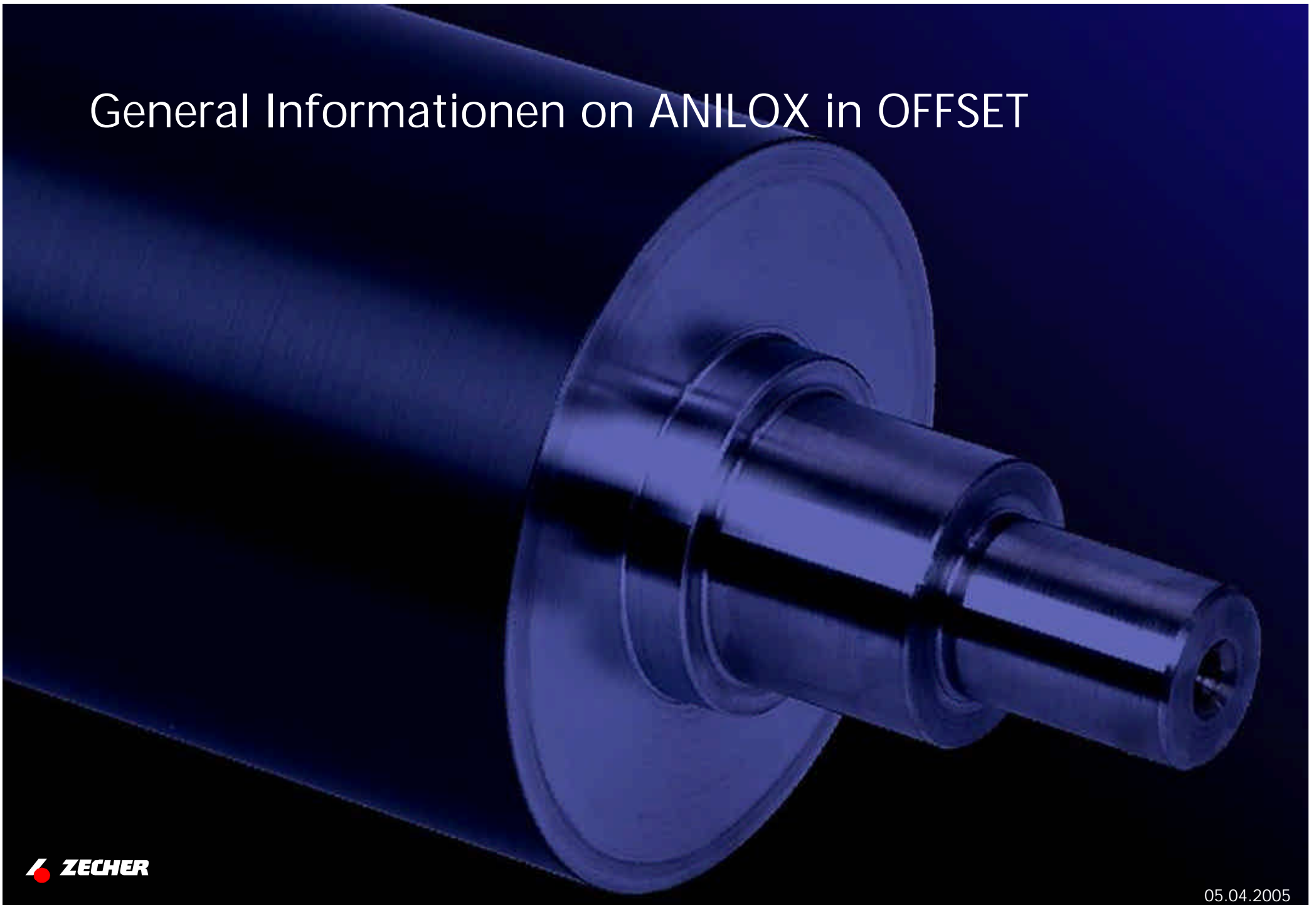


General Informationen on ANILOX in OFFSET



Offset Inline Lacquering

Increasing manufacturing costs and shorter lead times had been among the reasons to think about improvement and more efficiency in Offset presses.

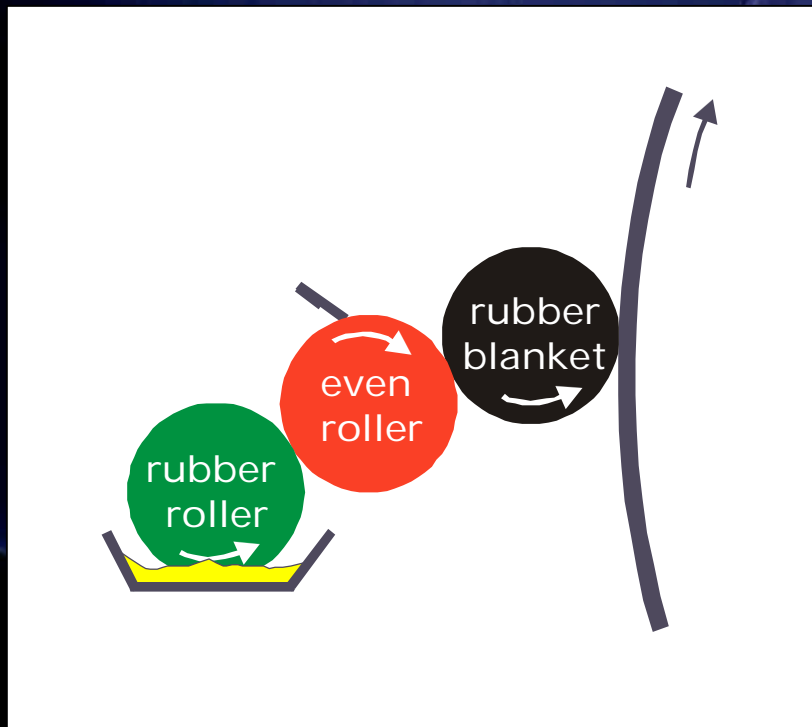
Separate and thereof cost-intensive machines are thought to be history.

Lacquering Inline was the only solution with a future perspective. Leading press manufacturers introduced a new generation of machines and a lacquering station appeared soon to be state of the art.

various setups of lacquering stations

Rubber Roller – Lacquering Station

Traditional Setup. A rubber roller transfer the lacquer onto an unengraved even chrome roller. The polished roller squeezes the lacquer against the lacquering plate.



Advantage

- Transferred amount of lacquer can be adjusted by the operator.
- Easy handling for cleaning

Disadvantage

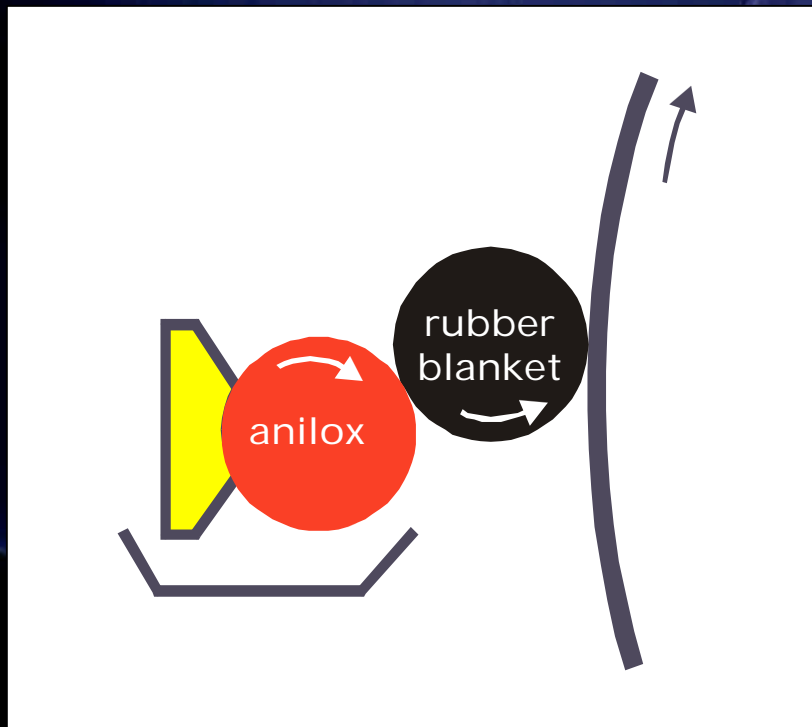
- Transferred amount of lacquer is different according to press speed
- Transfer not homogeneous
- Reproducibility is restricted

various setups of lacquering stations

Chamber Blade – Lacquering Station

Further development of modern transfer stations, which is established in the Flexo and Coating Industry since long years.

The transfer is controlled by the Anilox engraving and the engraving volume.



advantage

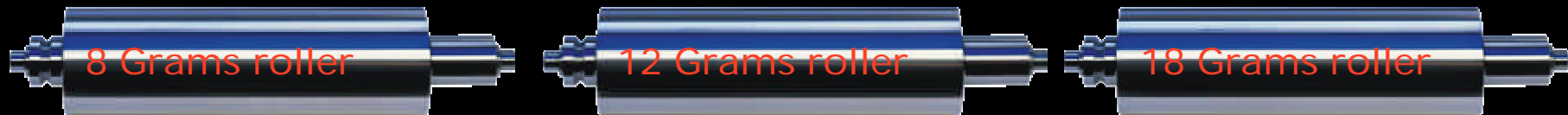
- Homogeneous transfer
- Constant transfer weight
- Reproducibility given
- Easy change of lacquer
- Cleaning by flushing

disadvantage

- A different transfer requires a different Anilox roller
- revise of working habits is essential !!!!!

Which Anilox are available?

known statements:



But what do those figures indicate ?

- Is it the amount, which is being transferred ?
- Is it the to be achieved dried weight ?
- Is it the volume capacity of the Anilox ?

Lots of open questions ...

Which demands are requested from the Anilox?

- Controlled lacquer transfer
- Homogeneous layout
- closed surface
- Defined amount of lacquer
- good wetting ability and release
- easy to clean
- universal application

demands which we have to secure

Parameter of the Anilox roller

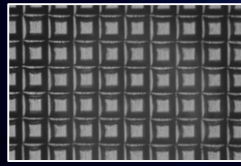
- the volume figure does not inform you about the release and inking properties of the anilox!

- important is the cell shape

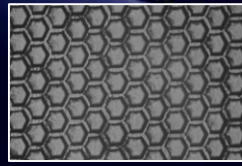
- check for all anilox parameters:

- | | |
|--------------------|-------------------------------------|
| 1. screen count | [l/cm] |
| 2. depth | [μ] |
| 3. engraving angle | [°] |
| 4. wall/cell-ratio | [1:x] |
| 5. volume | [cm ³ /m ²] |

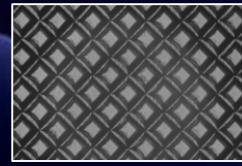




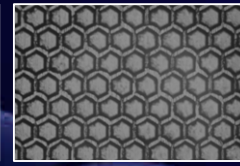
90°



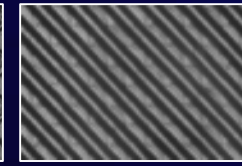
30°



45°



60°



Tri-Helical

receive an idea of cell dimensions:

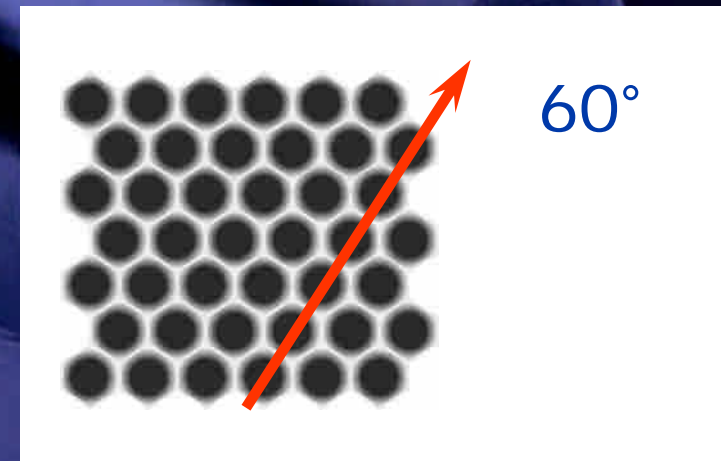
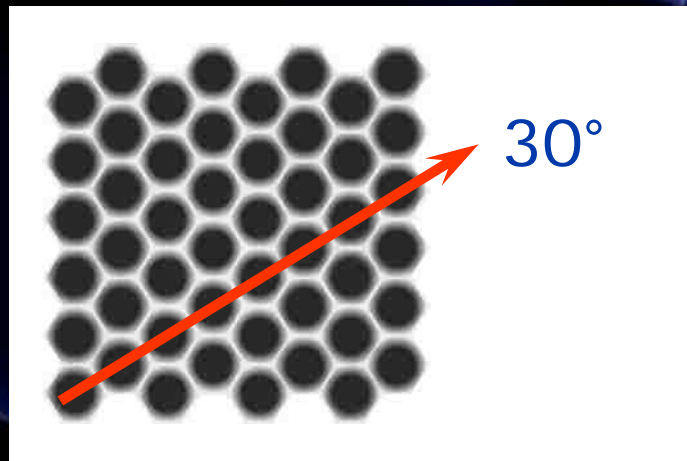
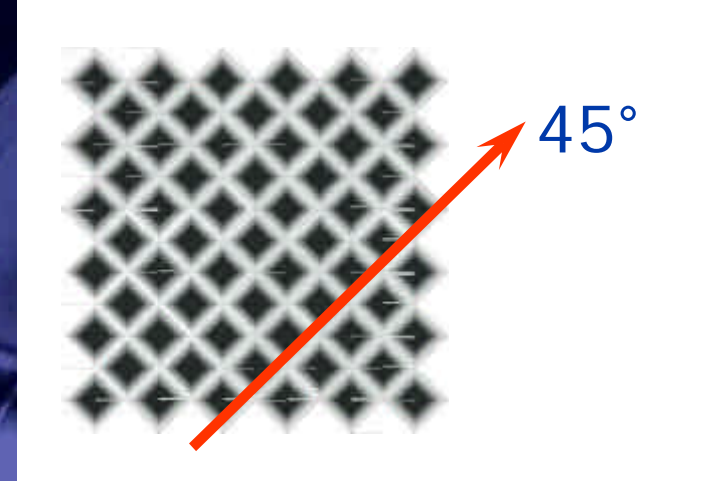
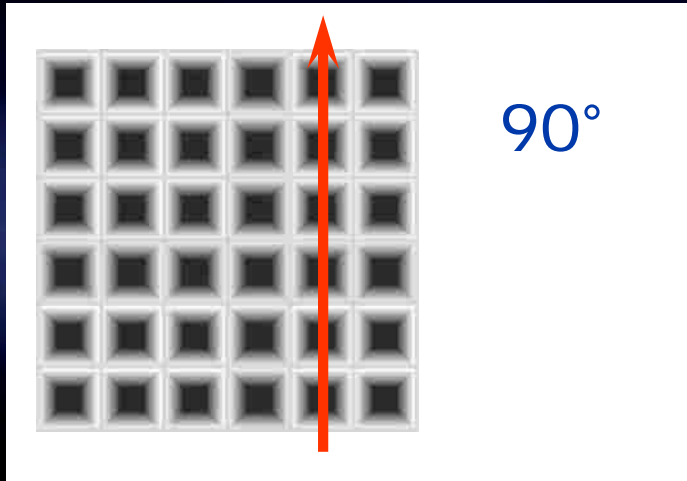
An engraving is characterized by it's screen count in lines/cm = cells per cm

It's possible to engrave a range from 1 l/cm up to 1000 l/cm.

