

# CYLINDER LIFETIME AND MILEAGE

**janoschka**

**Uthiyakumar Murugaiah**  
**Director Cluster Asia-Pacific,**  
**Janoschka Group**



# CYLINDER LIFETIME AND MILEAGE

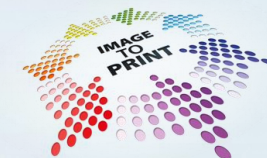
**janoschka**

**Uthiyakumar Murugaiah**  
**Director Cluster Asia-Pacific,**  
**Janoschka Group**



**Daetwyler**

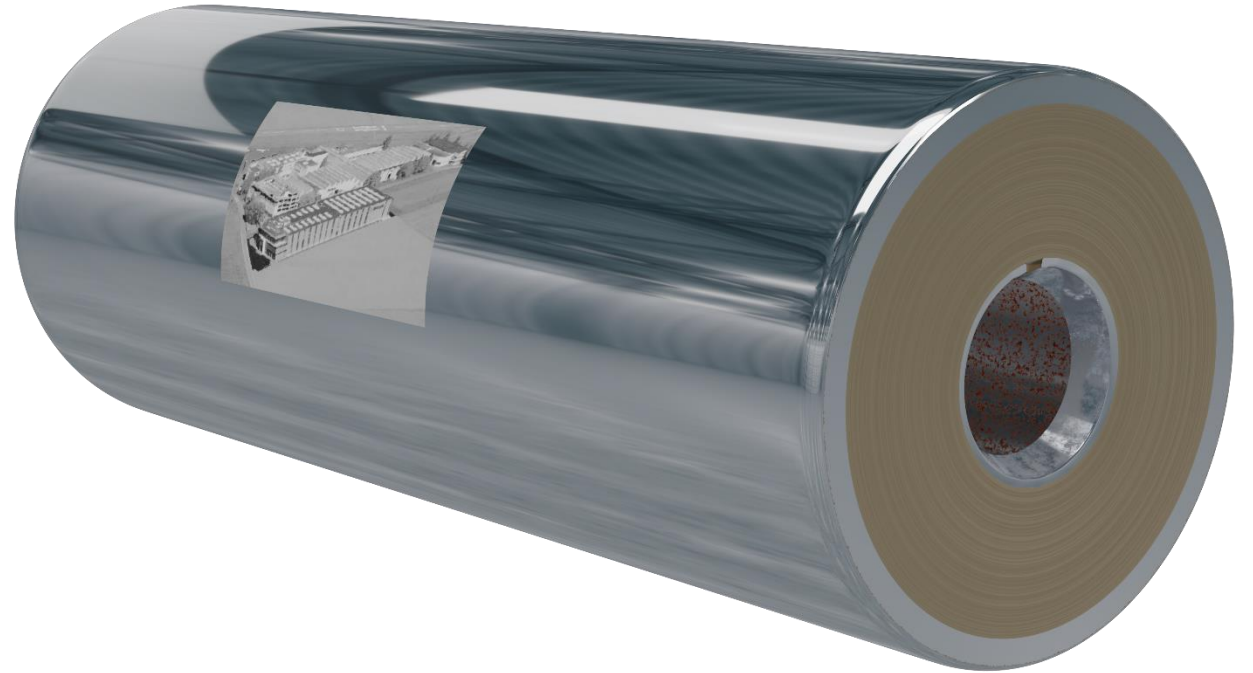
**Nathan Clarke,**  
**Technical Sales Manager SEA**  
**Daetwyler SwissTec**



# What has an influence on cylinder lifetime?

## 1. Cylinder:

- Balancing of the base
- Quality of chrome
- Surface structure
- Handling
- Storage Conditions



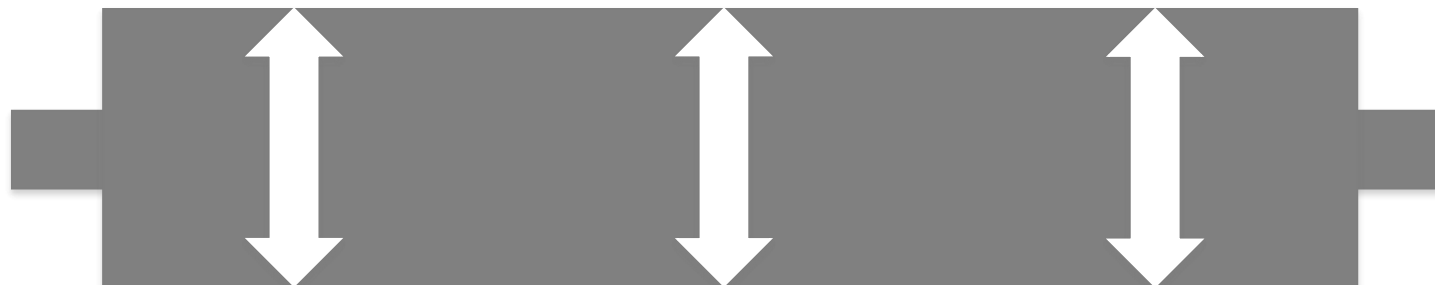
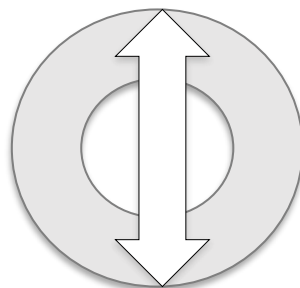
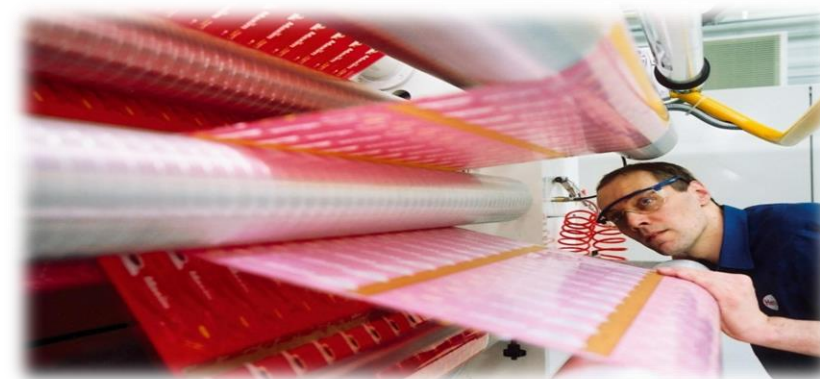
# CYLINDER PRODUCTION

## Polishing and Finishing

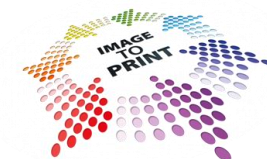
Modern printing-machines reach production speeds of up to 500 meters per minute.

Therefore, the diameter and of the cylinder needs to be extremely accurate.

→ And this over the full length of a cylinder



→ Any Irregularity cause problems with web-tension,  
register problems and printing defects  
and as a result, cause customer claims !

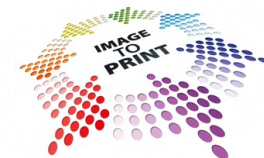
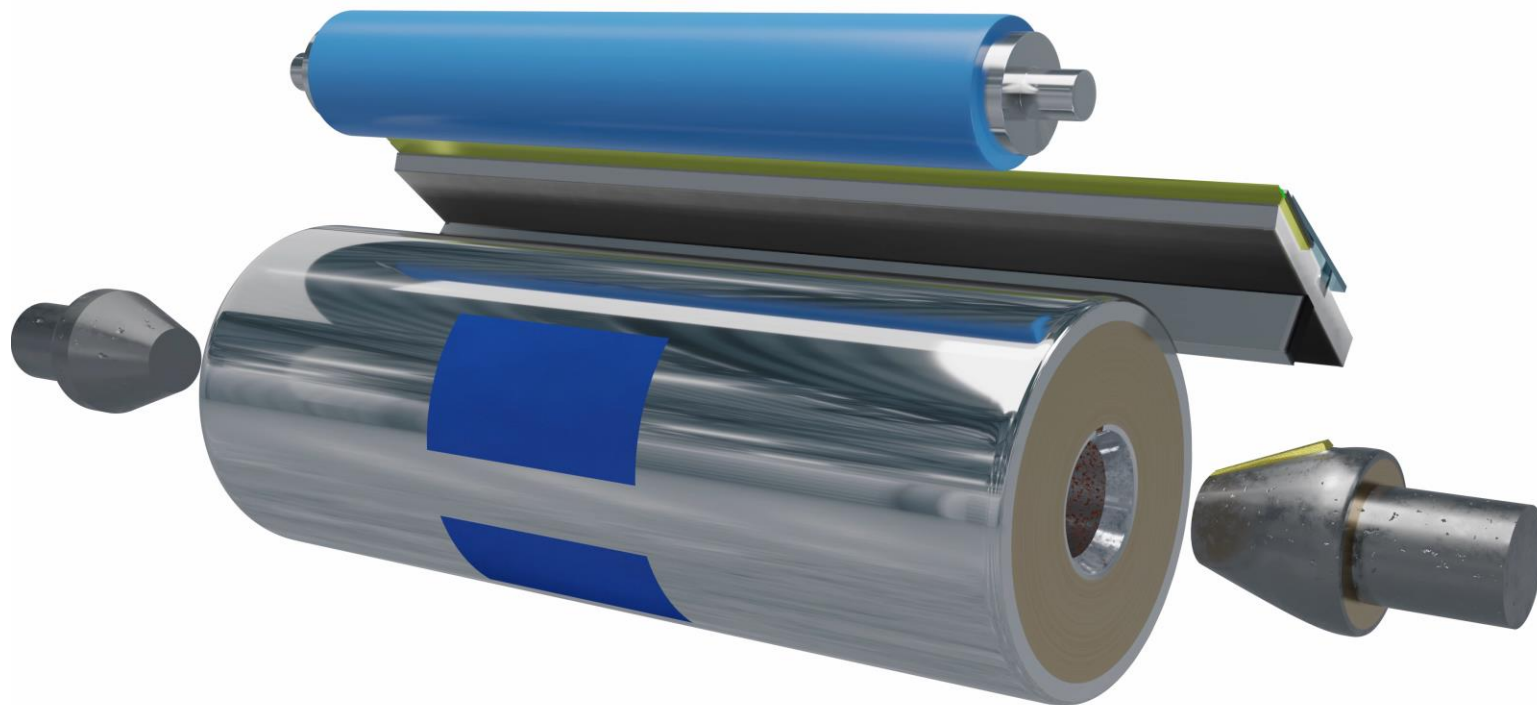


