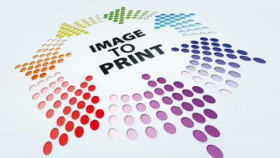


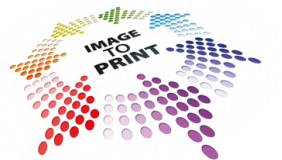
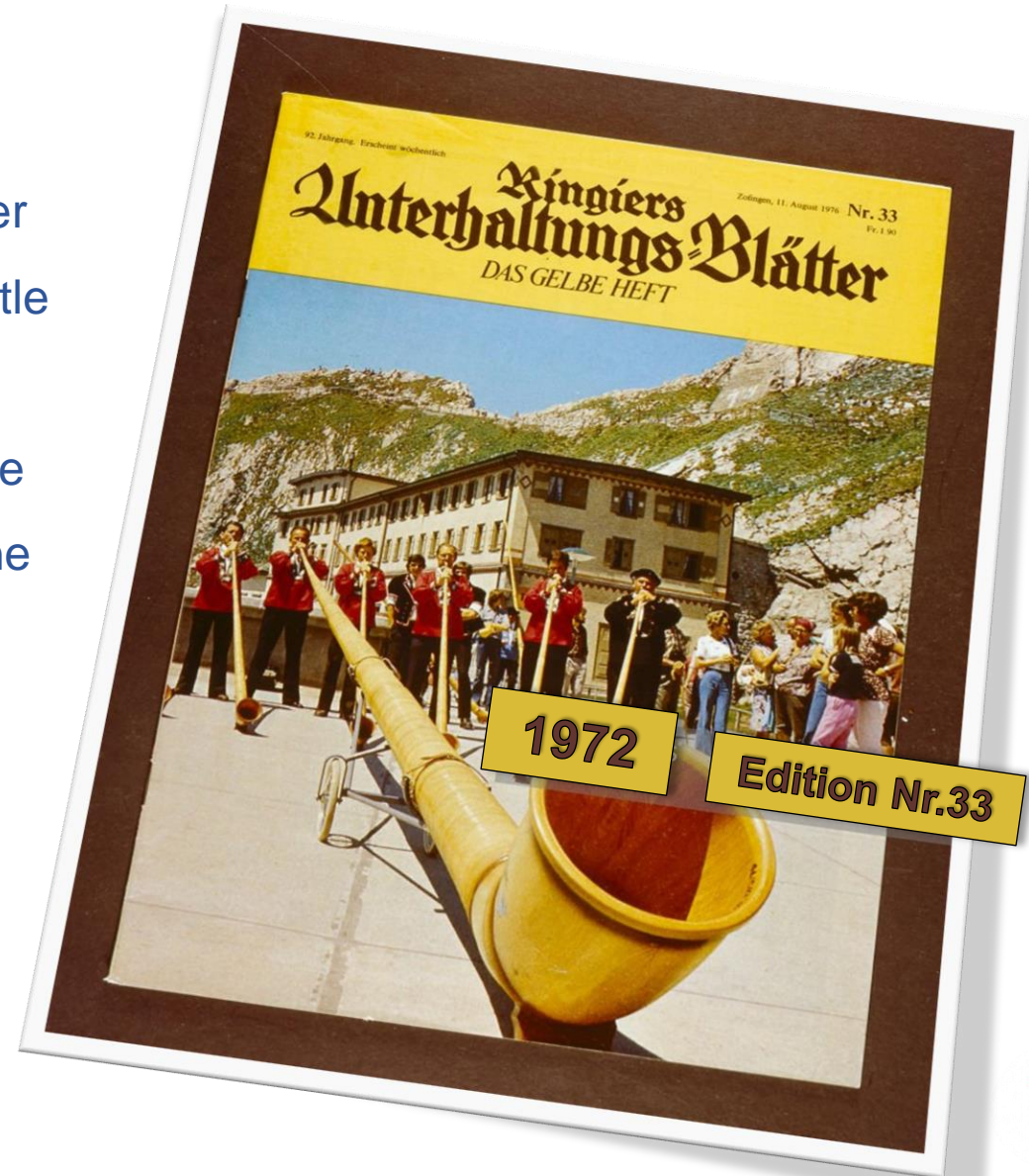
# 50 years MDC Lamella Blade: „the successful story“

