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Image-to-Print

Printing Technology & Innovation Days
for flexible packaging

Laser Technology for cylinder making

Ralf Zähringer, Janoschka

19 June 2013 | Piacenza

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The Future is Laser

In general, there are 5 Laser technologies available:

- Daetwyler DLS (Swiss)
- Hell Cellaxy (German)
- Digilas direct (German)
- Digilas exposed (German)
- Think Lab (Japanese)

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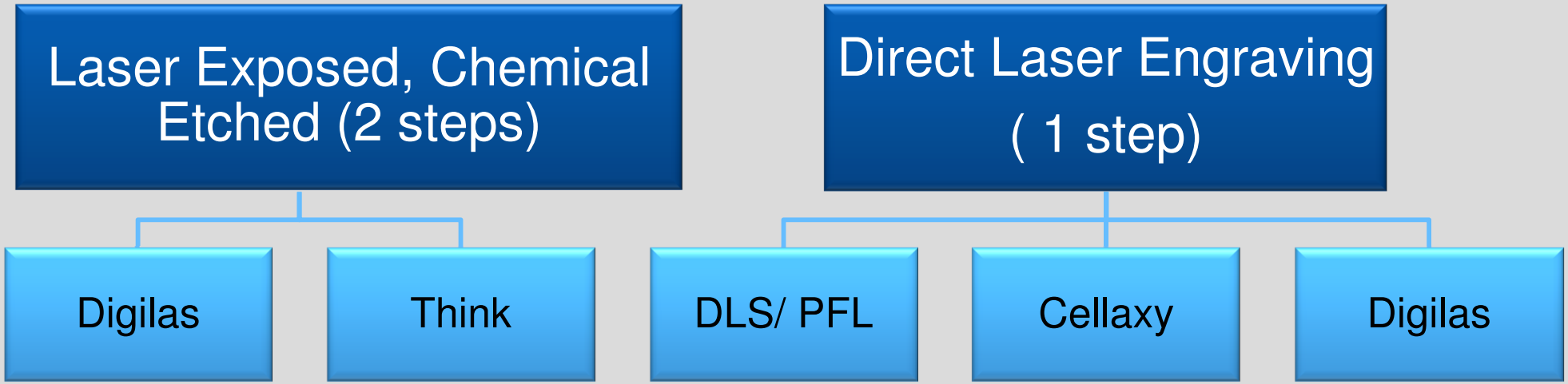
Laser Technologies at Janoschka



Janoschka is the only service-house equipped with ALL 5 types and having experience with all existing Laser Technologies.

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Cell geometries

Etching

Variable area

Stylus

Variable area and
variable depth
(not flexible)

Direct Laser Engraving

Variable area and
variable depth
(flexible)

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DIGILAS | Exposition Laser

- Fiber laser in a one beam- or multiple beam configuration or imaging specially coated gravure cylinders.
- Dot size and resolution < 10 µm
- Provides special screens, razor-sharp lines at very high quality level

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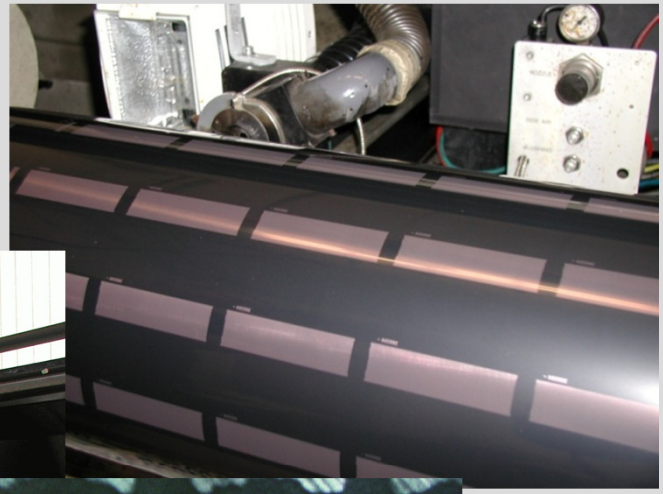
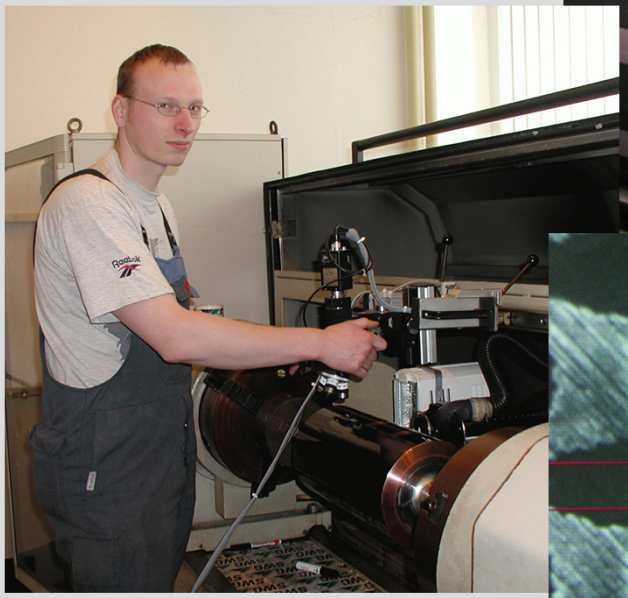
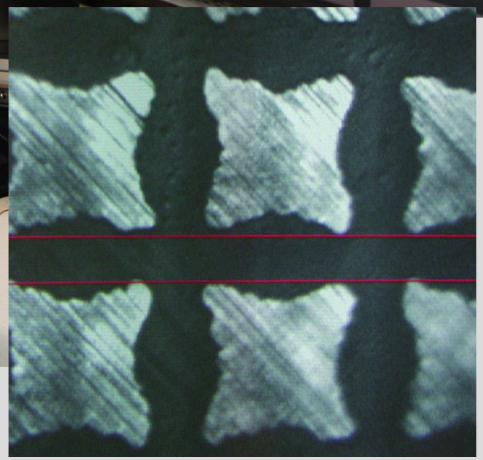
DIGILAS | Laser-engraving with YAG-laser



Laser
Cylinder



Cylinder
check



„pillow-shaped“
cell

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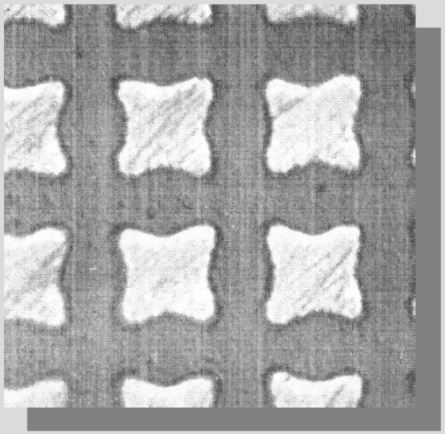
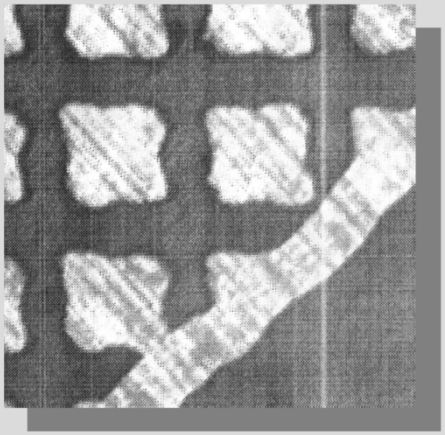
DIGILAS | special screens

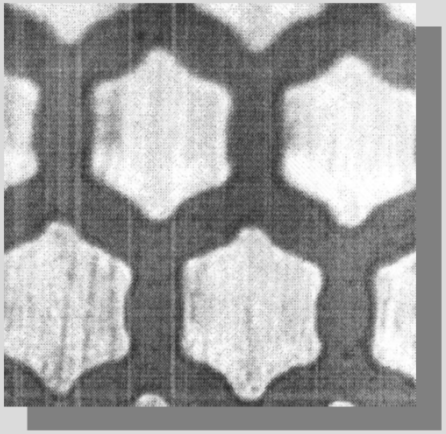
„Pillow“ shaped cells

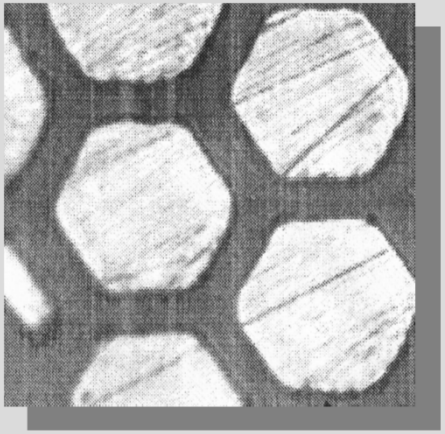




„Pillow“ shaped cells with outline

Hexagonal shaped cells





Hexagonal shaped cells (Honeycomb)

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DIGILAS | "high resolution“ applications

Labels (with fine gold and text images)

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DIGILAS | “Heavy volume“ applications

- Hotmelt / Wax
- Cold Seal
- Laquer
- Primer
  example: medical packaging
- Embossing cylinders:
  example: Acrylic cylinders for foam transfer (for wall paper)

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Think-Lab

Similar results can be achieved by using the Think-Lab technology
- Blue Coating

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Direct Laser engraving

- Laser material Interaction
- Worklfow
- Different Direct Laser systems

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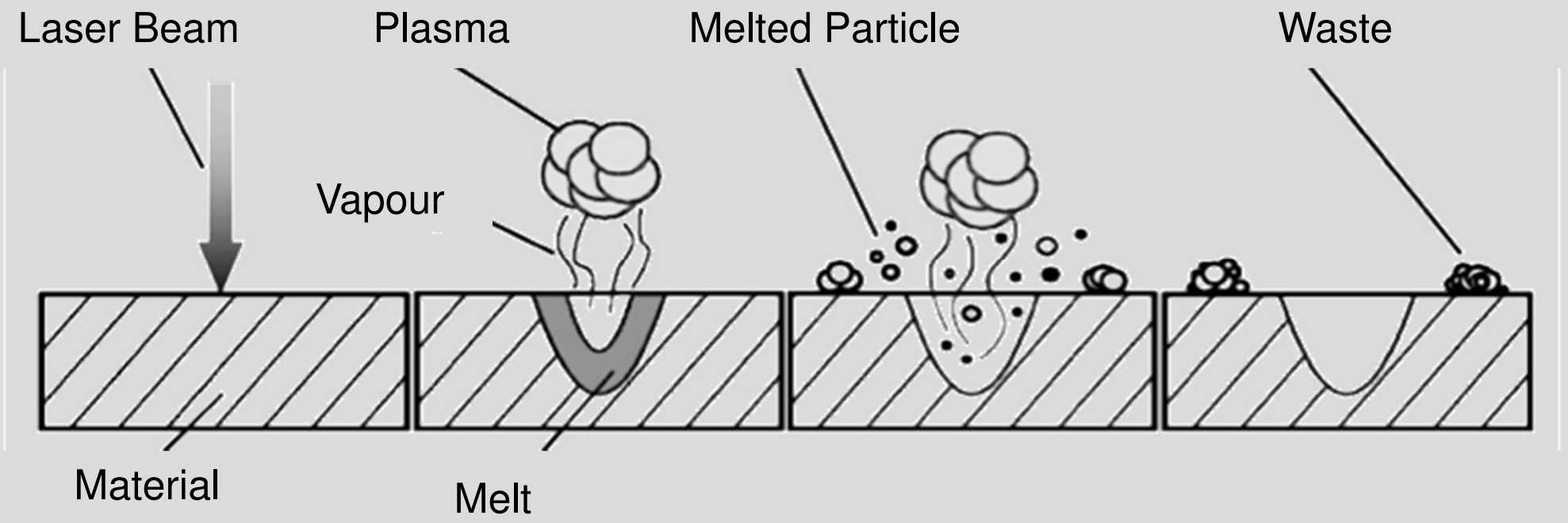
Laser Material Interaction, Laser direct engraving



