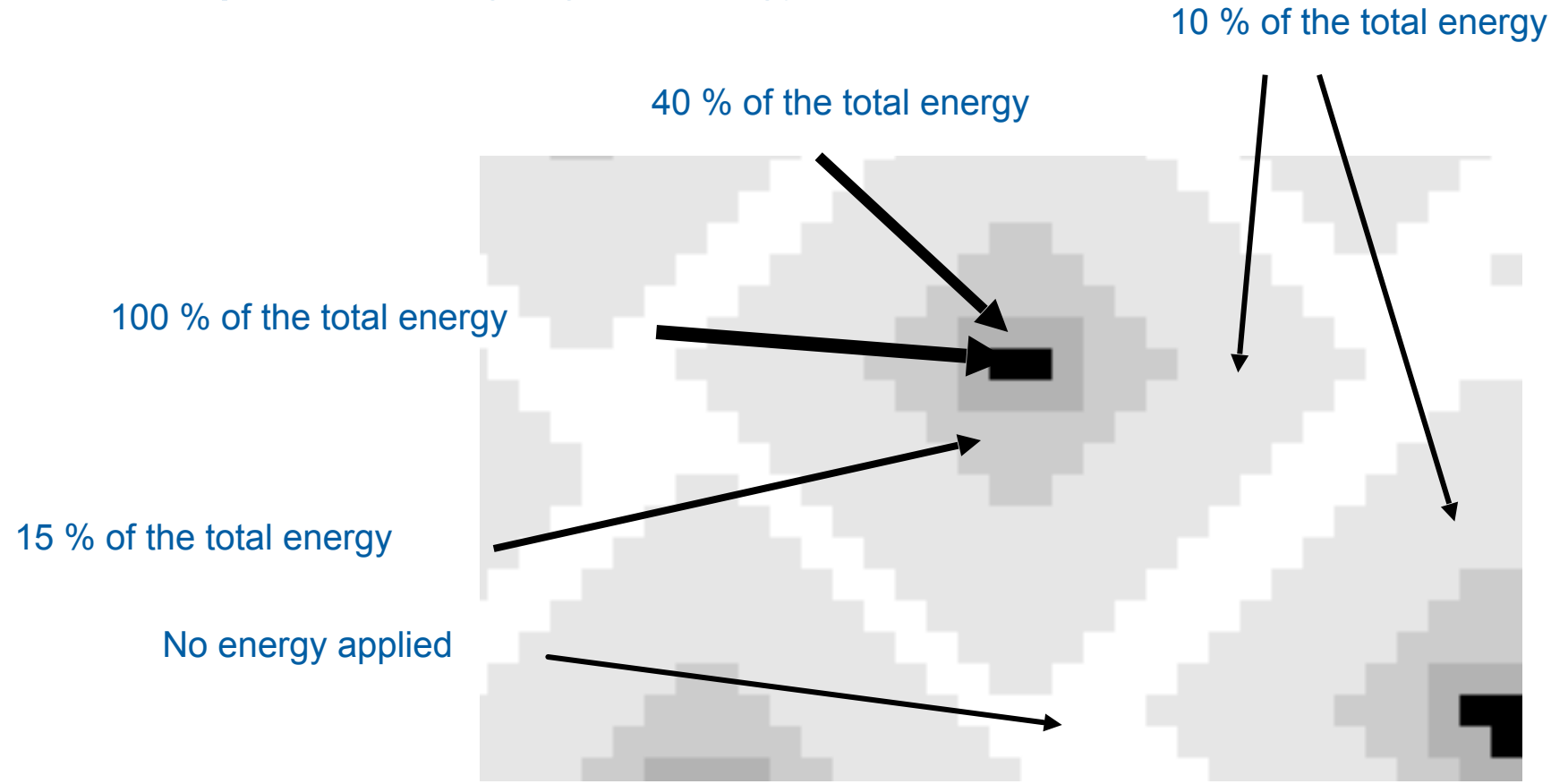
Imaging (Polymerisation)

- The imaging energy is applied in a defined number of scans (or passes), the imaging information can therefore be specific for each scan.
- Requirement for high rotation speed of plate (or optic).
- More precisely:
  - A black pixel means 100% of the energy is applied locally. This is corresponding to the original Tiff file.
  - Pixels in grey are imaged with an adjustable fraction of the overall energy.
- The gradient of energy around positive elements is used to shape the shoulders.



Imaging overview (Polymerisation)

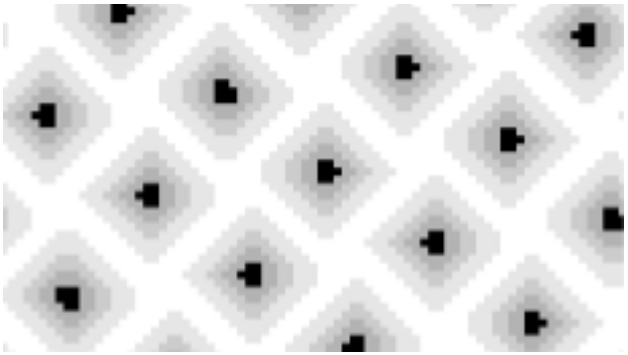
Spatial distribution of energy controlled by software.
Example of imaging strategy:



Direct UV imaging workflow (4/4)

- Imaging of positive line work:

- Imaging of highlight dots:



- Imaging of reverses:

Benefits of polymerisation…..