# PRODUCTION INSTALLATION

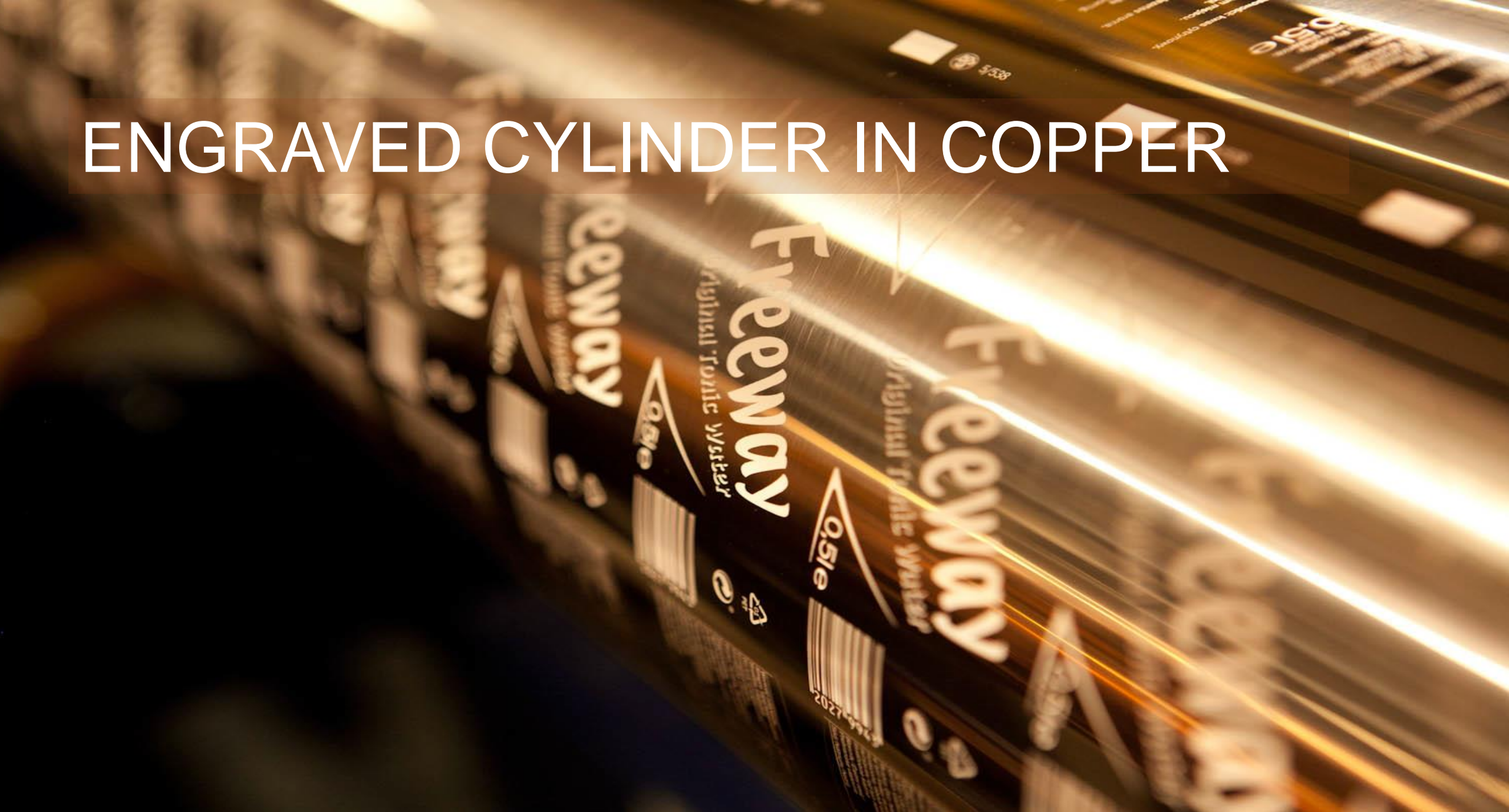
## THE CONNECTION



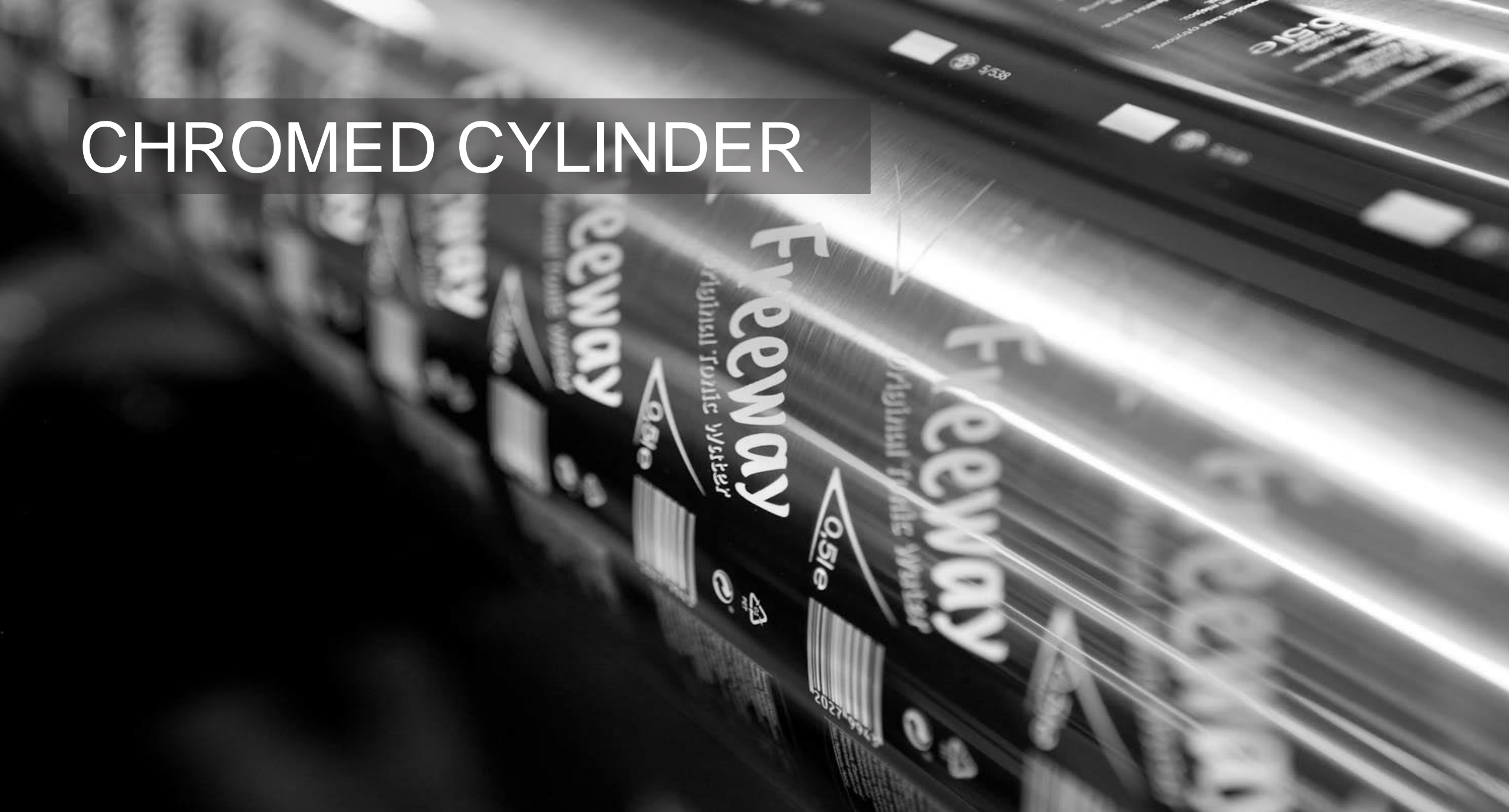
Drive shafts should be kept clean



# ENGRAVED CYLINDER IN COPPER



# CHROMED CYLINDER



# CYLINDER PRODUCTION



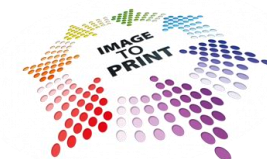
Some people believe that  
thicker chrome **protects**  
cylinders better...

**WRONG!**

- ✓ Copper-Hardness is  $\approx 190 - 220 \text{ Wy}$
- ✓ Chrome-Hardness is  $\approx 850 - 1150 \text{ Wy}$

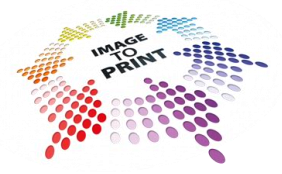
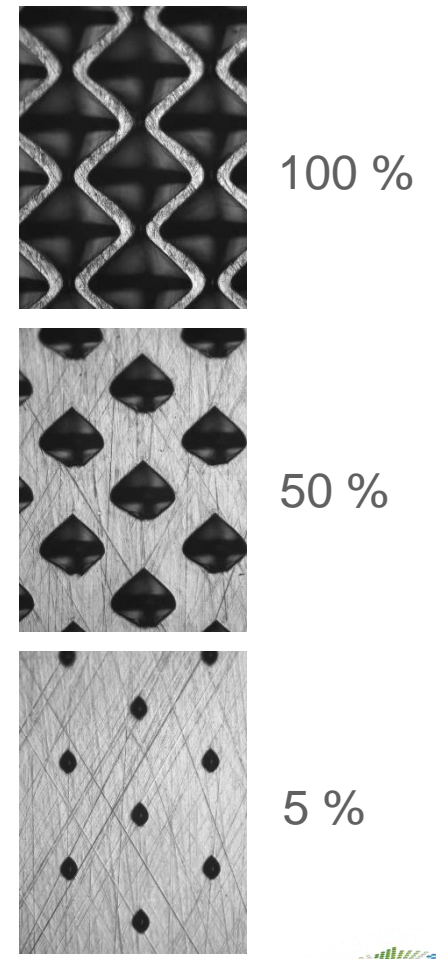
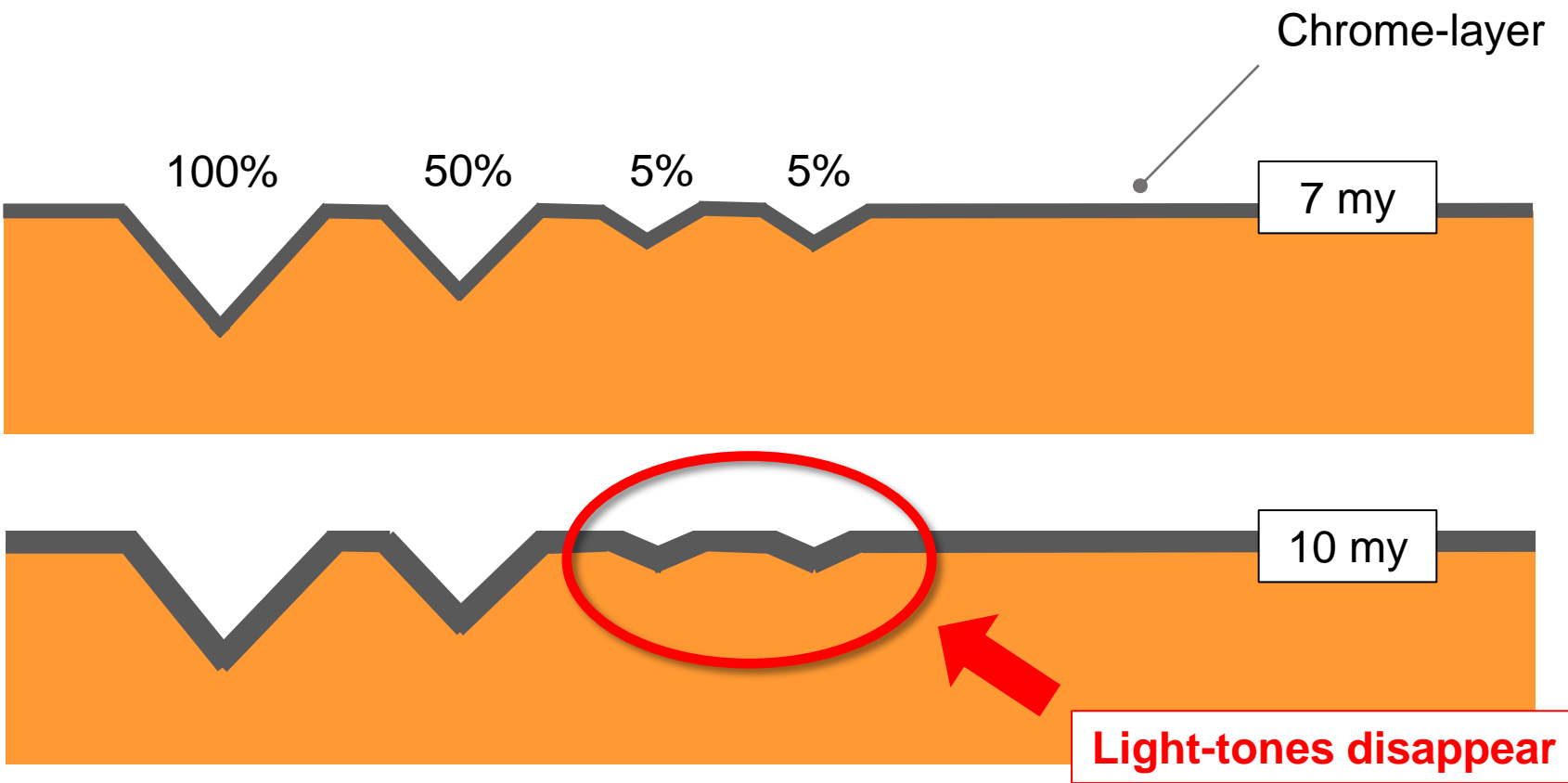
## Chrome-layer:

- Chrome is 5-times harder than copper
- Chrome layer thickness is usually 7-8 my
- In Asia, market requirement is 10 my
- protecting the engraving
- resistant to doctor-blade, ink and substrate
- de- and re-chroming is possible  
(but not unlimited)



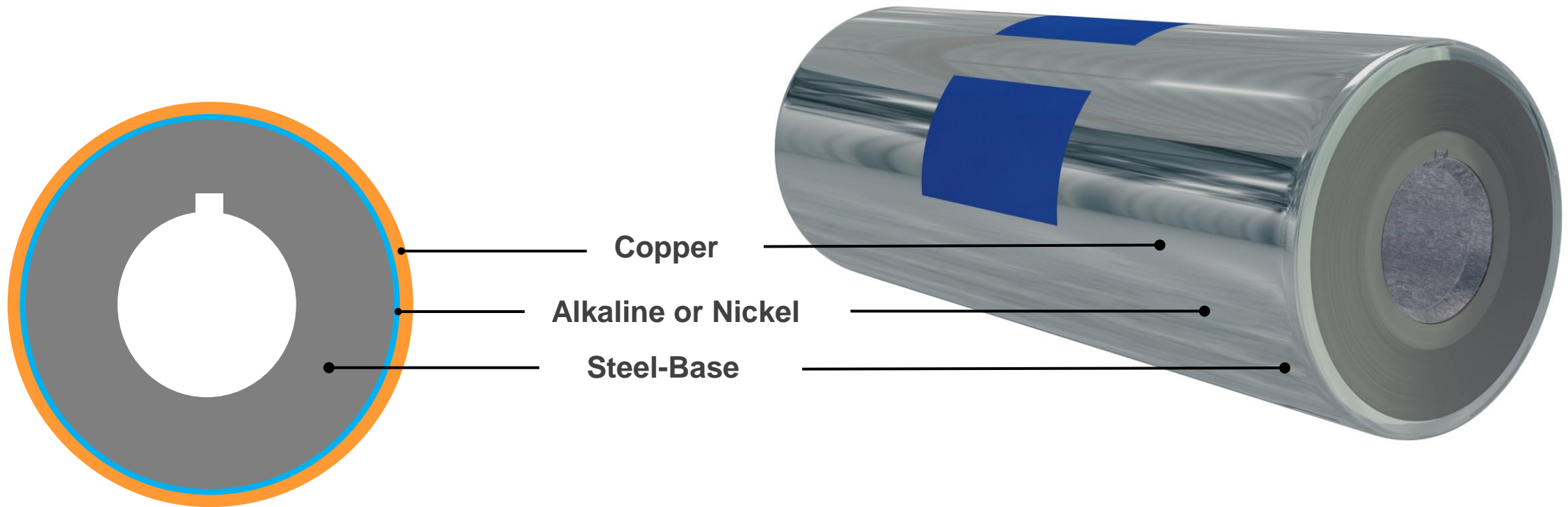
# PRODUCTION STEPS

## Chrome-Plating



# CYLINDER PRODUCTION

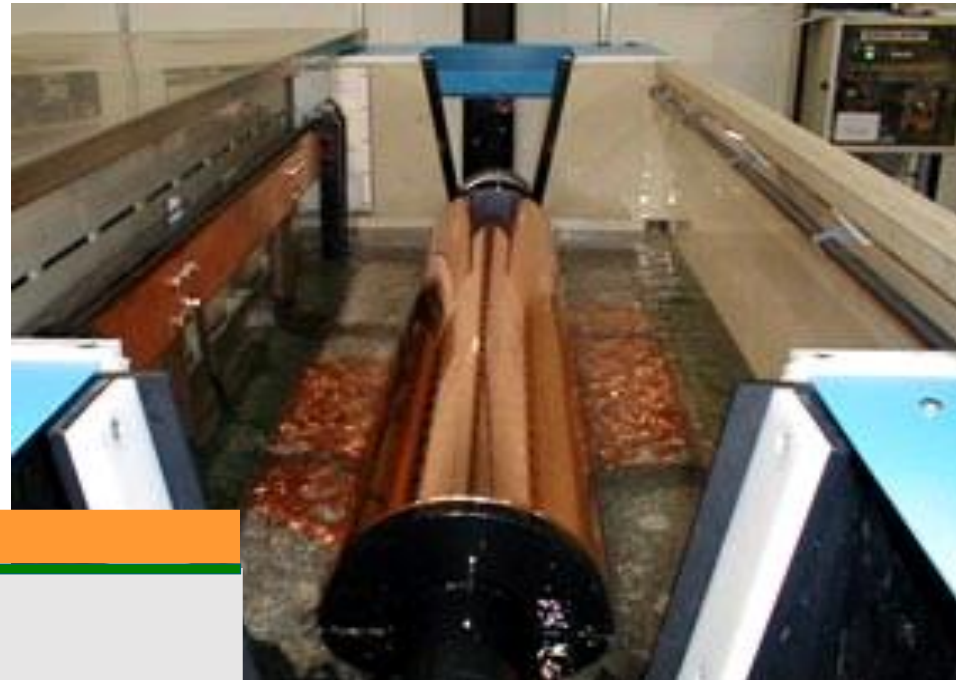
Copper-plating process



# CYLINDER PRODUCTION

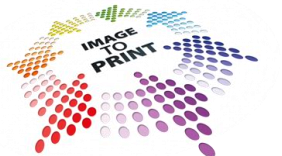
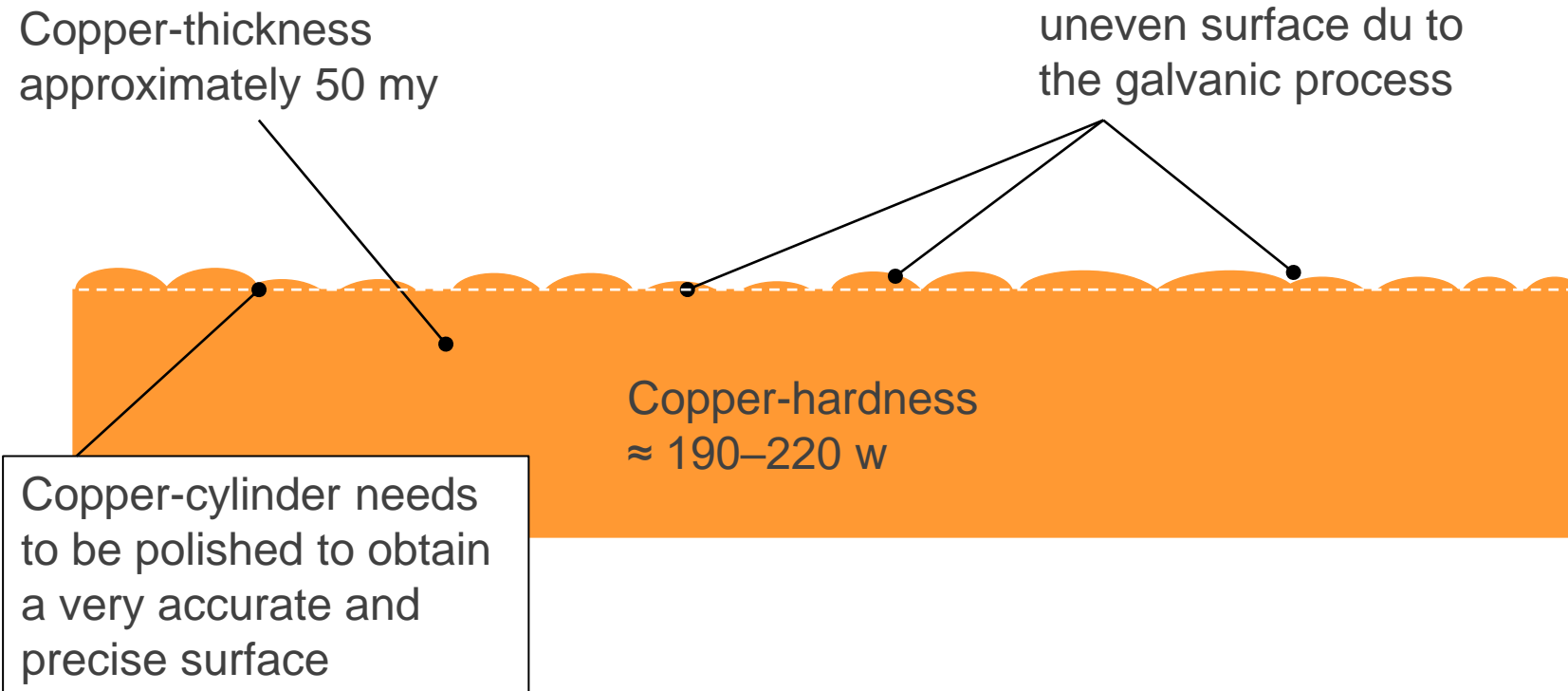
Galvano- or electro-plating process

