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Seven CtP-Myths

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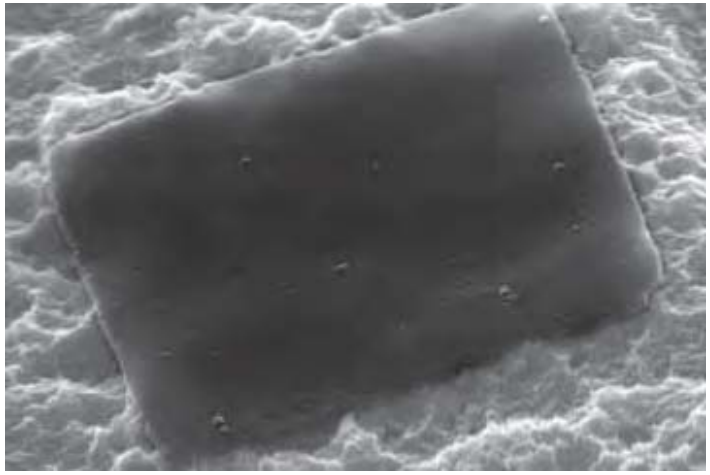
Seven Myths

- Printing surface is smooth
- Scan lines are parallel to plate edges
- Thermal spots are "binary"
- Light valves cause sharp spots
- Plate resolutions are not properly definable
- Raster points are regular
- Calculation of grey levels

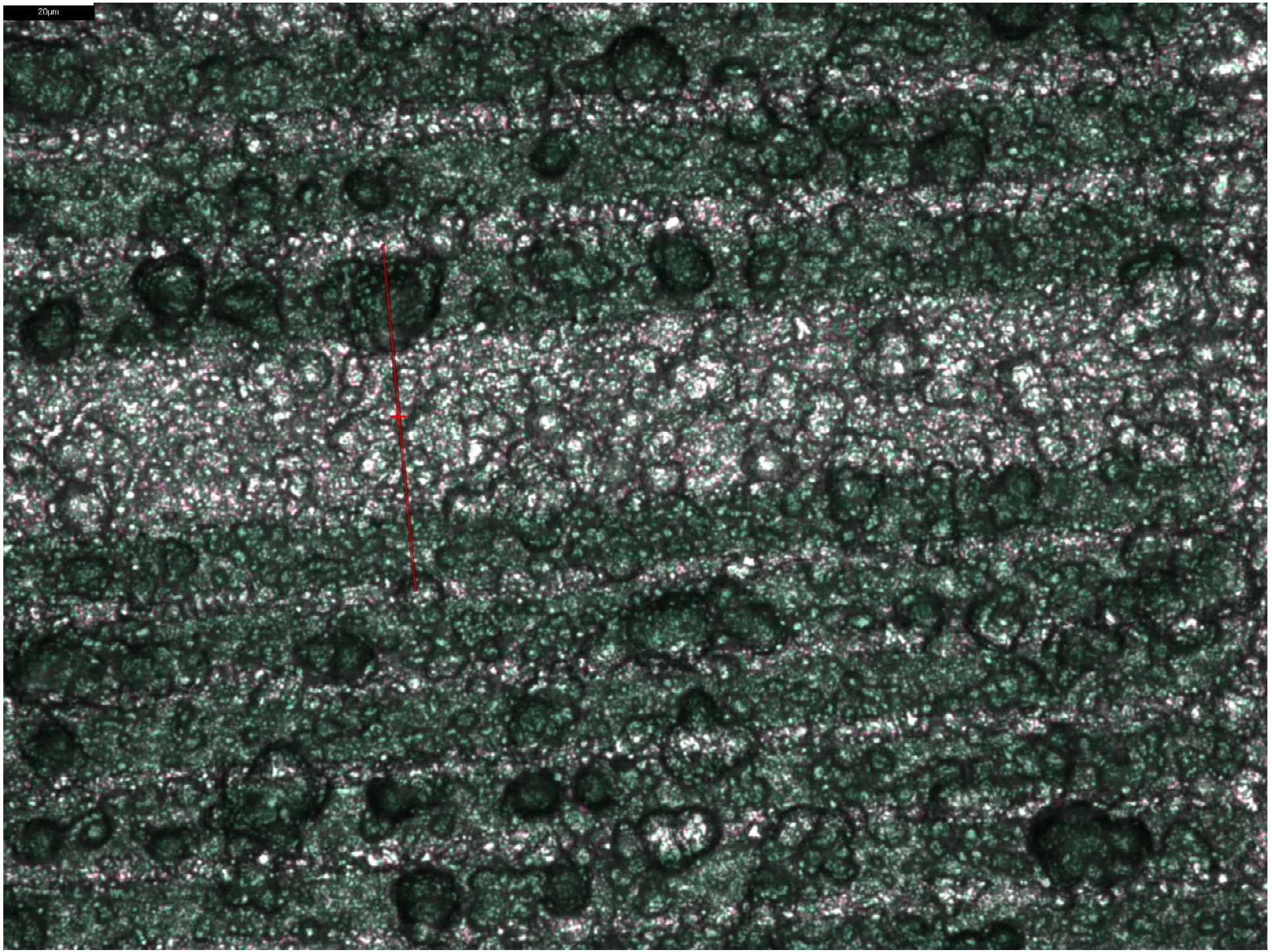
Myth 1: Printing Surface is Smooth

- Coating levels the coarse aluminium surface
  - ⇒ Coating in parts thicker than deepest pits
  - ⇒ Laser must affect the coating with maximal thickness