- Truly digital imaging
- No loss of details due to mask. Pixel accurate reproduction.
- Fewer production steps (simplicity and reliability)
- No mask and no mask processing issues (developing & chemicals contamination)
- Possibility to image conventional plates (lower cost?)
- Broader range of plates and plate technologies
- Photochemical processes are the most efficient in nature, and nature shows us the way (green features).
- Potential to boost imaging quality with a whole new set of parameters that can be called on for optimization.

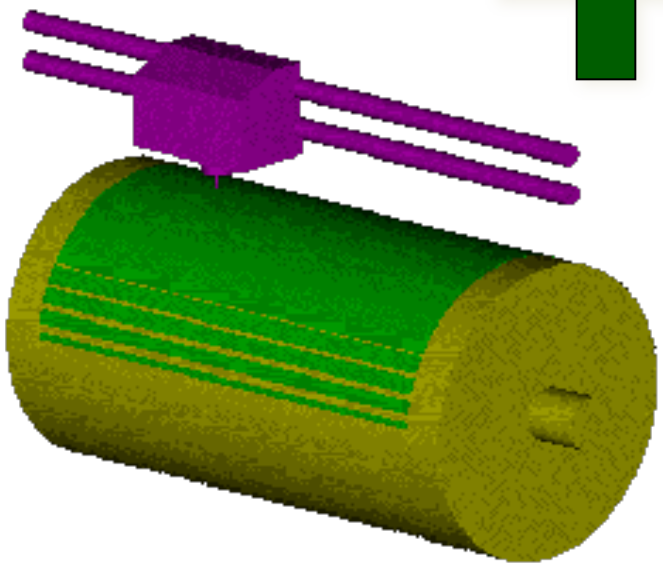
Outlook…..

- Conventional Letterpress plates (UV light sensitive) can be imaged directly and digitally with UV laser diodes
- A whole range of new software parameters are at our disposal for the optimization of imaging
- UV lasers are continually developing, due to high investment in R&D by laser manufacturers, because of the data storage applications (BluRay etc… smaller wavelength = higher density storage)
- Direct imaging has the potential to be better than mask ablation with a more cost effective, more energy efficient process
- This is a *possible* future path for flexo

Product Presentation -Lüscher Flex

Unique Architecture

Imaging Technologies - External Drum



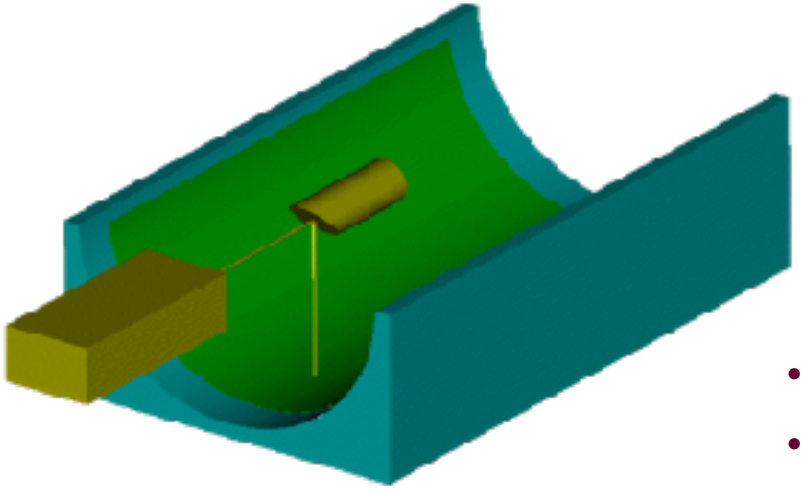
Pros

- Laser diode Technology
- Multi-Beam/laser for speed
- power needed at plate surface