Fritz Klocke, Wilfried König: „Fertigungsverfahren 3 – Abtragen, Generieren, Lasermaterialbearbeitung“, 2007 ‚Aachen, Springer Verlag Berlin

Direct Laser Engraving • Workflow

Electro Plating – Cu & Zinc

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Laser System – Schepers Digilas

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Laser engraving Schepers Digilas

- Direct laser engraving
- Dot size and resolution < 10 µm
- Provides special screens, razor-sharp lines at very high quality level
- Engraving direct in copper
- For rotogravure and embossing

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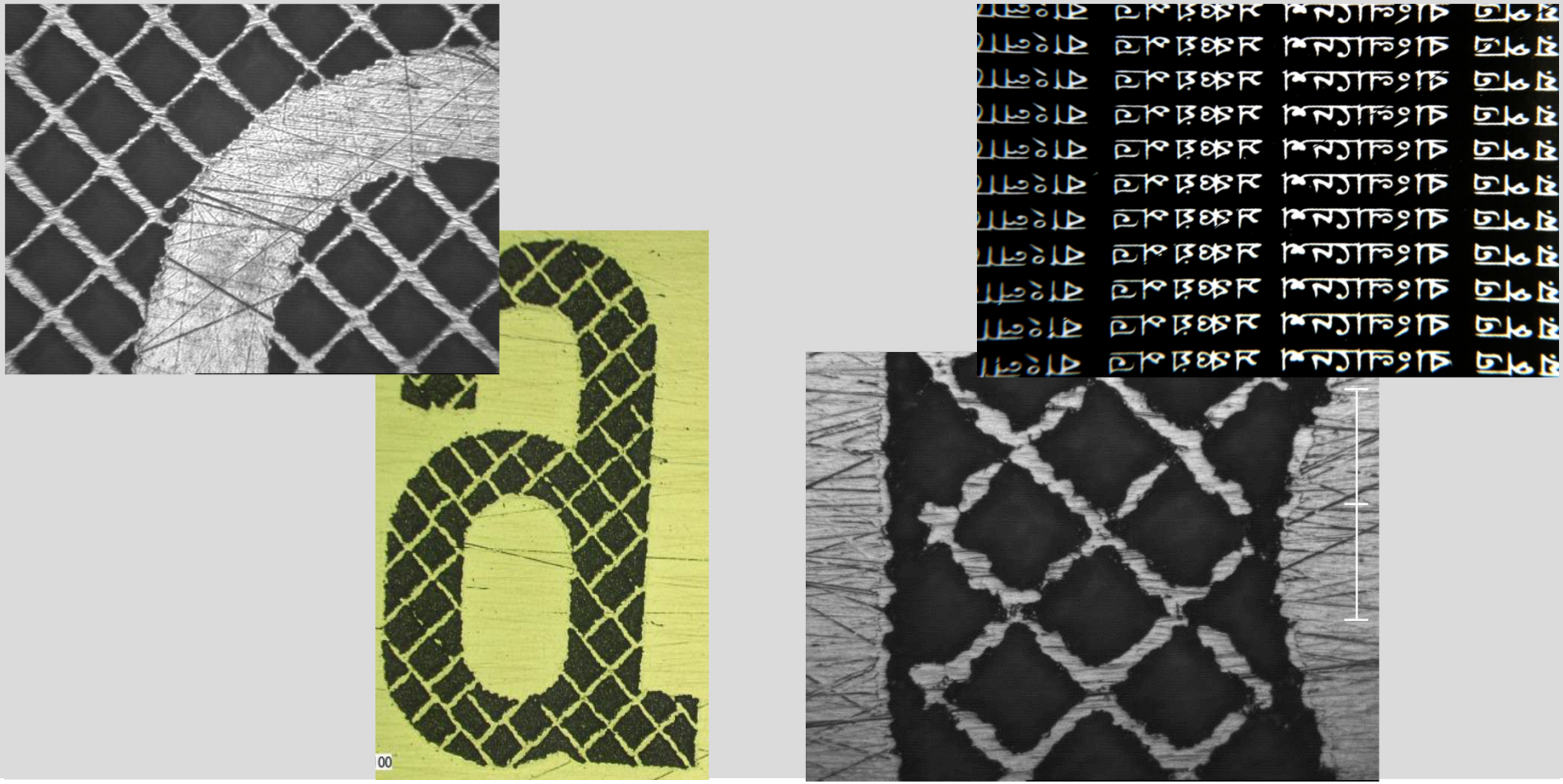
Schepers Digilas engraving in copper



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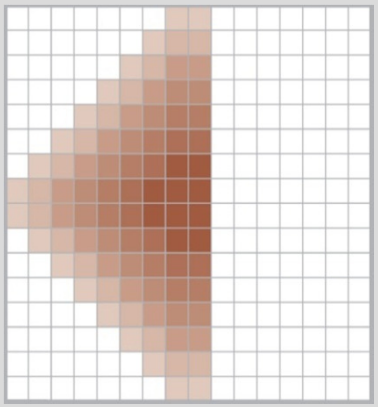
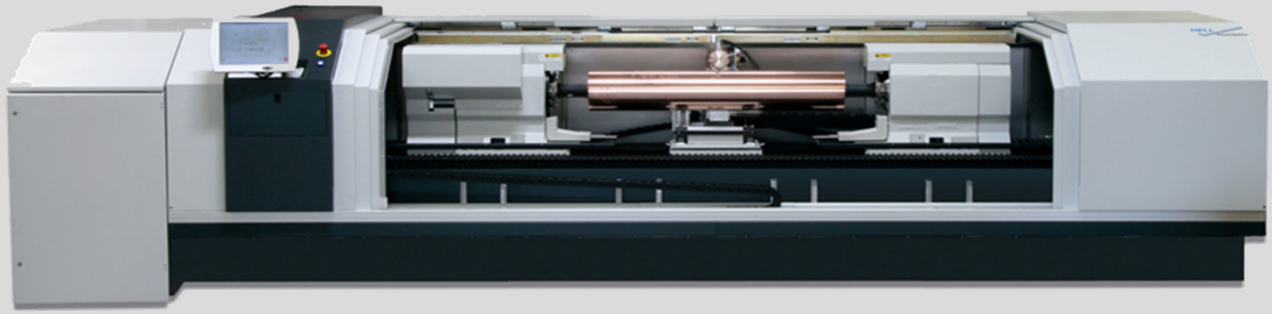
Laser engraving | Hell Cellaxy

- Direct laser engraving
- Similar to Offset ImageSetter (Cells are created by multiple exposing lines)
- Engraving in copper



HELL cellaxy



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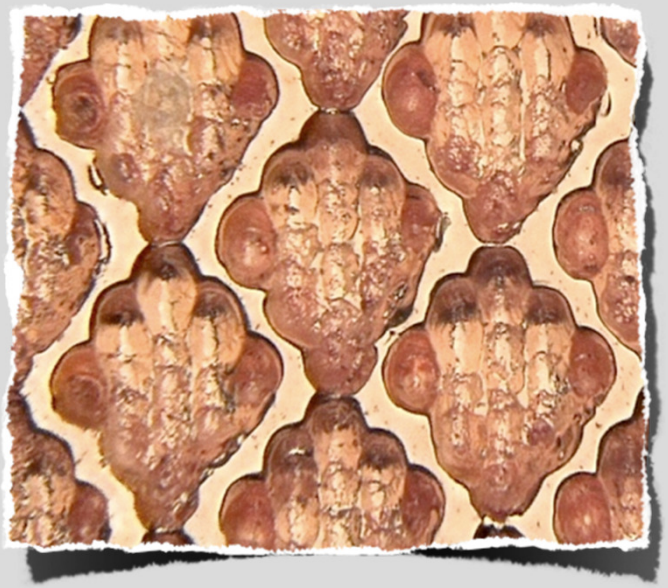
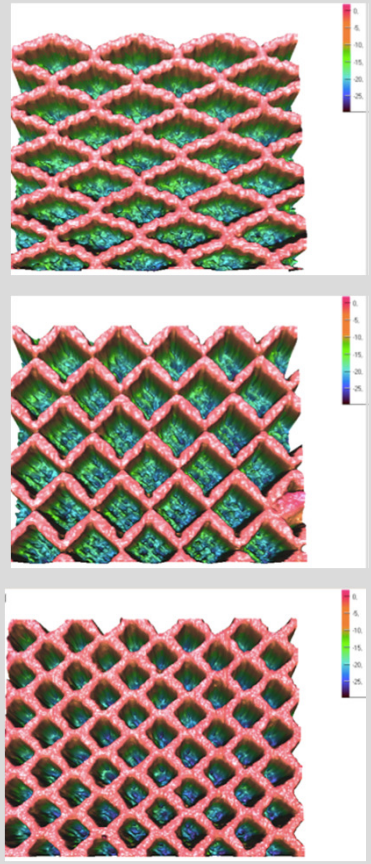
Hell Cellaxy | engraving in copper





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Direct Laser System – Daetwyler DLS

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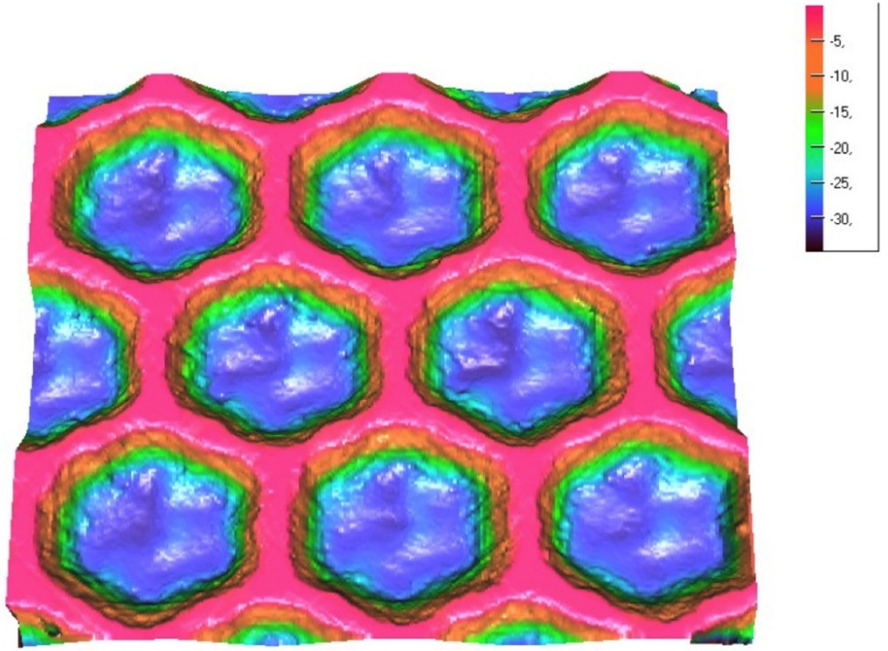
Laser System – Daetwyler DLS