What does this indicate in total dimension?

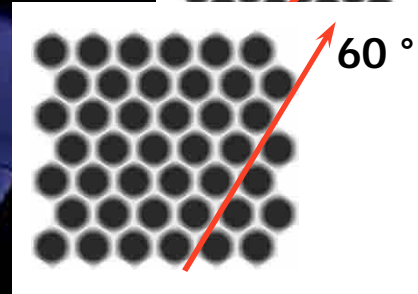
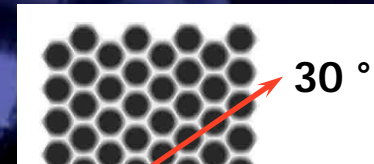
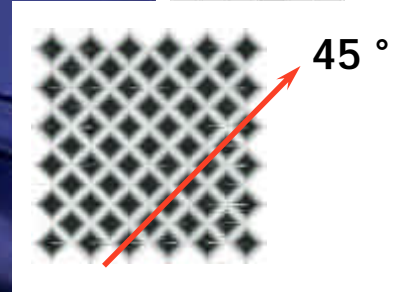
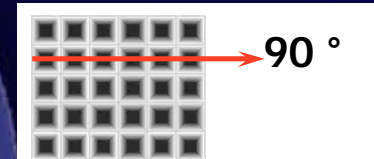
10 l/cm	width of one cell is	1 mm	- on 1 cm ² area you count	100 cells/cm²
100 l/cm	width of one cell is	100 µm	- on 1 cm ² area you count	10.000 cells/cm²
200 l/cm	width of one cell is	50 µm	- on 1 cm ² area you count	40.000 cells/cm²
300 l/cm	width of one cell is	33 µm	- on 1 cm ² area you count	90.000 cells/cm²
500 l/cm	width of one cell is	20 µm	- on 1 cm ² area you count	250.000 cells/cm²
1000 l/cm	width of one cell is	10 µm	- on 1 cm ² area you count	1.000.000 cells/cm²

Which engraving angles are available?

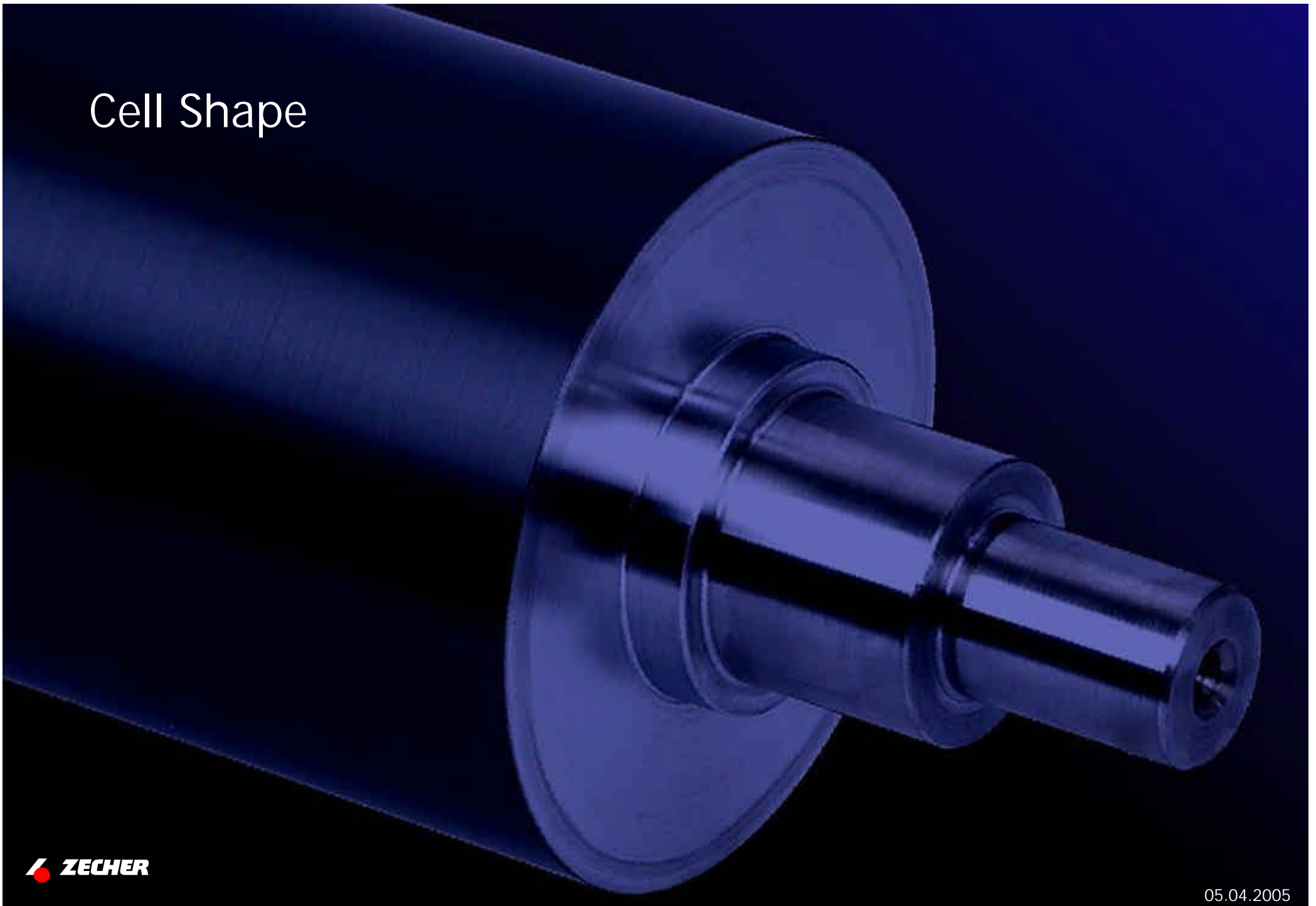


engraving angle 45° or 60°

- these angles are to be preferred
- 60° offers 12% more cells per area
- 60° improves homogeneous print out and gives more contrast in the print



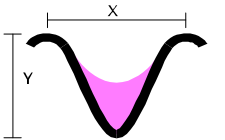
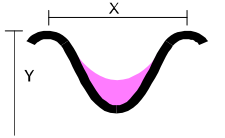
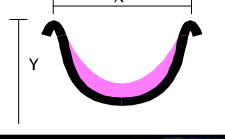
Cell Shape



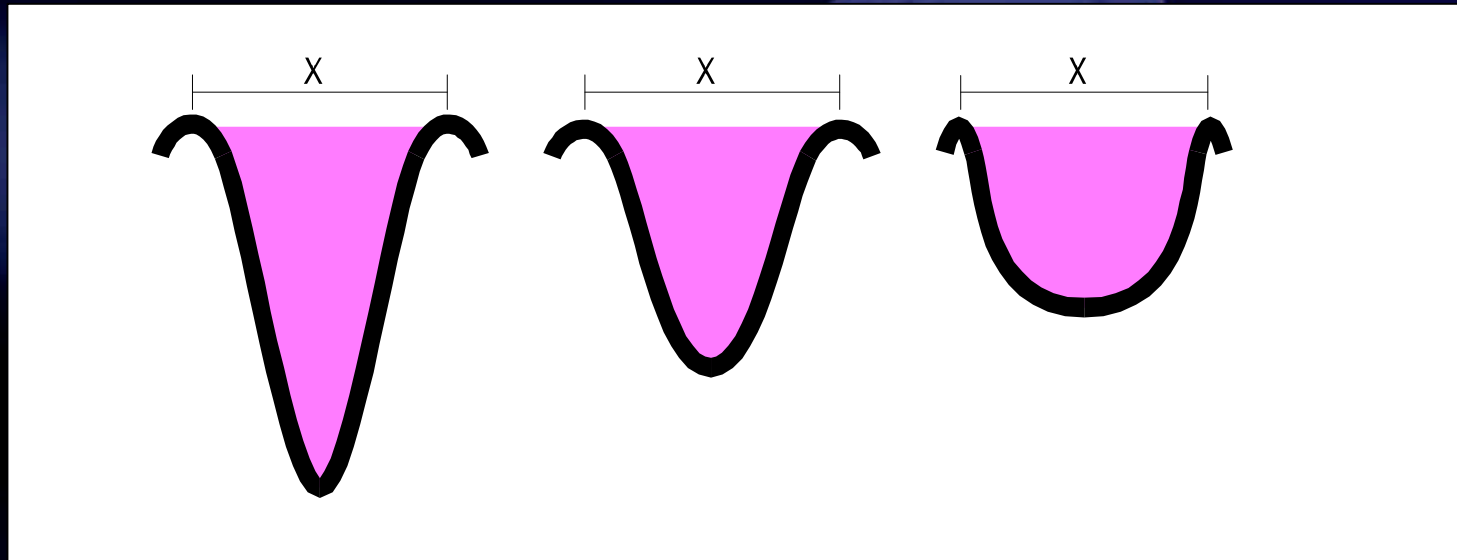
Chrome-Anilox
mechanical engraving

cell shape		properties
	sharp pyramid	poor release high danger to become dirty
	flattened pyramid	improved release
	flattened pyramid, straight cut	optimized release high volume

Ceramic-Anilox
laser engraved

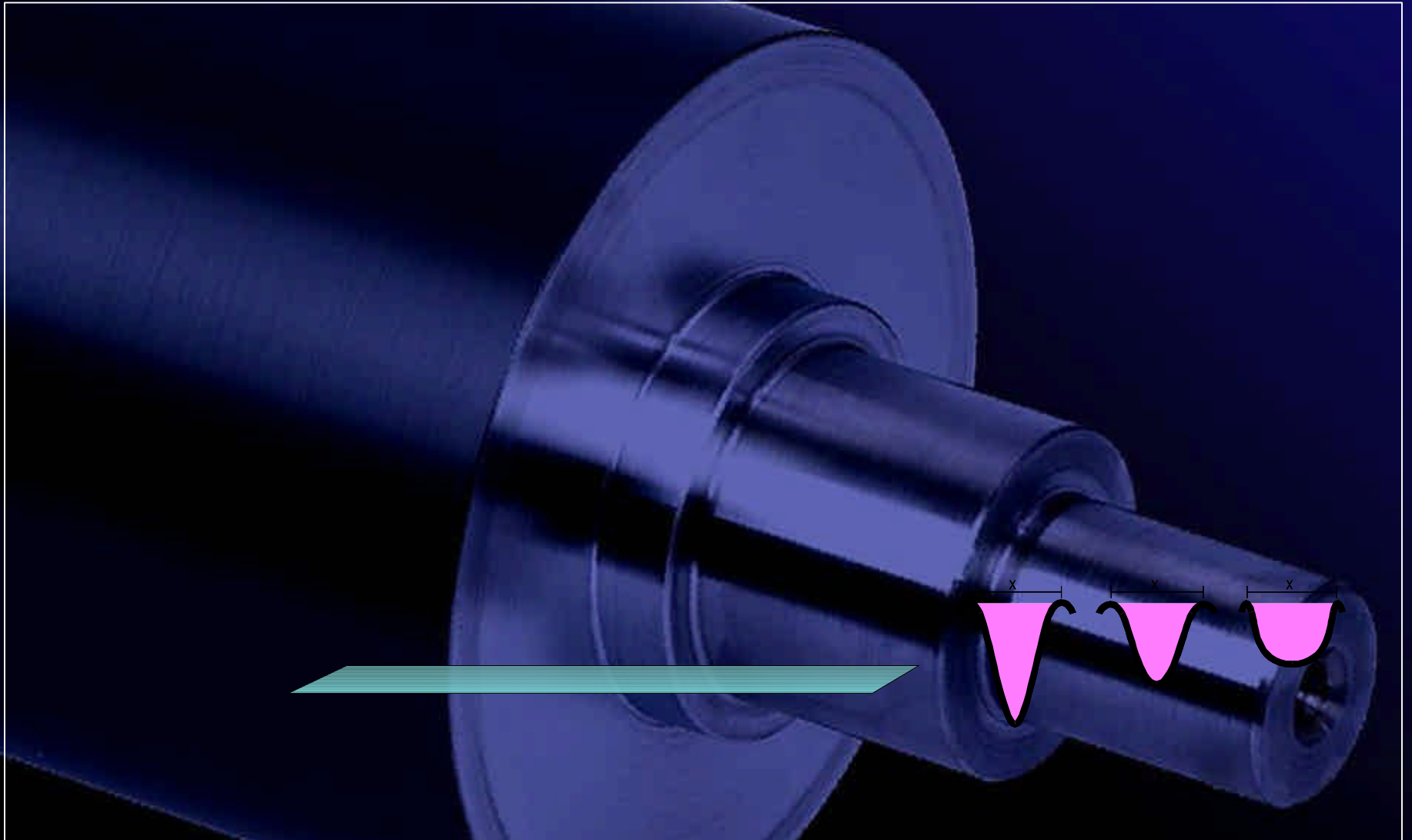
cell shape		properties
	sharp calotte	poor release high danger to become dirty
	normal calotte	improved release
	U-Shape straight cut, wide bottom	optimised release high volume optimised contact area ink to plate

what does the volume figure indicate?