Cons

- Fighting physics
- Stop / Start operation
- Plate load/unload management

Imaging Technologies – Internal Drum



Pros

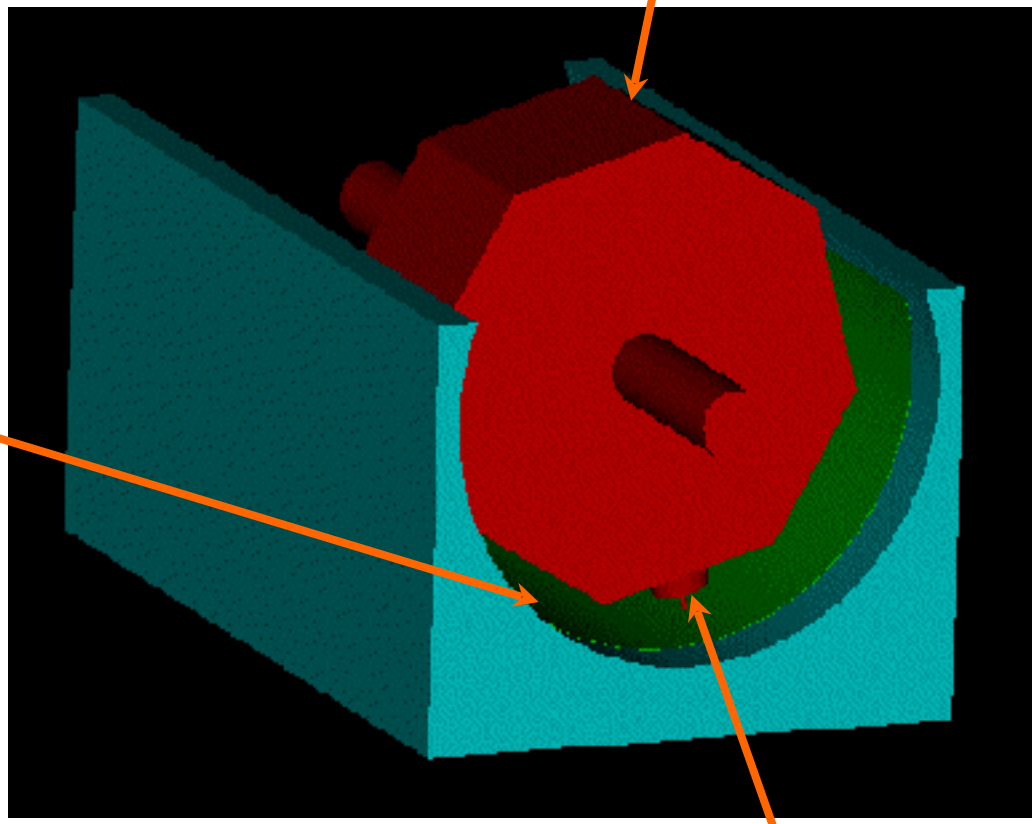
- Stationary Target
- No balancing problem
- Highly Accurate (target not moving)
- Historically used for light sensitive substrates (imagesetters)

Cons

- Not suitable for thermal imaging
- Not enough power at the plate surface for most plate types

Lüscher incorporates Both internal and external drum technology!

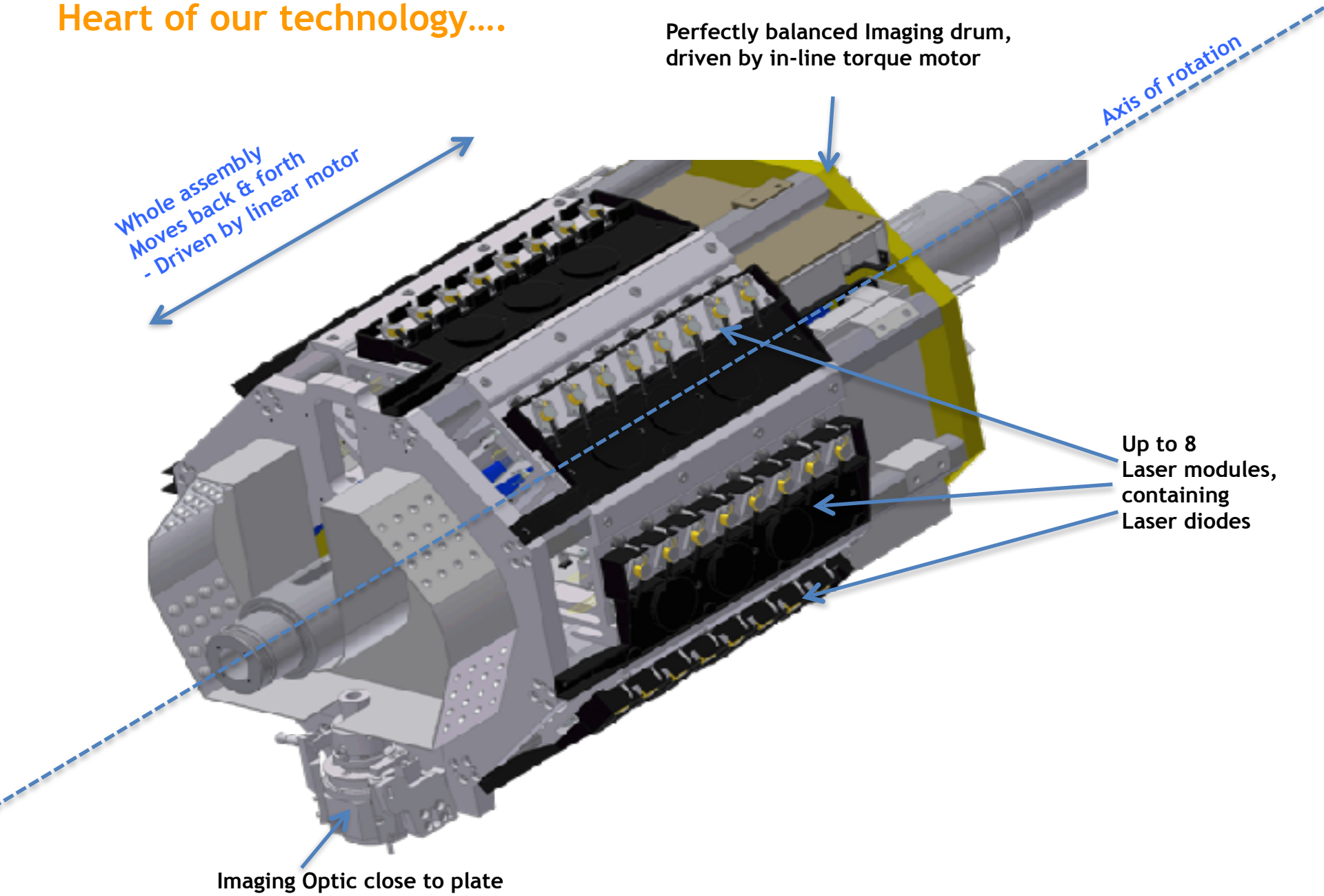
External drum Imaging Head Containing laser diodes, Perfectly balanced