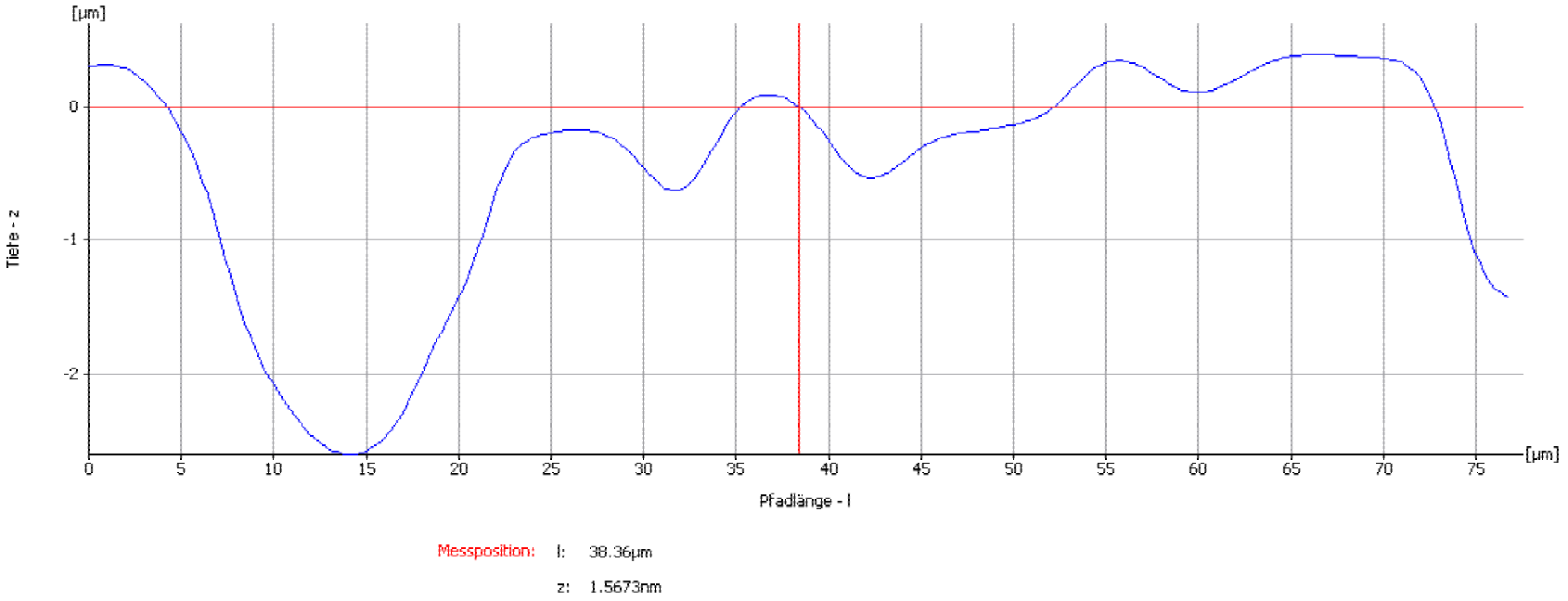
    More energy needed at those areas



Kodak-Brochure: Square Spot (2007)

