Computer-to-Plate (CtP)
Materials, Equipment and Workflow for Digital Offset Plate Making

Guest Lecture at the Hellenic Open University
Andreas Berchtold, Mai 2008
Introduction:
Offset Plate Making Workflows

Individual films → assembly → master copy → UV exposure → plate processing → printing plate

Film setter → assembled film → plate setter

Prepress workflow → digital press

Computer-to-Plate (CtP)
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Outline:
Computer-to-Plate (CtP)

CtP Processes:
- Plate Materials
- Exposure Technologies

CtP Systems:
- System Configuration
- Specification Parameters
Plate Materials

- hydrophilic (water accepting) base material
  - mostly aluminum (alternative: polyester)
  - electrochemically grained, anodized (Al₂O₃)
  - hydrophilic (accepts dampening, rejects ink)

- oleophilic (ink accepting) coating materials
  - diazo coating (UV sensitive)
  - photopolymer (sensitized for different lasers)
  - thermal sensitive polymer

- non-printing area: grained, anodized hydrophilic surface
  - $R_z \approx 3 \mu m$

- printing area: oleophilic coating:
  - $\approx 2 \mu m$

- aluminum base: 0.15 - 0.50 mm
Matching of Plate Materials and Exposure

- example: assortment of plates optimized for different laser sources
- (other plate suppliers offer a similar range of products)

- violet laser diode, 410 nm (argon ion laser, 488 nm)
- (FD:YAG laser, 532 nm)
- (red laser diode, 670 nm)
- IR laser diode, 830 nm (Nd:YAG laser, 1064 nm)

Sensitivity of Plate Materials

energy requirement (sensitivity) [mJ/cm²]

- conv. diazo
- visible light photopolymer
- process-less thermal polymer
- silver halide

wave length [nm]

UV range 300 400 500 visible Range 600 700 thermal range 800 900 1000
Example: Conventional Diazo Plate

- conventional diazo coating on aluminum base
- positive working plate (exposed areas are non-printing)
- sensitized for UV exposure (360 – 450 nm)
  - conventional film copy
  - computer to conventional Plate (CTcP®)

Reference: www.agfa.com/en/gs (Meridian)
Example: Silver Halide Plate

- silver halide emulsion coating on aluminum base
- positive working plate (exposed areas are non-printing)
- very sensitive (0.0025 mJ/cm²), optimized for different light sources:
  - violet laser diodes (410 nm)
  - argon-ion laser (488 nm) or FD:YAG laser (532 nm)
  - red laser diode (670 nm)
- run length: 250 000

Example: Silver Halide Plate

By laser exposure the silver halide particles are fixed in the emulsion layer.

During development the unexposed silver ions migrate through the barrier layer onto the aluminum surface. A chemical reaction forms a hard, insoluble and oleophilic layer on the plate.

In the final step the emulsion and unexposed parts of the barrier layer are washed off.

Reference: www.agfa.com/en/gs (Lithostar)
Example: Silver Halide Polyester Plate

- photopolymer on polyester base
- sensitized for different lasers
- for short run only: 10 000 - 20 000

Reference: [www.mitsubishi-paper.com](http://www.mitsubishi-paper.com) (Silver Digiplate)
Example: Photopolymer Plate (violet)

- photopolymer on aluminum base
- negative working plate (exposes areas are printing)
- pre-heating required
- sensitized for violet laser diodes (410 nm)
- run length: 200 000

Reference: [www.graphics.kodak.com](http://www.graphics.kodak.com) (Violet News)
Example: Photopolymer Plate (violet)

- photopolymer on aluminum base
- negative working plate (exposed areas printing)
- pre-heating required
- sensitized for violet laser diodes (410 nm)
- run length: 250 000

Example: Thermal Plate (Processing Required)

- thermal decomposing layer on aluminum base
- positive working plate (exposes areas are non-printing)
- sensitized for IR laser diodes (830 nm)
  sensitivity: 120 – 180 mJ/cm²
- run length: 50 000 (with baking: 1 Mio)

Reference: www.graphics.kodak.com (Electra Excel)
Example: Chemistry-free Thermal Plate