Internal drum with
stationary
Printing plate(s)

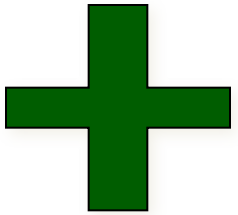
Imaging Optic close to plate

Heart of our technology….

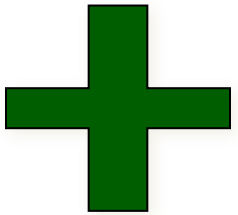


Unique Architecture

- Internal drum advantages
  - Easy loading
  - Plate size independence
  - Accuracy (image and registration)
  - No balancing Issues



- External drum advantages
  - Power at the plate



Flexo plates to 52” x 80”

Flexo plates to 35” x 47”

Flexo plate sizes up to up to 54” x 114” (2900mm x 1370mm)

Scalable Range Of Machines

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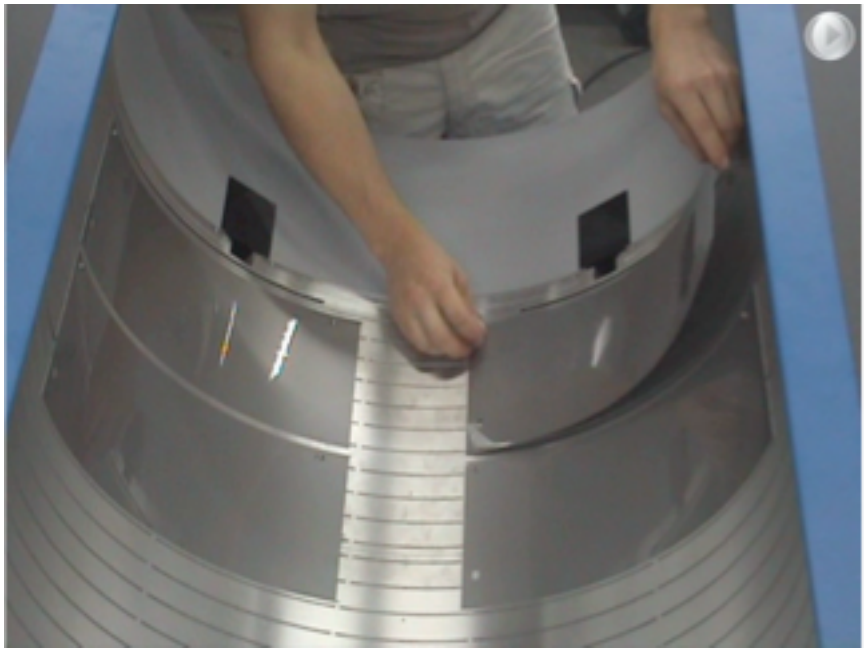
Big Plate Handling

http://www.youtube.com/watch?v=J35T8vgY6xo

Flexibility

- Aluminum / Steel / Polyester / Screens
- Multiple jobs on 1 large plate
- Plate-size independent workflow
- Multiple plate loading
- Pin Registration = ABSOLUTE FIT
- Small plates / Off-cuts = less waste



http://www.youtube.com/watch?v=Ng5a7bpo3VY

Equipment Installation and Support

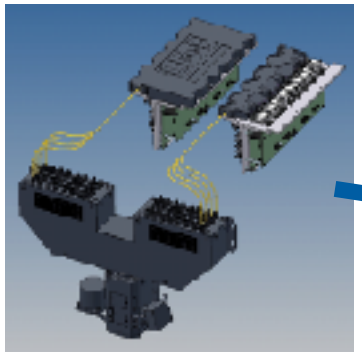
- Service
  - USA Based engineers
  - Supported by Lüscher dedicated Technical Support department
  - Customer Technician Training in Training School
  - On-site Spares Kits available
  - Pre-Scheduled PM visits based on equipment usage