Single Shot



Master Screen

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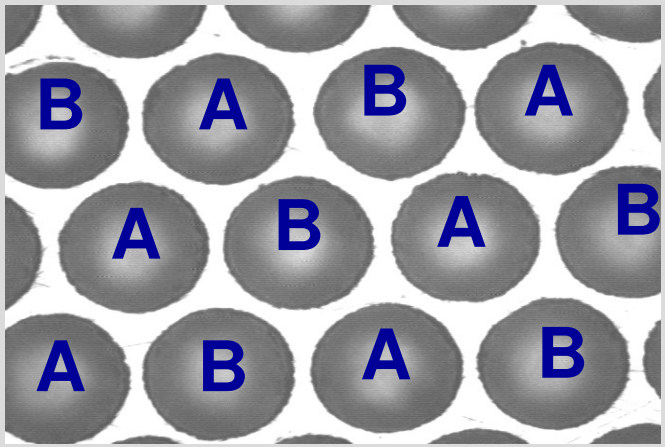
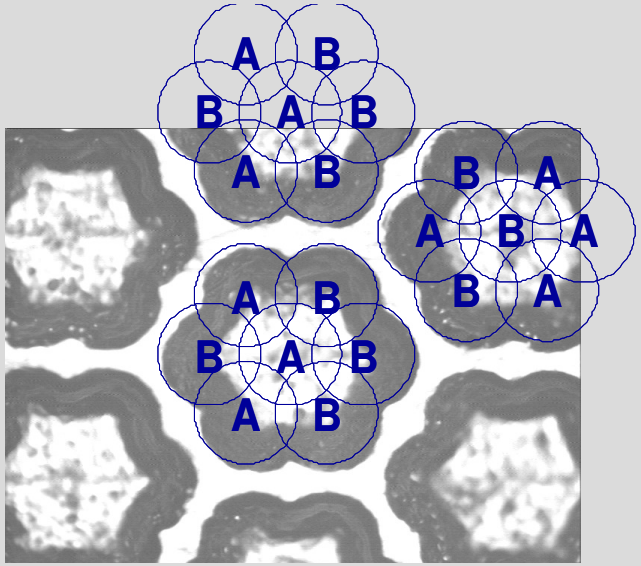
Performance

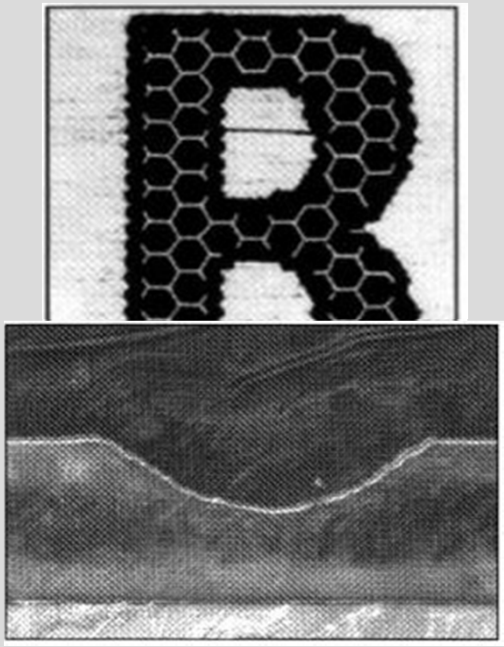
- Engraving Speed: **35,000 or 70,000 cells/s**
- Effective Range of Screen: **30-160L/cm**
  (Single Shot and Master Screen)
- Effective Resolution used: **100-400L/cm**



Single Shot



Master Screen



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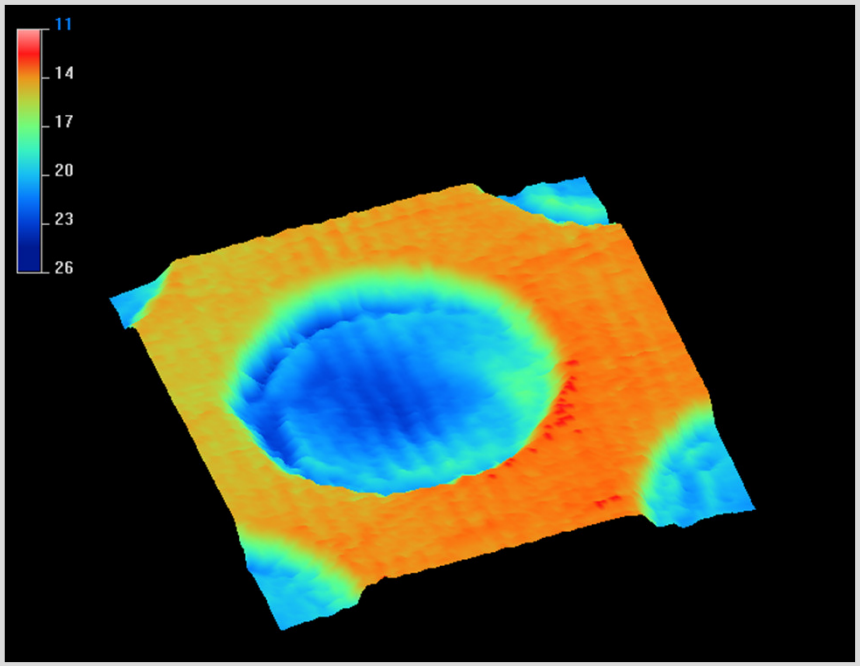
Cell Geometry • Single Shot vs Master Screen

Single Shot

- Screen equals resolution
- Very fast engraving
- Only round cells possible
- Variation in cell types conventional, half-autotypical and super half-autotypical
- Cell depth up to 35µm (in one pass)
  (multi passes possible)



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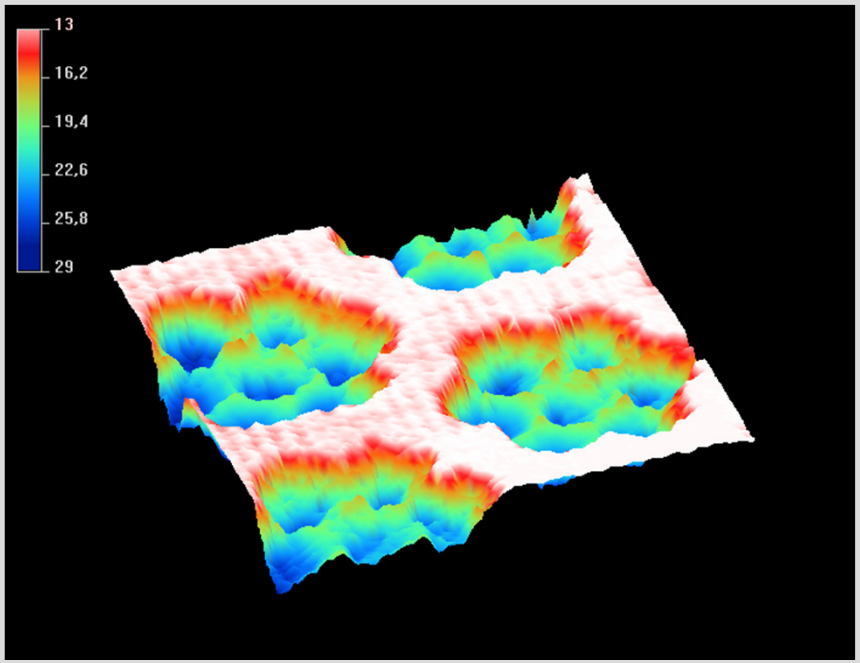
Cell Geometry • Single Shot vs Master Screen

Master Screen

- Resolution higher than screen
  (similar to image setter)
- Hexagonal cell
- Variation in cell types conventional, half-autotypical
- Outline possible
- Cell depth up to 35µm (in one pass)
  (multi passes possible)



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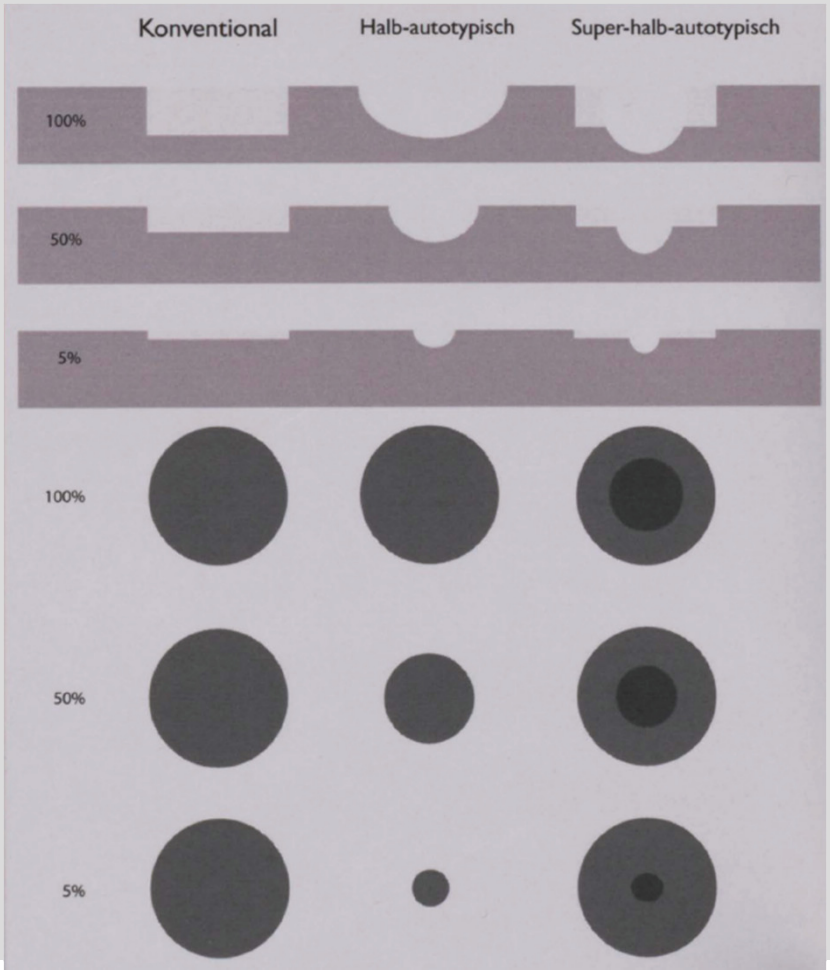
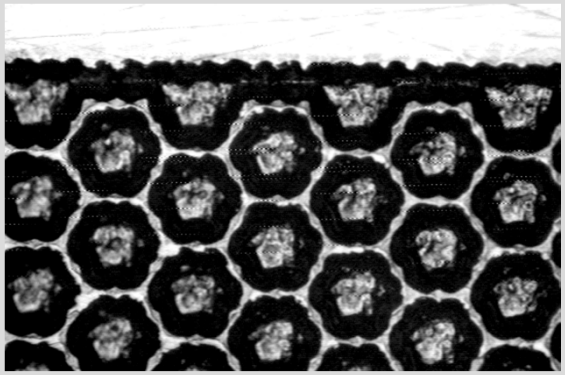
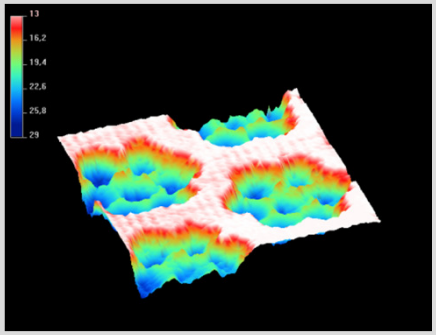
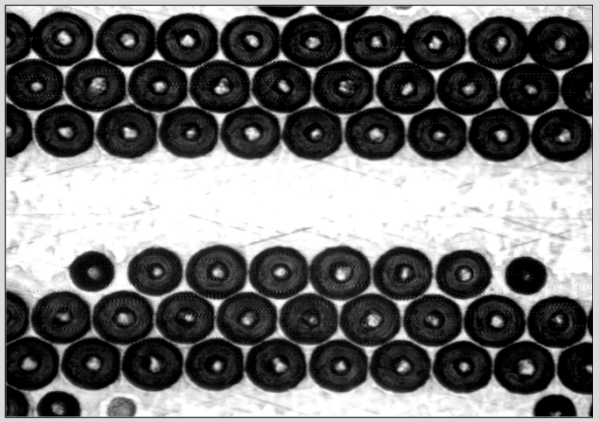
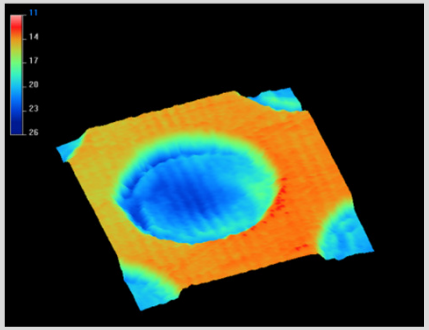
Cell Geometry