- thermal cross linking polymer on aluminum
- negative working plate (exposed areas printing)
- sensitized for IR laser diodes (830 nm) sensitivity: 220 – 260 mJ/cm²
- run length: 200 000 (baking: 500 000)

exposure with IR laser diodes | washing and gumming

Example: Process-less Thermal Plate

- thermal cross linking polymer on aluminum base
- negative working plate (exposed areas are printing)
- sensitized for IR laser diodes (830 nm)
  sensitivity: ~125 mJ/cm²
- run length: < 100 000
- on-press development (dampening and inking)

Reference: www.fujifilm.com (Brillia Pro-T)
Example: Thermal Plate for Waterless Offset

- thermal ablation of silicone on polyester or aluminum base
- negative working plate for waterless offset
- decomposition of IR-absorbing (830 nm) layer
- debris removal by suction and cleaning

Reference: www.presstek.com (Pearl Dry)
Computer-to-Plate Exposure Sources

violet laser diode
410 nm
10 - 100 mW

FD:YAG laser
532 nm
10 - 400 mW

red laser diode
670 nm
5 - 10 mW

UV radiator
360 - 450 nm
450 - 850 W

argon ion gas laser
488 nm
5 - 75 mW

helium-neon gas laser
633 nm
5 - 25 mW

infrared laser diode
830 nm
16 - 64 W

Nd:YAG solid-state laser
1064 nm
10 - 20 W

UV range
visible Range
thermal range

wave length [nm]
Relationship between Plate Sensitivity and Imaging Power

- the size of one image spot depends on the recording resolution (assumption: square spot)
- the exposure source offers a certain power, focused to the image spot
- the plate coating has a certain sensitivity and requires an according amount of energy to be imaged
- so the minimal exposure time is defined by the laser power and the imaging energy required by the material

\[ s = \frac{1}{f_s} \]

\[ A = \frac{1}{f} \]

\[ P = \text{exposure power} \]

\[ E = \text{plate sensitivity} \]
Relationship between Plate Sensitivity and Exposure Power

<table>
<thead>
<tr>
<th>(assumptions)</th>
<th>formula</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>image geometry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>resolution</td>
<td>$f_s$</td>
<td>2400 dpi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>94 dots/mm</td>
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<tr>
<td>pixel dimension</td>
<td>$s = 1 / f_s$</td>
<td>0,011 mm</td>
</tr>
<tr>
<td>spot area</td>
<td>$A = s^2$</td>
<td>1,1E-04 mm²</td>
</tr>
<tr>
<td><strong>plate coating</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sensitivity</td>
<td>$E$</td>
<td>1,5 mJ/mm²</td>
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<tr>
<td>energy for one spot</td>
<td>$E_s = E \times A$</td>
<td>1,7E-04 mJ</td>
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<tr>
<td><strong>exposure</strong></td>
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<td></td>
</tr>
<tr>
<td>power per spot</td>
<td>$P_s$</td>
<td>100 mW</td>
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<tr>
<td>min. spot exposure</td>
<td>$t_s = E_s / P_s$</td>
<td>1,7E-06 s</td>
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<tr>
<td>max. fast-scan</td>
<td>$v_f = s / t_s$</td>
<td>6,3 m/s</td>
</tr>
</tbody>
</table>

exposure power focused on spot $P_s$

plate sensitivity $E$

fast-scan $v_f$
External Drum Plate Setter Architecture

- the plate is mounted on a rotating external drum
- a multiple beam thermal laser array records multiple parallel lines onto the rotating plate (fast-scan)
- at the same time the laser head is travelling along the drum surface (slow-scan) to record the whole image
External Drum Plate Setter Architecture

laser array with multiple beams traveling along the external drum

rotating external drum with plate
External Drum Architecture: Imaging Raster Data (Example)

- Screen ruling: 70 lines/cm
- Laser-array resolution: 2540 dpi
- Swath: 200 laser-channels