- Legendary up-time from Lüscher
  - Solid Build
  - Modularity of components
  - **Superb remote diagnostics**
  - XPose monitors and calibrates itself

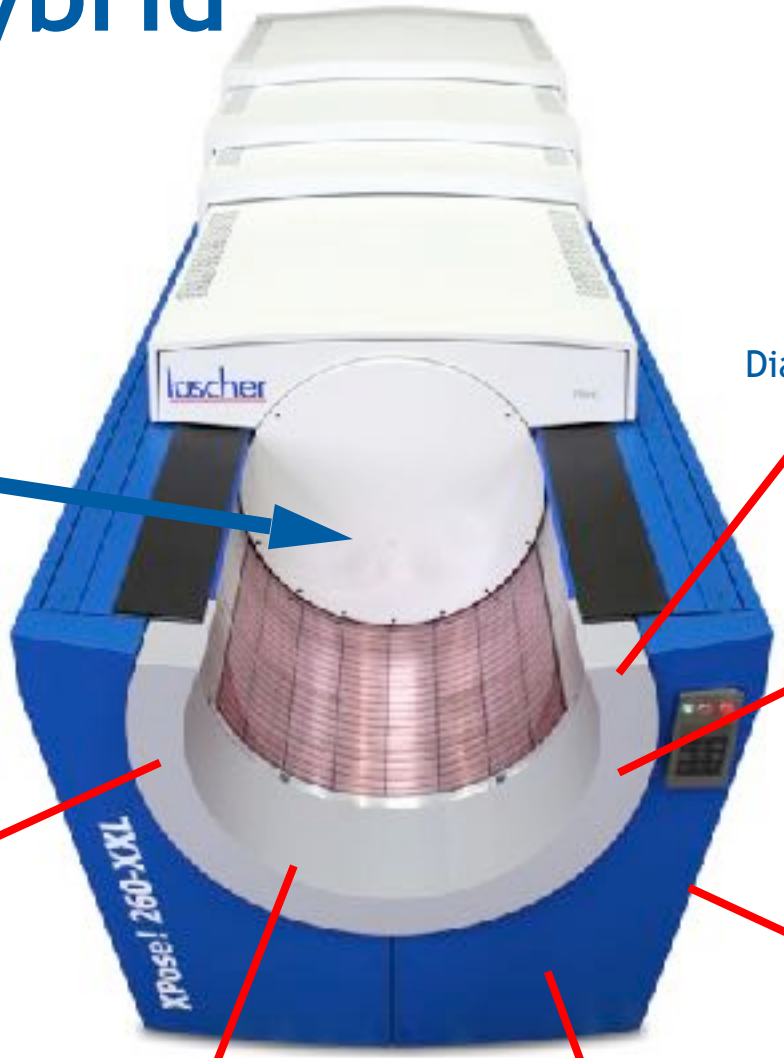

unique
drum
design
lüscher
easy
handling
Flexibility
low
service
reliable

Unique Features

Unique Hybrid Optic



Laser modules



Diazo film

Screeny system
UV lasers

Flexo & coating plates
Carbon layer
Thermal lasers

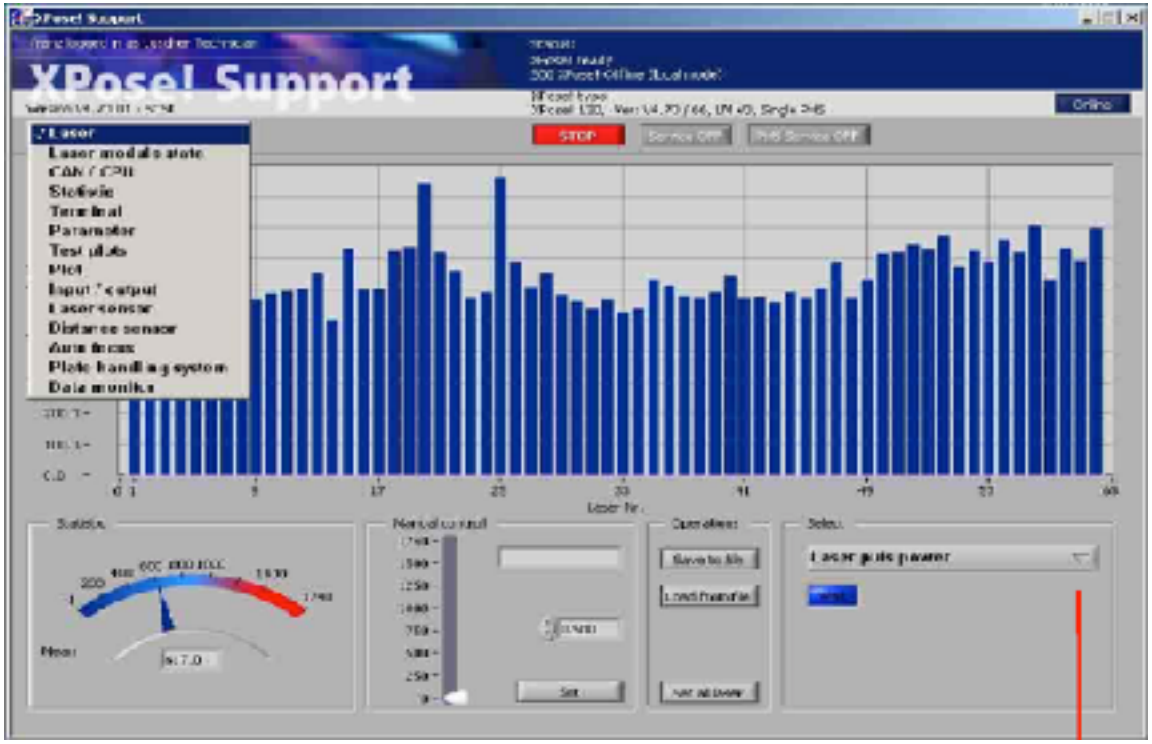
Letterpress plates IR lasers

Accent Varnish plate UV

Conventional offset plates
UV lasers
Thermal ablation offset plates
IR lasers
Thermal offset plates 830Nm

Process control…

- By Design
- Continuous Calibration Technology (CCT) for perfect consistency