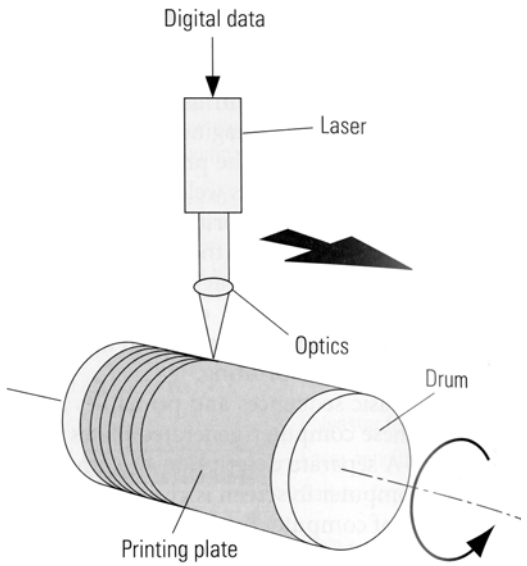

20µm

Reality Myth1

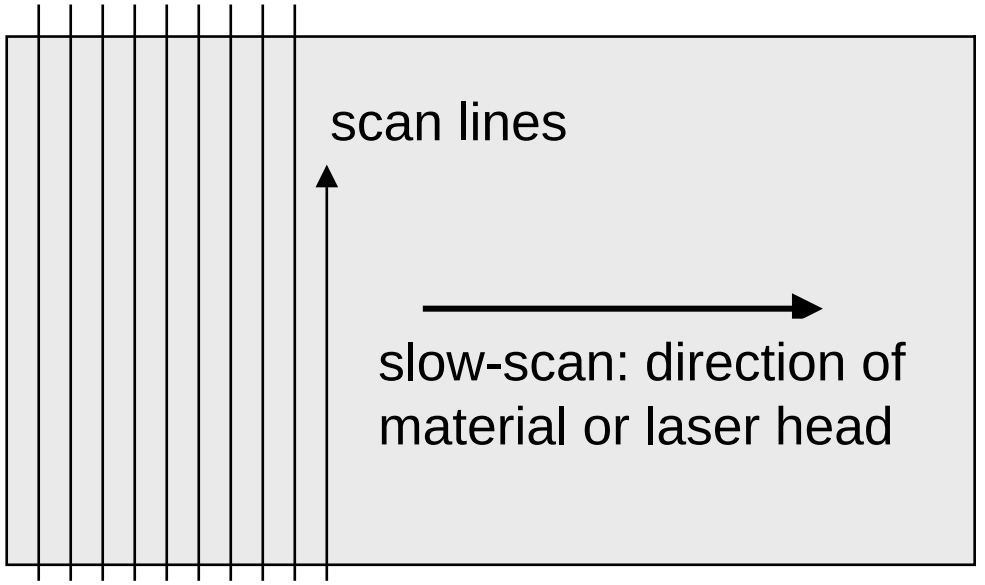


- The coating is like snow in a hilly landscape!

Myth 2: Scan Lines Parallel to Plate Edges

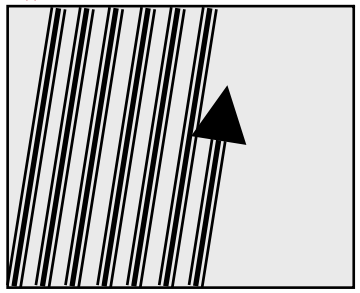


Kipphan: Handbook of Media Fig 4.3.2

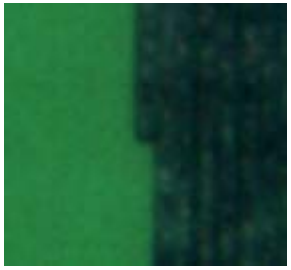


Reality Myth 2

- Laser head moves continuously in slow-scan
  - » d = number of parallel laser beams / addressing
  - » d = 2,56 mm with 2540 dpi and 256 parallel beams
- Therefore compensations are needed:
  - » Fast-scan lines are not straight
  - » Gripper and slow-scan line are not straight
  - » Re-calculation of the image data
- One should distinguish between physical and logical scan lines



One line represent the set of all parallel sub-beams

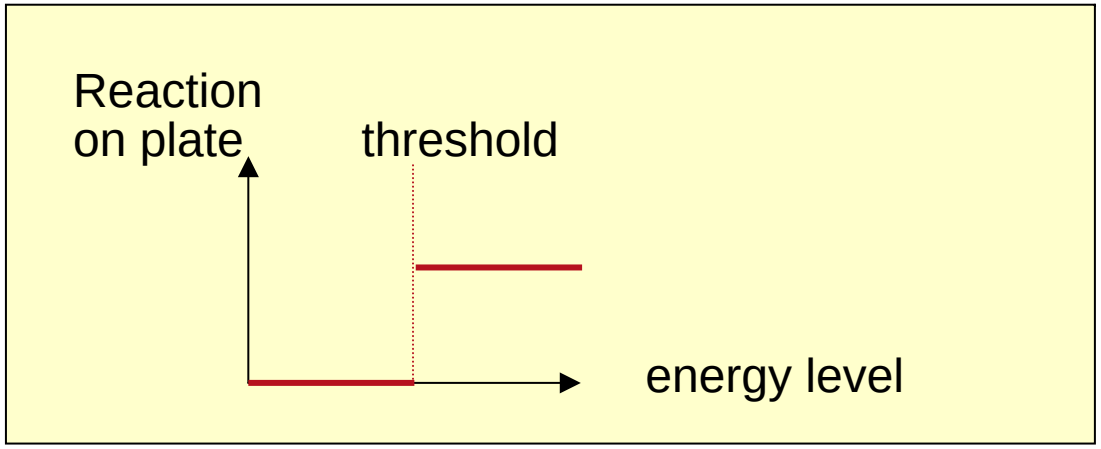


Single sub beams

Myth 3: Thermal Spots are “Binary”