**Nathan Clarke / Cameron McIntosh**  
**Technical Sales Managers SEA**  
**Daetwyler SwissTec**



# THE CHALLENGE

- Ringier, the largest Swiss publication printer
- Printing “*Ringiers Unterhaltungs-Blätter*” Title
- Frequent brown ink streaks and bladelines
- Satisfactory quality was not easy to achieve
- This was Switzerland's #1 selling magazine



# AN INGENIOUS IDEA

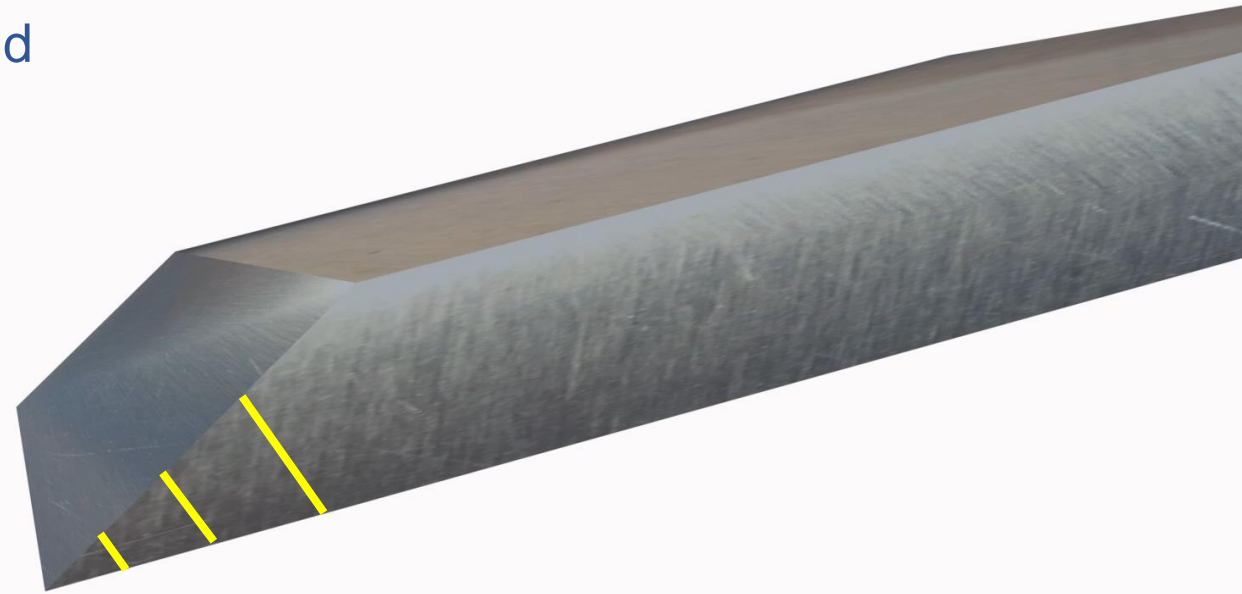
## MR. HANS BURGNER

- The weak point of the printing process was identified by former Ringier employee, ***Mr. Hans Burgener***
- The Doctor blade needed a uniformed contact zone to the cylinder
- ***Hans Burgener*** refined the newly developed doctor blade with an etching solution, and thus achieved the first improvements in gravure printing



# CONVENTIONAL DOCTOR BLADES

- Particularly in gravure printing, the doctor blade is a decisive factor in achieving consistently high-quality print
- Pre-1972 doctor blades were honed by hand
- Blade quality relied on printers' skill
- This led to variation in tone printing