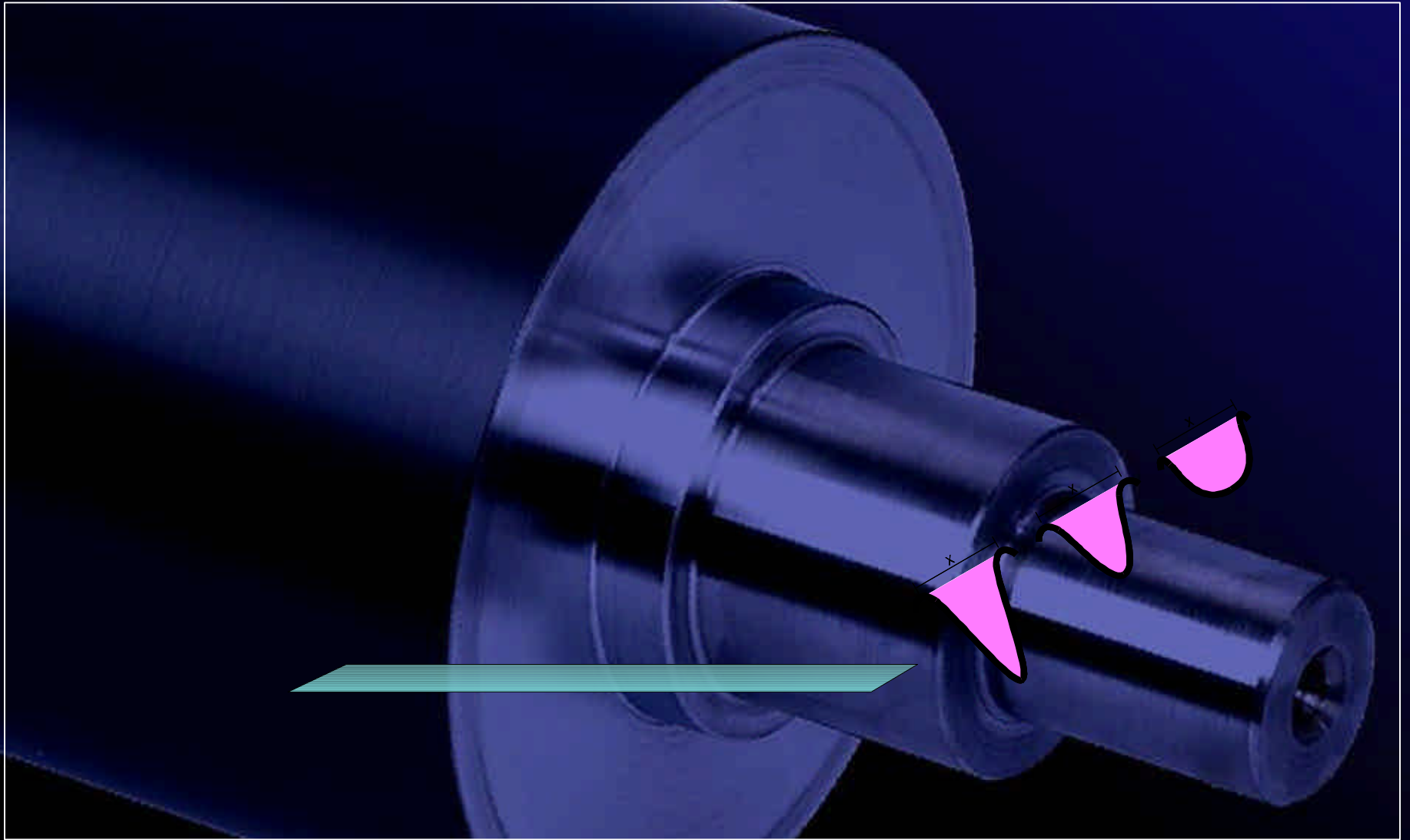


three different cell shapes
same measured volume
but different release !