Copper-thickness  
approximately 50 my



# CYLINDER PRODUCTION

Galvano- or electro-plating process



# CYLINDER PRODUCTION

## Surface Polishing

Polishmaster – Finishmaster - CFN



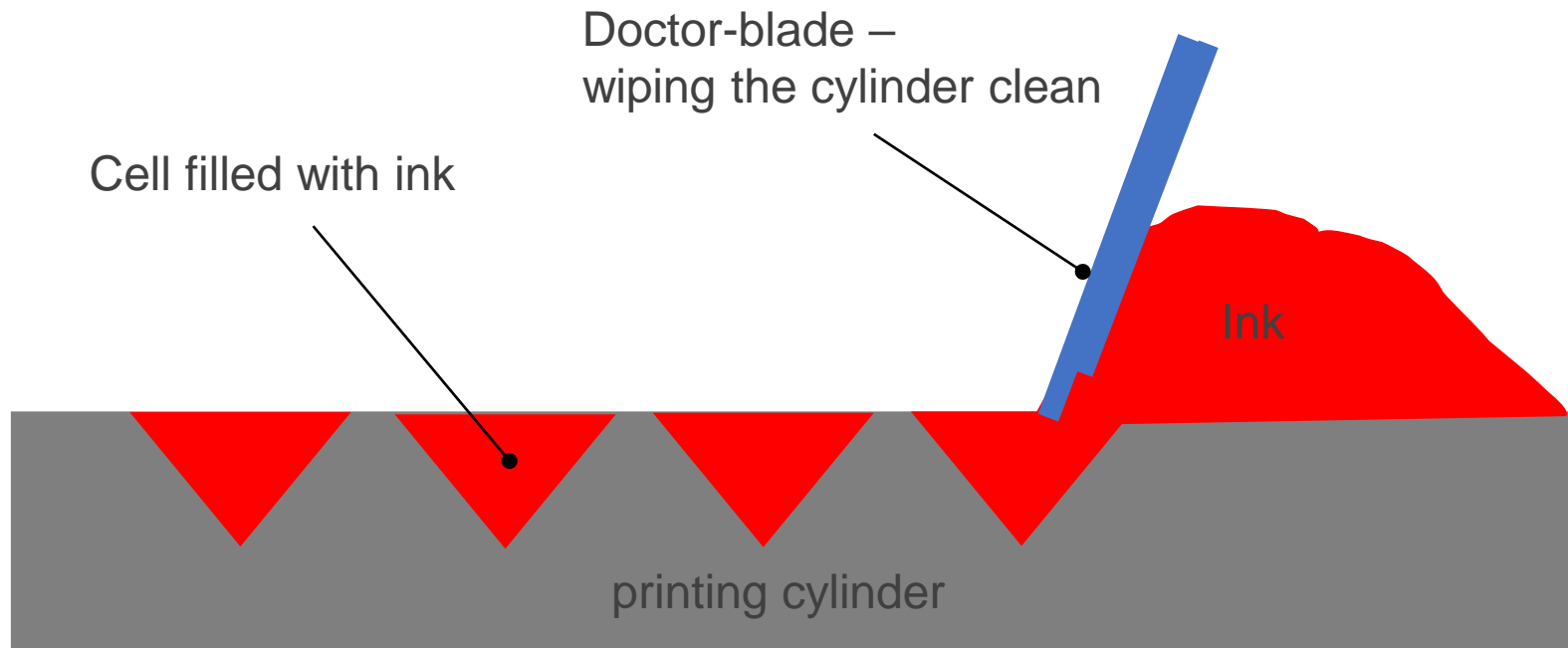
# CYLINDER PRODUCTION

Cylinder Surface after Polishing



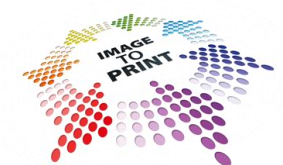
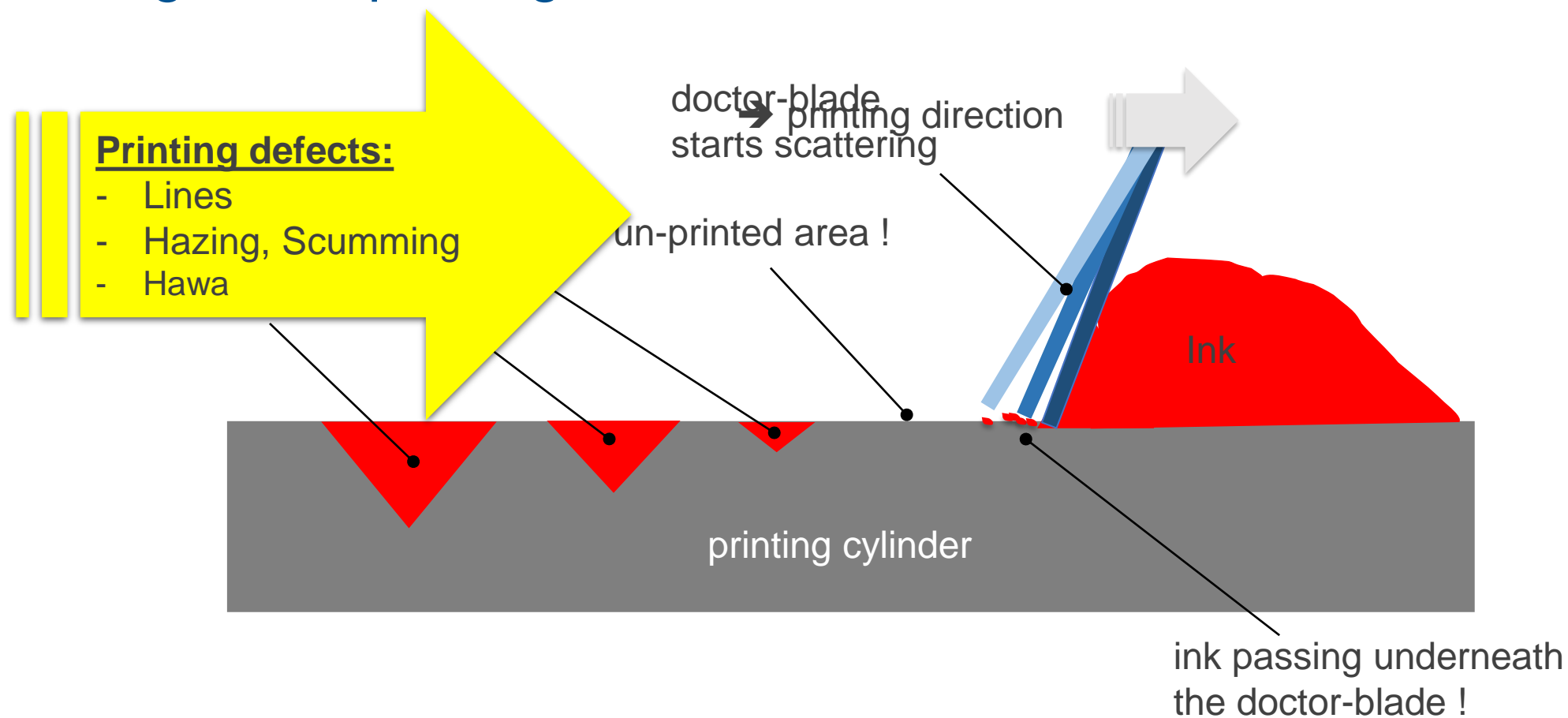
# THE PRINCIPLES

## of rotogravure printing



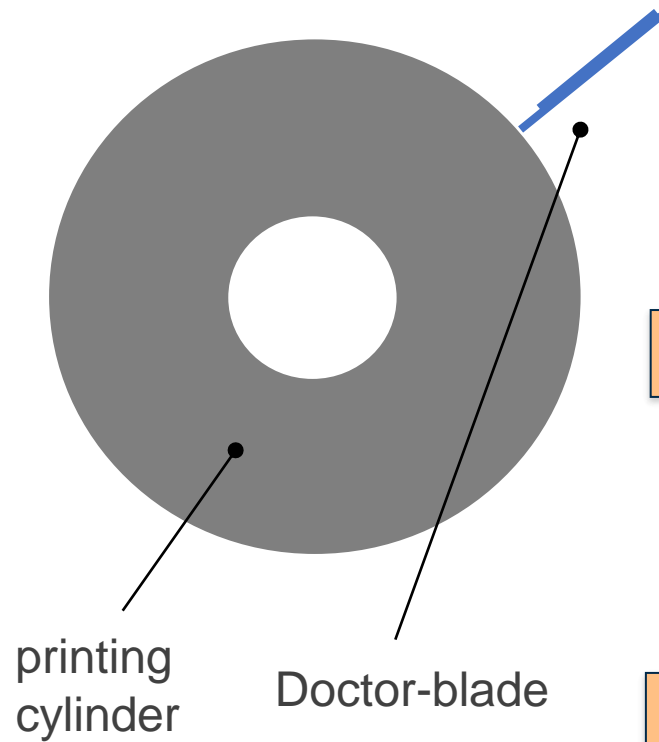
# THE PRINCIPLES

## of rotogravure printing

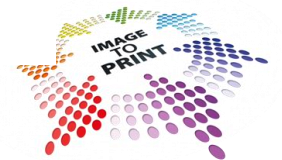
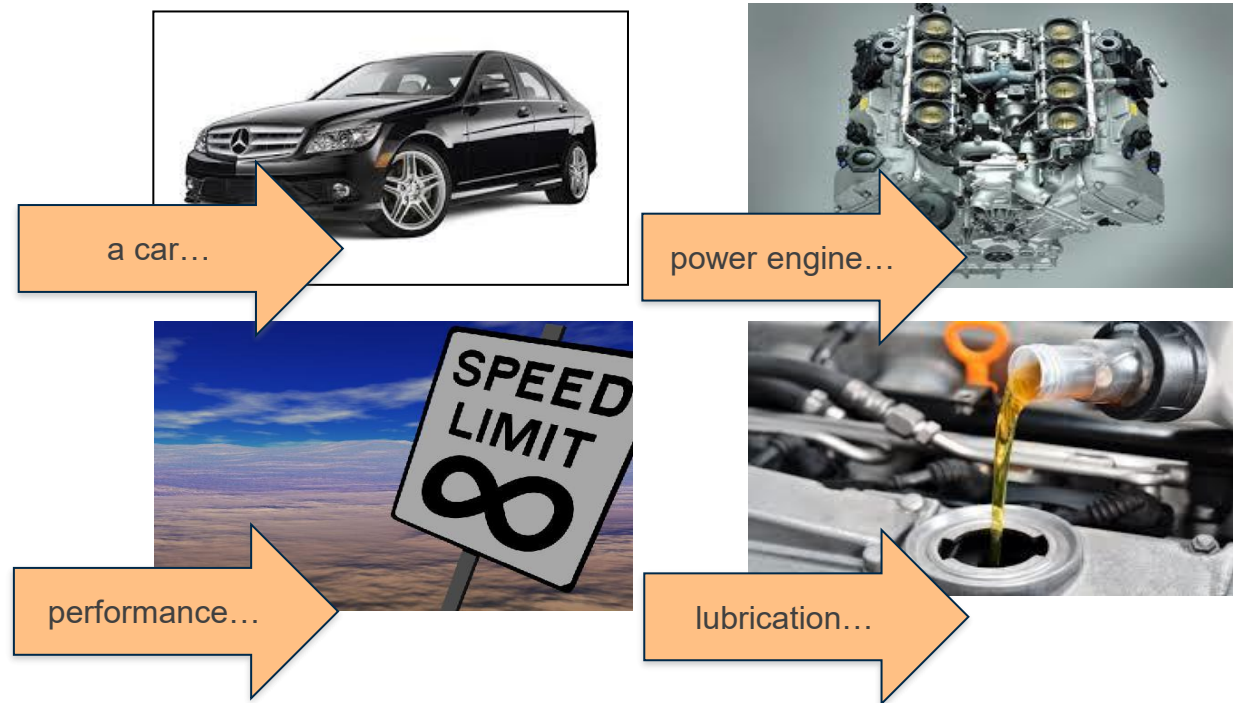