Scan direction
Computer-to-Plate Imaging

imaging resolution: e.g. 2540 dpi

screen ruling: e.g. 60 lines/cm

laser pixel

printing dot
# External Drum Architecture: Characteristic Data

<table>
<thead>
<tr>
<th>(assumptions)</th>
<th>formula</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>external drum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>$d$</td>
<td>0,25 m</td>
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<tr>
<td>plate width</td>
<td>$w$</td>
<td>0,7 m</td>
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<tr>
<td><strong>image geometry</strong></td>
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<tr>
<td>resolution</td>
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<td>2540 dpi</td>
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<tr>
<td></td>
<td></td>
<td>100,0 dots/mm</td>
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<tr>
<td>pixel dimension</td>
<td>$s = 1 / f_s$</td>
<td>0,010 mm</td>
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<tr>
<td><strong>rotating drum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rotation speed</td>
<td>$n$</td>
<td>150 1/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,5 1/s</td>
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<tr>
<td><strong>recording</strong></td>
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<td></td>
</tr>
<tr>
<td>beams (swath)</td>
<td>$i$</td>
<td>200</td>
</tr>
<tr>
<td>time for one swath</td>
<td>$t_f = 1 / n$</td>
<td>0,40 s</td>
</tr>
<tr>
<td>fast-scan speed</td>
<td>$v_f = \pi \cdot d / t_f$</td>
<td>1,96 m/s</td>
</tr>
<tr>
<td>slow-scan speed</td>
<td>$v_s = i \cdot s / t_f$</td>
<td>5,00 mm/s</td>
</tr>
<tr>
<td>time for one plate</td>
<td>$t_p = w / v_s$</td>
<td>140 s</td>
</tr>
</tbody>
</table>

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laser array with $i$ beams

swath

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Example:
Medium Format External Drum Plate Setter

- modular configuration:
  plate loader / recorder / processor
- thermal laser head with
  64 IR diodes, each 1W, 830 nm
- small and medium format

Reference: www.screeneurope.com (PlateRite)
Example:
Medium Format External Drum Plate Setter

- modular configuration: plate loader, recorder, processor
- scalable number of IR laser diode arrays (64 channels)
- performance: up to 30 plates / h
- resolutions: 1270 and 2540 dpi
- medium format

Reference: [www.heidelberg.com](http://www.heidelberg.com) (Suprasetter)
Example:
Large Format External Drum Plate Setter

- modular configuration: plate loader, recorder, processor
- IR laser diode with light valve 200 channels, 830 nm, up to 100 W
- resolution: 2400 dpi
- plate format up to 2,070 x 1,510 mm
- performance: up to 28 plates / h

Reference: www.graphics.kodak.com (Magnus VLF)
Flat Bed Plate Setter Architecture

- a single laser beam (visible light) is modulated according to the image content
- the modulated laser beam is reflected by a fast spinning polygon mirror and directed by corrective optics to the plate surface
- each facet of the polygon creates one line of pixels (fast scan)
- the plate moves continuously, to record the image line by line (slow scan)
Flat Bed Architecture

polygon mirror  modulator  laser  optics  mirror  plate
## Flat Bed Architecture: Characteristic Data

<table>
<thead>
<tr>
<th>(assumptions)</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>plate format</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>plate height</em></td>
<td><em>h</em></td>
<td>0,5 m</td>
</tr>
<tr>
<td><em>plate width</em></td>
<td><em>w</em></td>
<td>0,7 m</td>
</tr>
<tr>
<td><strong>image geometry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>resolution</em></td>
<td><em>f_s</em></td>
<td>2540 dpi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 dots/mm</td>
</tr>
<tr>
<td><em>pixel dimension</em></td>
<td><em>s = 1 / f_s</em></td>
<td>0,010 mm</td>
</tr>
<tr>
<td><strong>polygon mirror</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>number of facets</em></td>
<td><em>i</em></td>
<td>6</td>
</tr>
<tr>
<td><em>rotation speed</em></td>
<td><em>n</em></td>
<td>5000 1/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83,3 1/s</td>
</tr>
<tr>
<td><strong>recording</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>time for one line</em></td>
<td><em>t_f</em></td>
<td>0,002 s</td>
</tr>
<tr>
<td><em>fast-scan speed</em></td>
<td><em>v_f</em></td>
<td>250 m/s</td>
</tr>
<tr>
<td><em>slow-scan speed</em></td>
<td><em>v_s</em></td>
<td>5 mm/s</td>
</tr>
<tr>
<td><em>time for one plate</em></td>
<td><em>t_p</em></td>
<td>140 s</td>
</tr>
</tbody>
</table>