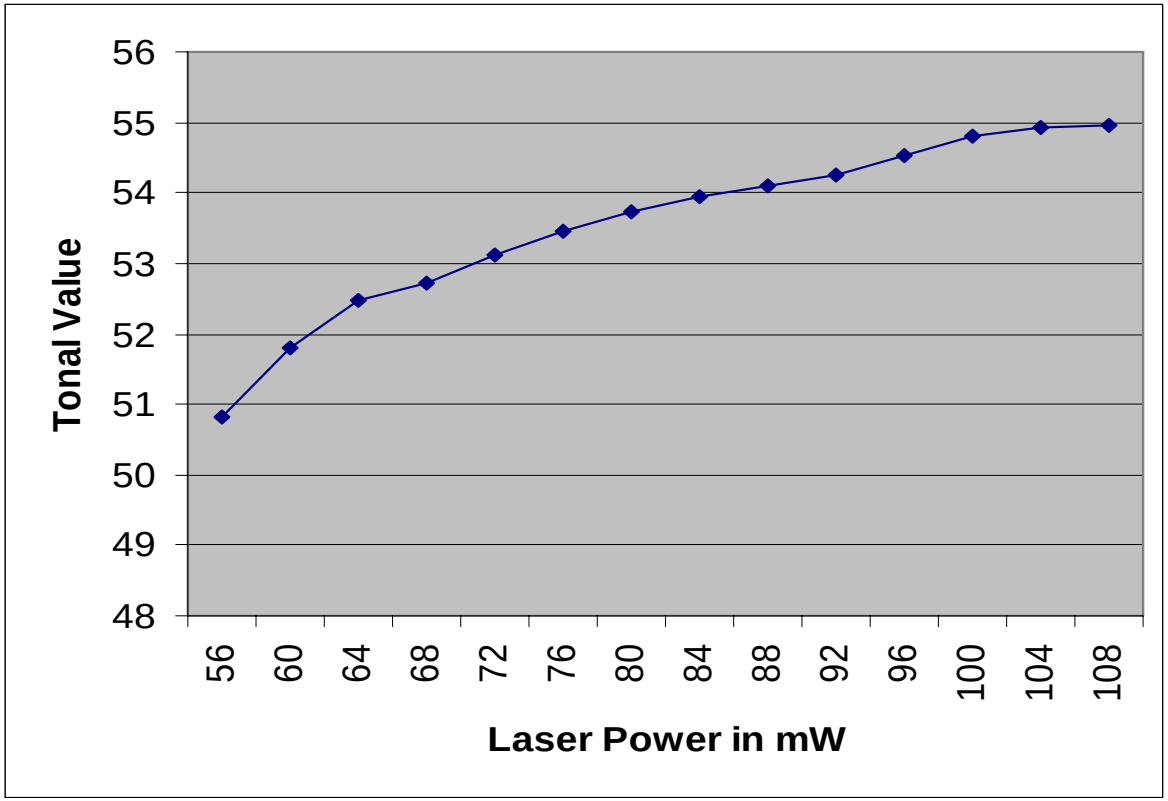
- Kipphan, Handbook of Print Media, p. 617:

„Thermal-sensitive plates… have a distinctive threshold characteristic during imaging: as soon as the thermal energy goes over a certain threshold during imaging, the surface changes completely, and any further increase in energy remains of insignificant effect with regards to dot quality“



Reality of Myth 3

- Tonal value increases when raising laser power



Myth 4: Light Valves Cause Sharp Spots

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- Intensity profiles of laser beams are very steep if the light valves are used.

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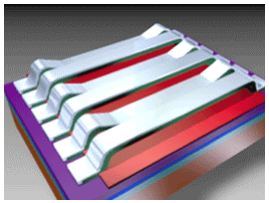

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Gaussian energy Distribution of laser

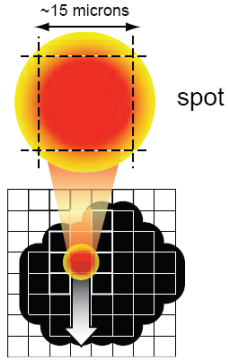
GLV light valve

after GLV

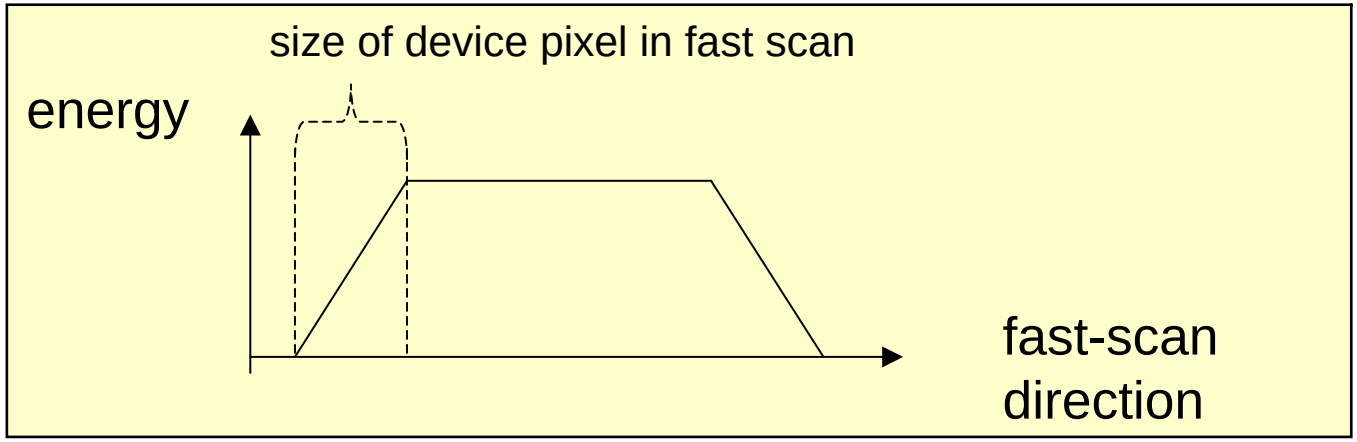
- This leads to a very precise laser spots without fluctuation width.