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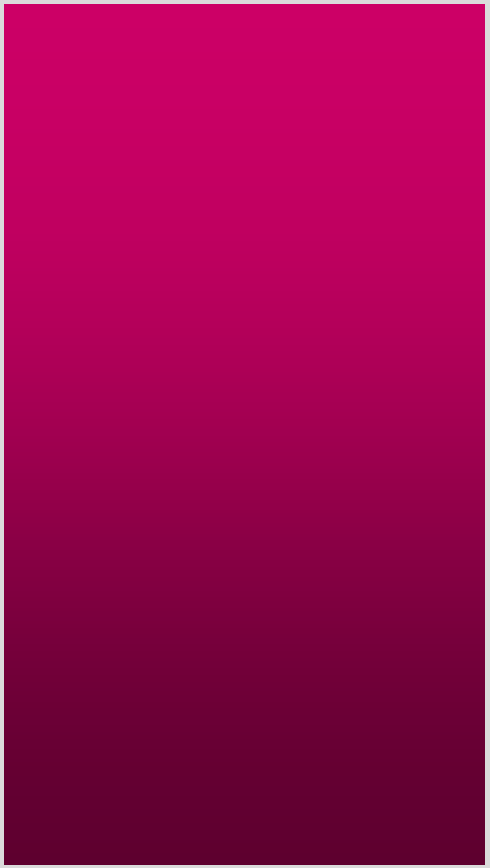
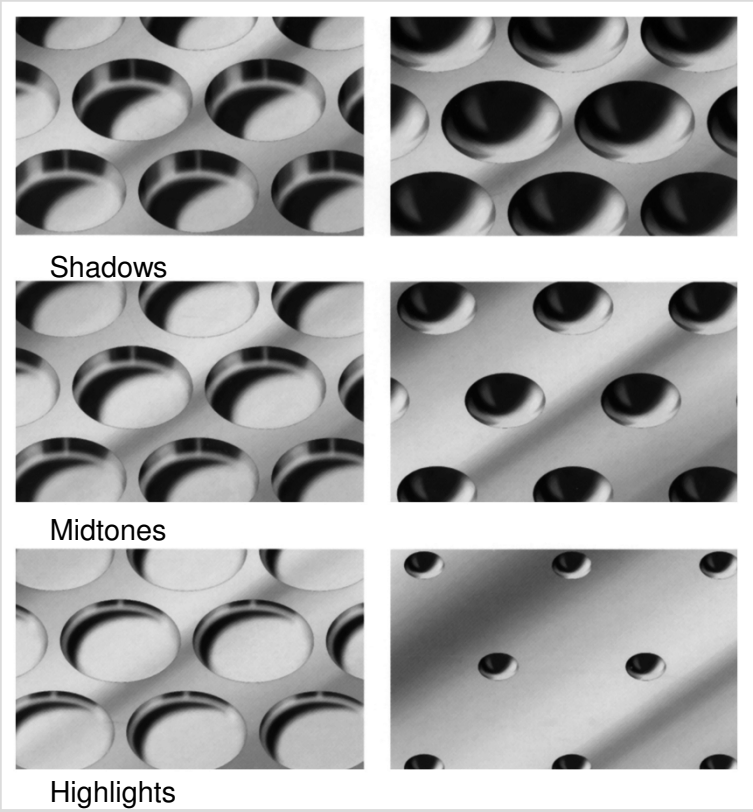
Advantages of Cell Geometry (round)

➔Excellent printing results in half-tones and vignettes

➔especially on rough substrates which are difficult to print





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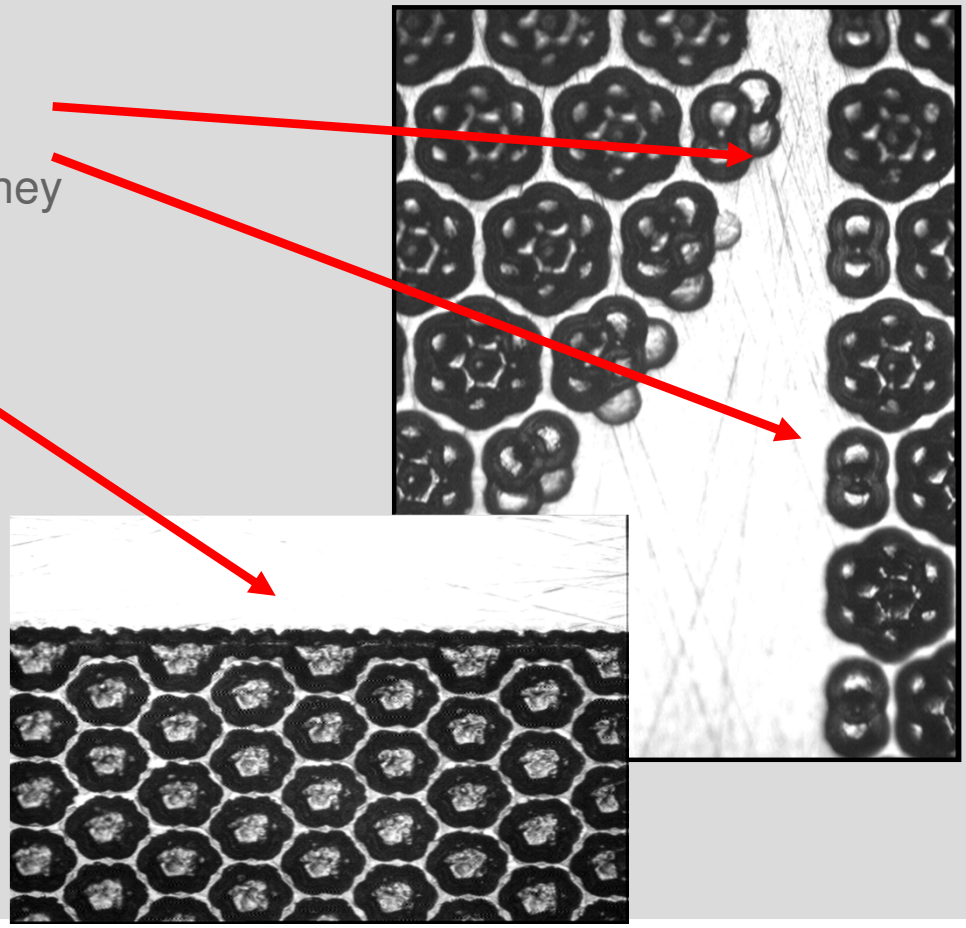
Advantages of Cell Shapes

➔Text, forms and designs can be reproduced without limits and will print in excellent quality.

➔ „Outlines“ can be produced as well, although they are not really needed...

➔ Offset-Quality with **Gravure Density…**



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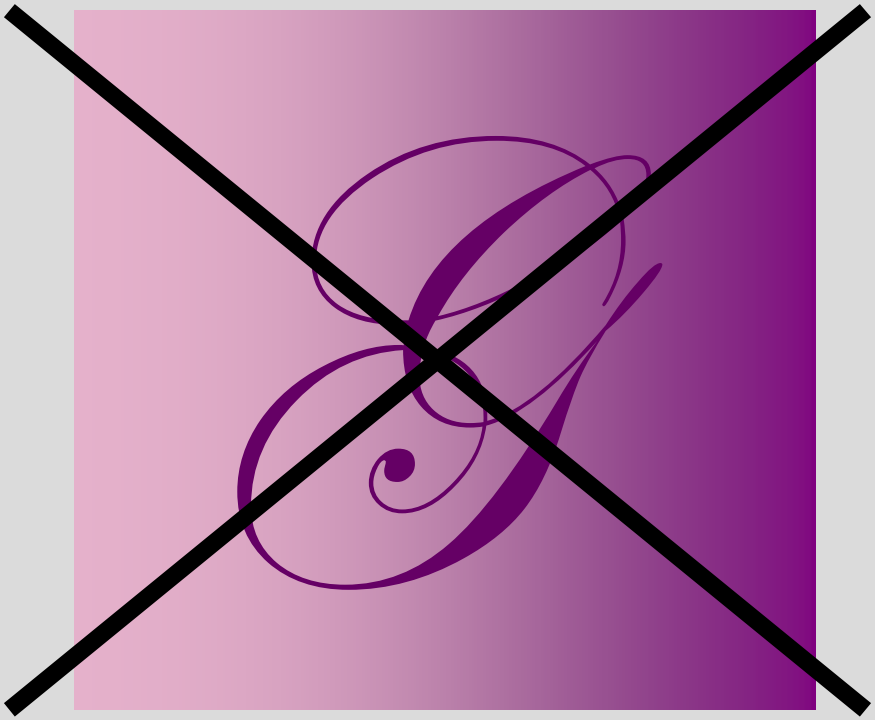
Advantages of Cell Shapes / Cell Geometry

➔ In the past, combinations of half-tones and fine text on same cylinder was only possible under very limited conditions.



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Advantages of Cell Shapes / Cell Geometry

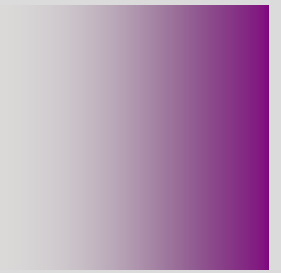
3 cylinders needed to be engraved for best result:

- Full-tone (background color)

Cylinder 1 - full tone

- half-tone vignette using electromechanically engraved cylinders

Cylinder 2 - half tone



- line-work (fine type) using Laser exposed and chemically etched cylinders

Cylinder 3 - Fine type

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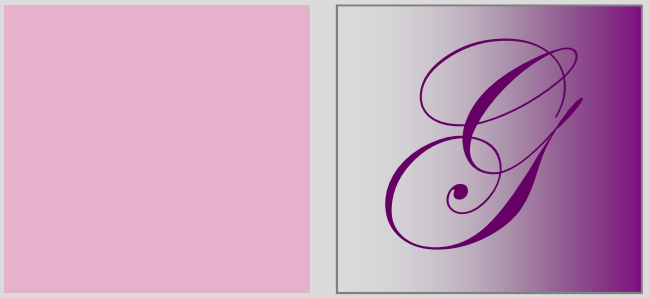
Advantages of Cell Shapes / Cell Geometry

➔ with DLS we can mix today half-tones and fine elements without any limit, and they can be combined on the same cylinder.

with DLS: 2 cylinders



with former technology: 3 cylinders

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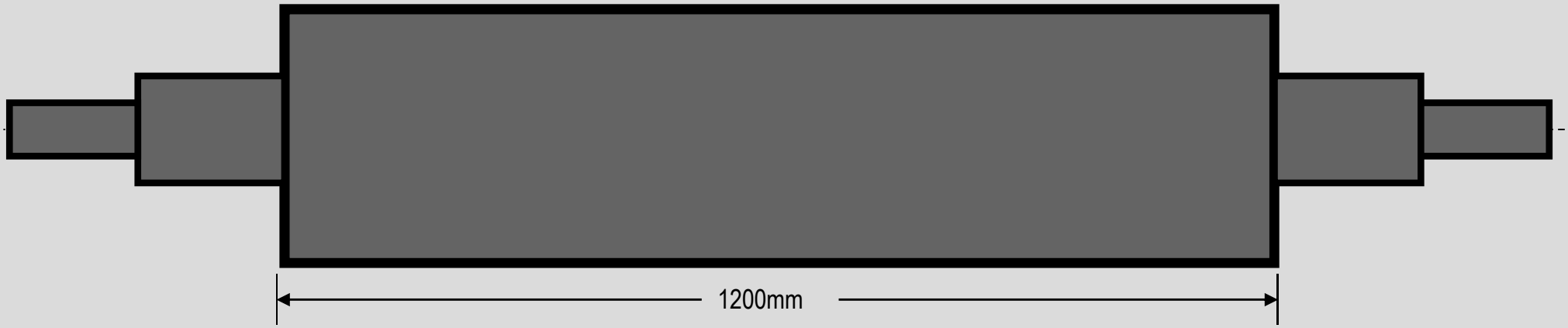
DLS – significant reduction of production time…



Electromechanically engraved…

Laser engraved…

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DLS – less productions time

- **Electromecanical Engraving**
  Production steps

Total time needed: 5 h 15 min.