![Diagram of flat bed architecture](image)
Example:
Small Format Flat Bed Plate Setter

- plate setter, auto loader, in-line processor
- violet laser: 410 nm, 60 mW
- plate format: 550 x 754 mm
- resolutions: 1200, 2400, 3000 dpi
- performance: ~ 20 plates / h

Reference: www.agfa.com (Palladio)
Example:
Flat Bed Plate Setter for Newspaper

- auto loader, plate setter, processor, punching
- FD: YAG or violet laser diode
- resolutions: 1270-2540 dpi
- max. format: 640 x 940 mm
- performance: 200 plates / h
- loader capacity: 600 plates

Reference: www.krause.de (Laser Star)
Internal Drum Plate Setter Architecture

- The plate is placed in a partially open internal drum.
- A single modulated laser beam (visible light) is directed into the centre of the internal drum.
- A very fast spinning mirror (30,000 – 60,000 U/min) reflects the beam onto the plate surface (fast-scan).
- The rotating mirror moves along the axis of the internal drum (slow-scan) to record the image line by line.
Internal Drum Architecture

- Laser
- Internal drum
- Modulator
- Spinning mirror
- Mirror
### Internal Drum Architecture: Characteristic Data

<table>
<thead>
<tr>
<th>(assumptions)</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>internal drum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>$d$</td>
<td>$0,3 , m$</td>
</tr>
<tr>
<td>plate width</td>
<td>$w$</td>
<td>$0,75 , m$</td>
</tr>
<tr>
<td><strong>image geometry</strong></td>
<td></td>
<td></td>
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<tr>
<td>resolution</td>
<td>$f_s$</td>
<td>$2540 , dpi$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$100,0 , dots/mm$</td>
</tr>
<tr>
<td>pixel dimension</td>
<td>$s = 1 / f_s$</td>
<td>$0,010 , mm$</td>
</tr>
<tr>
<td><strong>rotating mirror</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rotation speed</td>
<td>$n$</td>
<td>$40000 , 1/min$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$667 , 1/s$</td>
</tr>
<tr>
<td><strong>recording</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time for one line</td>
<td>$t_f = 1 / n$</td>
<td>$0,002 , s$</td>
</tr>
<tr>
<td>fast-scan speed</td>
<td>$v_f = \pi \cdot d / t_f$</td>
<td>$628 , m/s$</td>
</tr>
<tr>
<td>slow-scan speed</td>
<td>$v_s = s / t_f$</td>
<td>$7 , mm/s$</td>
</tr>
<tr>
<td>time for one plate</td>
<td>$t_p = w / v_s$</td>
<td>$113 , s$</td>
</tr>
</tbody>
</table>

![Diagram of internal drum architecture](image)
Example:
Small Format Internal Drum Plate Setter

- manually loaded plate setter
- violet laser diode: 30 mW
- photopolymer or silver halide plates
- resolution: 2450 dpi
- plate format up to 745 x 615 mm
- performance: up to 20 plates / h
Example:
Modular Internal Drum Plate Setter

- 5 different format sizes:
  - 700 x 820 mm
  - 820 x 1.050 mm
  - 1.050 x 1.420 mm
  - 1.380 x 1.700 mm
  - 1.380 x 2.000 mm

- different laser sources:
  - violet laser diode (410 nm)
  - FD:YAG green laser (532 nm)
  - ND:YAG thermal laser (1.064 nm)

- resolutions: 1016 - 2540 dpi

Reference: www.krause.de (Laser Star)
Example:
Large Format Internal Drum Plate Setter

- special internal drum architecture with a rotating laser diode array
- IR (830 nm) laser diode array on a rotating wheel (32 or 64 diodes, each 1 W)
- resolution: 2400 dpi
- max. plate format: 2060x1600 mm
- recording speed: ca. 42 cm²/s

Reference: [www.luescher.com](http://www.luescher.com) (XPose)
Step and Repeat Plate Setter Architecture

- A UV radiator illuminates a digital mirror device (DMD®) consisting of an array of micro-mirrors which can be individually controlled.
- The digital mirror device selectively reflects individual pixels according to the image content.
- The reflected digital image is directed to the plate and exposes an area corresponding to the mirror size.
- In a step and repeat process the whole plate area is successively exposed.