Reality Myth 4

- Effect takes place only at the edge of raster point
  - » Laser is switched on from edge to edge
- Even with "binary" energy level, there is still a energy slope because of the laser movement

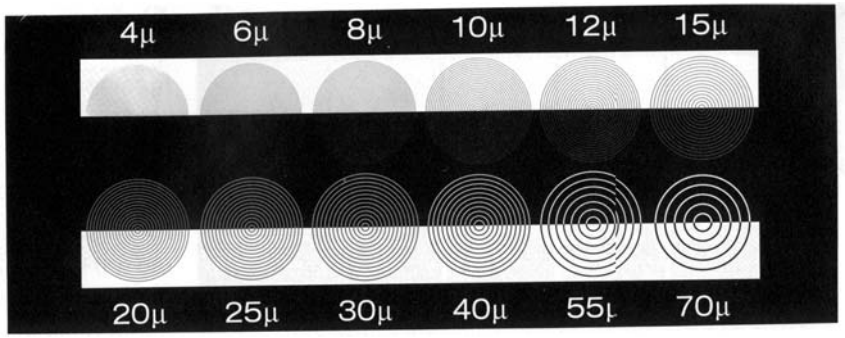


Kodak
Square Spot



Myth 5: Plate Resolution is not Definable

- The term resolution of a plate is only properly defined for conventional plate copy.



  - » Smallest width of positive and negative lines of a test control strip that can be reproduced on a conventional plate at one go.
  - » The laser in CtP-devices normally have spot sizes between 10 and 15 µ. Thus, such a test control strip can not be imaged.
  - » The resolution of a CtP-plate is given by minimal and maximal tonal values that can be reproduced by a certain frequency.

    e.g. 2-98% at 80/cm, 1-99% at 100/cm, 2-98% at 200 lpi

- That is, plate resolutions are not comparable

Reality of Myth 5

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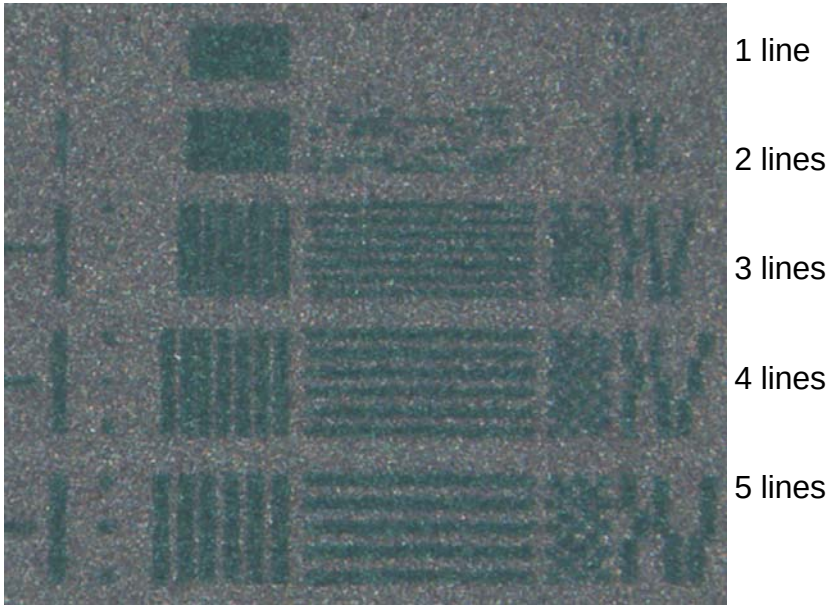
- There are CtP-devices with 8.000 or even 12.000 dpi adressability.
  - » Calculated (!) edge length for square spots: 3,2 µ or 2,1 µ
  - » Calculated (!) diameters for round spots: 4,4 µ or 3,0 µ
- Tests with a 8000 dpi device have shown that resolutions of standard CtP-plates are larger that these values.
  - » Calculated values:

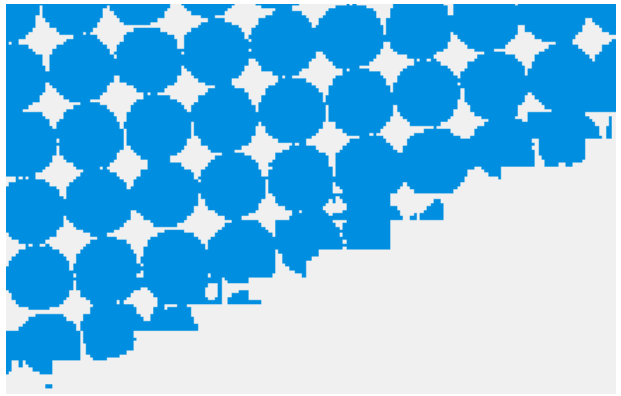
    2 scanline 7,6 µ

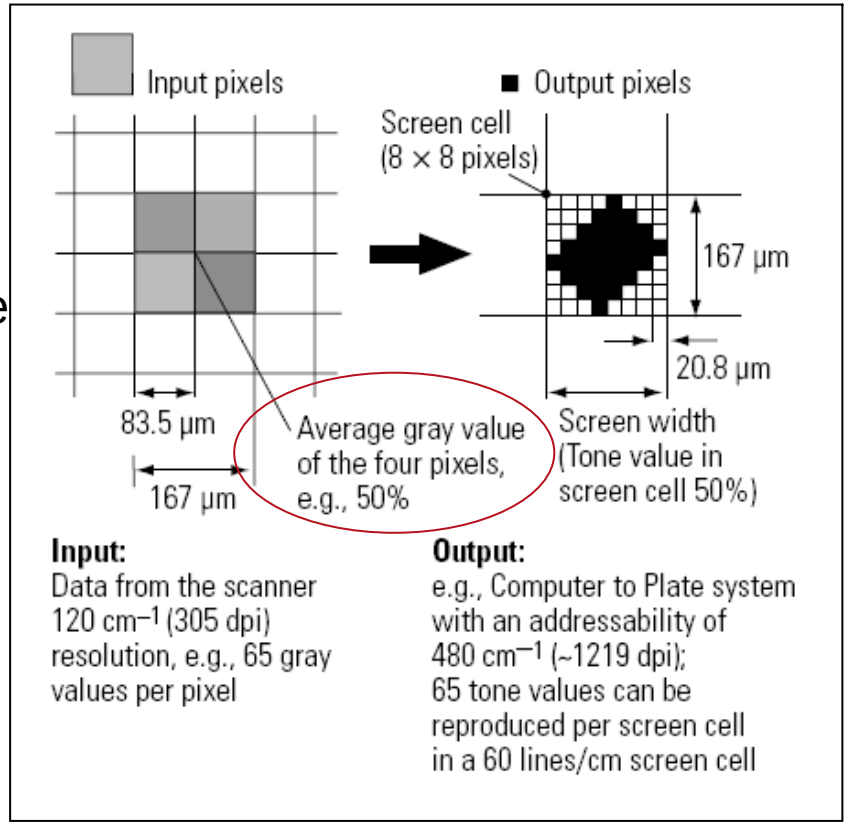
    3 scanlines 10,8 µ



Myth 6: Raster Points are Regular

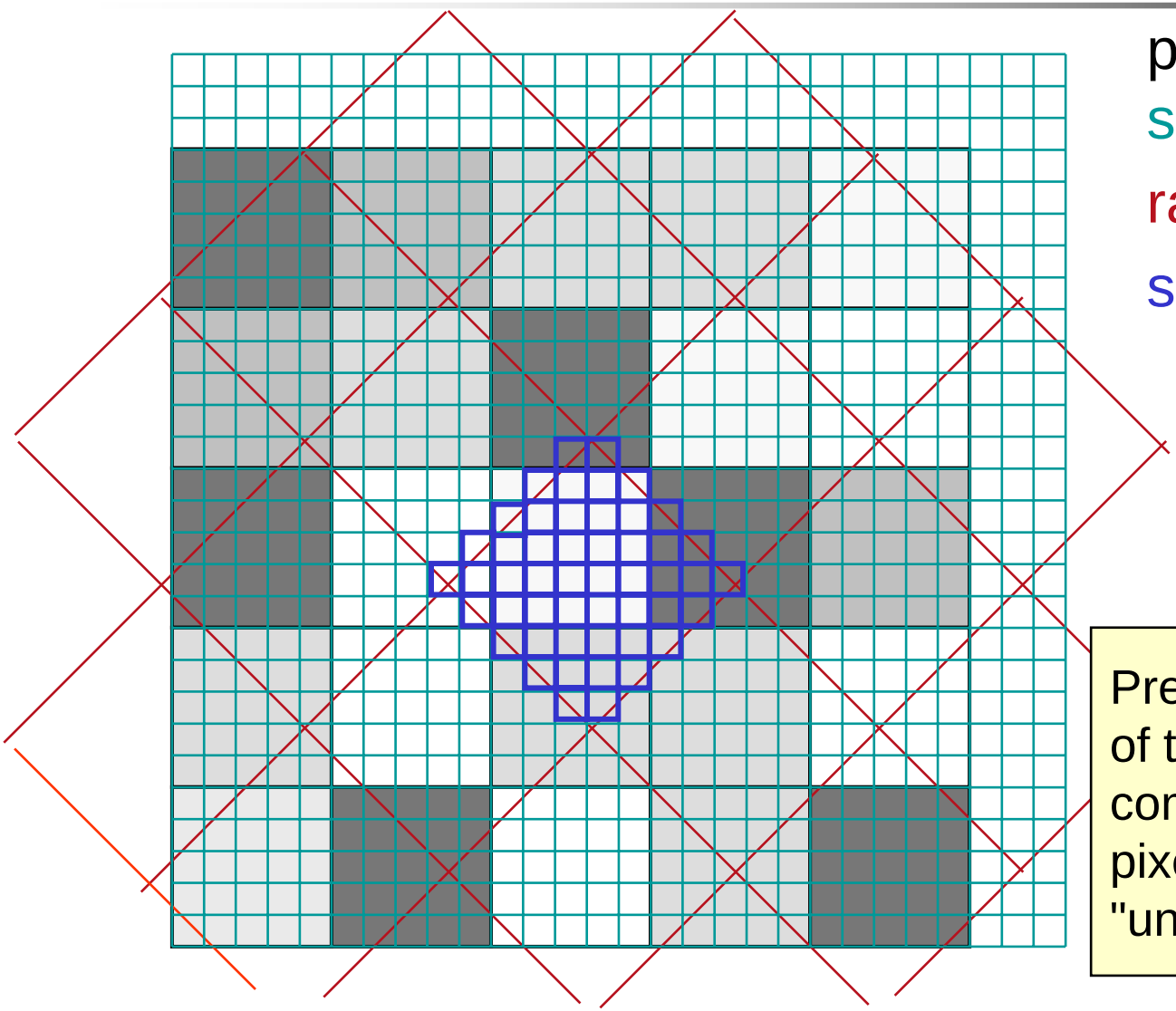
- „…one pixel covering a quarter of the area…The mean is found from the tonal values…“
  - » If that holds, there would be saw tooth-effects at edges of graphical objects with tonal value of 100%…
  - » …and the screen-shot below of the TIFF-b would be faked