Engraving Speed: 8.000 cells/sec.

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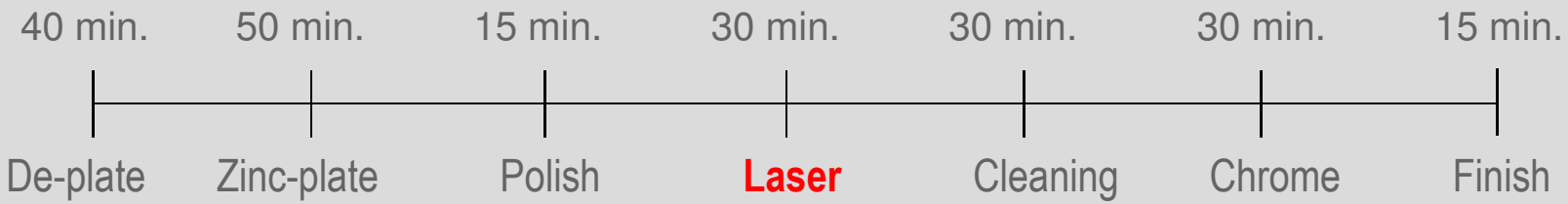
DLS – less productions time

- **Direct-Laser-System**

  Production steps



Total time needed: 3 h 10 min.

Engraving Speed: 70.000 cells/sec.

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DLS – less productions time

- **Electromecanical Engraving**
  Total time needed: 5 h 15 min.
  Engraving Speed: 8.000 cells/sec.
- **Direct-Laser-System**
  Total time needed: 3 h 10 min.
  Engraving Speed: 70.000 cells/sec.

➔ 2 h 5 min. less / or 40% reduction in production time!

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Substrate: met PET

EM Gravur

Laser Masterscreen

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Substrate: met PET

EM Gravur

Laser Masterscreen

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Substrate: Flexpap - Mixpap

EM Gravur

Laser Masterscreen

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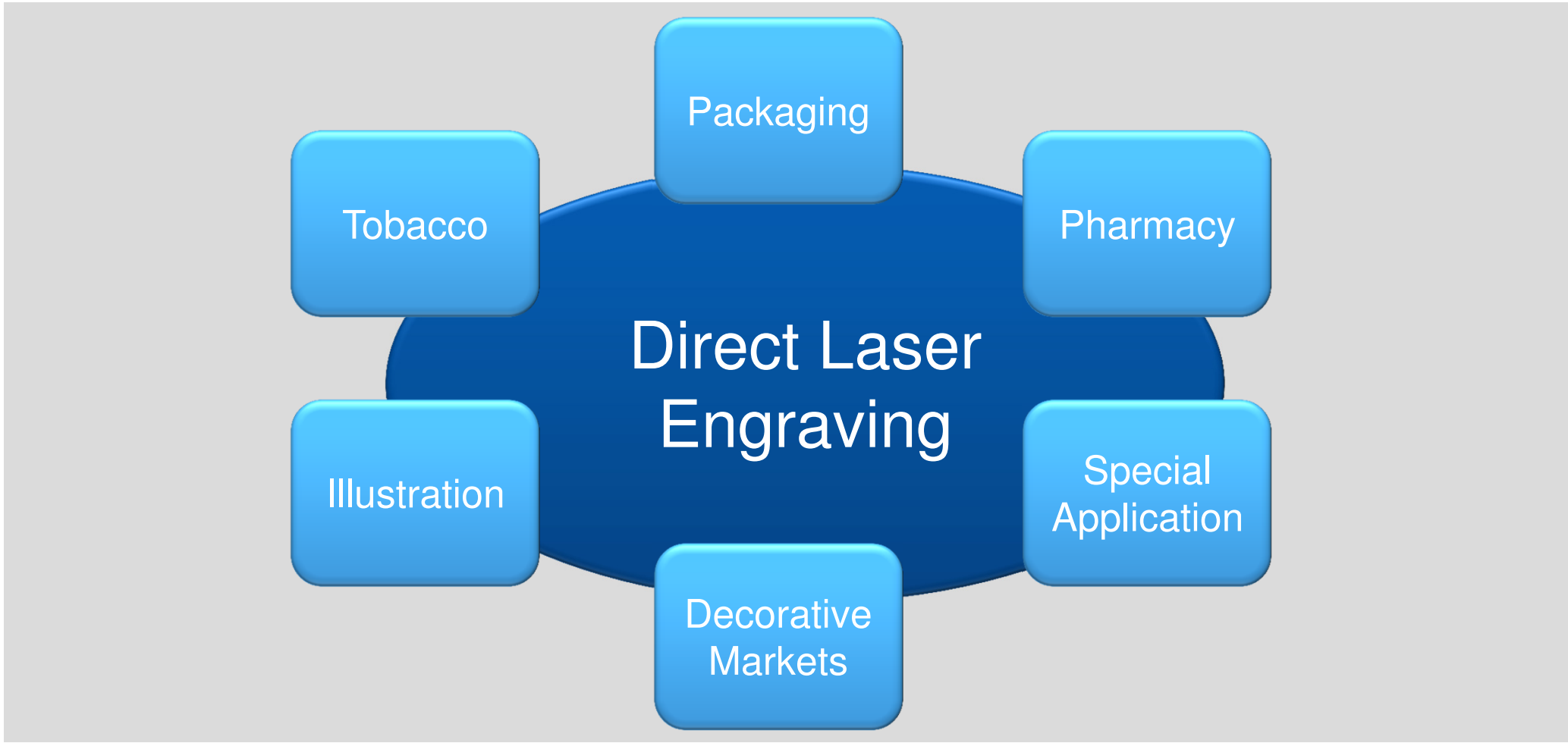
Markets



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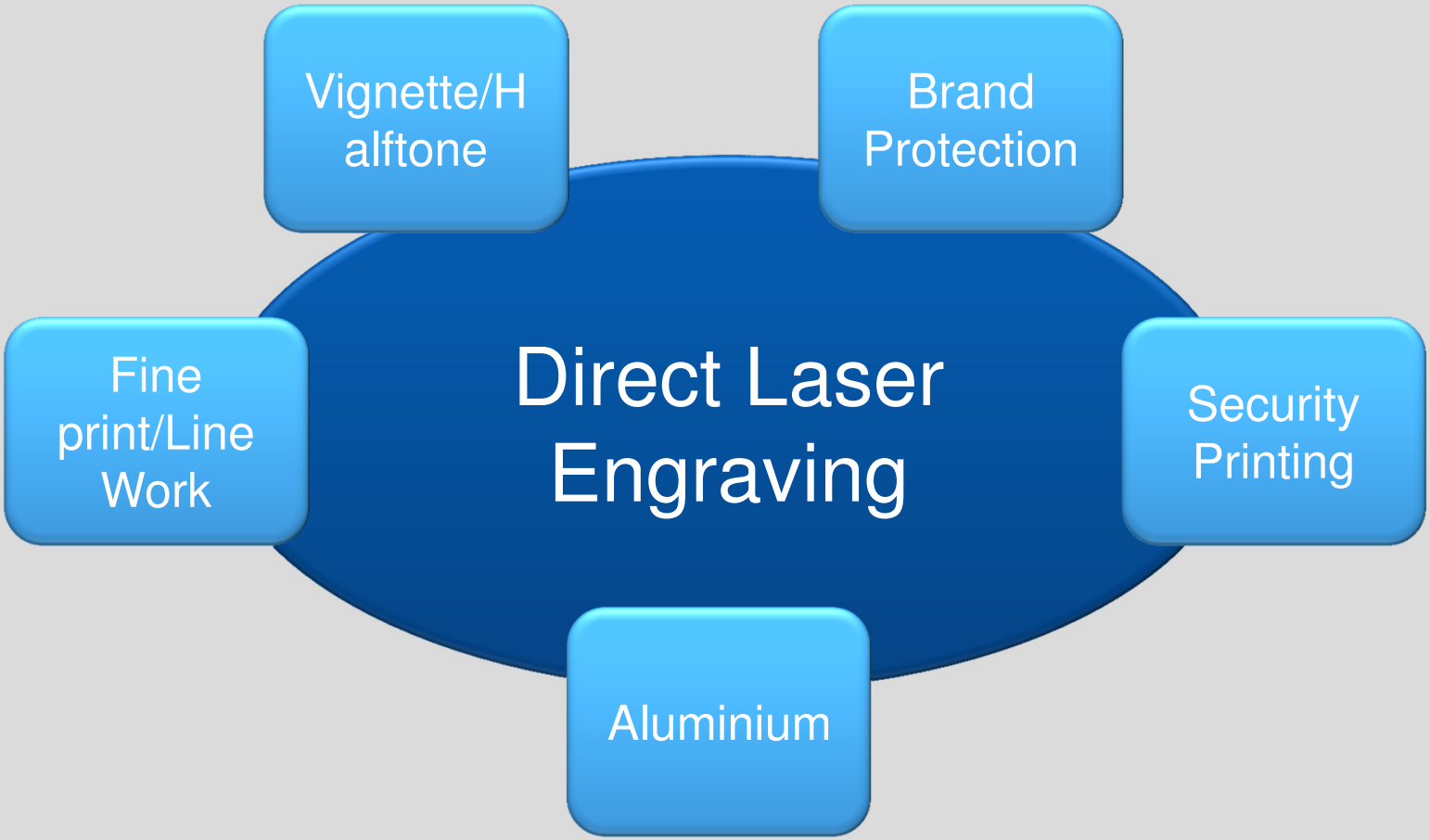
Fields of Application