  - because Lasers by their nature will vary
  - All machine parameters can be monitored and consistency maintained



- Needed to Satisfy Banknote Printers – Lüscher is market leader

Modular Design
- adaptable to change

- Lasers can be added = more speed
- Laser Types can be changed for new materials
- All plate types can be loaded
- Modular Electronics = swift repairs
- EPROM based software - remotely upgradable
- Full Remote Diagnostics

Future Proof

Accuracy and Movement

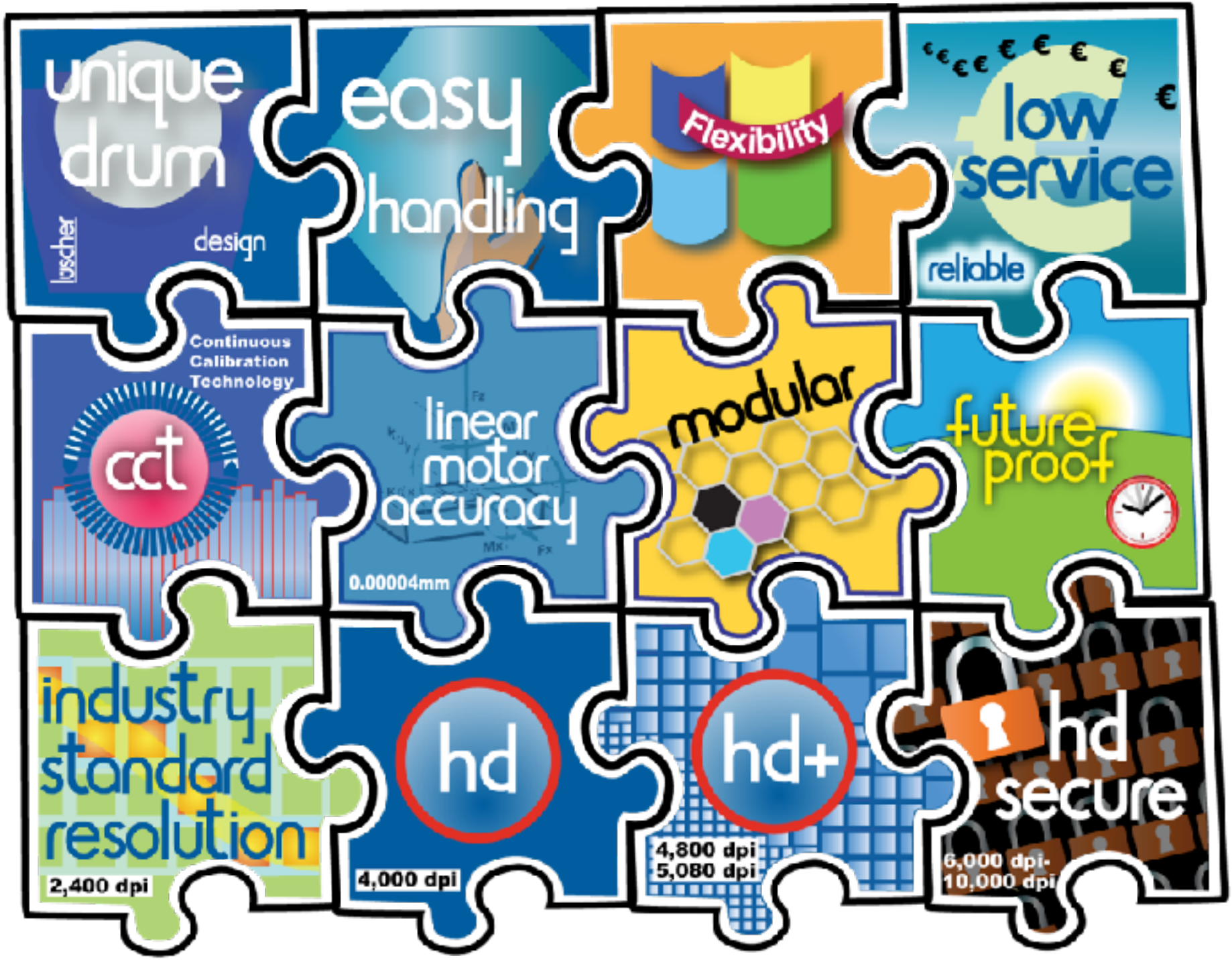
- Linear Motor
  - For moving the optics
  - accurate to 0.0004mm
  - Swift Movement
  - Maintenance free
  - Combines with X!Skip s/w for production gains
- Torque Motor
  - Inline for vibration-free rotation of optics