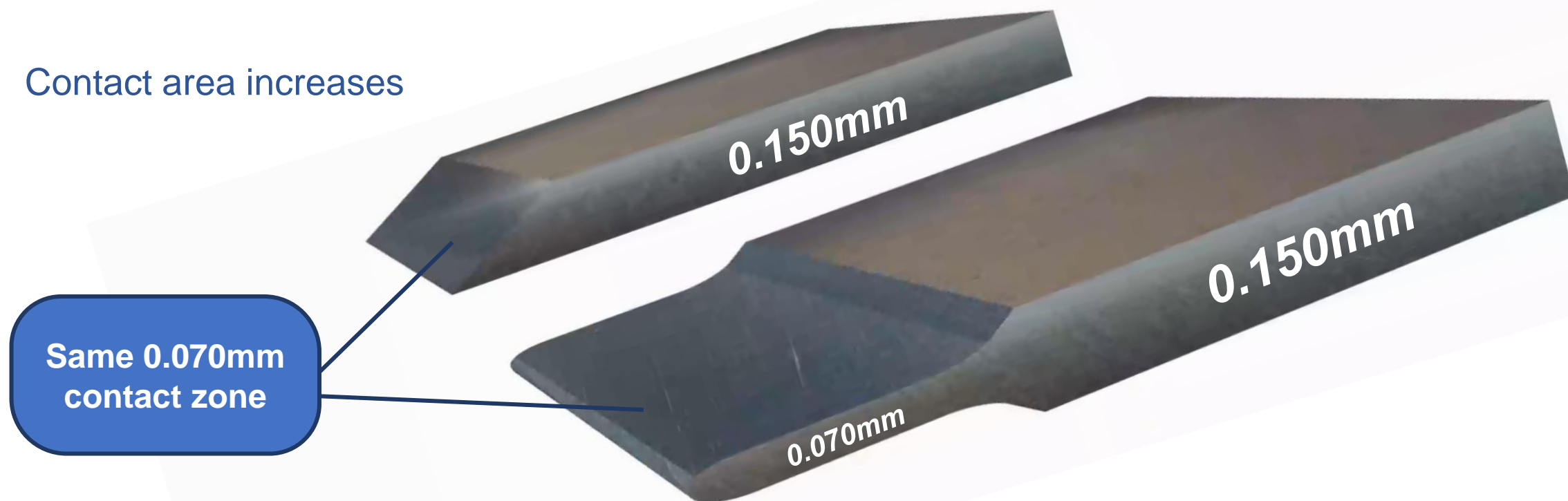
***Contact area needs to be uniform for quality print results***



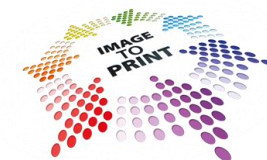


# THE SITUATION

- Bevel blade has a fine tip
- Contact area increases

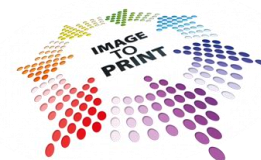
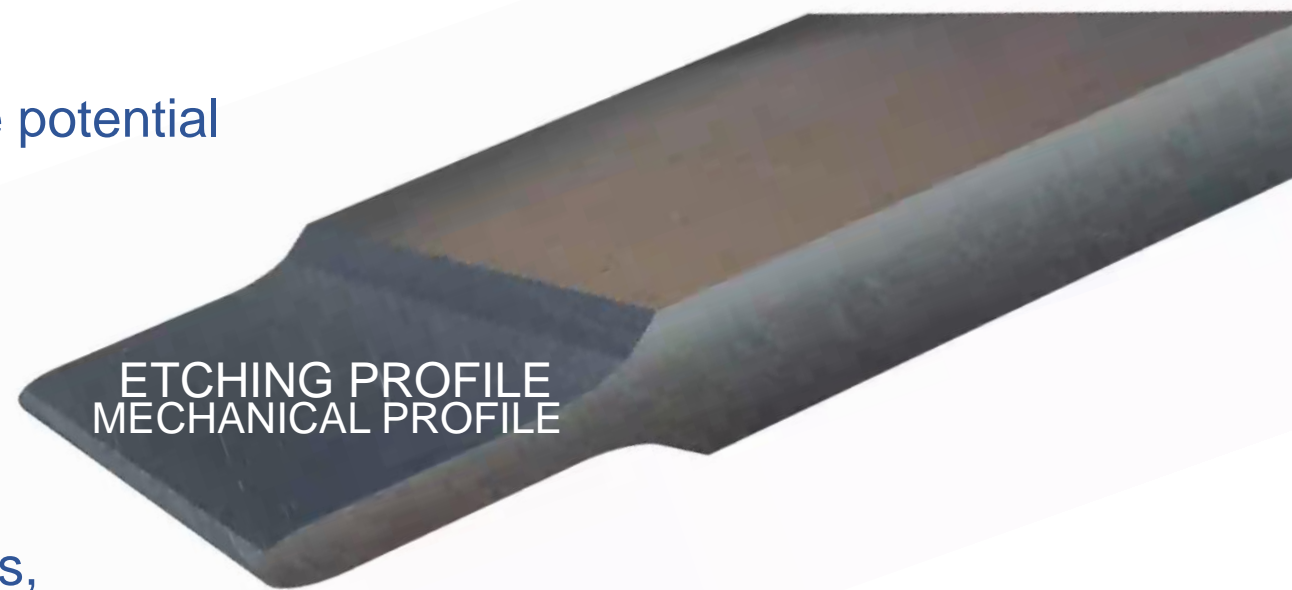