# LUBRICATION

## – Cylinder / Doctor-Blade

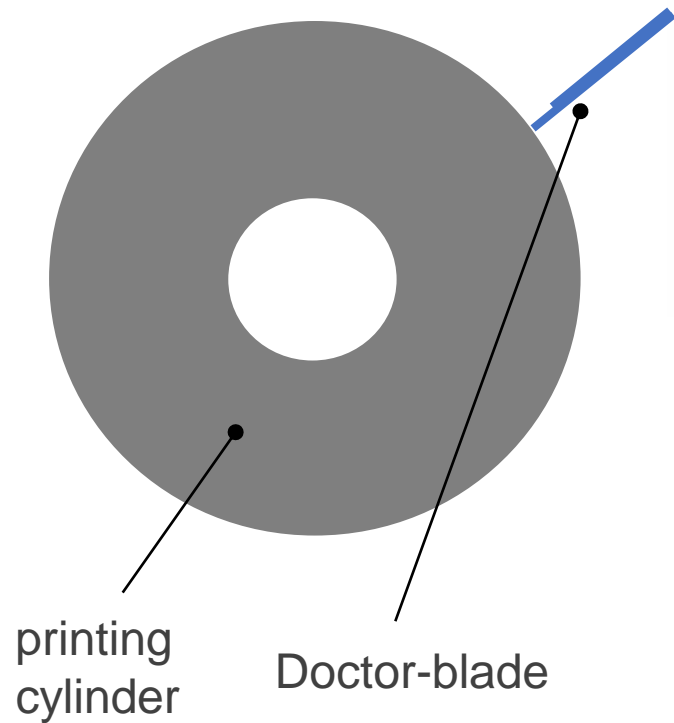


Metal on metal is a resistant,  
but not a preferred combination of materials.



# LUBRICATION

## – Cylinder / Doctor-Blade



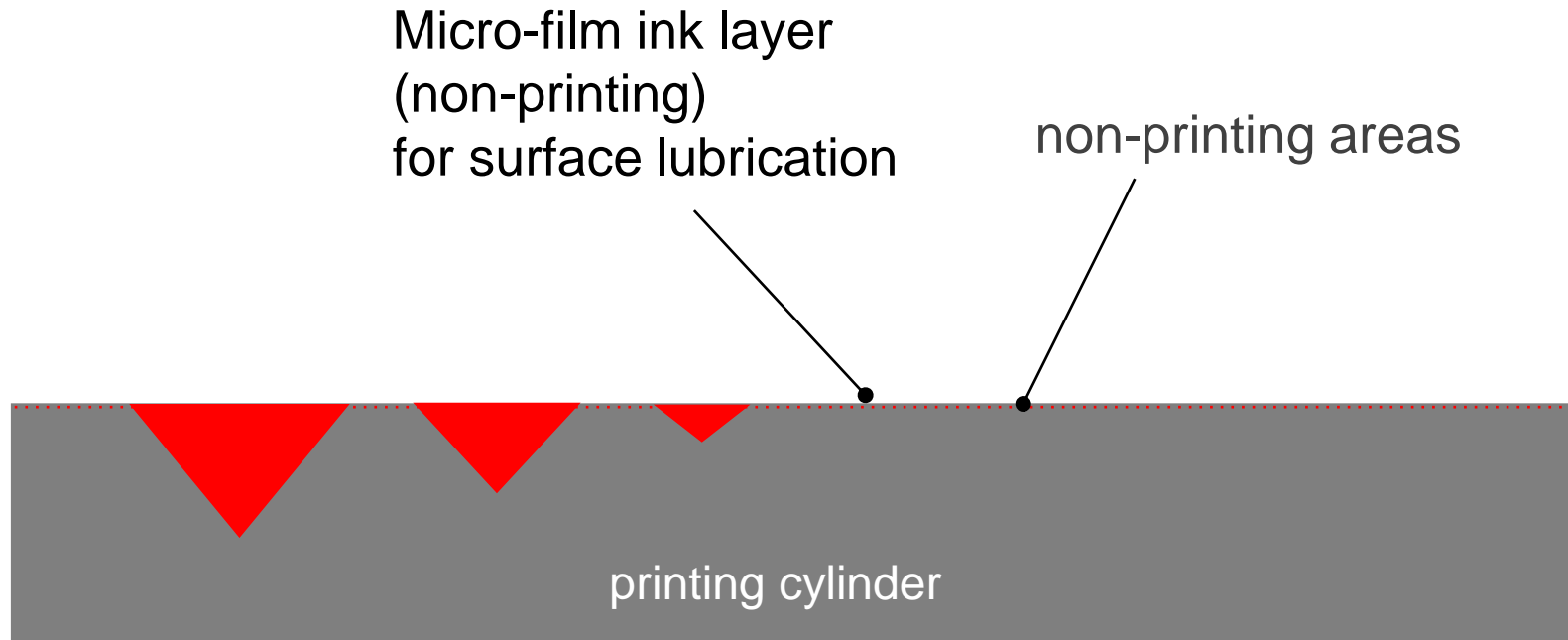
Metal on metal is a resistant, but not a preferred combination of materials.

**Lubrication** is needed to improve **correlation** between the 2 materials



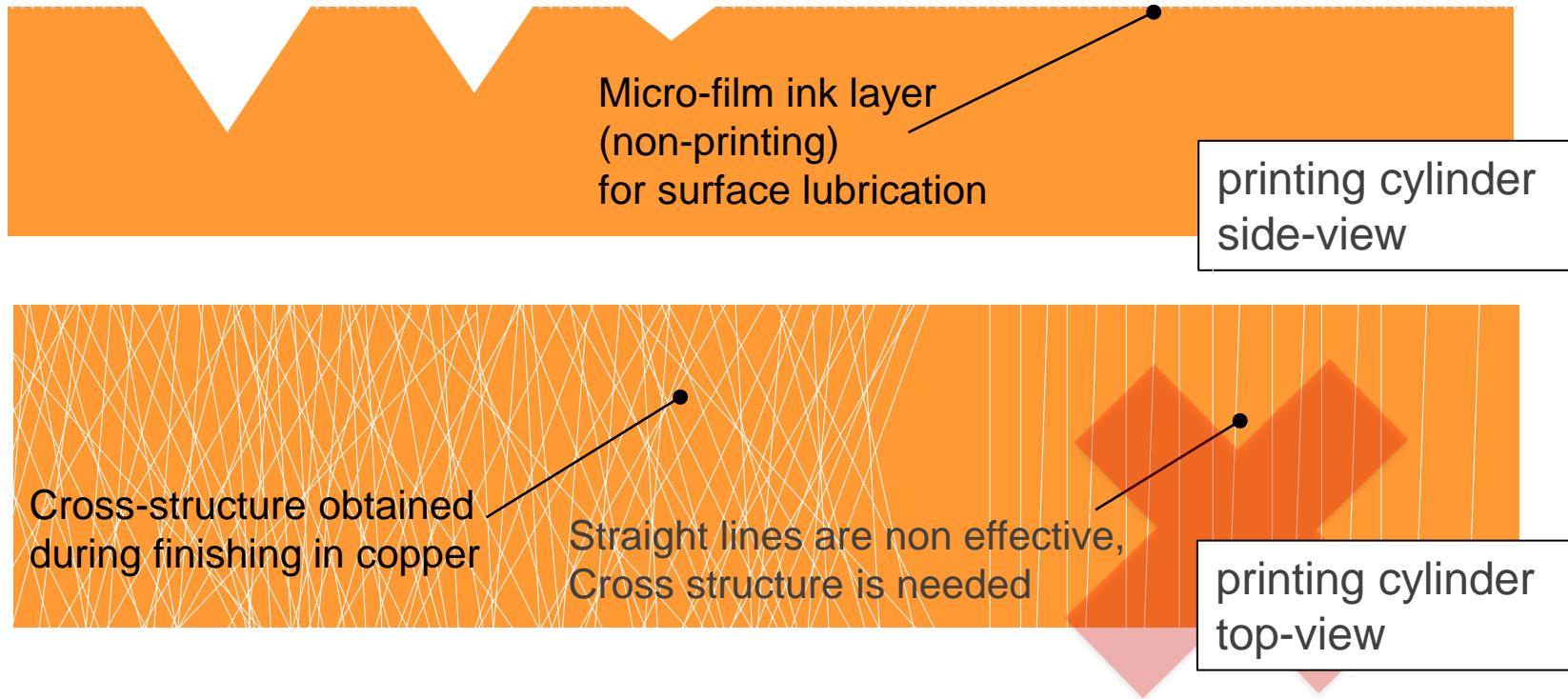
# LUBRICATION

## – Cylinder / Doctor-Blade



# LUBRICATION

## – Cylinder / Doctor-Blade



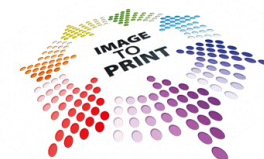
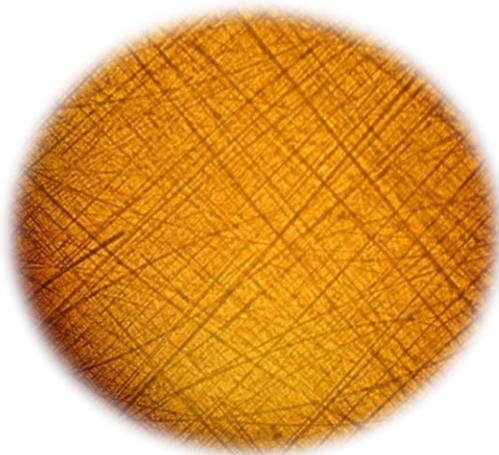
# SURFACE FINISHING

## – before engraving

Surface finishing has to be done in copper, After polishing and before engraving.