unique drum
lüscher
design
easy handling
Flexibility
low service
reliable
Continuous Calibration Technology
cct
linear motor accuracy
0.00004mm
modular
future proof

Resolution

Resolution

- Depending on the Application:
  - 2400 is a ‘standard’ in Offset, Screen & Flexo
- New Industry Trends driving quality in Flexo
  - High Definition (‘HD’) in Flexo @ 4000dpi
  - Higher resolution gives rounder highlight dots
- Depending on the Market:
  - Security market needs higher resolutions
    - For Wet and Waterless Offset (6,000, 8,000, 9,000, 10,000)
    - For Letterpress / dry Offset (up to 10,000 dpi)


unique drum
design
easy handling
Flexibility
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reliable
Continuous Calibration Technology
cct
linear motor accuracy
0.00004mm
modular
future proof
industry standard resolution
2,400 dpi
hd
4,000 dpi
hd+
4,800 dpi
5,080 dpi
hd secure
6,000 dpi-
10,000 dpi


unique drum
design
easy handling
Flexibility
low service
reliable
Continuous Calibration Technology
cct
linear motor accuracy
0.00004mm
Lasers..
modular
future proof
industry standard resolution
2,400 dpi
hd
4,000 dpi
hd+
4,800 dpi
5,080 dpi
hd secure
6,000 dpi-
10,000 dpi

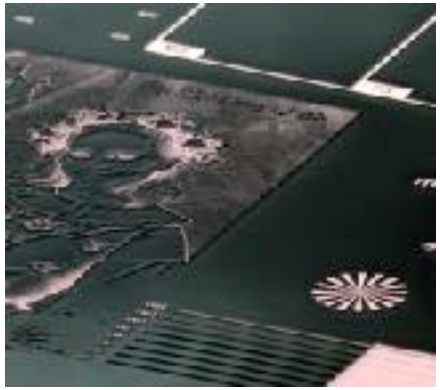

standard resolution
2,400 dpi
hd
4,000 dpi
hd+
4,800 dpi
5,080 dpi
secure
6,000 dpi-
10,000 dpi
blue lasers
405Nm
flexo lasers
940Nm
ablation

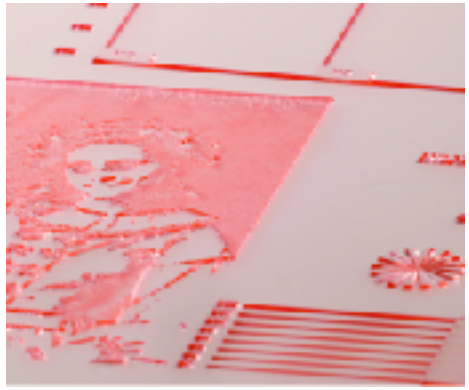
Lasers…..

Flexo Laser Possibilities…

- All brands of 'digital' flexo plates
  - Either solvent or water washout
- All brands of digital dry offset plates
- 4800dpi, 5080dpi, 6000, 8000, 10,000dpi
- Coating or Varnishing plates
- Steel backed plates: no magnetic drum needed!
- Ablative film (but expensive option)