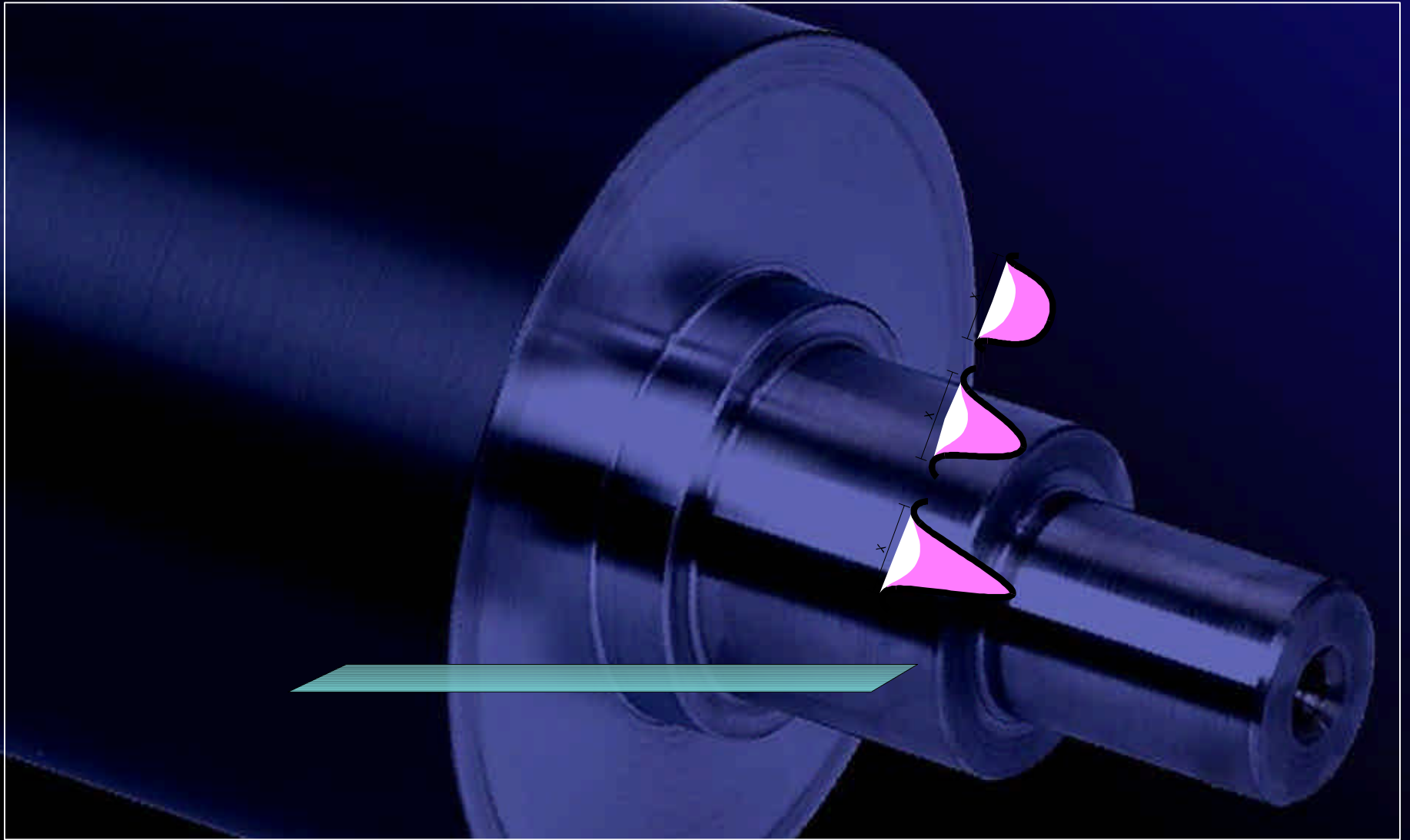
ink release



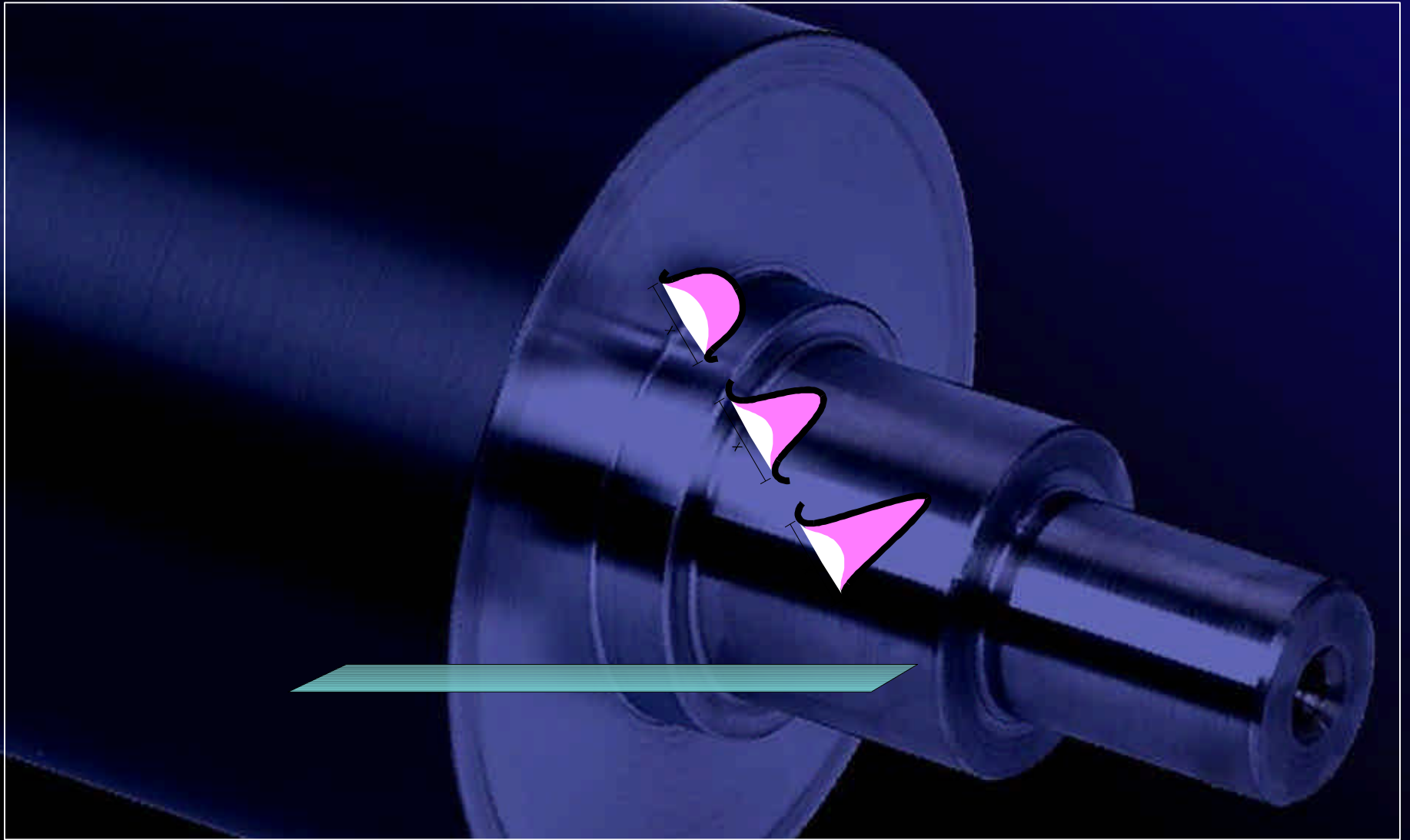
ink release



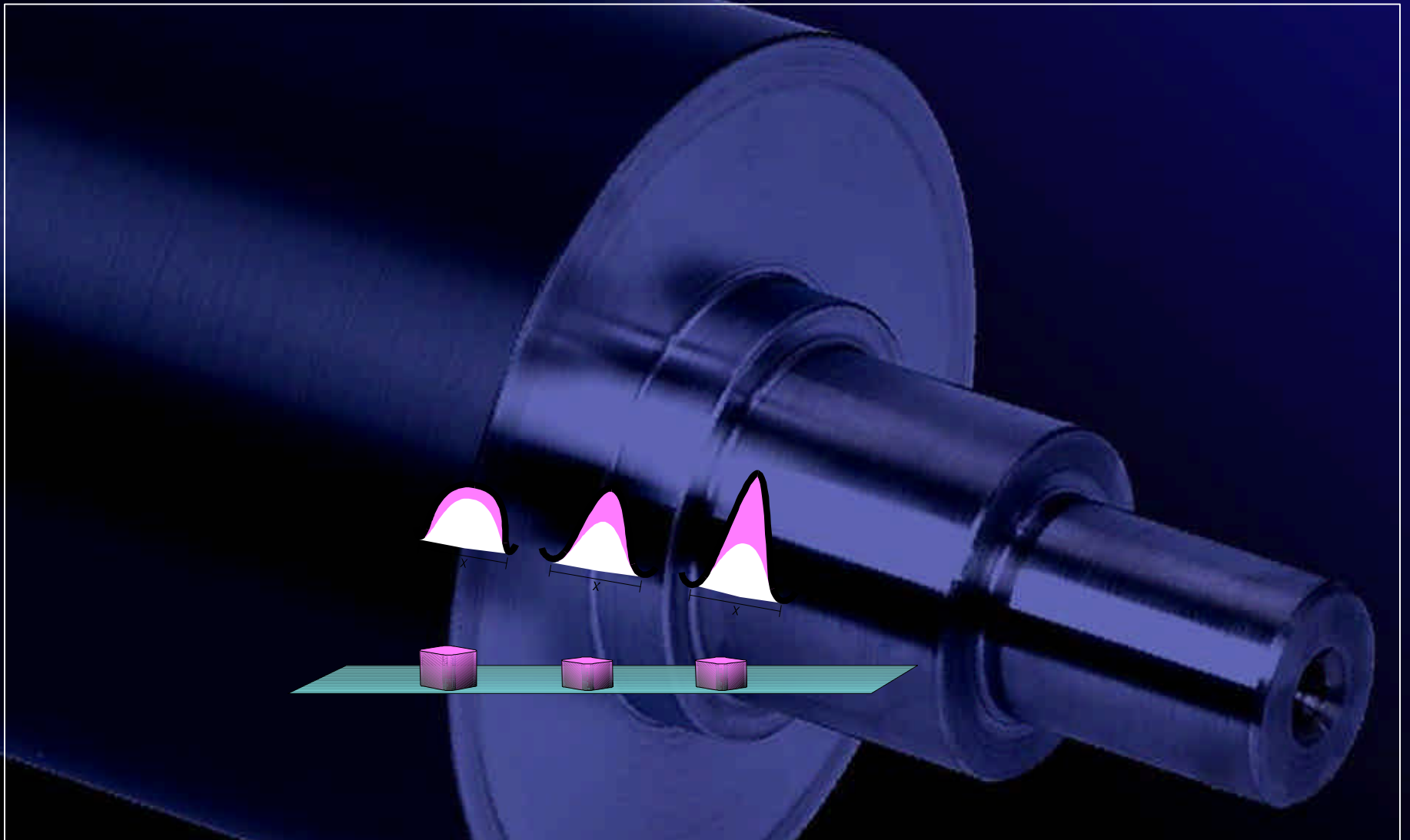
ink release



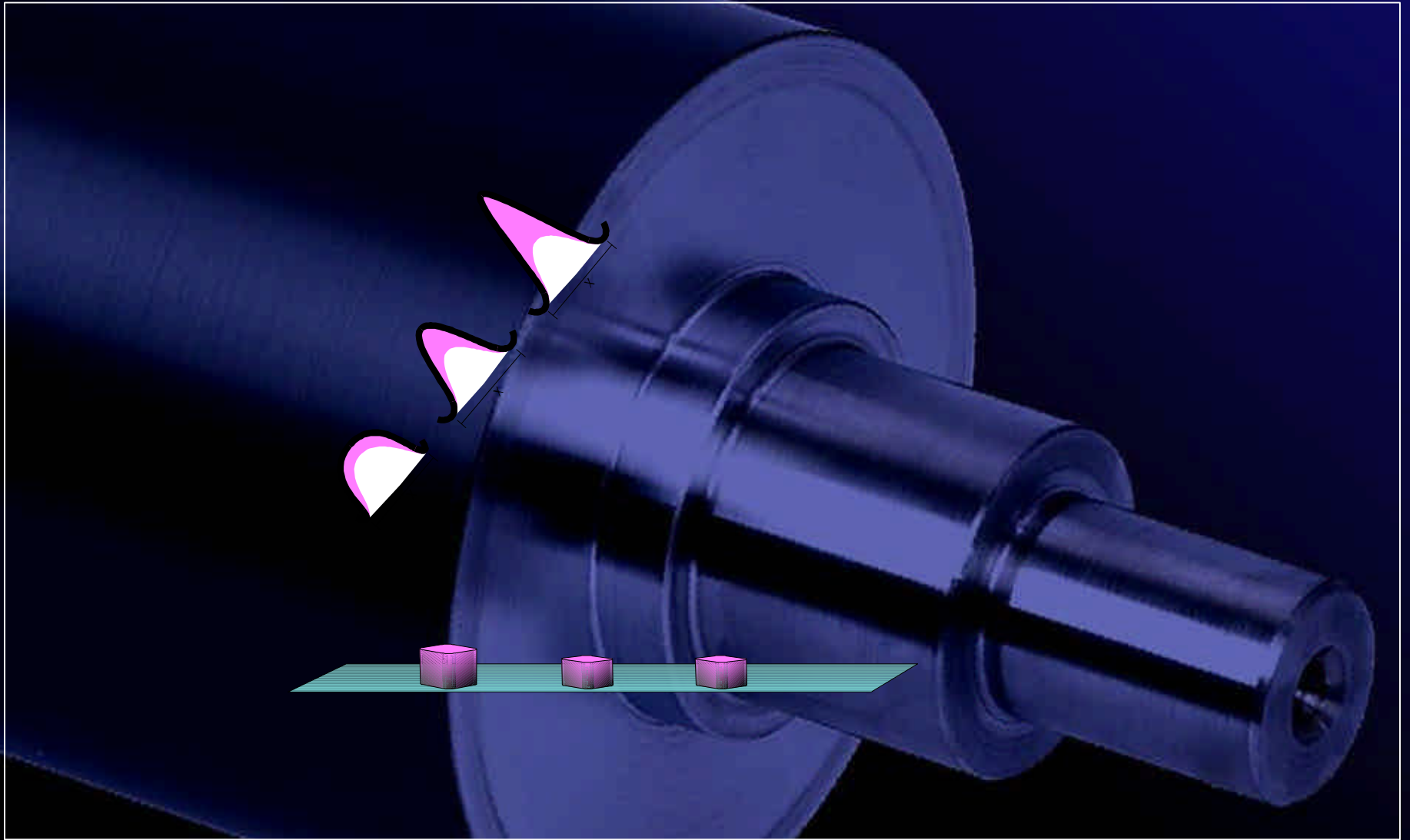
ink release



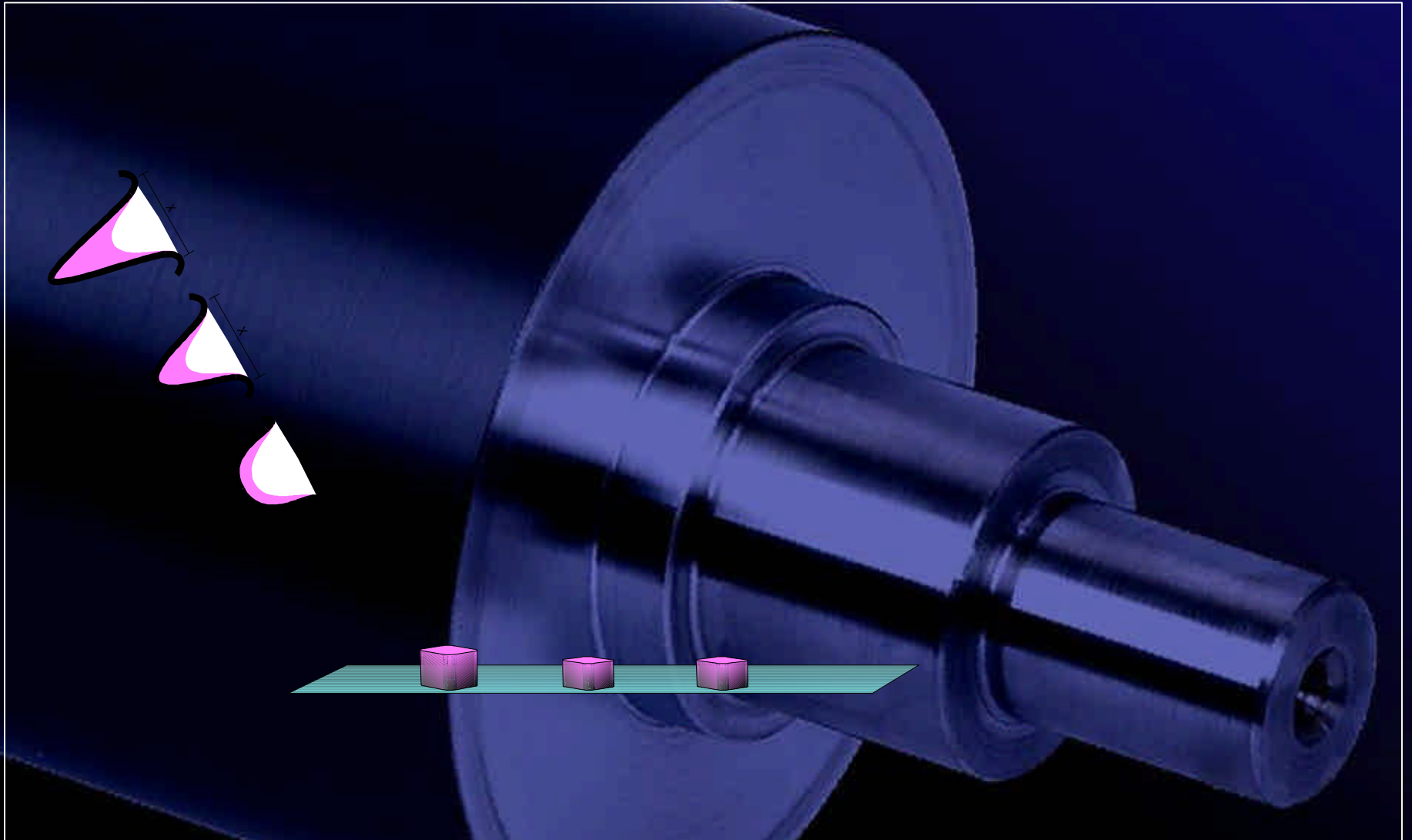
ink release



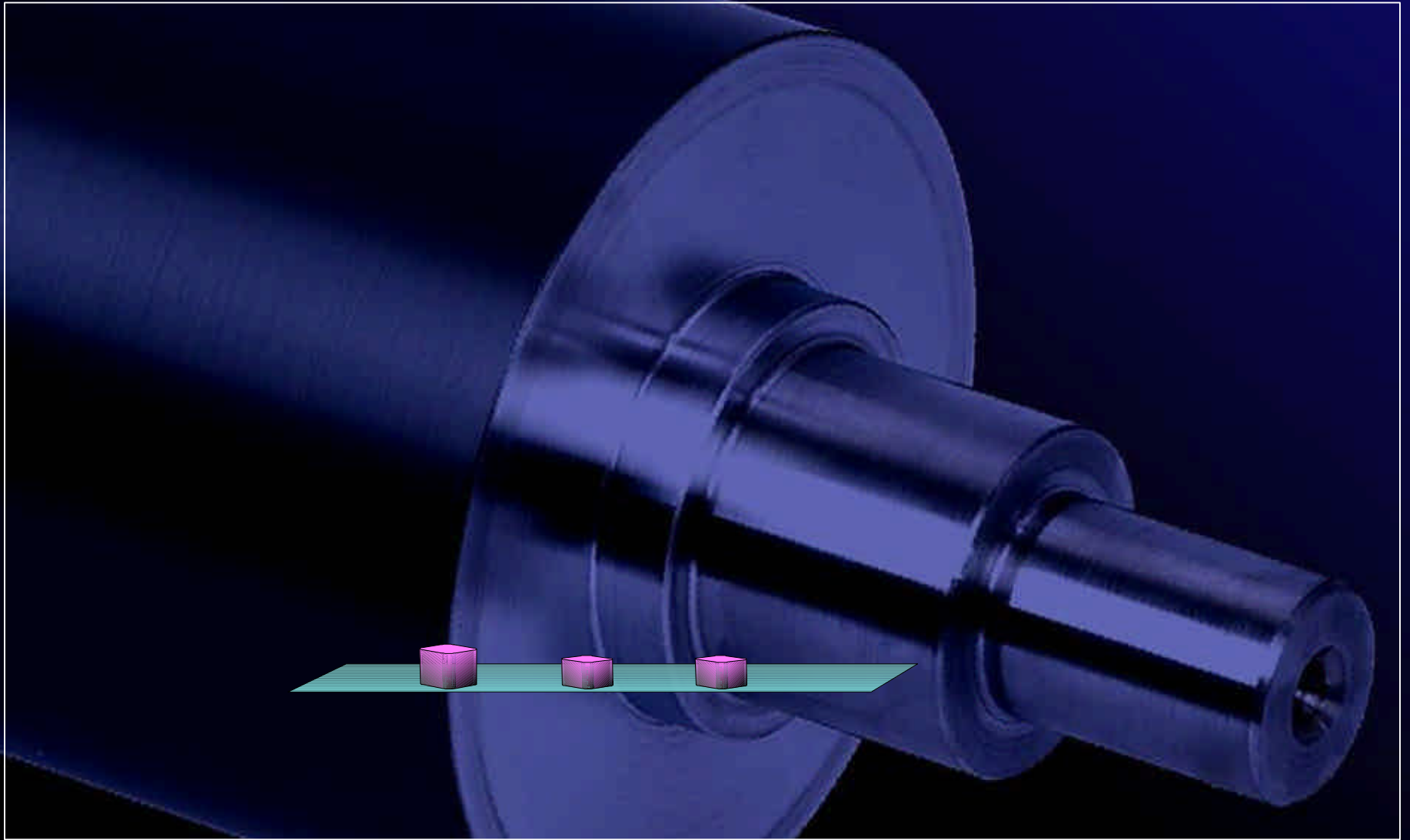
ink release



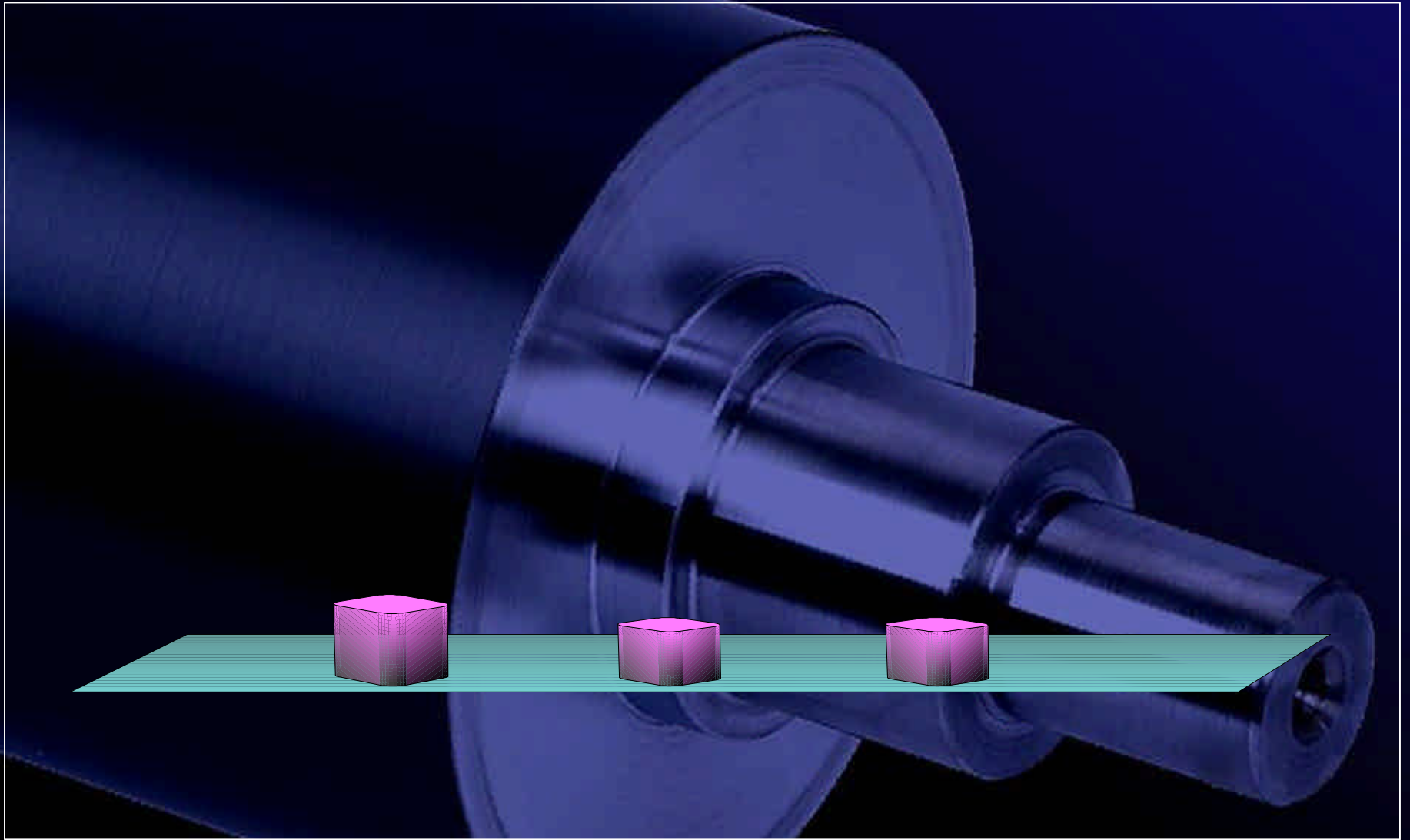
ink release



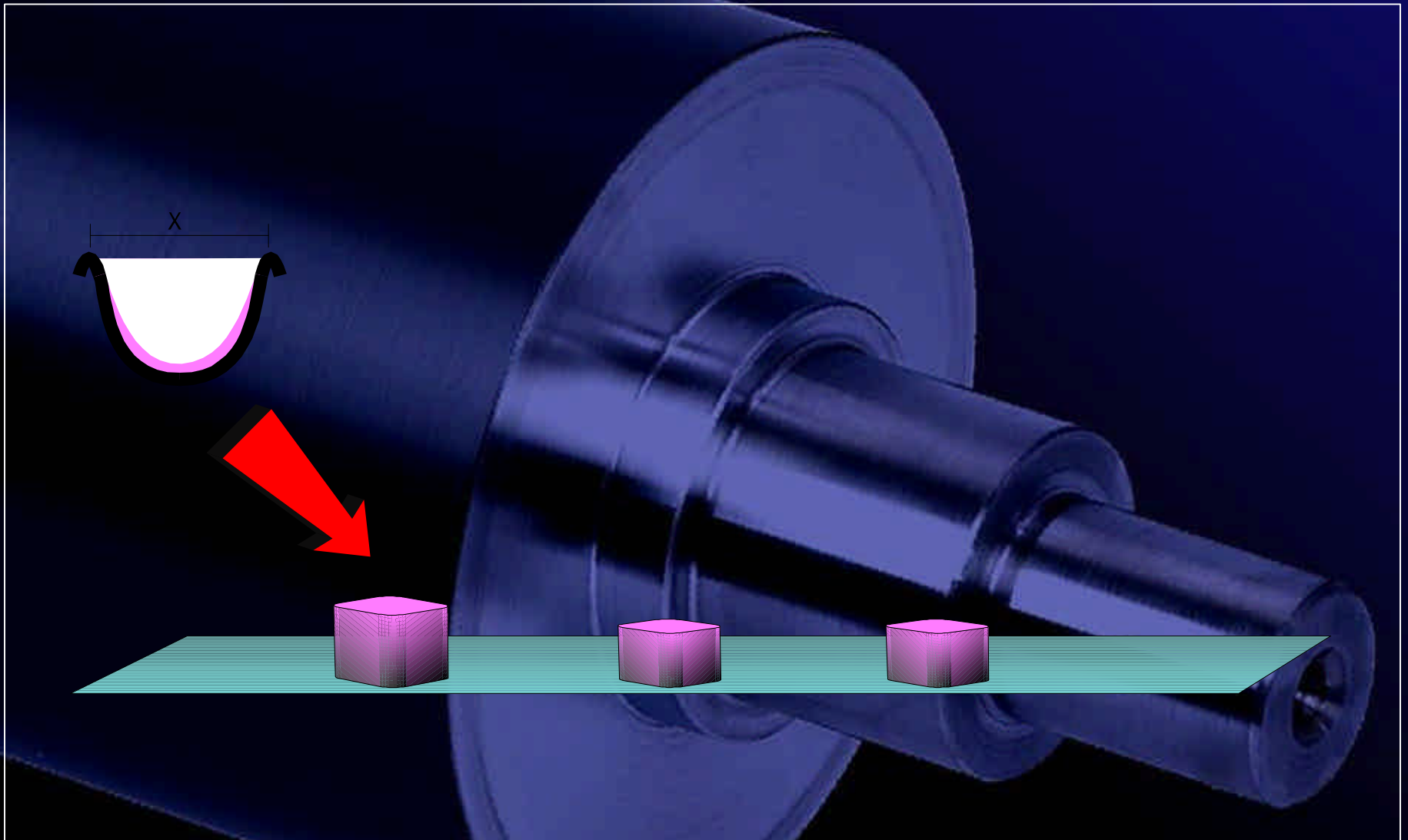
ink release



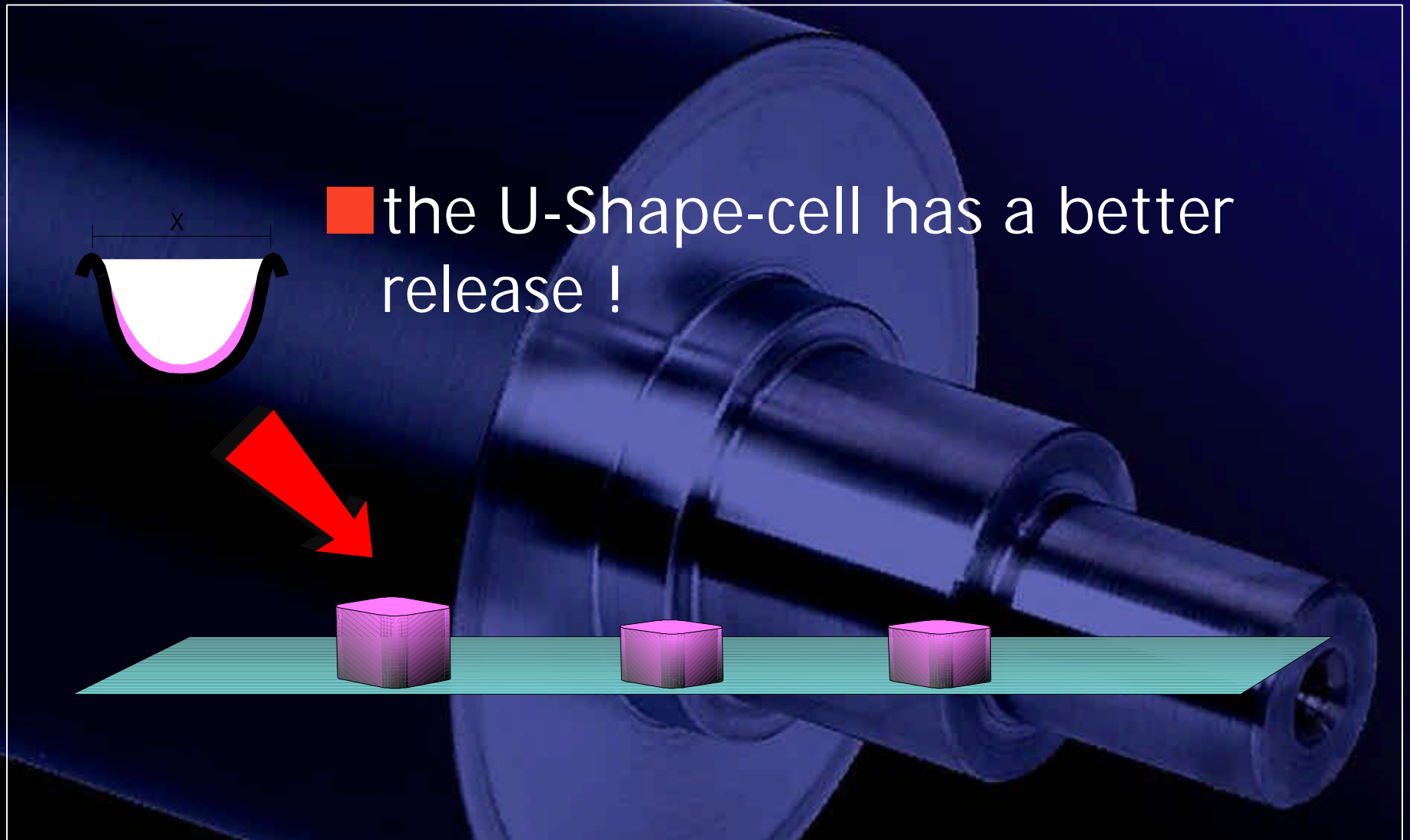
ink release



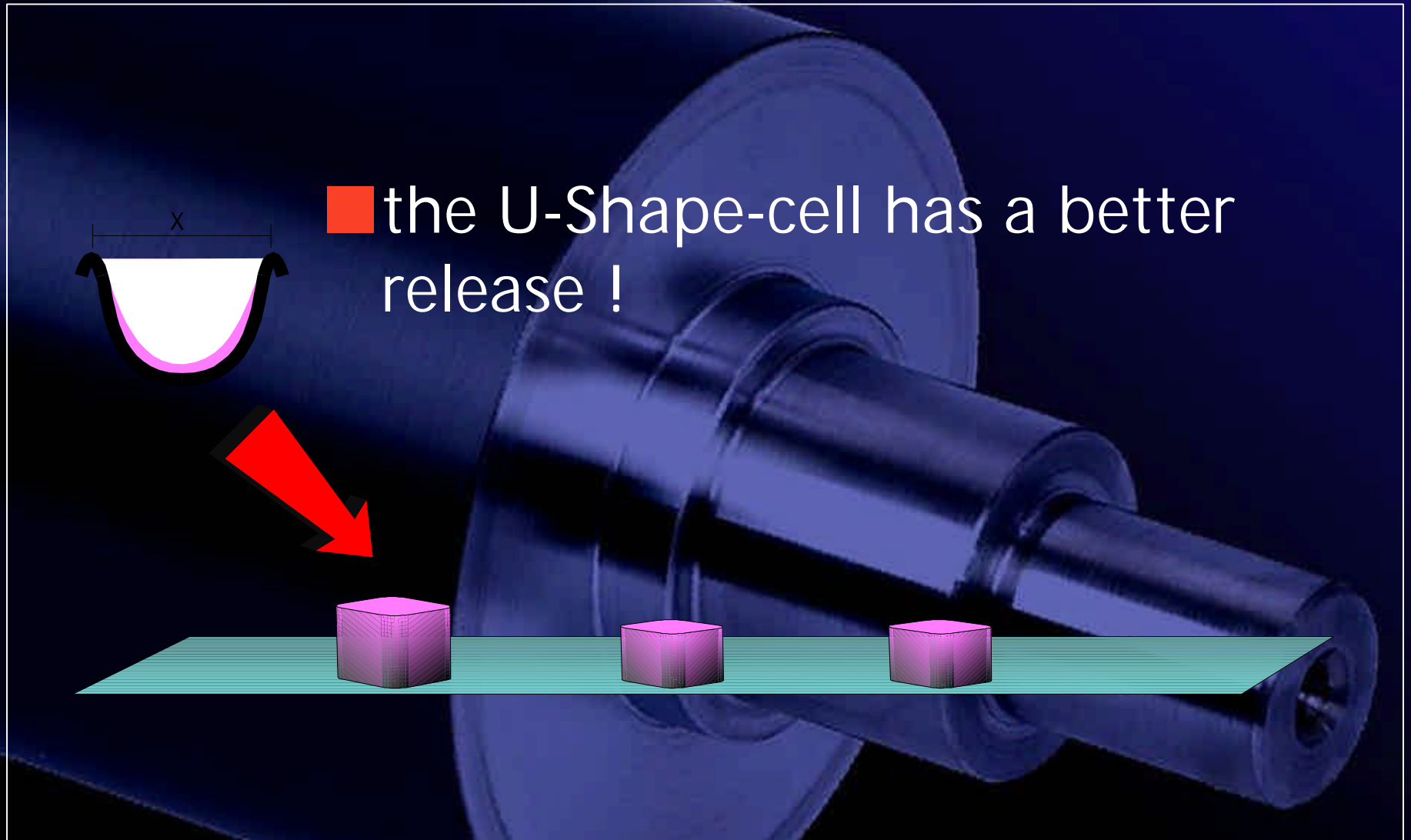
ink release



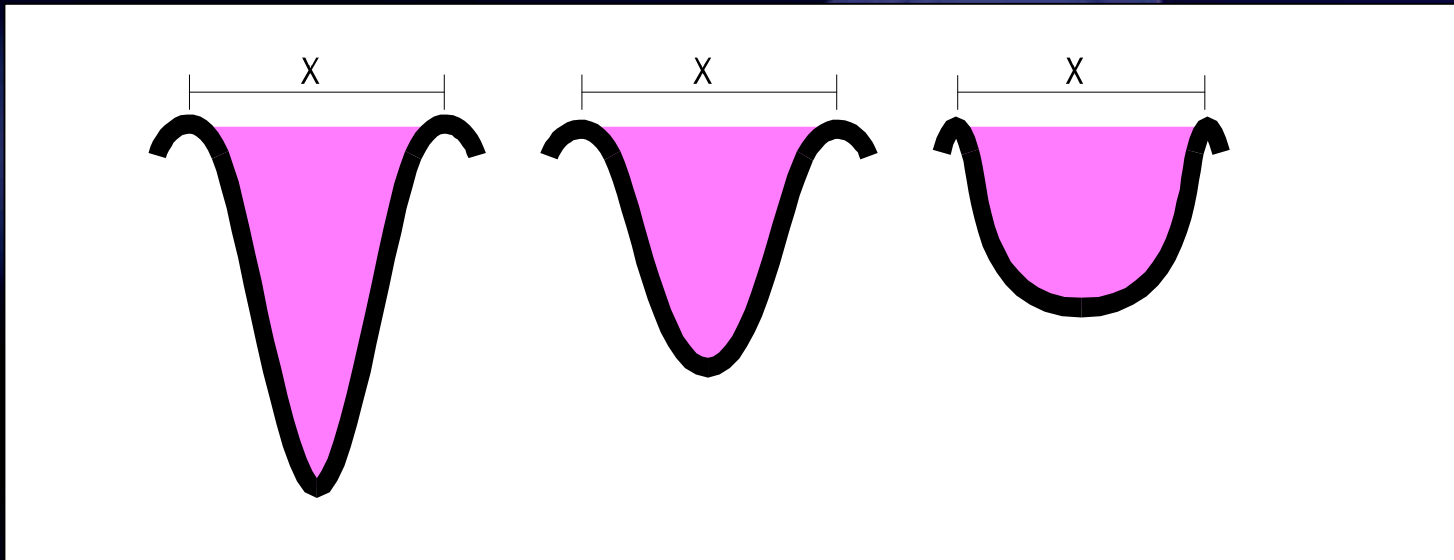
ink release



ink release