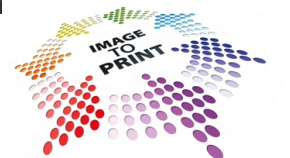
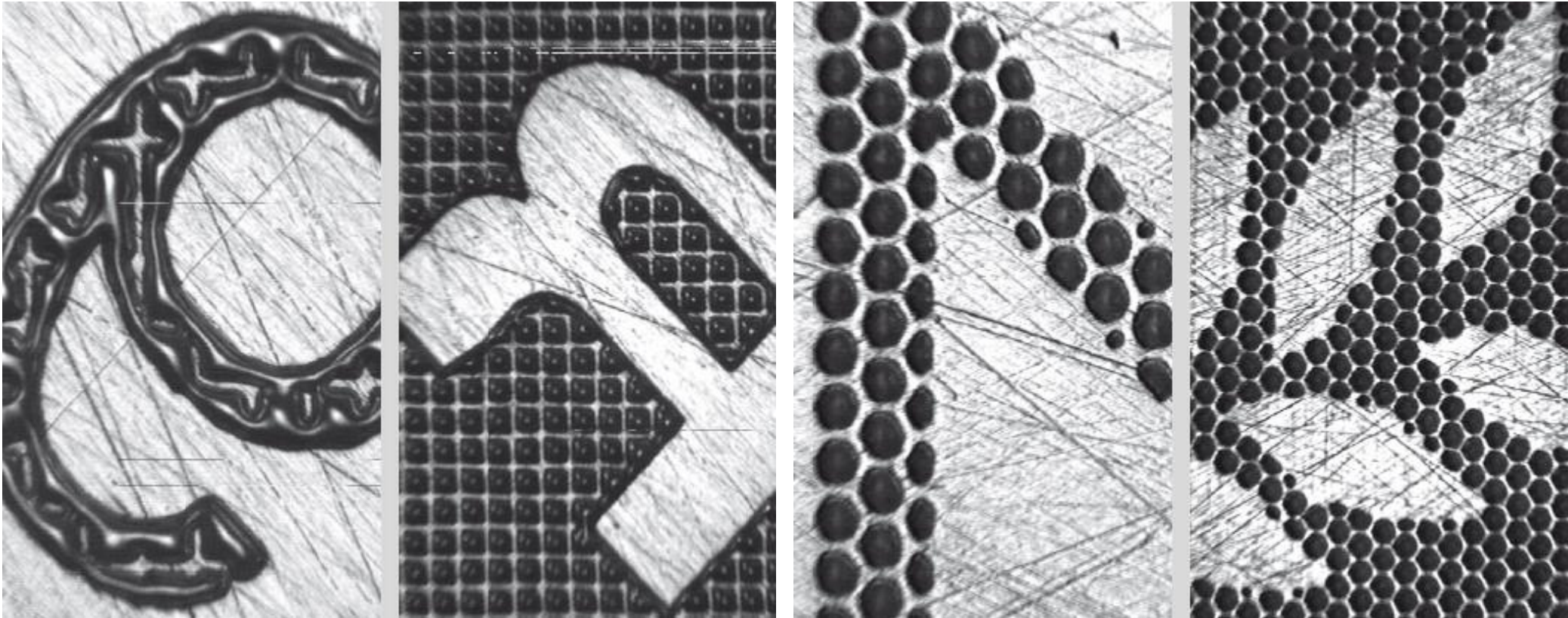
The Surface-Structure needs to be adjusted according to the Printers-specifications, and it is measured in RZ or RA values, taking into consideration:

- Inks
- Doctor-blade
- Substrate
- Machine settings
- Printing speed
- ... /



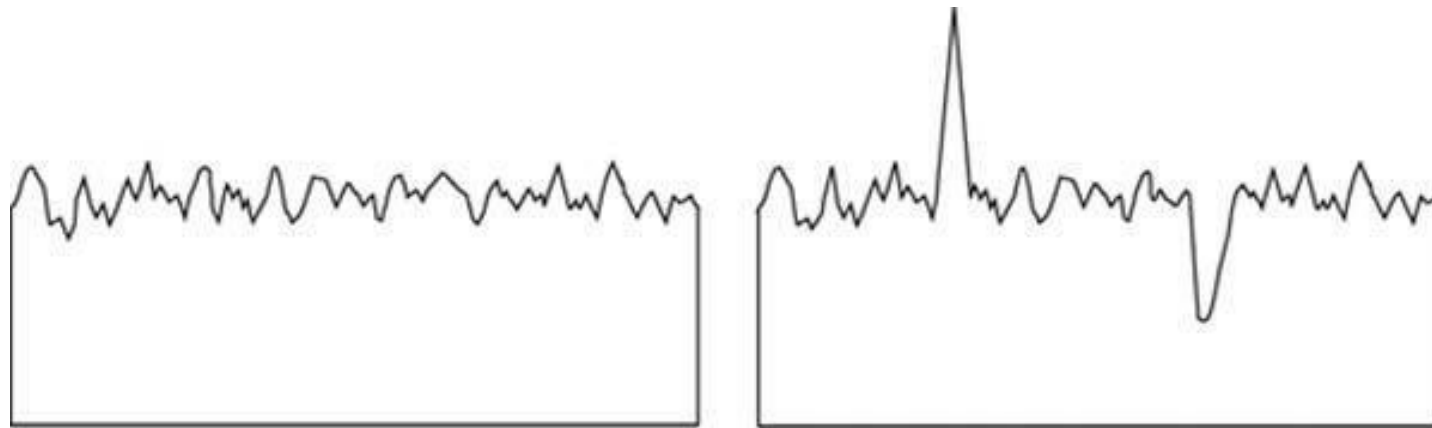
# SURFACE ROUGHNESS

in none printing areas



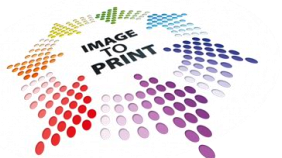
# Surface Roughness: RA - RZ

- **Ra** measures the average length between the peaks and valleys and the deviation from the mean line on the entire surface within the sampling length.
- **Rz** measures the vertical distance from the highest peak to the lowest valley within five sampling lengths and averages the distances.