- Continuous Calibration technology for perfect consistency

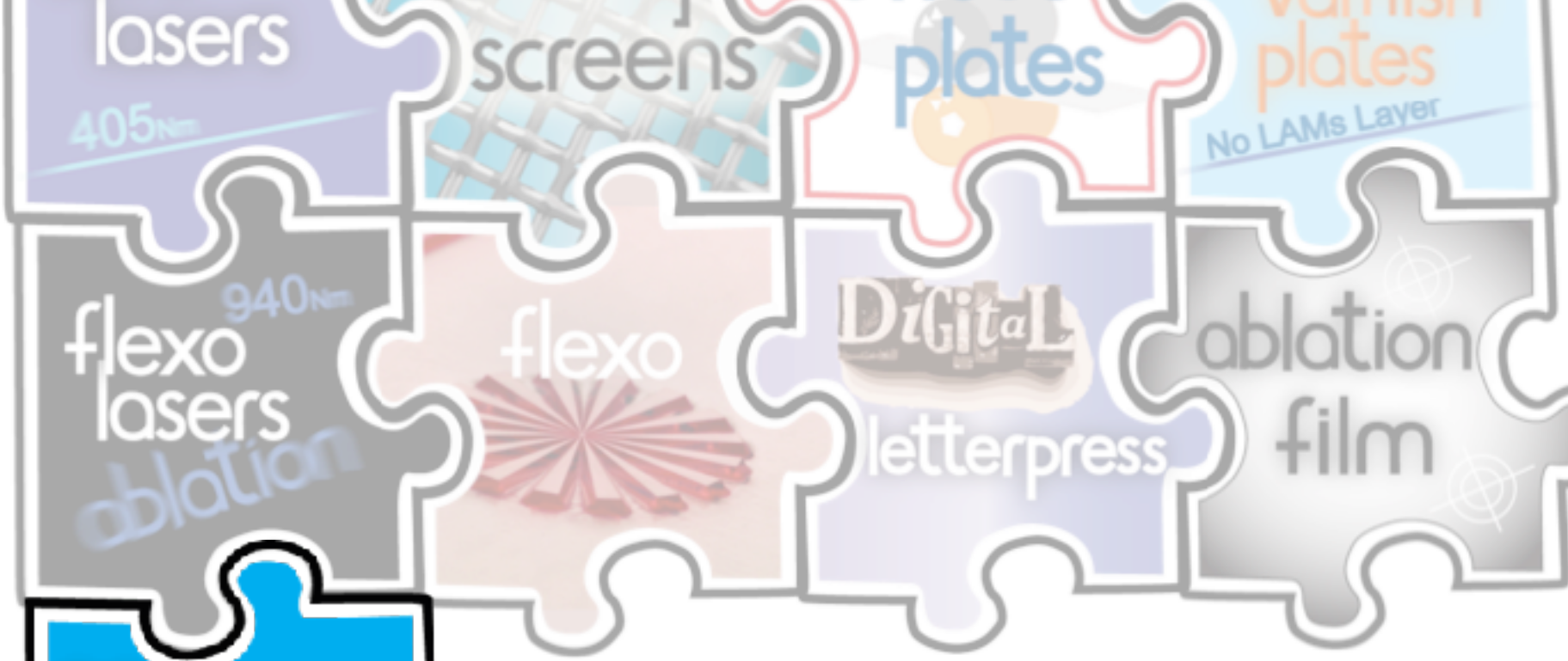




Blue (405 Nm UV) Laser Possibilities…

- Diazo Film
  - High Quality, Tough, fast imaging
  - Half the price of imagesetter film
  - Can be imaged with ‘supercell’ patterning for better ink transfer
- Conventional Offset Plates
- Rotary Screens (Gallus Screeny, Stork, K&B)
  - Pin registered precision
- NEW LUSCHER IMAGING TECHNOLOGY


standard resolution
2,400 dpi
hd
4,000 dpi
hd+
4,800 dpi
5,080 dpi
secure
6,000 dpi-
10,000 dpi
blue lasers
405Nm
rotary screens
offset plates
new varnish plates
No LAMs Layer
flexo lasers ablation
940Nm
flexo
DiGitaL
letterpress
ablation film



Also now available **375Nm UV lasers**….

- imaging **conventional** dry offset plates
  - Used with **Lüscher X!Direct** 3D imaging software
- further development in flexo plate imaging


lasers
405Nm
screens
plates
plates
No LAMs Layer
flexo
lasers
940Nm
ablation
flexo
DiGitaL
letterpress
ablation
film
blue
lasers
375Nm
Conventional
letterpress
Diazo
film
405nm
375nm


unique drum
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easy handling
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blue lasers
405nm
rotary screens
offset plates
new varnish plates
No LAMa Layer
flexo lasers ablation
940nm
flexo
Digital
letterpress
ablation film
blue lasers
375nm
Conventional
letterpress
Diazo film
405nm
375nm

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Summary

- One Machine: multiple plate types
- Swiss Quality engineering
- Continuous Calibration Technology CCT (process control)
- Thermal lasers for
  - digital flexo & letterpress today

- But UV lasers are revolutionising…
  - Diazo film –(available now)
  - Offset ctp –(available now)
  - Rotary Screens – (available now)
  - Coating plates – (available now)
  - Dry Offset/Letterpress (available soon)
  - Flexo – potential digital flexo of the future
- Customers can change lasers to meet market needs

And……..

http://www.youtube.com/watch?v=FTAWO8SUwjo

Multi-DX – Flatbed architecture

- **SAME FUNCTIONALITY with a FlatBed Architecture**
  - **Offers new direct imaging opportunities (rigid materials)**

Together we are strong

Thank you very much for your attention.

Herzlichen Dank für Ihre Aufmerksamkeit.

Merci de votre attention.

La ringraziamo per la vostra attenzione.

Muchas gracias por su atención.

Muito obrigado por sua atenção.