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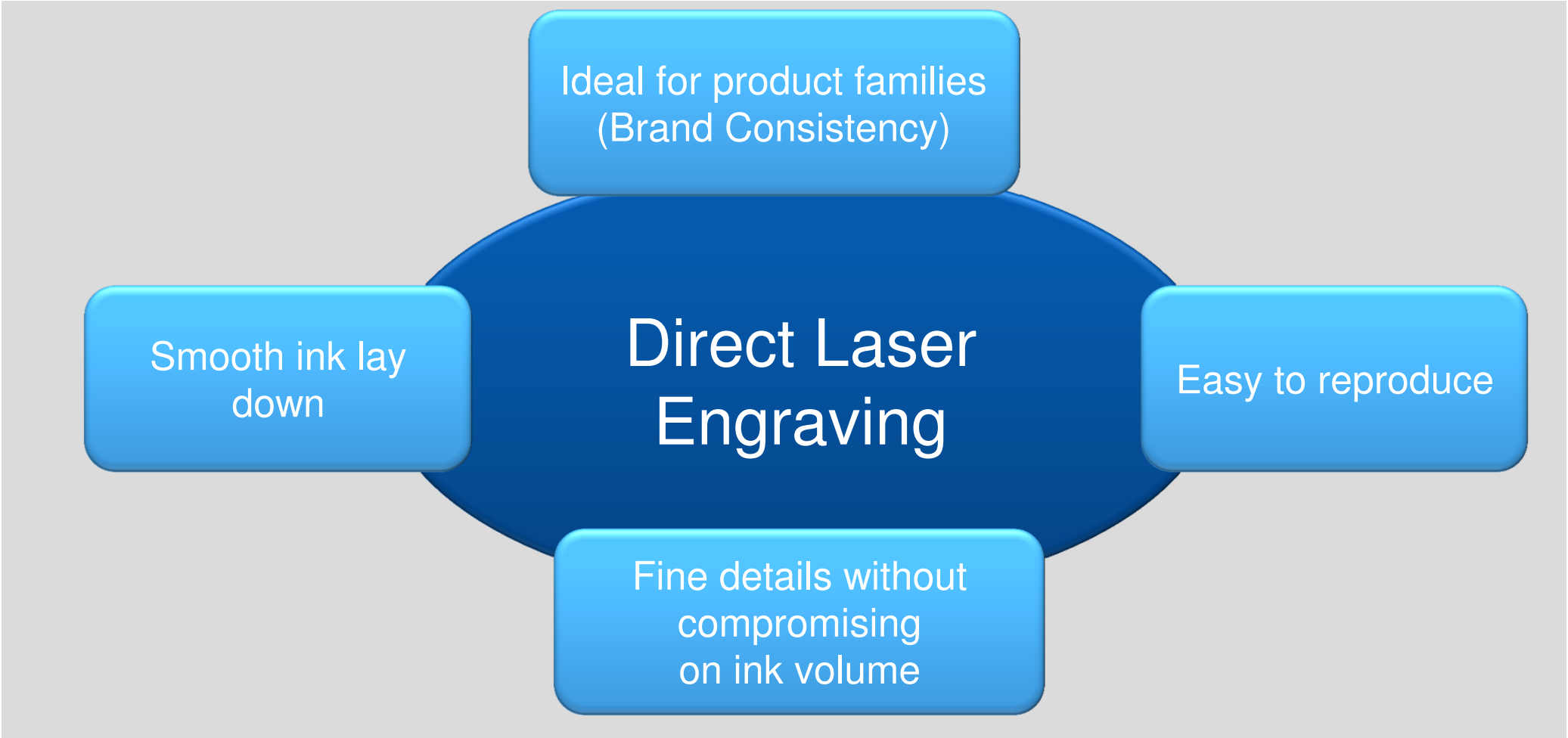
Advantages



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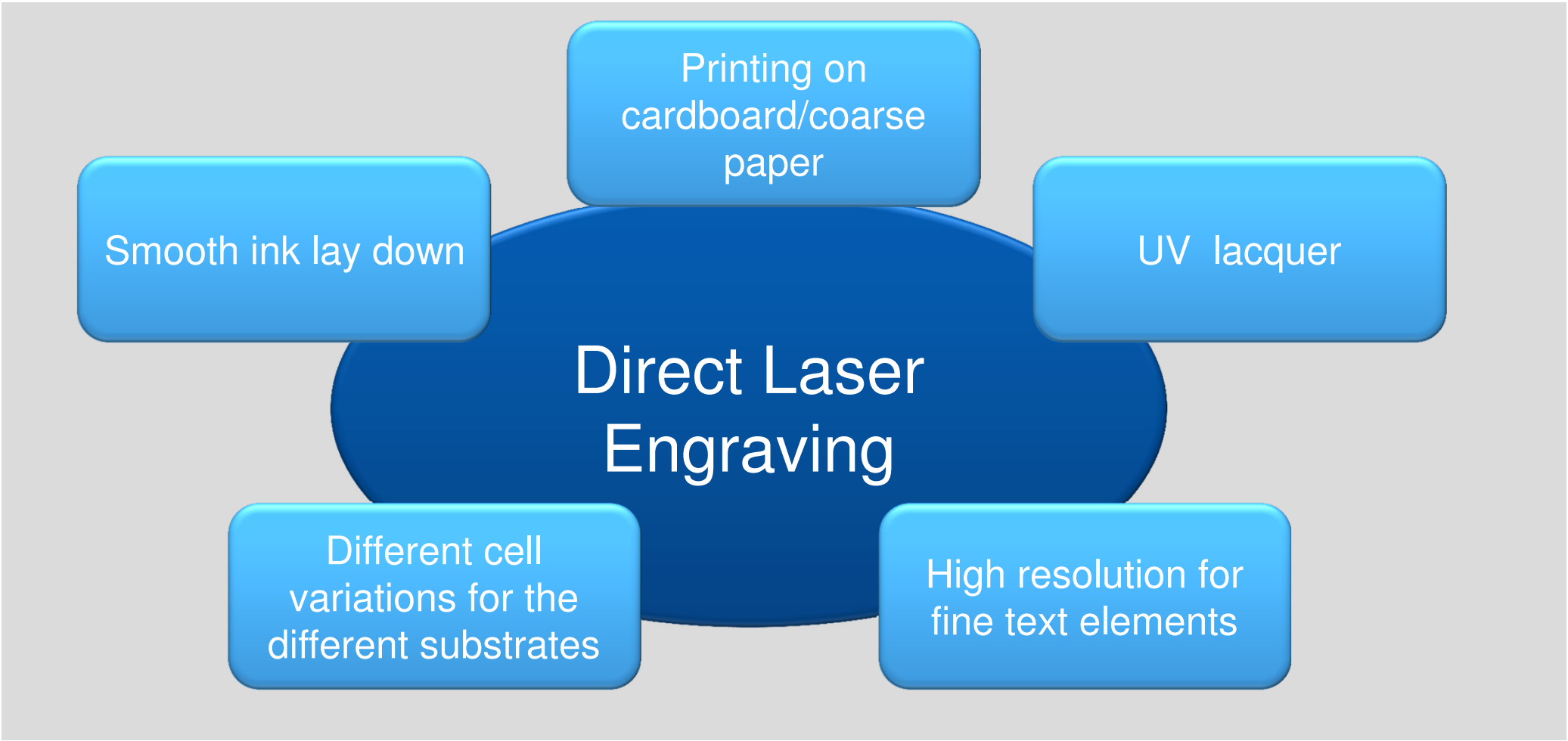
Demands: Tobacco



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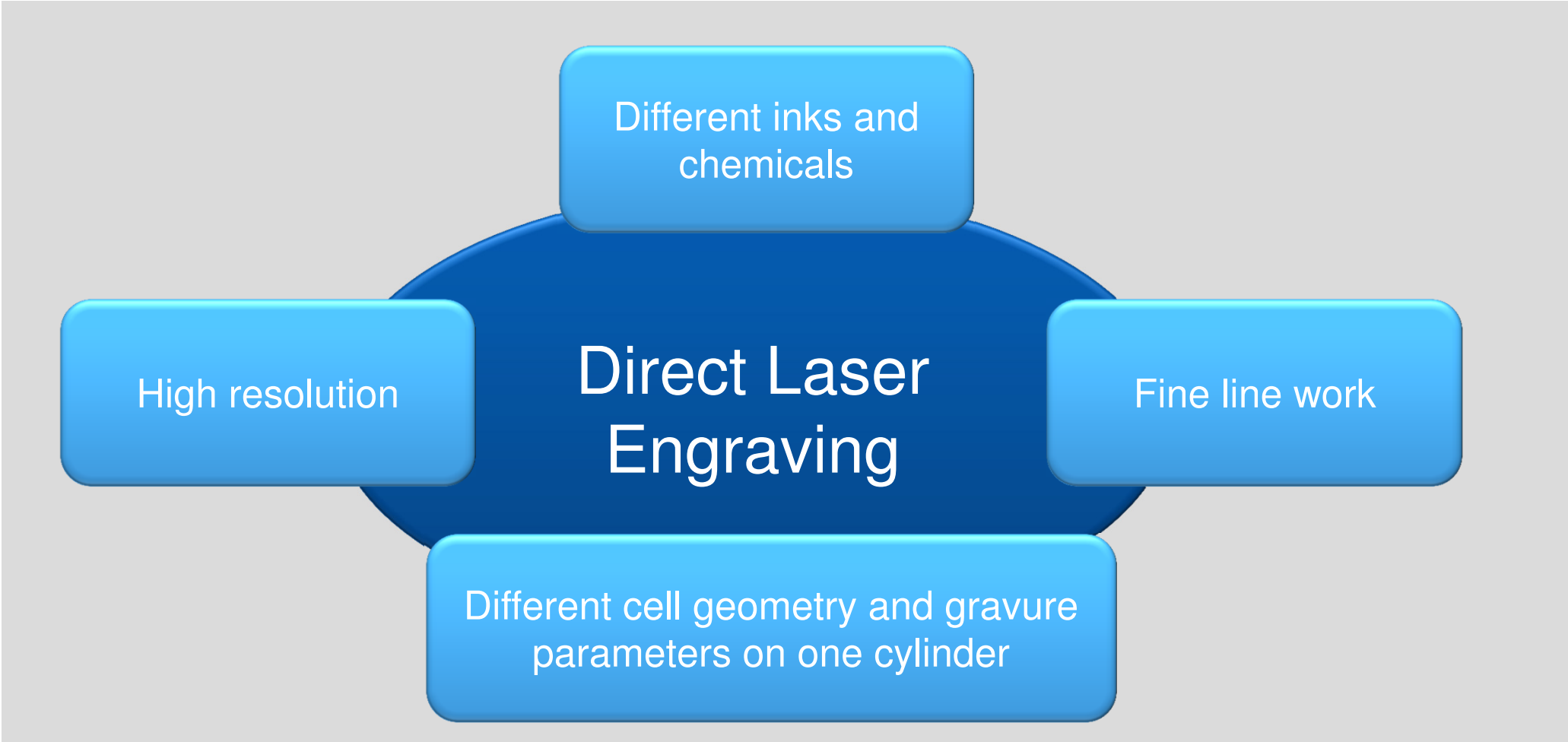
Demands: Security Printing