Kipphan: Handbook of Media Fig 3.2.14

Reality of Myth 6



pixel data

spots

raster cells

spots / cell

Predefined threshold values of the master cell are compared for each device pixel with the image pixel "underneath"

Reality of Myth 6: Screening Algorithmus

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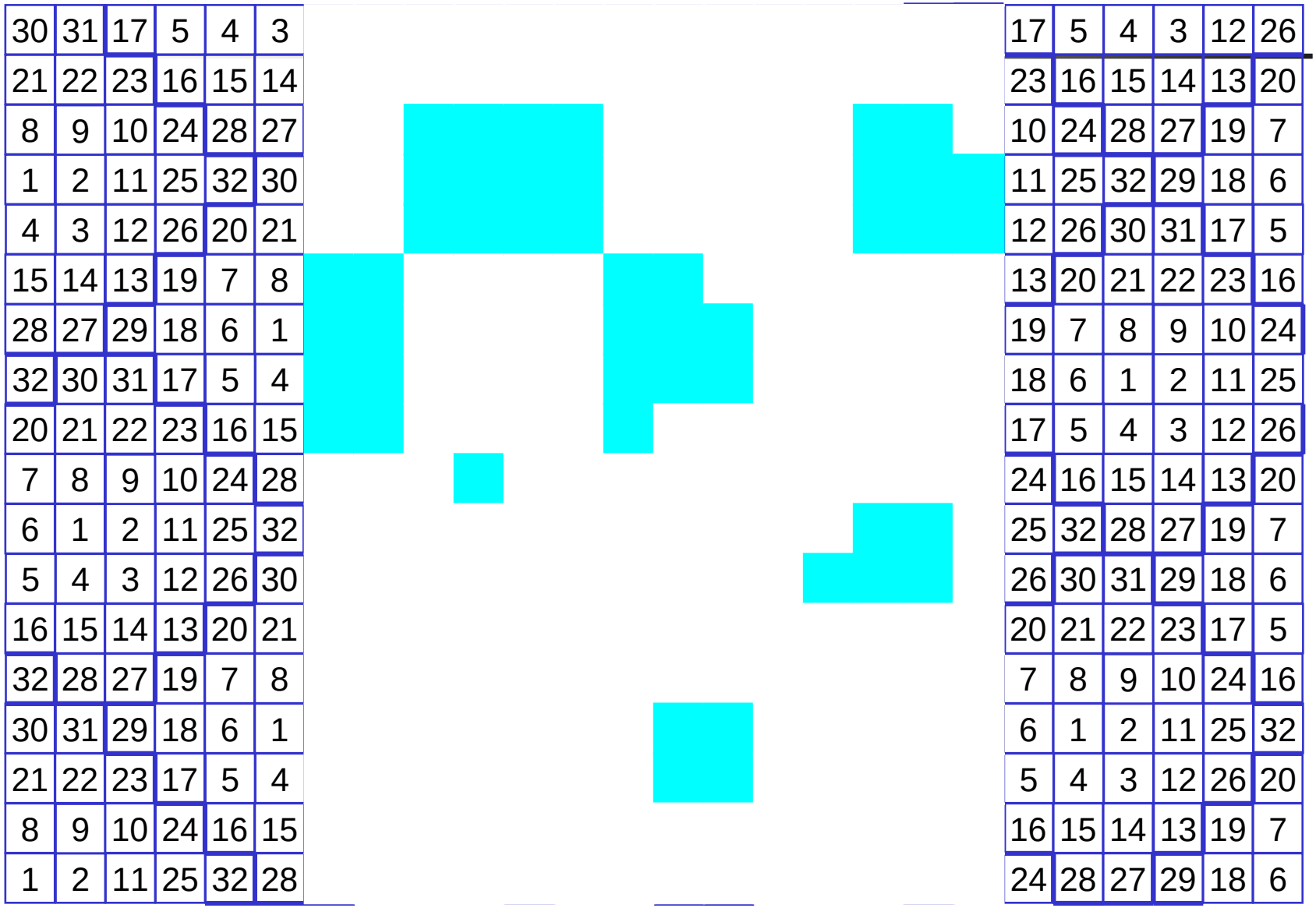
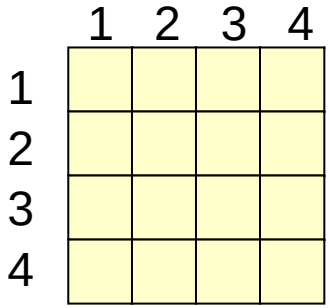