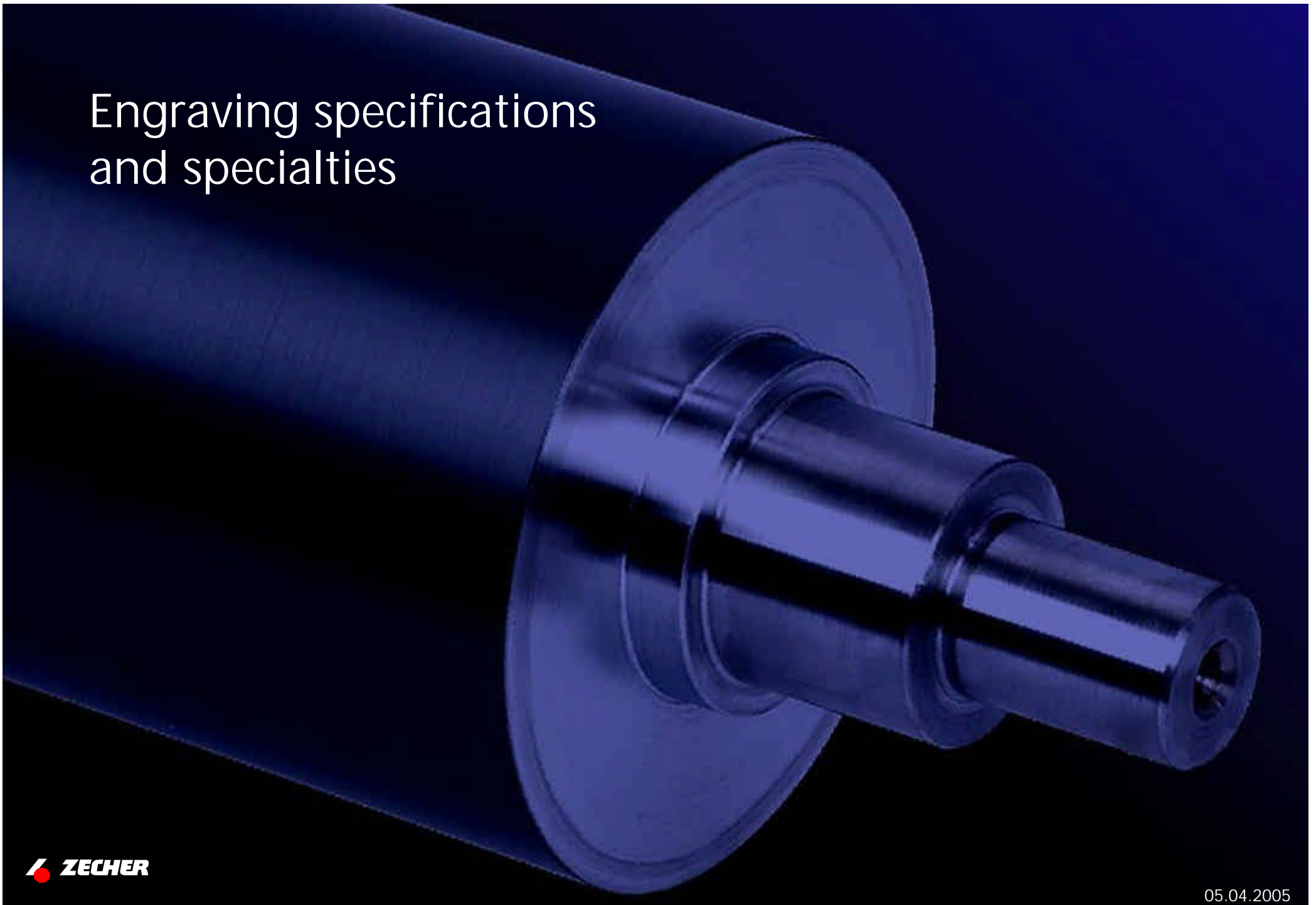


what does the volume figure indicate?



three different cell shapes
same measured volume
but different release !

Engraving specifications and specialties



the volume figure is not the whole story:

- the volume figure does not inform you about the release and inking properties of the anilox!
- important is the cell shape
- check for all anilox parameters:
 1. screen count [l/cm]
 2. depth [μ]
 3. engraving angle [$^{\circ}$]
 4. wall/cell-ratio [1:x]
 5. volume [cm^3/m^2]



Lacquering with Anilox and Chamber blade

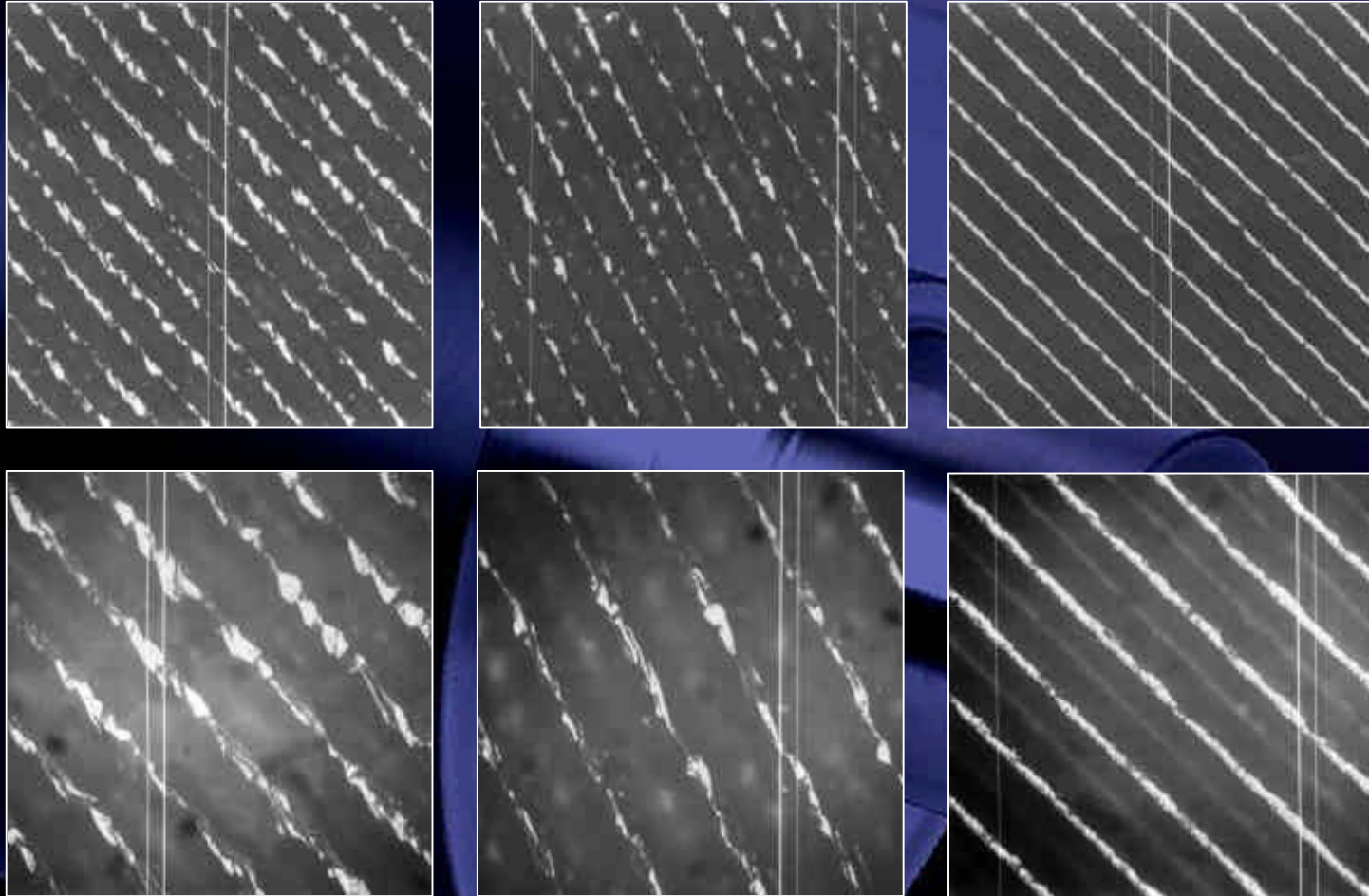