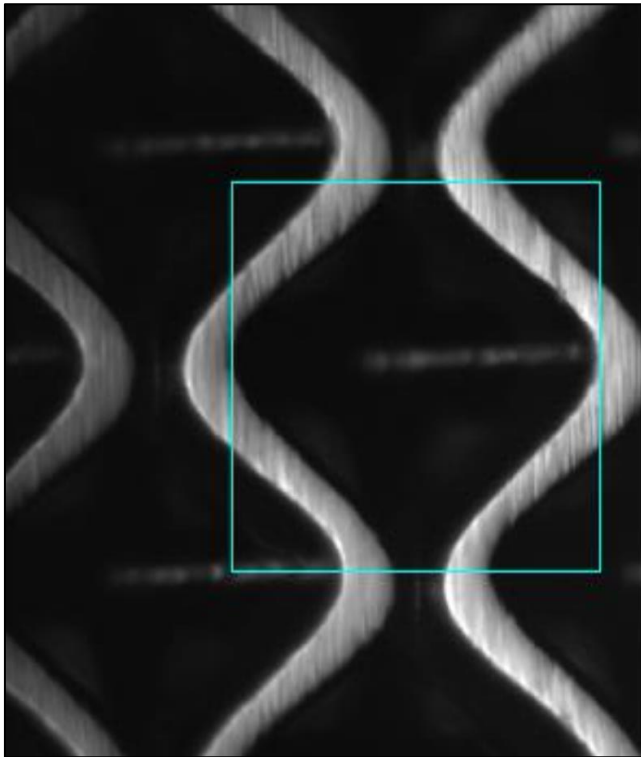
$$R_a = R_a$$

$$R_{max} < R_{max}$$

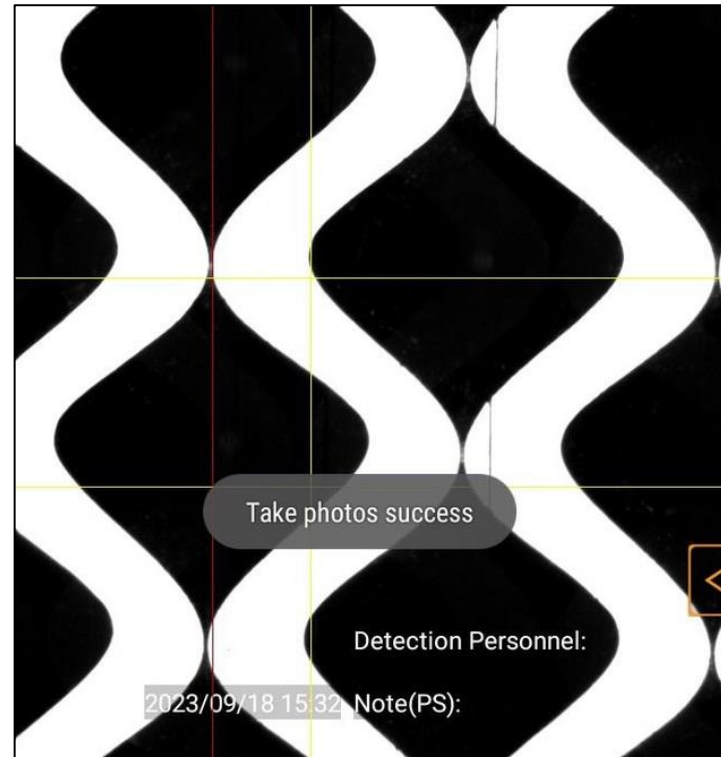


# THE RESULT

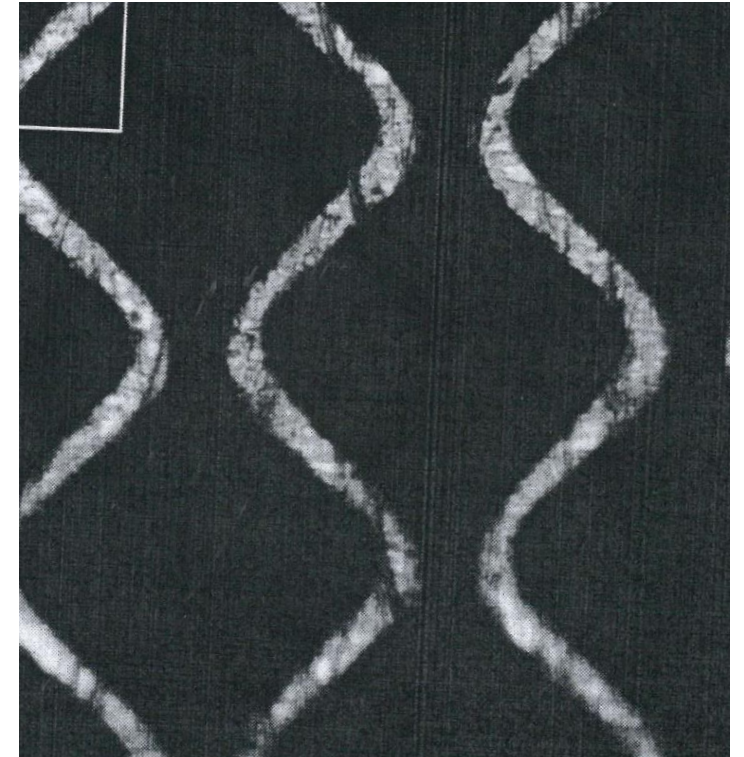
New Cylinder



Cylinder after print-run



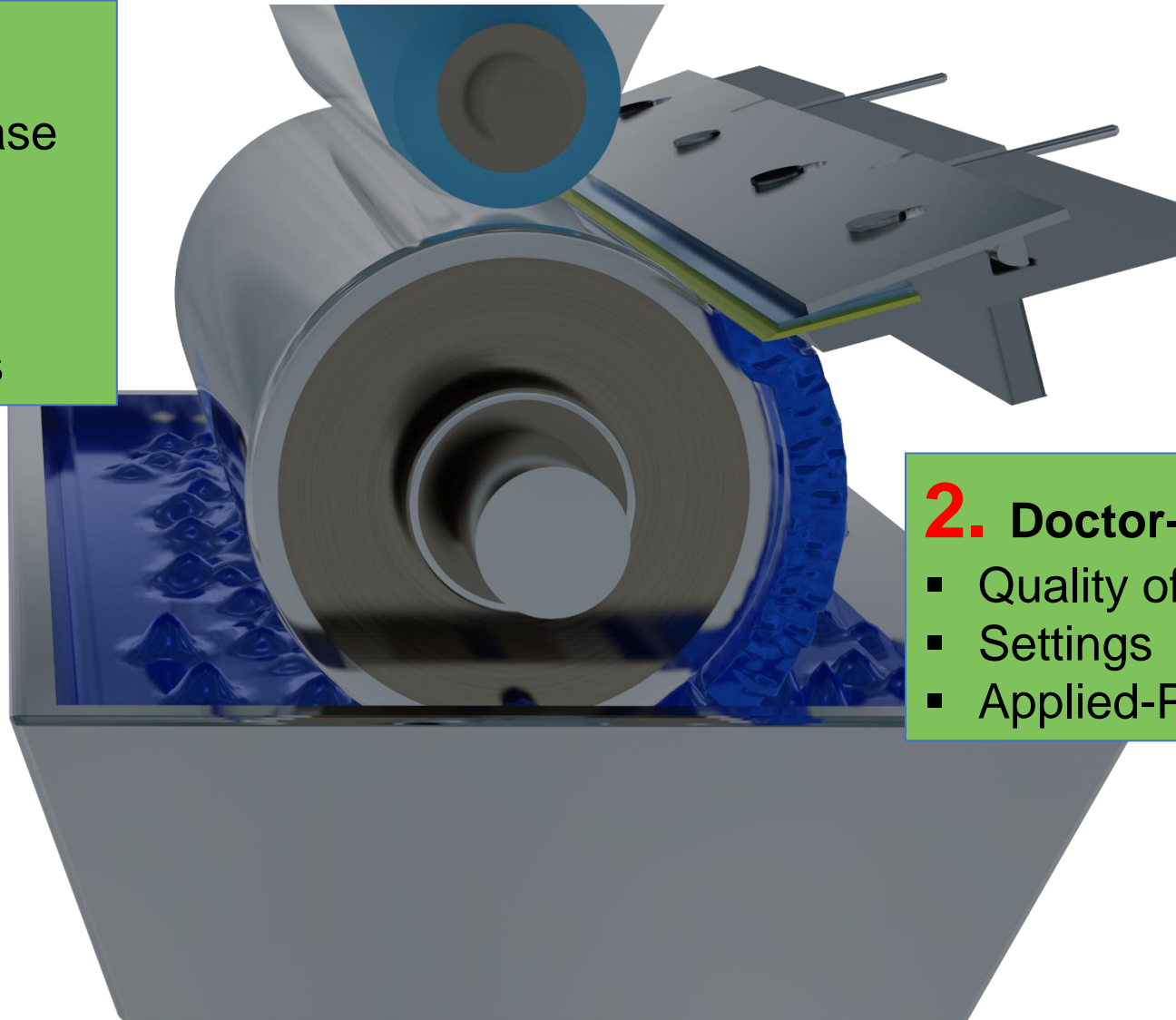
Cylinder after de-chrome



# What has an influence on cylinder lifetime?

## 1. Cylinder:

- Balancing of the base
- Quality of chrome
- Surface structure
- Handling
- Storage Conditions



## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure

# What has an influence on cylinder lifetime?

## 1. Cylinder:

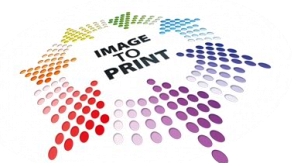
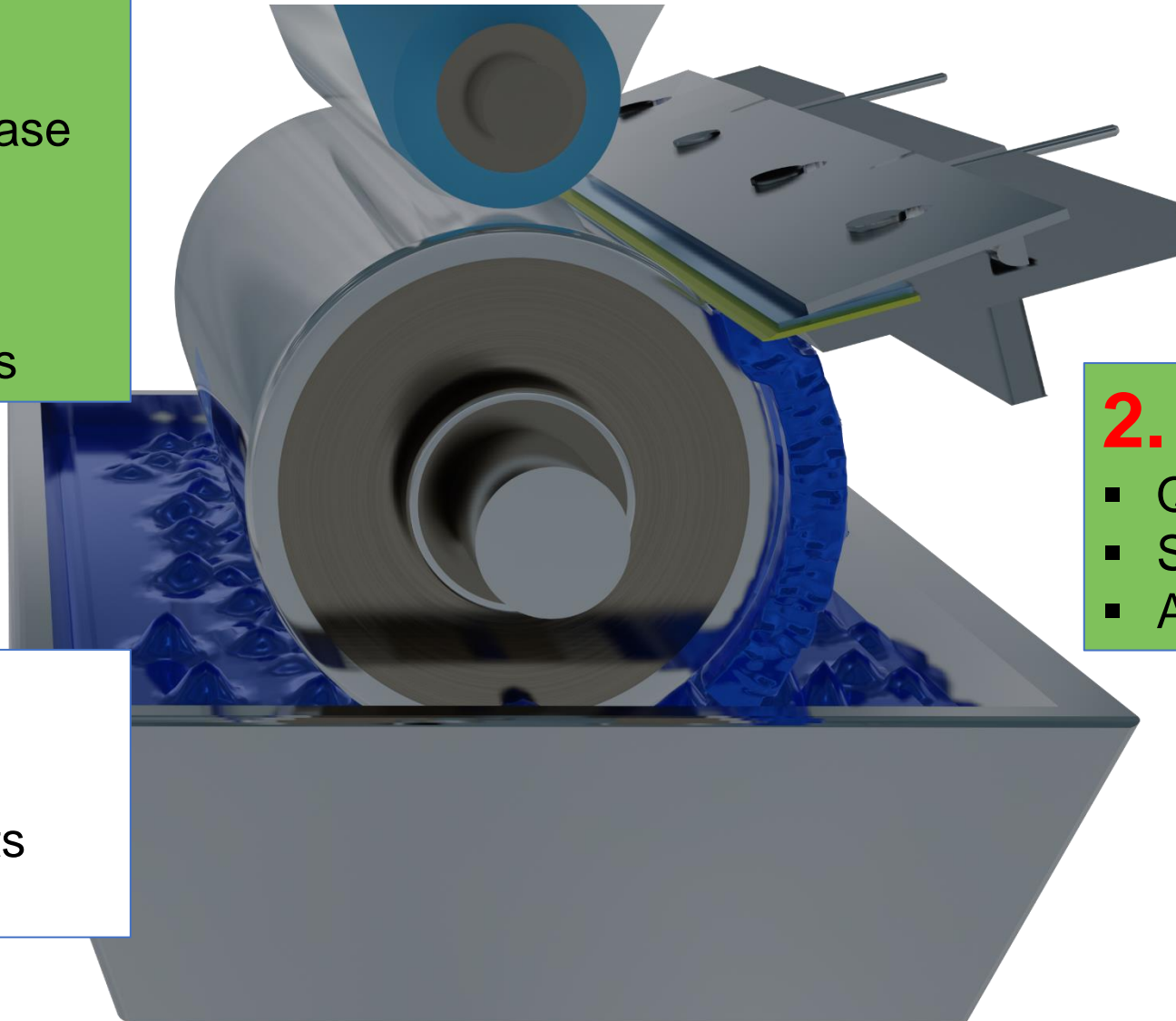
- Balancing of the base
- Quality of chrome
- Surface structure
- Handling
- Storage Conditions

## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure

## 3. Inks:

- Type of pigments
- Quality of pigments
- Formulation



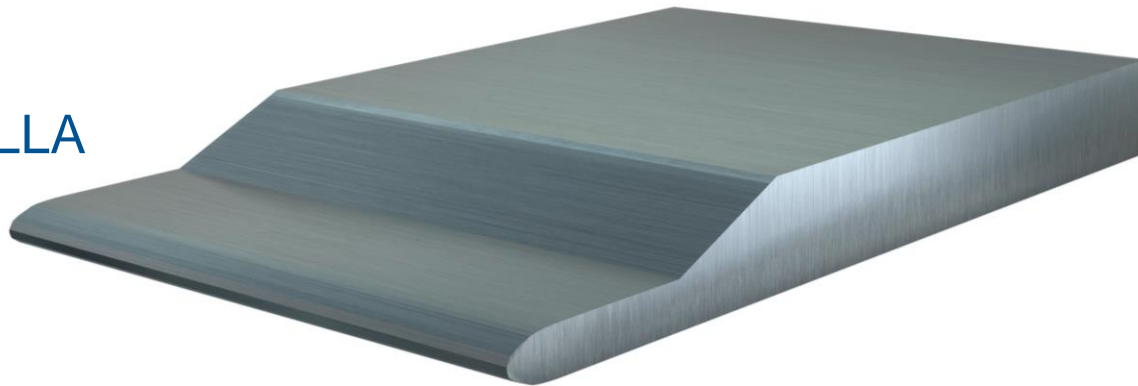
# What has an influence on cylinder lifetime?

## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure

Blade Configuration

LAMELLA

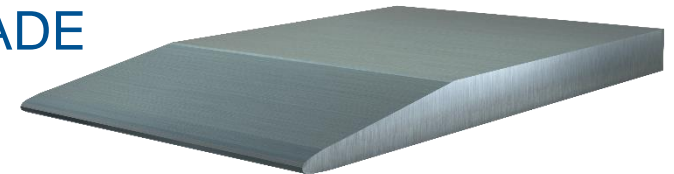


**Function** – Wipe (Doctor) surface clean with minimal damage to surface or Doctor Blade

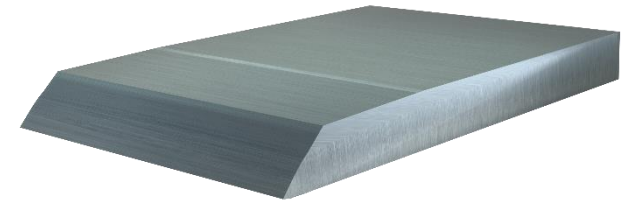
FLEXOLIFE



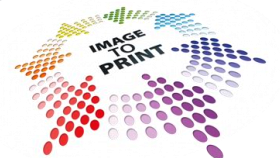
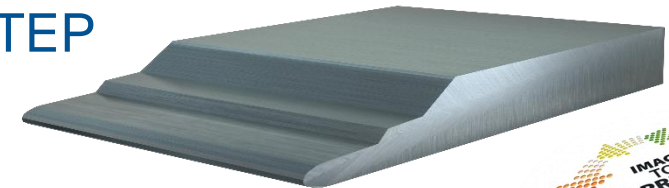
MULTIBLADE



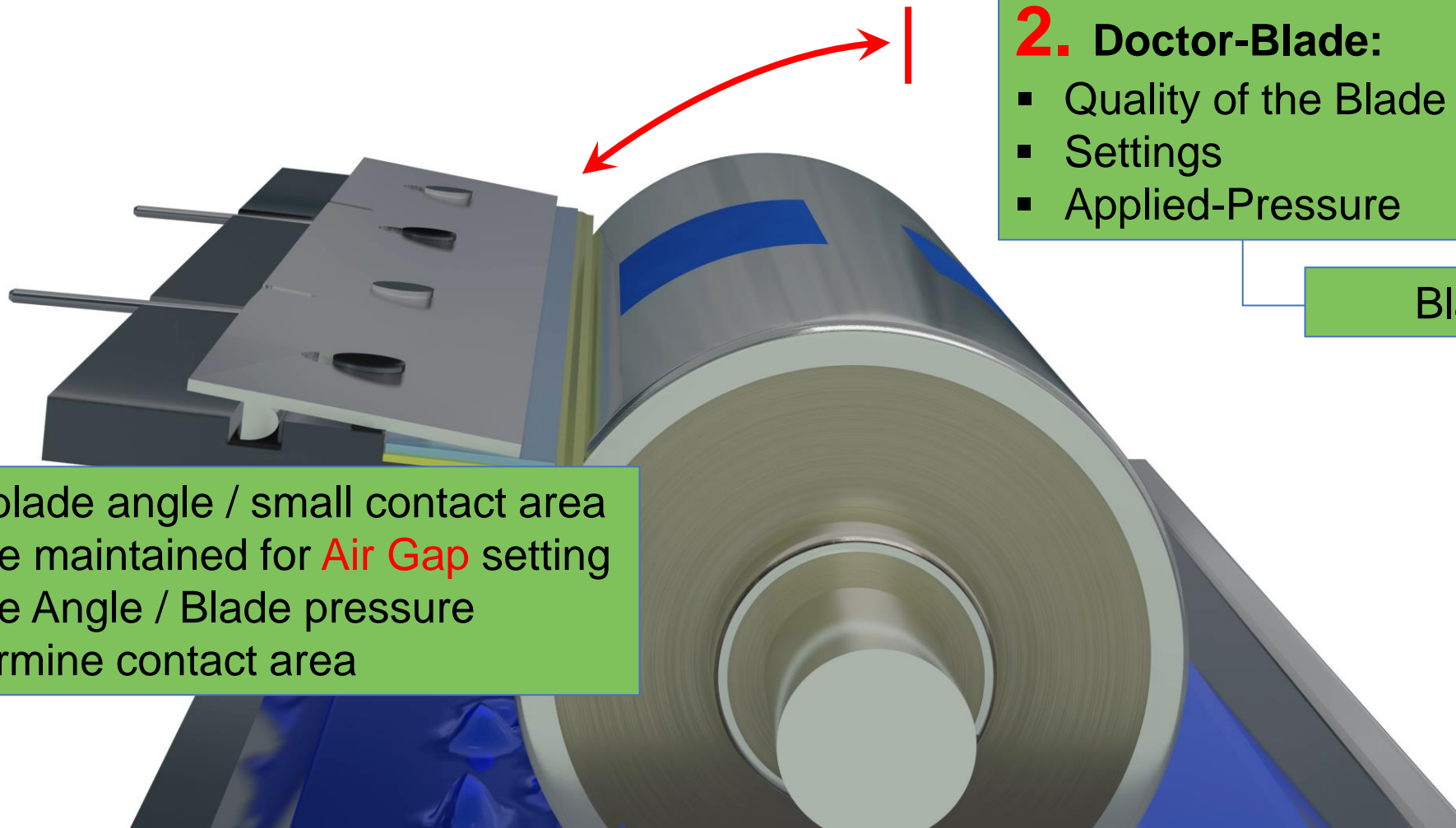
BEVEL



ONE-STEP



# What has an influence on cylinder lifetime?

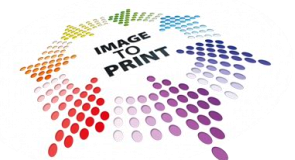


## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure

Blade Settings

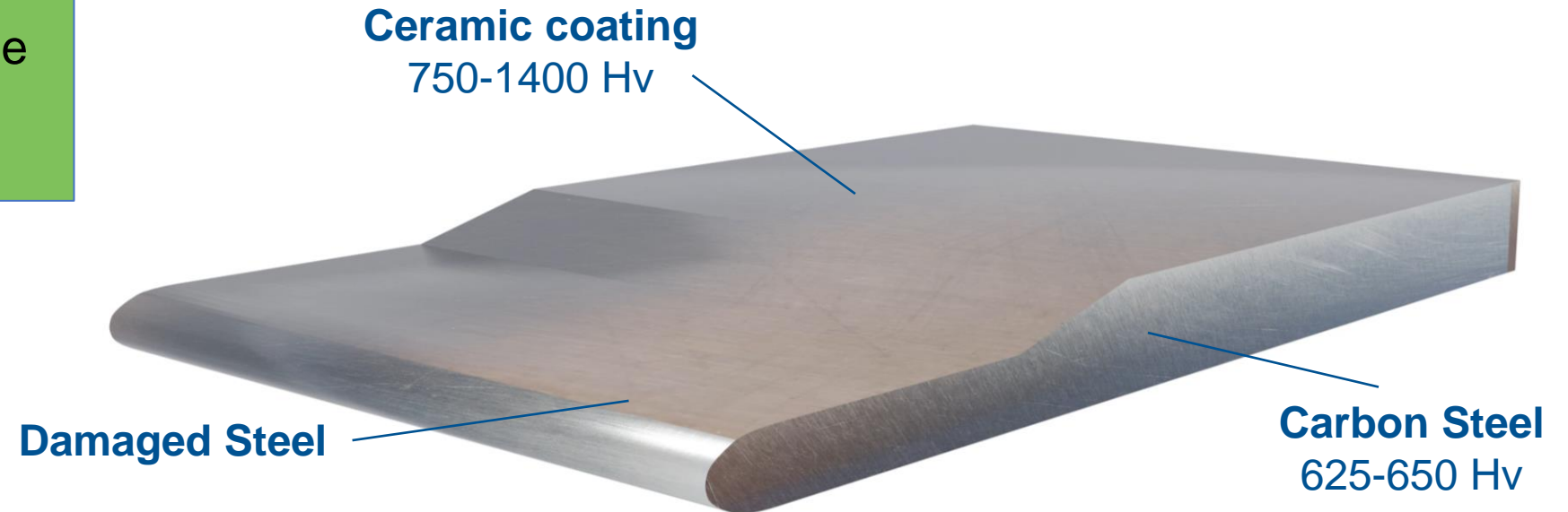
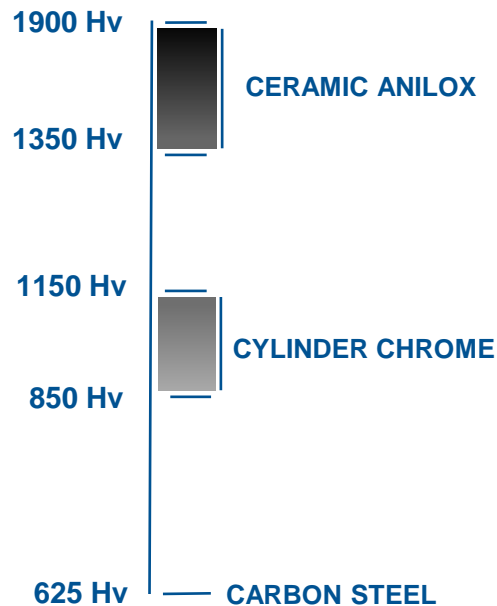
- 60° blade angle / small contact area
- Angle maintained for **Air Gap** setting
- Blade Angle / Blade pressure determine contact area



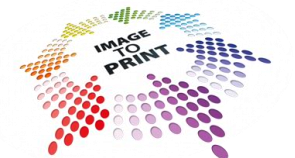
# What has an influence on cylinder lifetime?

## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure



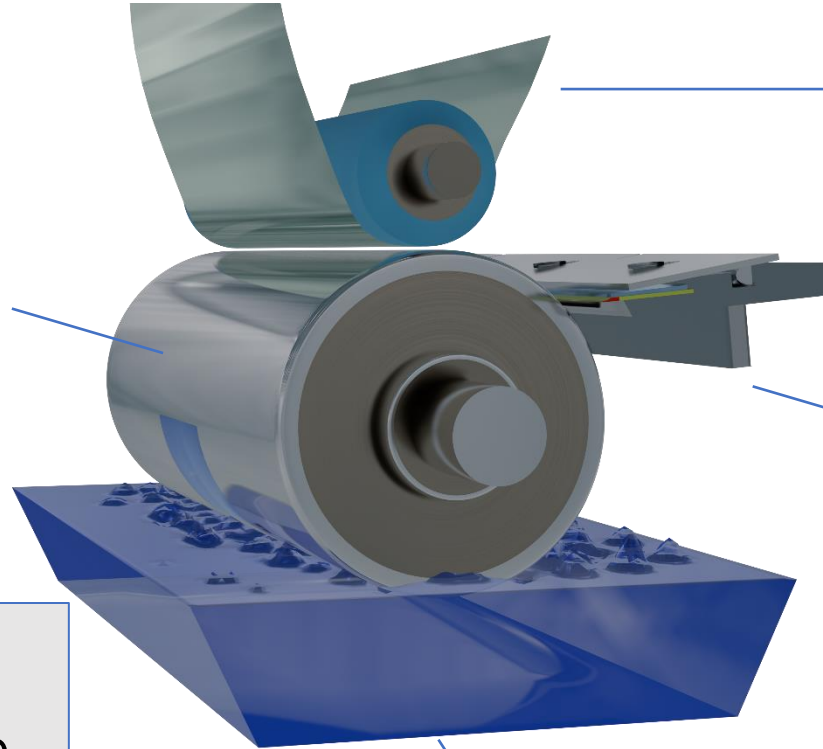
- Ceramic coated blades protect base steel
- Ceramic lubricates contact point
- Less Friction / Less chrome damage



# What has an influence on cylinder lifetime?

## 1. Cylinder:

- Balancing of the base
- Quality of chrome
- Surface structure
- Handling
- Storage Conditions



## 4. Substrate:

- Surface structure
- Content
- Roughness / printability

## 2. Doctor-Blade:

- Quality of the Blade
- Settings
- Applied-Pressure

## 5. Printing Machine:

- Type of printing machine
- Age of printing machine
- tidiness
- Settings
- Printing-speed

## 3. Inks:

- Type of pigments
- Quality of pigments
- Formulation

## 6. Operators:

- Attention and Dedication
- Awareness & Skills