Reference: [www.basysprint.com (CTcP®)](http://www.basysprint.com)
Example: 
CTcP® (Computer to Conventional Plate)

- exposure of conventional plates (diazo or photopolymer)
- positive/negative working plates
- sensitized for UV radiation (360 – 450 nm)
- digital control of individual pixels by digital mirror device (DMD®)
- conventional plate processing

Reference: [www.basysprint.com](http://www.basysprint.com) (CTcP®)
# Step and Repeat Architecture: Characteristic Data

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>plate format</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>plate hight</em></td>
<td><em>h</em></td>
<td>0,5 m</td>
</tr>
<tr>
<td><em>plate width</em></td>
<td><em>w</em></td>
<td>0,7 m</td>
</tr>
<tr>
<td><strong>image geometry</strong></td>
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<tr>
<td><em>resolution</em></td>
<td><em>f_s</em></td>
<td>1500 dpi</td>
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<td></td>
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<td>59 dots/mm</td>
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<tr>
<td><em>pixel dimension</em></td>
<td><em>s = 1 / f_s</em></td>
<td>0,017 mm</td>
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<tr>
<td><strong>digital mirror device</strong></td>
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<tr>
<td><em>micro mirrors vert.</em></td>
<td><em>n_v</em></td>
<td>1024</td>
</tr>
<tr>
<td><em>micro mirrors horiz.</em></td>
<td><em>n_h</em></td>
<td>1280</td>
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<tr>
<td><strong>recording</strong></td>
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<td></td>
</tr>
<tr>
<td><em>verticel steps</em></td>
<td><em>i_v = h / (s \cdot n_v)</em></td>
<td>29</td>
</tr>
<tr>
<td><em>horiz. steps</em></td>
<td><em>i_h = w / (s \cdot n_h)</em></td>
<td>32</td>
</tr>
<tr>
<td><strong>number of steps</strong></td>
<td><em>i = i_v \cdot i_h</em></td>
<td>931</td>
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<tr>
<td><strong>time per step</strong></td>
<td><em>t_s</em></td>
<td>0,5 s</td>
</tr>
<tr>
<td><strong>time per plate</strong></td>
<td><em>t_p = t_s \cdot i</em></td>
<td>466 s</td>
</tr>
</tbody>
</table>

**DMD** (e.g. 1280 x 1024 mirrors)
Computer-to-Plate Processes

Processes:
- CTcP®
- Visible Light CtP
- Violet Chemical-free
- Thermal CtP
- Thermal Process-less

Materials:
- diazo or photopolymer
- silver halide
- photopolymer
- thermal polymer

Exposure:
- UV-radiator digital mirror (DMD®)
- violet laser diode (red laser diode, fd Nd:YAG argon laser, helium-neon)
- violet laser diode
- infra red laser diode Nd:YAG laser

Development:
- wet chemical development
- wet chemical development
- heating, washing
- (heating) wet chemical development
- (gumming) on-press development

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# Computer-to-Plate
Plate Materials – Exposure Sources