- The desired 0.070mm contact zone is reached
- Lamella maintains contact zone throughout a longer lifetime



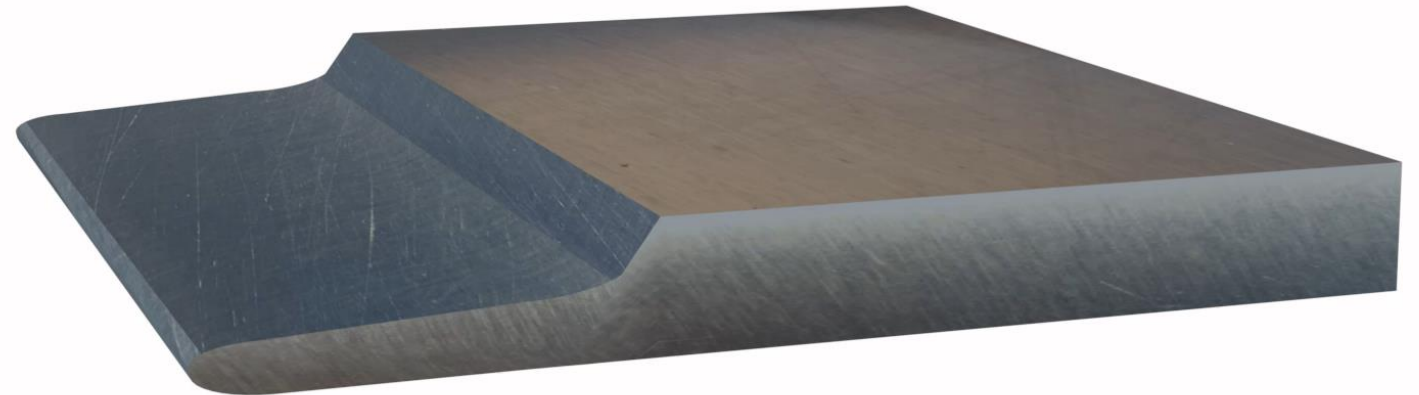
# LAMELLA DOCTOR BLADES

- *Ringier* approached Daetwyler, known for their etching technology
- *Ringier* and *Max Daetwyler* identified the potential of the lamella blade
- Further development and the patent was transferred to *Max Daetwyler Co.*
- After fiddling around with etching methods, purposely built grinding machines were built
- Blades are still produced by grinding today!