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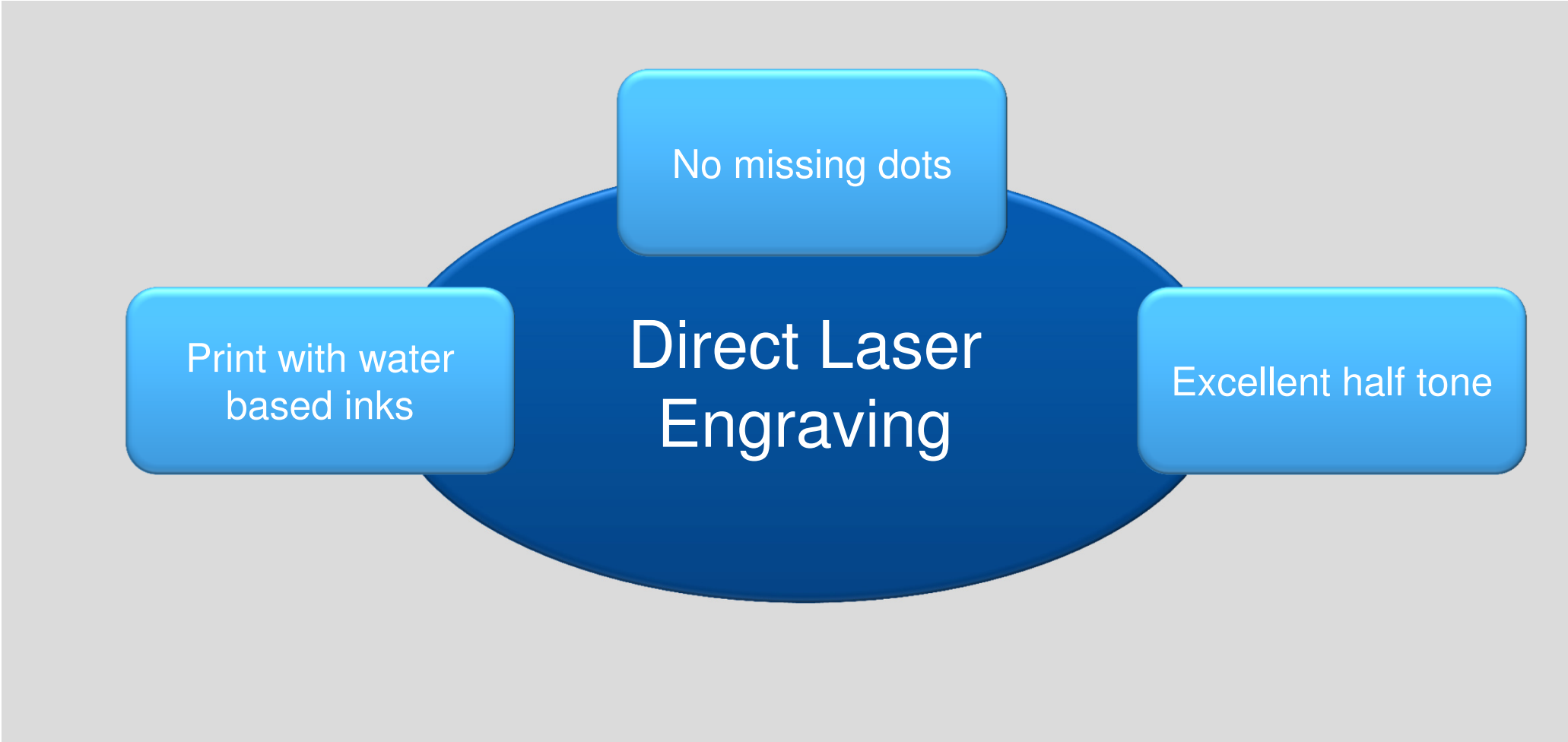
Demands: Decor



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Direct Laser Engraving – Summary of benefits

- High Quality / High Resolution
- Excellent in Ink transfer and ink lay
- Tailored made gravure structures for different applications
- Fast & consistence
- Great potential - new and innovative applications (Infant stage)

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DLS Development at Janoschka

The Year 2000:

- Installation of the first Direct Laser Line (DLS) at Janoschka in Germany.
  Beginning of the DLS development
- R&D team of Janoschka worked hand-in-hand with the suppliers team.
- The technology was established and accepted quickly in the high quality markets.

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DLS Development at Janoschka

Year 2003:

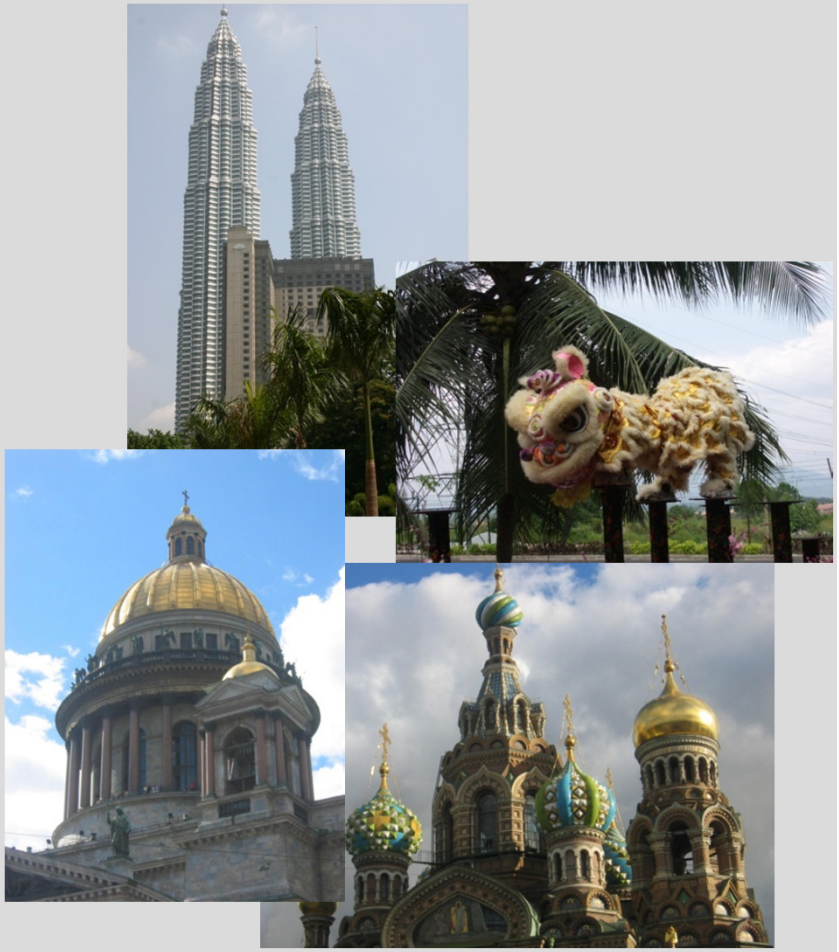
- Installation of the second DLS line at Janoschka in Germany

Year 2006:

- Installation of the first DLS line at Janoschka APE in Malaysia

Year 2006:

- Installation of the first DLS line at Janoschka Pavlovsk in Russia



Laser Development at Janoschka

Year 2009:

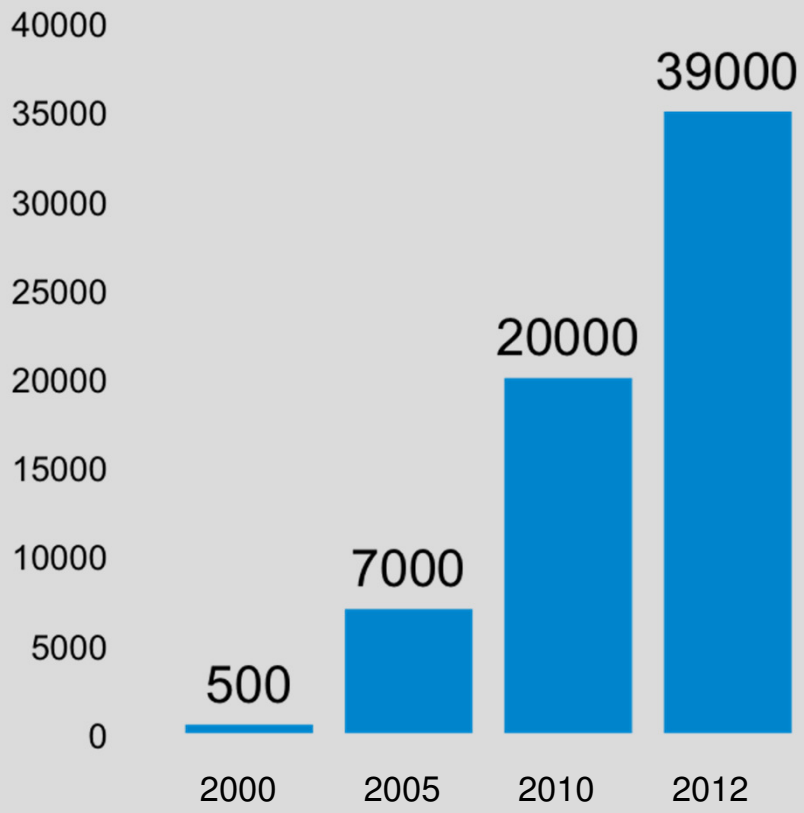
- Janoschka produces more than 20.000 Laser cylinders per year

Year 2010:

- Installation of the first DLS line in South America at Janoschka Bosisio

Year 2011:

- Janoschka joins up with Grupo Gondi in Mexico and will strive to become a leader in the packaging printing market in Mexico in terms of quality & service.



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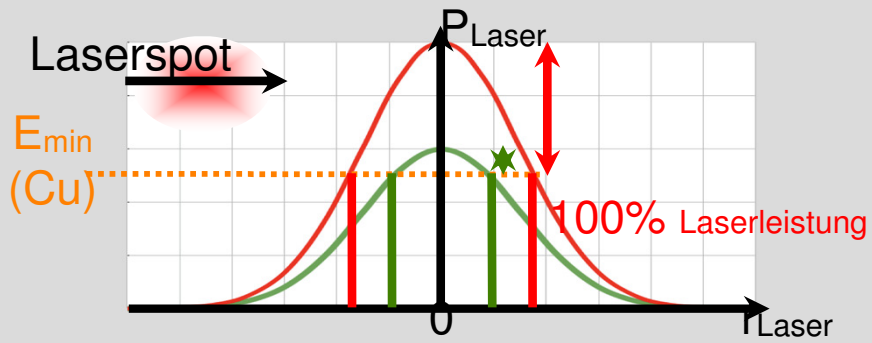
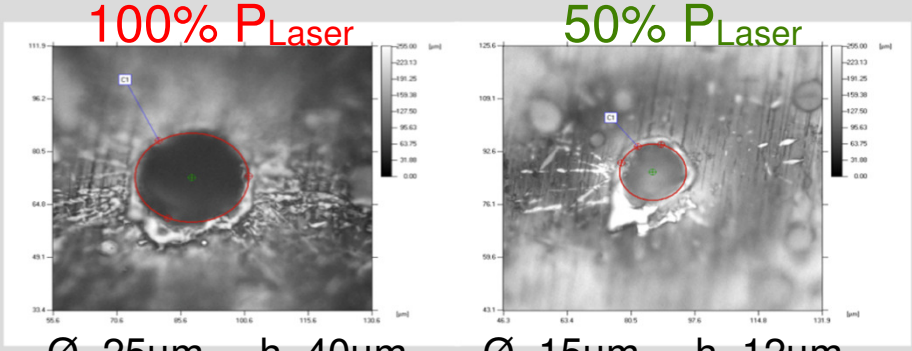
Continued development of Laser technology

- New Laser technology (Pulsfaser-Laser)
- Higher speed (120.000 cells per second)
- Less energy
- New screens
- New Materials
- …/





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Laser Technology for Embossing