<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>conv. UV diazo coating</td>
<td>10 - 500</td>
<td>pos</td>
<td>100 - 500 (1 Mio)</td>
<td>UV-radiator</td>
<td>360 - 450</td>
<td>up to 500</td>
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<tr>
<td>conv. UV photopolymer</td>
<td>up to 500</td>
<td>neg</td>
<td>100 - 500 (1 Mio)</td>
<td>UV-radiator</td>
<td>360 - 450</td>
<td>up to 500</td>
</tr>
<tr>
<td>Silver halide</td>
<td>0,0003-0,003</td>
<td>pos/neg</td>
<td>200 - 350</td>
<td>violet laser diode</td>
<td>410</td>
<td>10-100 mW</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(argon ion laser)</td>
<td>488</td>
<td>5-75 mW</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(FD:YAG laser)</td>
<td>532</td>
<td>10-400 mW</td>
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<td></td>
<td></td>
<td>(helium neon laser)</td>
<td>633</td>
<td>5 - 35 mW</td>
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<td></td>
<td></td>
<td>(red laser diode)</td>
<td>670</td>
<td>2 - 10 mW</td>
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<tr>
<td>Visible light photopolymer</td>
<td>0.04 - 0.2</td>
<td>pos/neg</td>
<td>100 - 250 (1 Mio)</td>
<td>violet laser diode</td>
<td>410</td>
<td>10-100 mW</td>
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<tr>
<td></td>
<td>(in part with pre-heating)</td>
<td></td>
<td></td>
<td>(argon ion laser)</td>
<td>488</td>
<td>5-75 mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(FD:YAG laser)</td>
<td>532</td>
<td>10-400 mW</td>
</tr>
<tr>
<td>Photopolymer chemistry-free</td>
<td>ca. 0.05</td>
<td>neg</td>
<td>20 - 50</td>
<td>violet laser diode</td>
<td>410</td>
<td>10-100 mW</td>
</tr>
<tr>
<td>Thermal polymer</td>
<td>70 - 200</td>
<td>pos/neg</td>
<td>100 - 150 (1 Mio)</td>
<td>IR-Laserdioden</td>
<td>830</td>
<td>16 - 64</td>
</tr>
<tr>
<td></td>
<td>(in part with pre-heating)</td>
<td></td>
<td></td>
<td>(ND:YAG Laser)</td>
<td>1064</td>
<td>5 - 20</td>
</tr>
<tr>
<td>Thermal polymer chemistry-free or process-less</td>
<td>120 - 300</td>
<td>neg</td>
<td>20 - 50</td>
<td>IR-Laserdioden</td>
<td>830</td>
<td>16 - 64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(ND:YAG Laser)</td>
<td>1064</td>
<td>5 - 20</td>
</tr>
</tbody>
</table>
Computer-to-Plate
Format Range

- plate setter formats correspond of course with the format classes of printing presses (sheet fed, commercial web, newspaper):
  - small format (4 pages, > 50 x 70 mm)
  - medium format (8 pages, > 70 x 100 mm)
  - large format (up to ~ 2100 x 1600 mm)
  - newspaper formats, e.g.
    - 365 x 510 mm
    - 315 x 470 mm
    - 400 x 570 mm
    ...
Computer-to-Plate System Configuration

- CtP systems have often a modular design and can be individually configured with respect to automation, performance and budget:
  - plate setter / recorder
    - base module with semi automatic plate change
  - inline plate punching
    - for different register systems
  - inline plate processor
    - automatic development of exposed plates
  - single cassette loader
    - automatic plate unpacking and loading
  - multi cassette loader
    - for different plate types or formats
Computer-to-Plate Workflow

PDF, (PS, EPS CT/LW, TIFF ...)

imposition

separation

trapping

RIP

plate setter (manual feed)

processor

plate loader / plate setter / processor

plate loader / plate setter

semi-automatic CtP

automatic CtP

process-free CtP
Computer-to-Plate Data Flow

PDF, (PS, EPS, CT/LW, TIFF ...)

imposition

RIP

Tiff bitmap

RIP

Plate Setter

Tiff Download

Plate Setter

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Computer-to-Plate Quality Loop

RIP → Plate Setter → Printing Press → Density Control

RIP Calibration
Conclusion

- An appropriate CtP solution depends on many factors:
  - CtP process: plate material, imaging and processing equipment
  - Format size and image quality
  - Integration of the CtP system
  - Automation and performance of the CtP workflow, ...

- ... that influence the economic and technical performance:
  - Investment
  - Labor, material and service cost
  - Productivity, ease of use, flexibility
  - Quality, stability, ...

- A sustainable decision requires an in-depth analysis
Thank you very much!