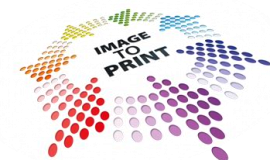
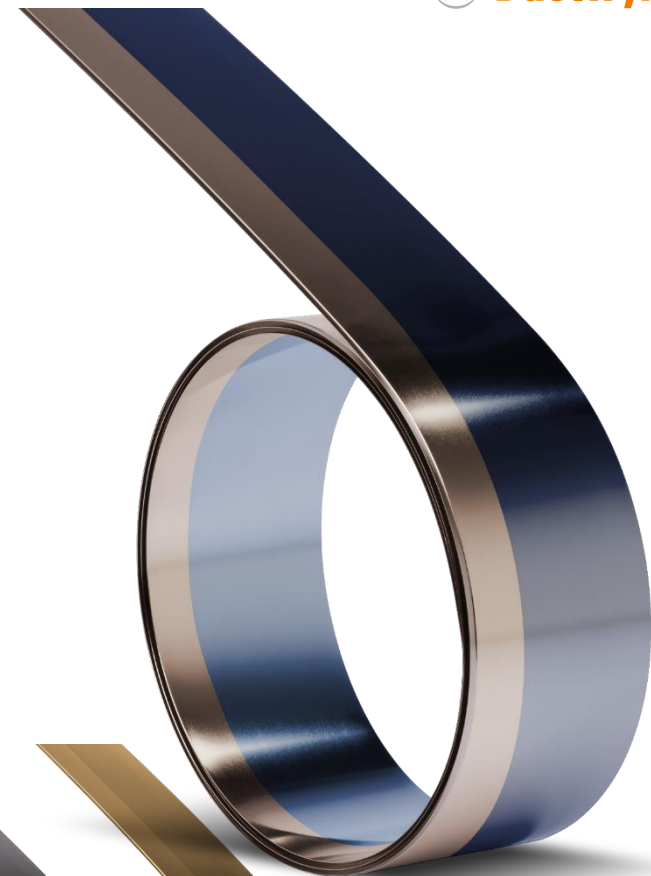
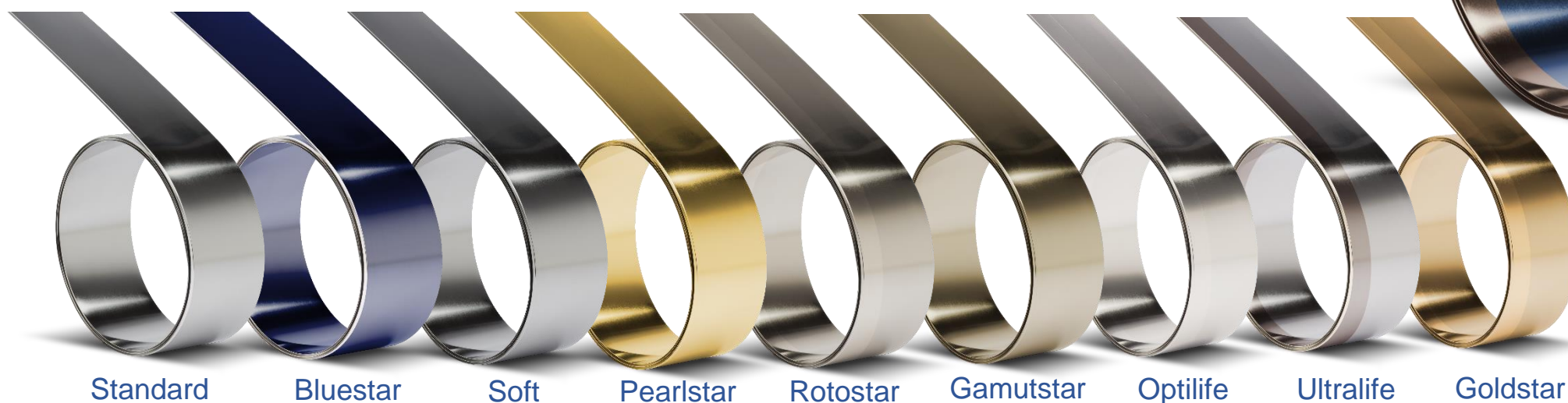
# LAMELLA DOCTOR BLADES

- Daetwyler continues to be the world's largest producer of doctor blades to this day
- There are many different designs on the market today
- Different Lamella lengths
- Different material thickness
- All have the same principle
- Controlling the contact area