screen [l/cm]	screen [l/inch]	angle	wall/cell	depth	volume [cm ³ /m ²]	volume [BCM]
55 l/cm	140 l/inch	60 °	1:20	70 μ	21,0 cm ³ /m ²	13,5 BCM

→ applicable for UV/Blister

60 l/cm	152 l/inch	60 °	1:20	60 μ	17,0 cm ³ /m ²	11,0 BCM
80 l/cm	203 l/inch	60 °	1:20	40 μ	14,0 cm ³ /m ²	9,0 BCM
100 l/cm	254 l/inch	60 °	1:18	30 μ	12,0 cm ³ /m ²	7,7 BCM
120 l/cm	305 l/inch	60 °	1:16	26 μ	9,2 cm ³ /m ²	5,9 BCM
140 l/cm	356 l/inch	60 °	1:14	24 μ	8,7 cm ³ /m ²	5,6 BCM

100 LR l/cm	254 l/inch	45 °	1:13	30 μ	14,0 cm ³ /m ²	9,0 BCM
120 LR l/cm	305 l/inch	45 °	1:12	25 μ	12,5 cm ³ /m ²	8,1 BCM
160 LR l/cm	406 l/inch	45 °	1:12	22 μ	8,0 cm ³ /m ²	5,2 BCM