30	31	17	5	4	3
21	22	23	16	15	14
8	9	10	24	28	27
1	2	11	25	32	30
4	3	12	26	20	21
15	14	13	19	7	8
28	27	29	18	6	1
32	30	31	17	5	4
20	21	22	23	16	15
7	8	9	10	24	28
6	1	2	11	25	32
5	4	3	12	26	30
16	15	14	13	20	21
32	28	27	19	7	8
30	31	29	18	6	1
21	22	23	17	5	4
8	9	10	24	16	15
1	2	11	25	32	28

17	5	4	3	12	26
23	16	15	14	13	20
10	24	28	27	19	7
11	25	32	29	18	6
12	26	30	31	17	5
13	20	21	22	23	16
19	7	8	9	10	24
18	6	1	2	11	25
17	5	4	3	12	26
24	16	15	14	13	20
25	32	28	27	19	7
26	30	31	29	18	6
20	21	22	23	17	5
7	8	9	10	24	16
6	1	2	11	25	32
5	4	3	12	26	20
16	15	14	13	19	7
24	28	27	29	18	6

Myth 7: Calculation of Gray Levels g



p = number of device pixels per cell

g = p + 1

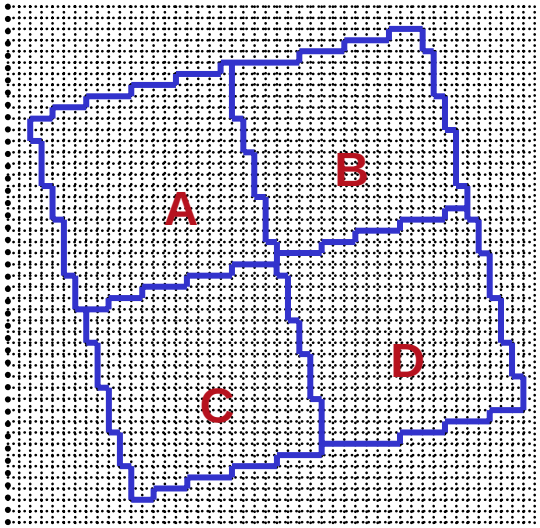
Thus: $$g = \left(\frac{\text{adressability}}{\text{frequency}} \right) + 1$$

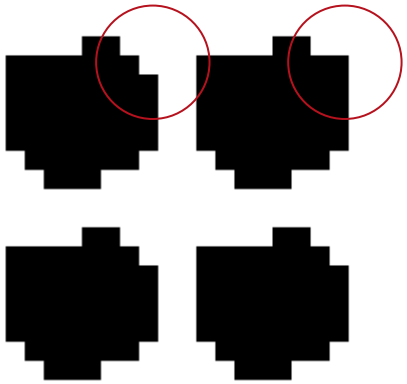
frequency

adressability	20	30	33	40	48	60	80
100	26	12	10	7	5	4	3
250	157	73	57	40	28	18	11
500	626	288	224	157	110	70	40
750	1407	646	503	353	245	157	89
1000	2501	1148	894	626	435	279	157

Reality of Myth7

- Rasterization with single cells is history! Using supercells is state-of-the-art since over a decade.





50% Tonal Value

n = number of cells in a supercell

g = number of grey levels in a single cell

⇒ **n*g = number of grey levels in a super cell**

More Myths:

- The raster angle you set is different from what you get
  - » WYSINWYG
- The raster frequency you set is different from what you get
  - » There differ for each separation
- It’s necessary to gum plates– but not for preserving them
  - » It’s only needed to make the plate more hydrophobic