# COATED DOCTOR BLADES

- Daetwyler are the pioneer in ceramic coated blades
- MDC Longlife first produced in 1991
- LongLife, an all-rounder for Flexible packaging
- We have the right blade for every printing application





# COATED DOCTOR BLADES

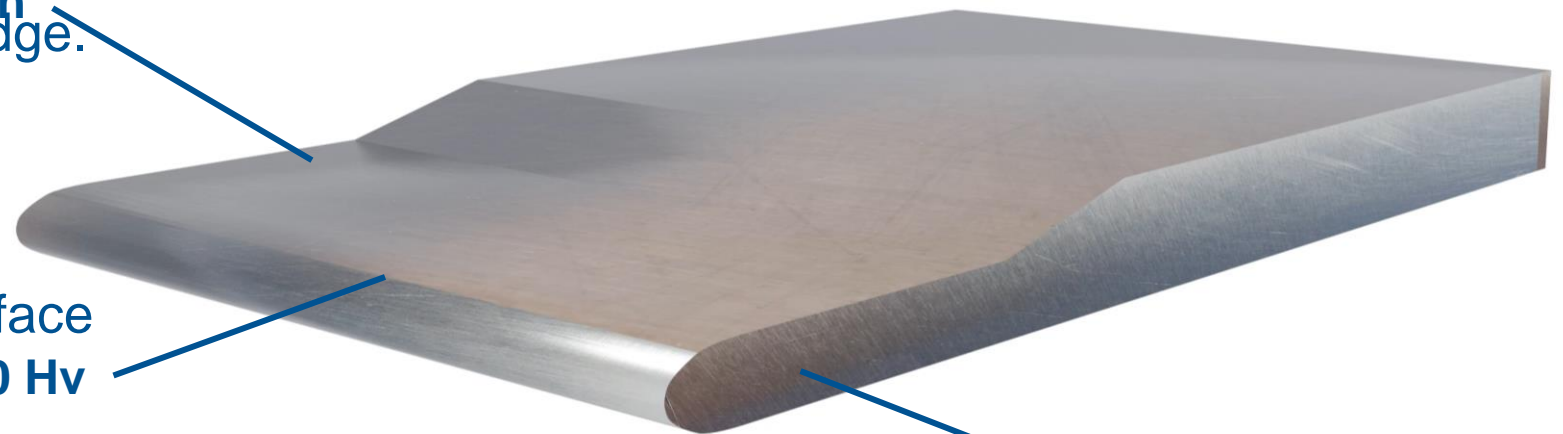
Ceramic coatings protect the base steel material

- When carbon steel is damaged the harder coating provides a clean sharp edge.

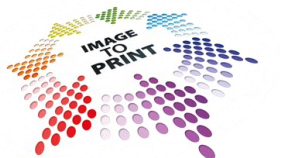
- This ensures the blade continues to wipe the surface