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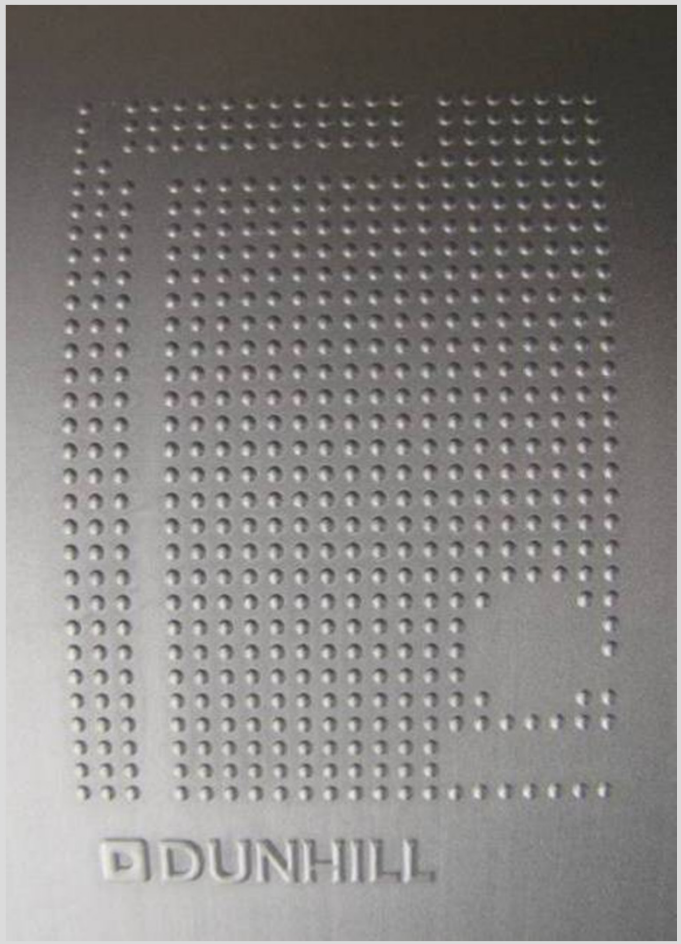
3D Embossing



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3D Embossing

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3D Embossing

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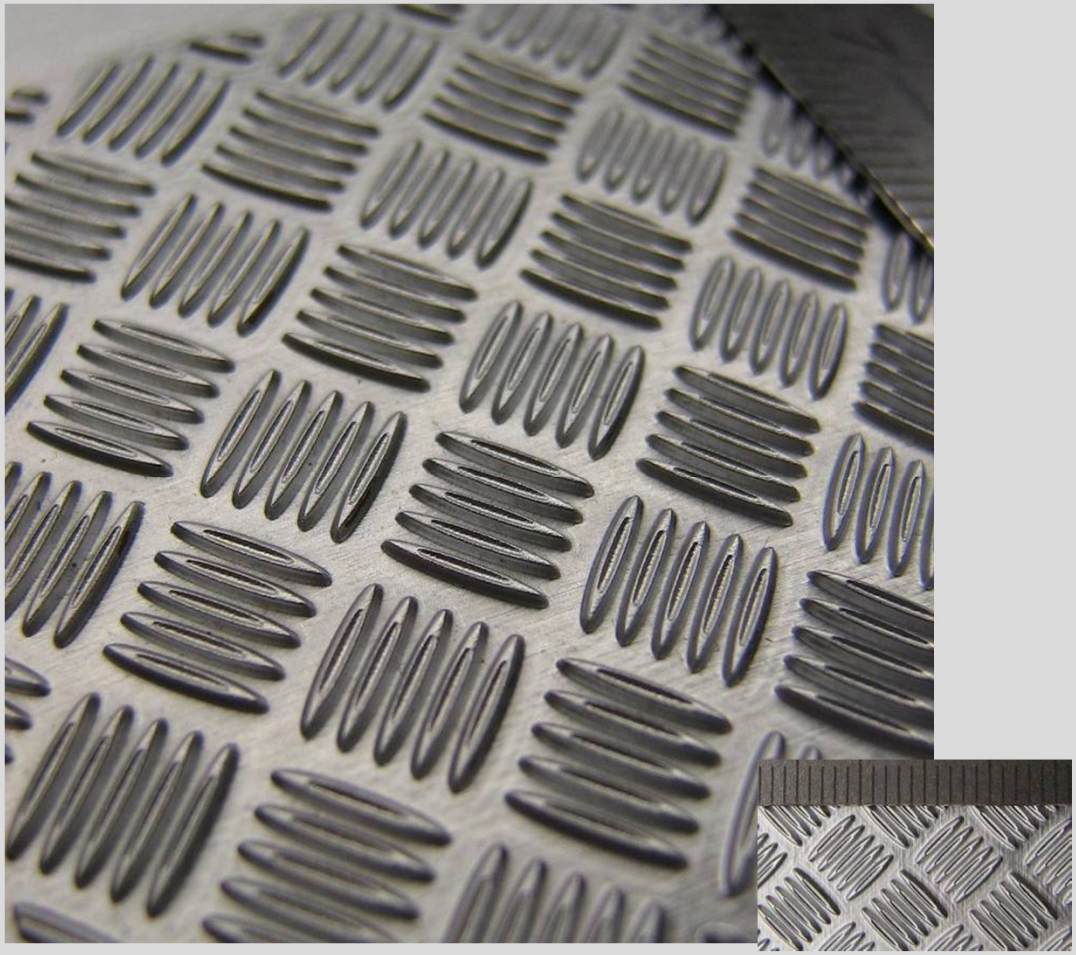
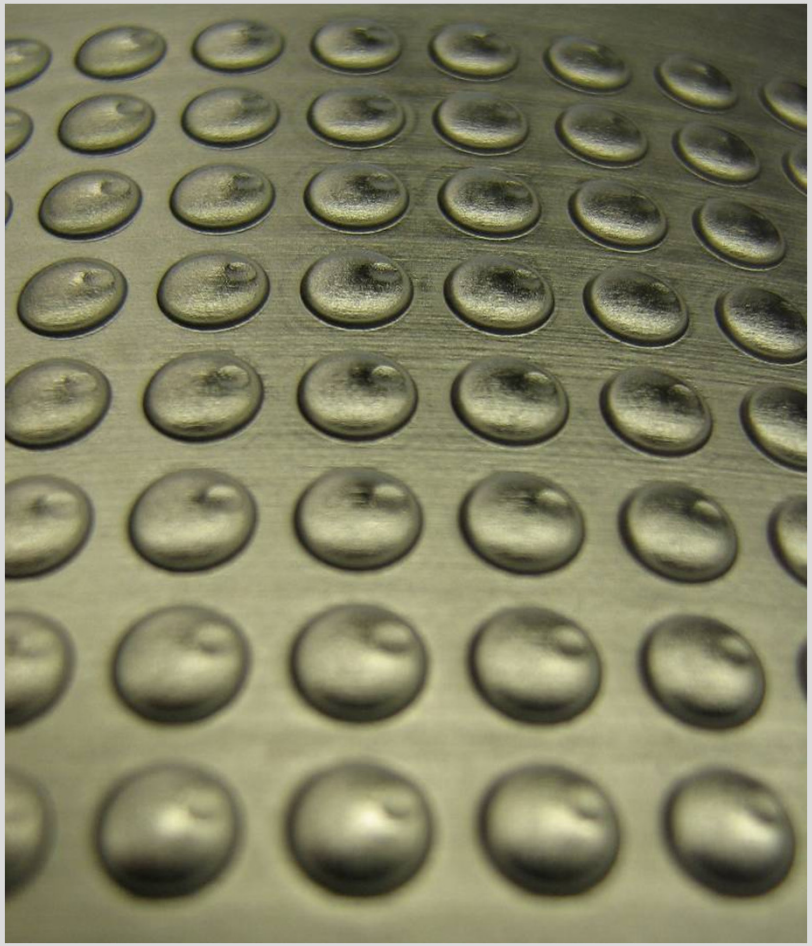
3D Embossing





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3D Embossing

CNC technology

Laser technology

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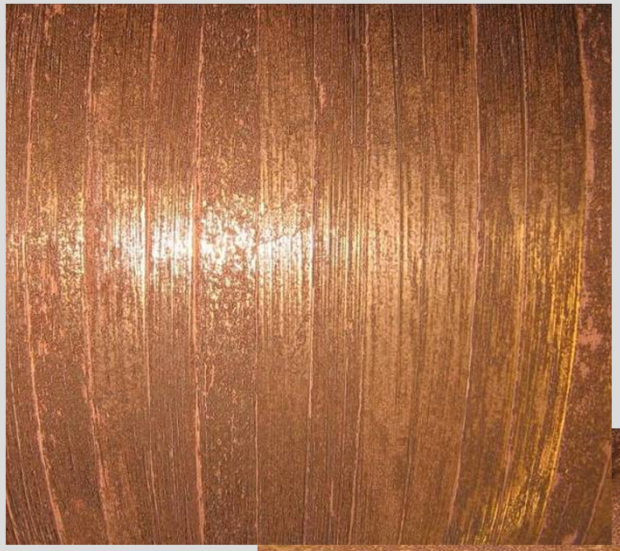
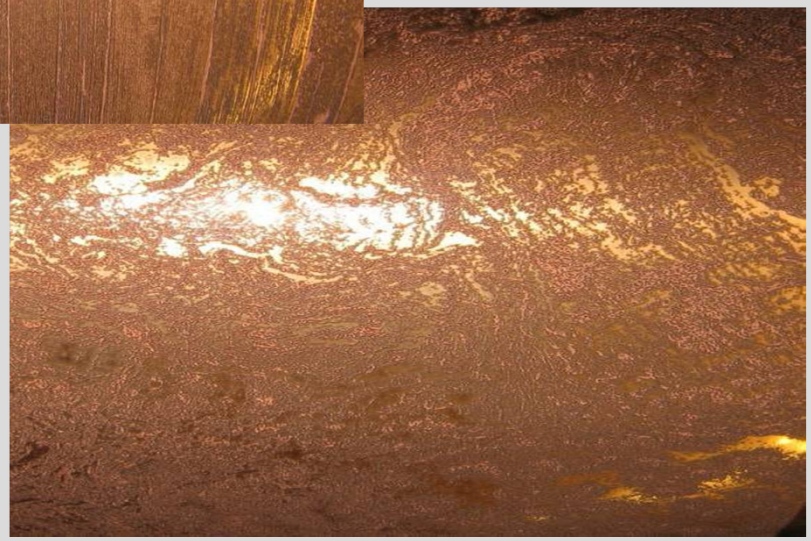
Structures: Wood





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Structures: Leather

Structures: Pictures

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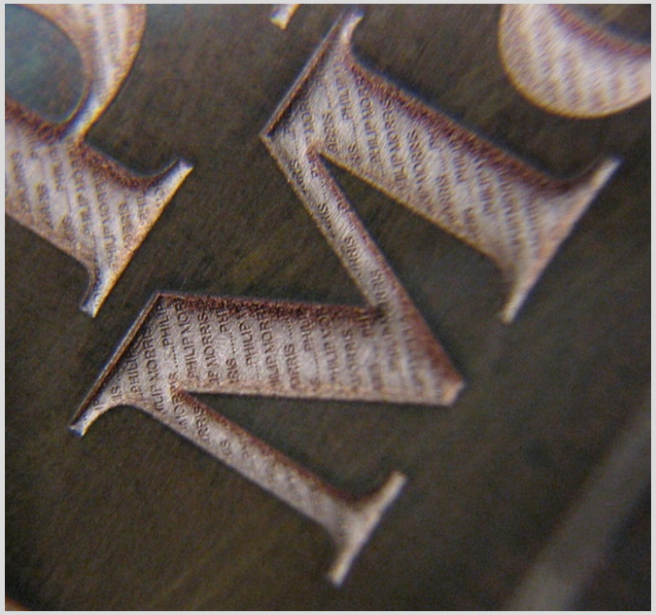
Micro Embossing,



Line Thickness 0,04mm

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New Challenges

Bring these worlds together

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Laser Technology becomes a global reference for quality

- Especially in the tobacco market, the Laser technology becomes the ultimate reference for quality
- Janoschka is the first service house to provide this technology in a global Network

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Janoschka's Global Network with Laser Technology

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IMAGE TO PRINT

Thank you for your attention

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