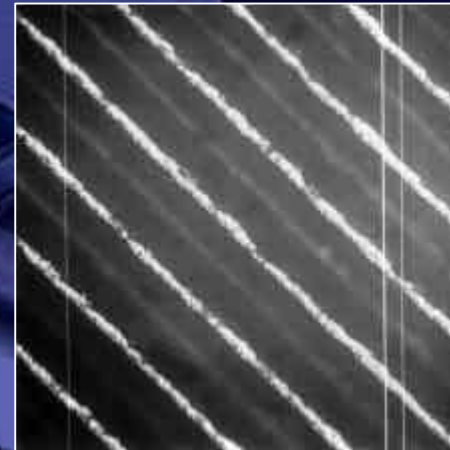
Tri-Helical-Engraving



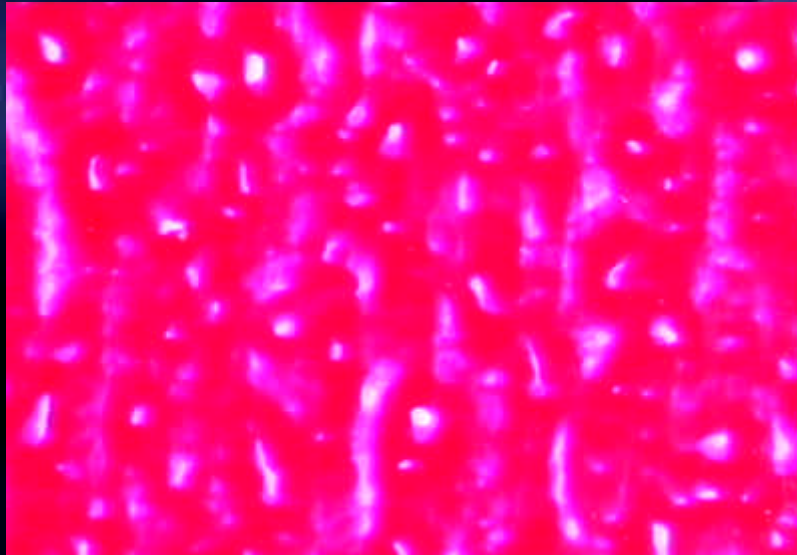
Tri-Helical-Engraving

advantages

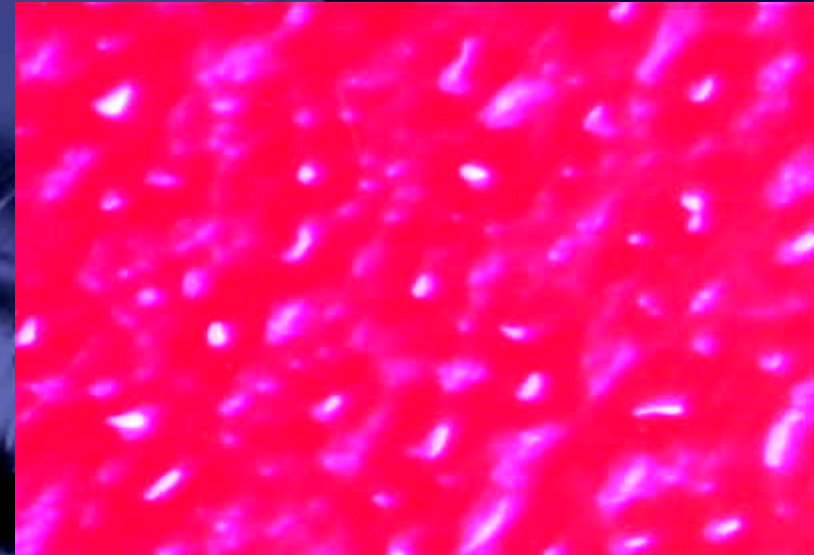
- ca. 30% more volume
- closed homogeneous surface
- more gloss
- easier to clean



Advantages of Tri-Helical-Engraving

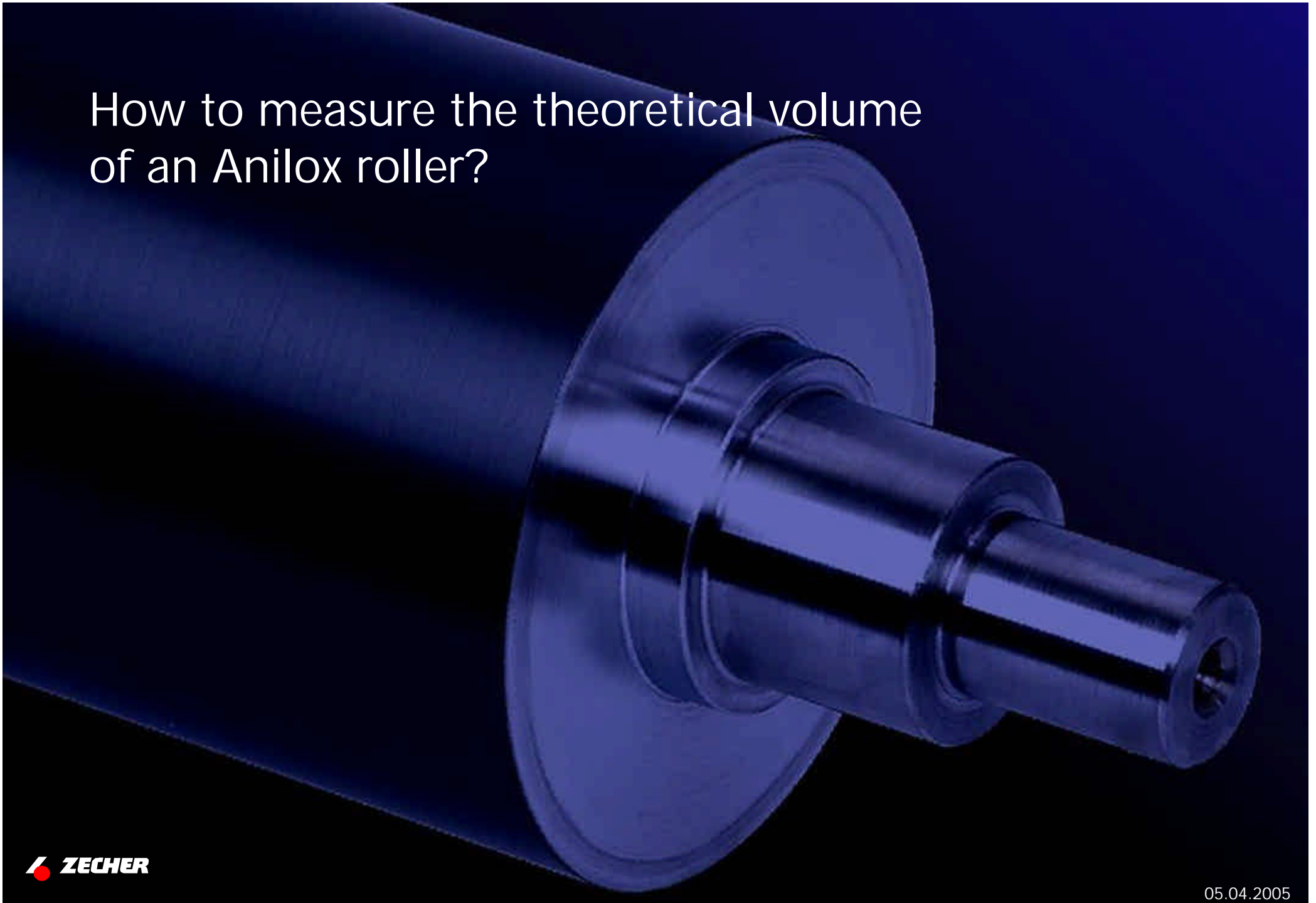


- Area not closed
- Pinholes are visible



- Area is closed better
- Pinholes reduced

How to measure the theoretical volume
of an Anilox roller?



Which volume measurement tools are available?

- Pipette measurement
 - ARMI, URMI 1, Volugraph, Ravol-Tester, etc. -
- Fluorescence
 - URMI 2 -
- Fluorescence
 - URMI2 new -
- Laser Scanning Microscope
 - Lasertec, Leica -
- Interference Microscope
 - WYKO -
- Measurement of electric capacity
 - Microspace -
- Capatch
 - Steinhardt -
- Math. Formula and mit Mikroskope
- needle

volume measurement

- in comparison -

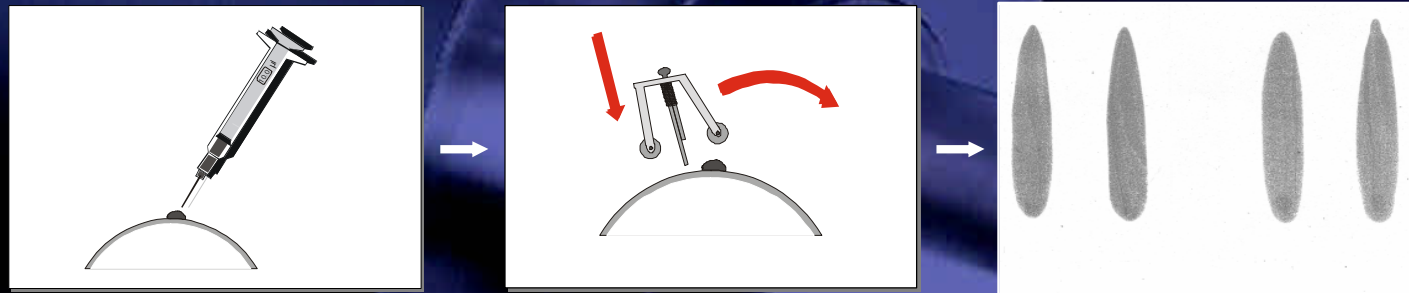
screen	angle	cell	depth	Laserscanning Microscope	Volugraph	Urmi 2	Urmi 2(neu)
300 l/cm	60°	1:13	9μ	3,00 cm ³ /m ²	3,47 cm ³ /m ²	2,83 cm ³ /m ²	2,40 cm ³ /m ²
255 l/cm	60°	1:14	12μ	4,20 cm ³ /m ²	4,26 cm ³ /m ²	3,53 cm ³ /m ²	2,75 cm ³ /m ²
225 l/cm	60°	1:14	16μ	5,40 cm ³ /m ²	4,97 cm ³ /m ²	3,85 cm ³ /m ²	3,10 cm ³ /m ²
195 l/cm	60°	1:15	13μ	4,60 cm ³ /m ²	4,79 cm ³ /m ²	4,03 cm ³ /m ²	2,95 cm ³ /m ²
160 l/cm	60°	1:15	18μ	5,90 cm ³ /m ²	6,26 cm ³ /m ²	4,70 cm ³ /m ²	3,60 cm ³ /m ²
140 l/cm	60°	1:16	18μ	5,80 cm ³ /m ²	5,65 cm ³ /m ²	4,73 cm ³ /m ²	3,33 cm ³ /m ²
100 l/cm	60°	1:18	35μ	9,20 cm ³ /m ²	9,30 cm ³ /m ²	8,20 cm ³ /m ²	6,15 cm ³ /m ²
80 l/cm	60°	1:20	40μ	11,70 cm ³ /m ²	12,60 cm ³ /m ²	9,93 cm ³ /m ²	8,18 cm ³ /m ²

*measurements done by DFTA-TZ, Stuttgart

Volume measurement by Volugraph

■ Pipette Applications

ARMI, URMI 1, Volugraph, Ravol-Tester, etc.



calculation

by Hand
(Planimeter)

or automatically by
Z.VoLuCheck

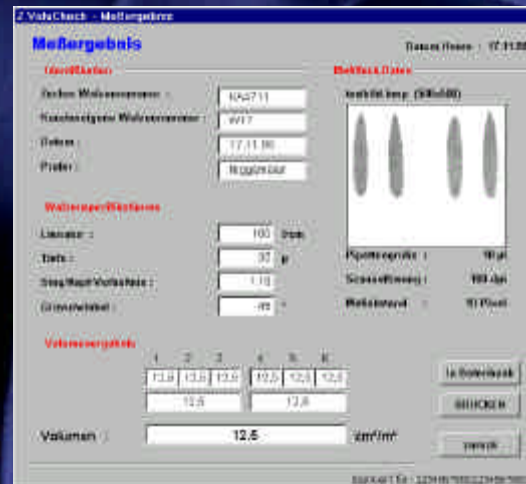
Z-VoluCheck

Single measurement
and database support

programmed
volume-
measurement

Detailed
measurement result

Add additional
information and build a
History-List



Z-VoluCheck

programmed
volume-
measurement

Measurement Result

Measurement Result

Today : 17.11.98

Identification

Zecher Roller ID : KA4711
Customer Roller ID: W17
measurement day : 17.11.98
measurement by : Niggemeier

measurement-data

testpicture.bmp (500x500)

Pipette Size : 10 µl
Scan Resolution : 100 dpi
Measurement : 10 Pixel

Roller Specification

screen count : 100 l/cm
depth : 35 µ
Land/Cell-ratio : 1:18
engraving angle : 45 °

Volume Result

1	2	3	4	5	6
12,5	12,5	12,5	12,5	12,5	12,5
12,5			12,5		

Volume : 12,5 cm³/m²

into database
PRINT OUT
back

licensed for: 12345678901234567890

tional
ion and build a
list

Datum Heute : 17.11.98

testbild.bmp (500x500)