**Ceramic coatings 700- 1400 Hv**

- Ceramic coating reduces friction at contact area



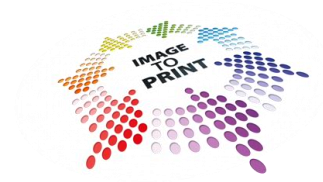
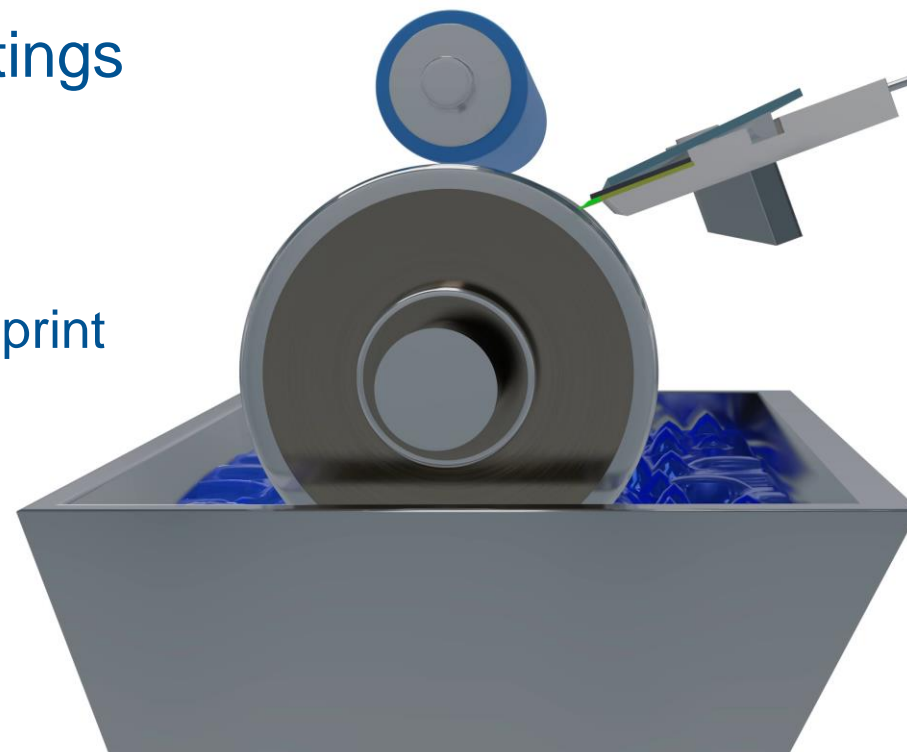
**Carbon steel 625 Hv**



# SETTING THE DOCTOR BLADE

There are a few considerations for settings

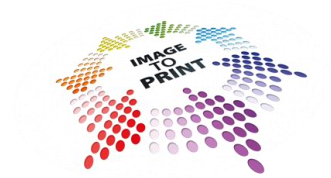
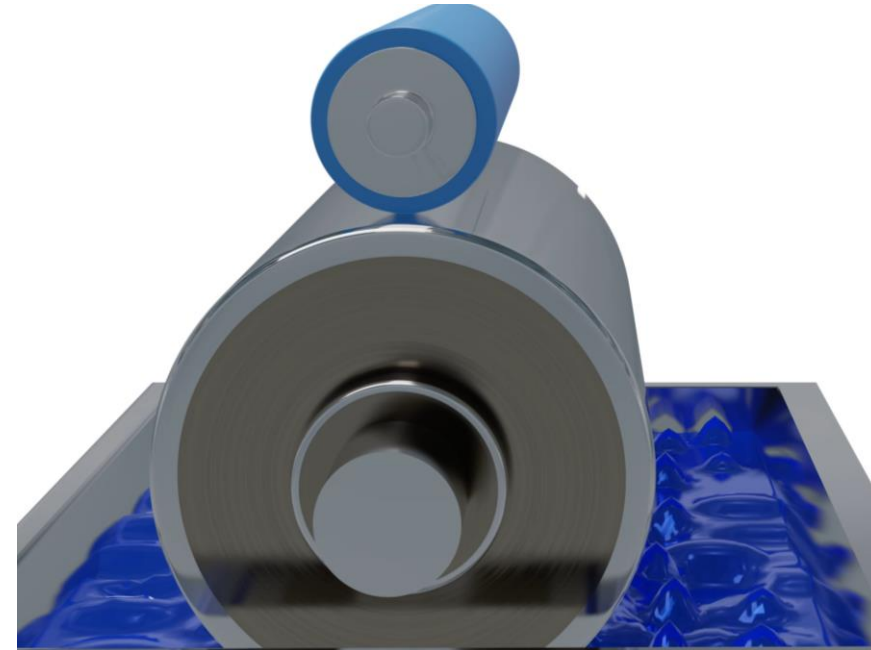
- Target blade angle should be 55°- 65°
- Maintain minimum contact zone to improve print quality
- Air Gap from blade to impression roller
- Use correct air pressure



# SETTING THE DOCTOR BLADE

## BLADE ANGLE—HOW TO MEASURE

- Tangent Line- **0°**
- Radius to cylinder surface at 90° -  
**Blade Contact point**
- Radius of cylinder - **Reference**