2	3	4	5	6
12,5	12,5	12,5	12,5	12,5

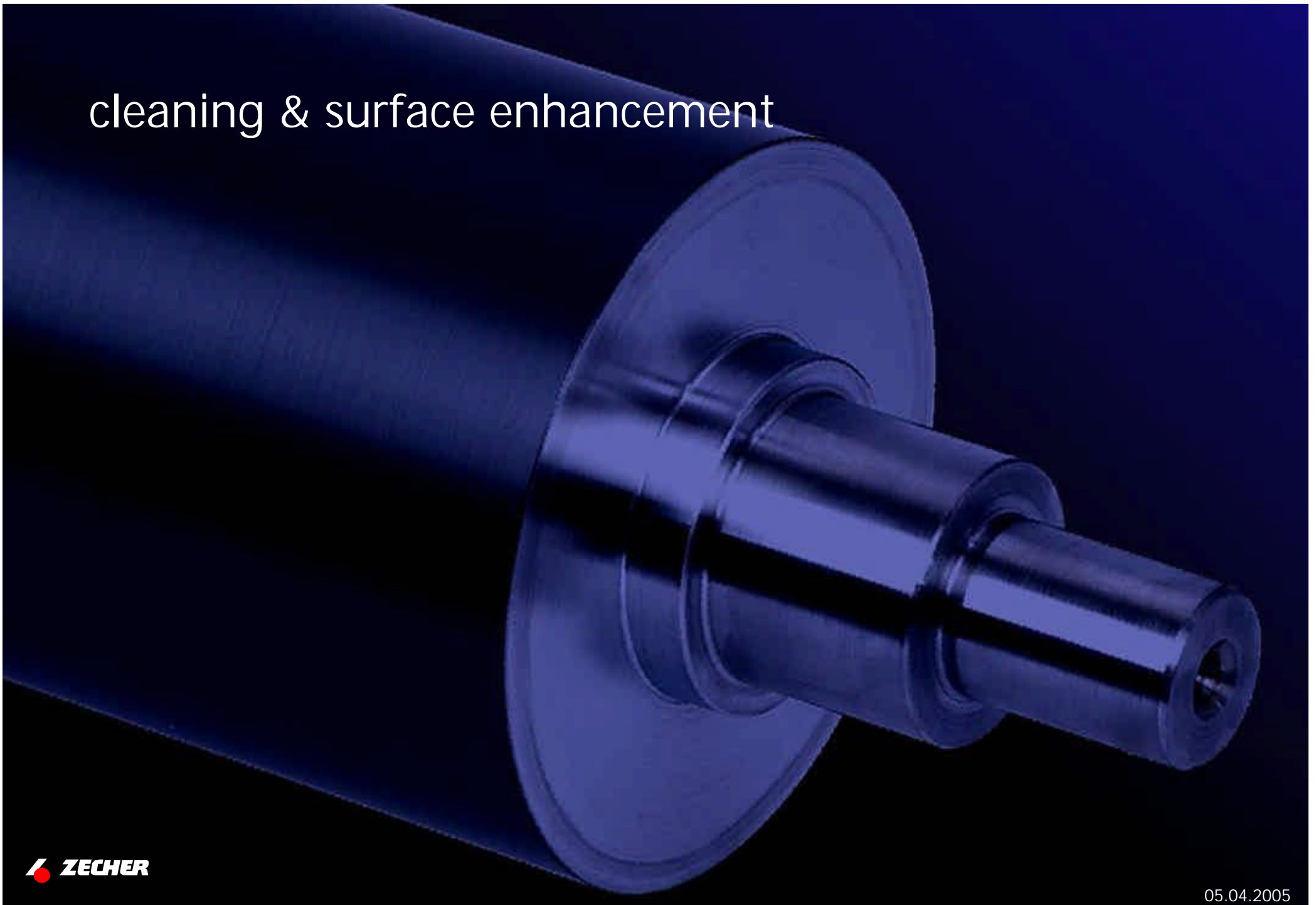
10 µl
100 dpi
10 Pixel

12,5 cm³/m²

satzes von 2K-Farbe mußte die Walze sehr intensiv gereinigt werden
Beschädigungen am Zapfen festgestellt
ist vorhanden. Die Walze ist vorzugsweise für Yellow einzusetzen.

zurück in Datenbank aufnehmen

cleaning & surface enhancement



cleaning

■ first rule:

- clean **always** and **immediately** !

■ second rule:

- clean after rinsing immediately with a wet towel

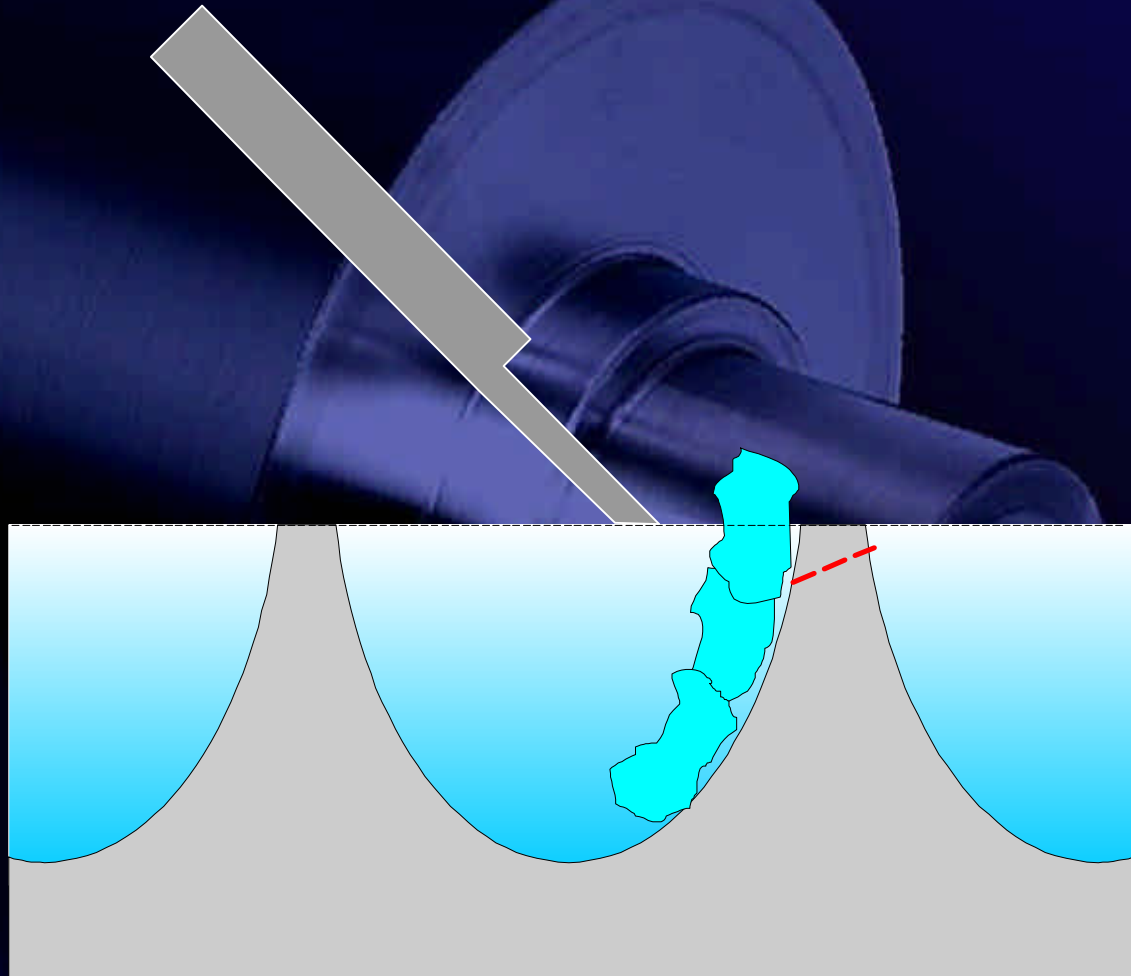
■ third rule:

- dry always
- use a dry and clean towel
- prevent dried rinsing traces etc.

cell walls

damaging of cells walls

- e.g. by hard ink particles -



Cleaning methods

■ chemical agents

- you will discover all sorts of agents on the market - from mild to aggressive
- realise: the more aggressive, the worse for the anilox cylinder

■ mechanical tools

- e.g. brush or blasting
- realise: you apply a more or less heavy working on the cell walls

■ ultra sonic cleaning

- as to our experience the most careful method and excellent cleaning results

- Ink release
- Cleaning ability
- Wear resistance
- Corrosion protection

improve
properties with

I.T.S.
surface enhancement

I.T.S.

modifies and condenses the molecular structure of the ceramic!

improvements are achieved in the atomic structure and are not to be detected by an usual light microscope. -> "invisible"

additional properties can be achieved
and are added :

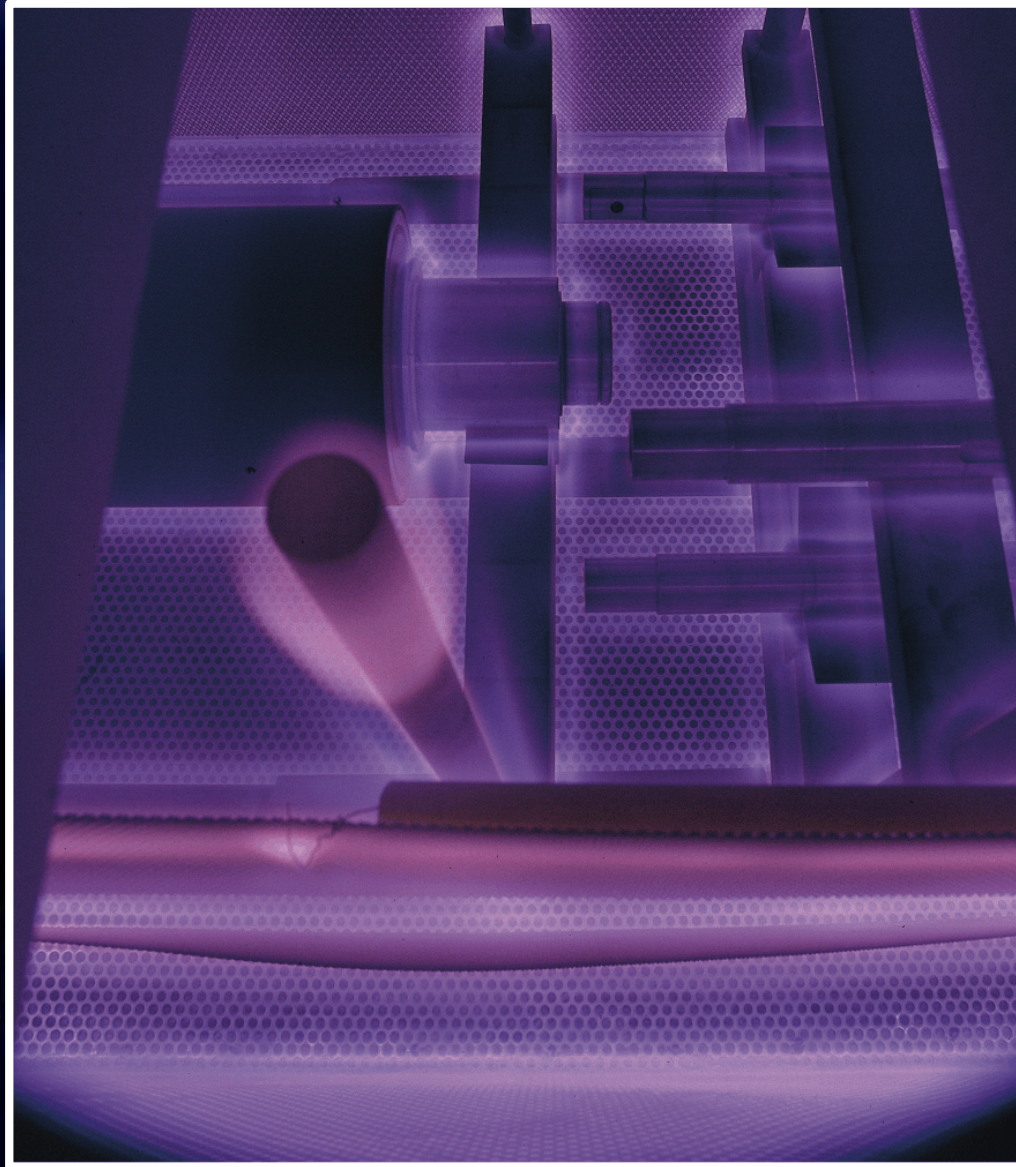
- e.g. Ink is not penetrating anymore into the ceramic layer!
It is being prohibited that the ceramic gets dirty and
necessary cleaning time is being reduced.
- e.g. The wear resistance is increased,
longer lifetime.
- e.g. An additional corrosion protection
is being achieved.

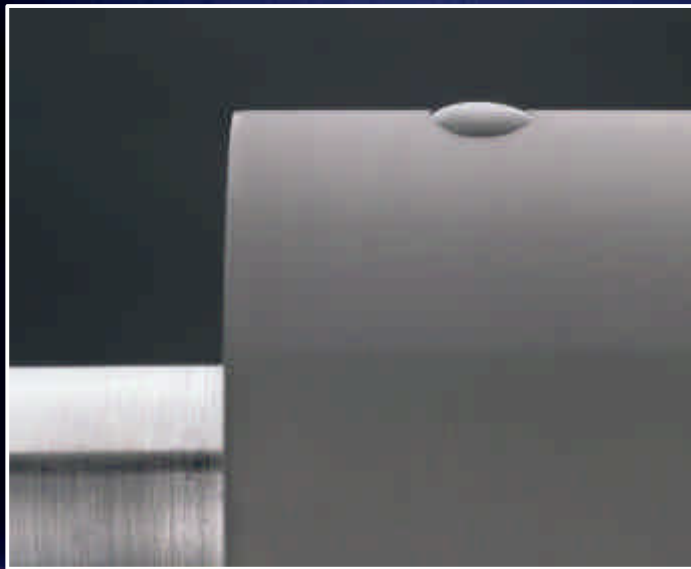
once the **I.T.S.**-treatment is applied it can not be removed anymore (!), neither chemical, nor mechanical.

The positive effect of the **I.T.S.**-treatment remains effective !

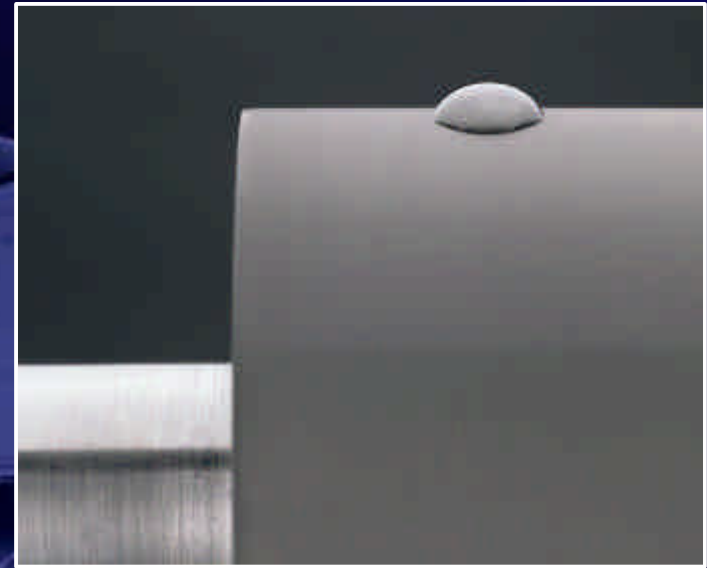
during treatment process:

I.T.S.
modifies and
condenses
the molecular
structure!





normal ceramic
normal surface tension



surface performance after
I.T.S.



Thank you for your attention !