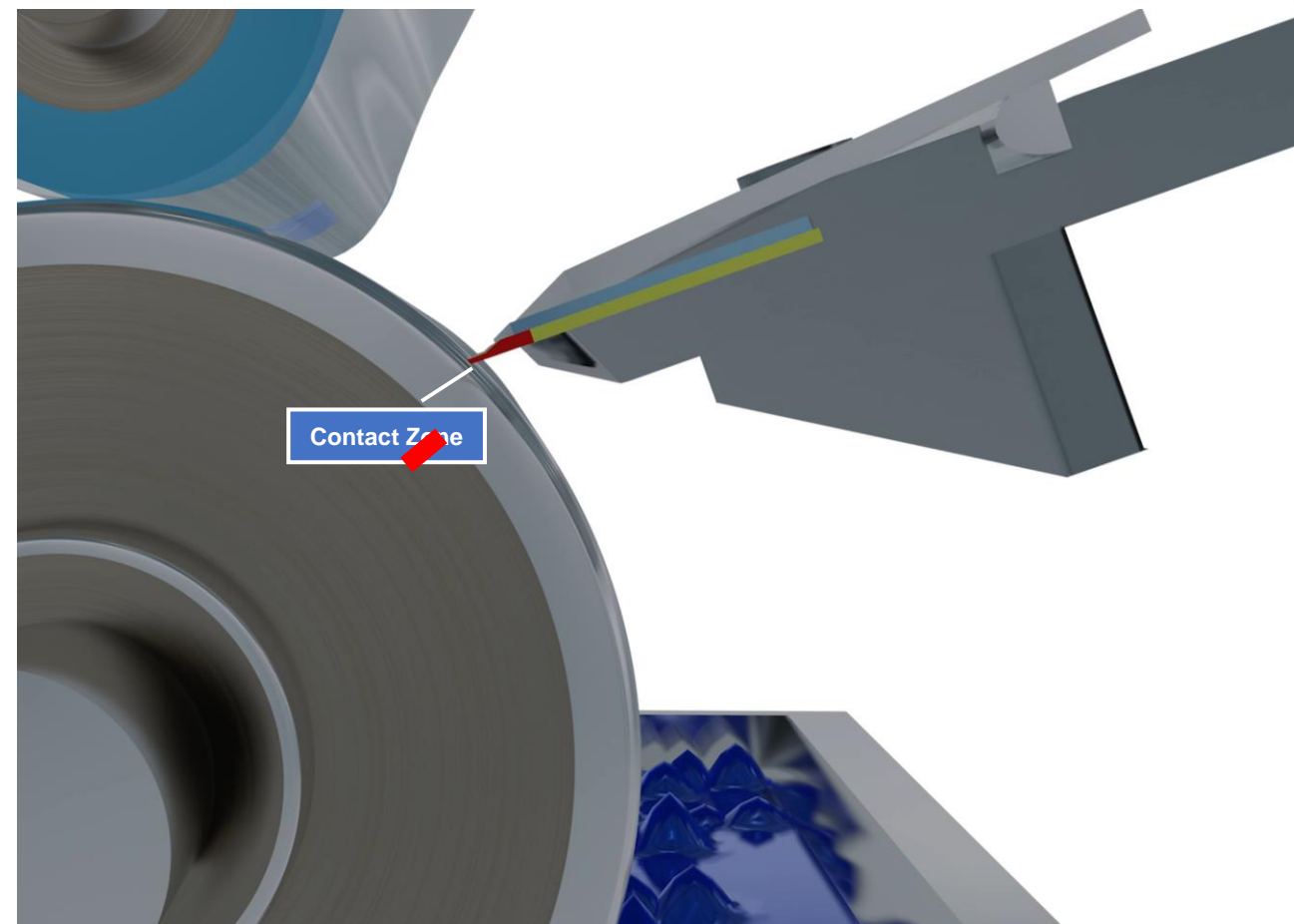


# ON PRESS SETTINGS

- Blade Pressure should not be excessive



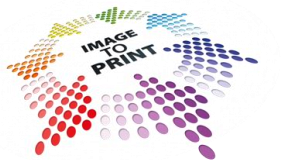
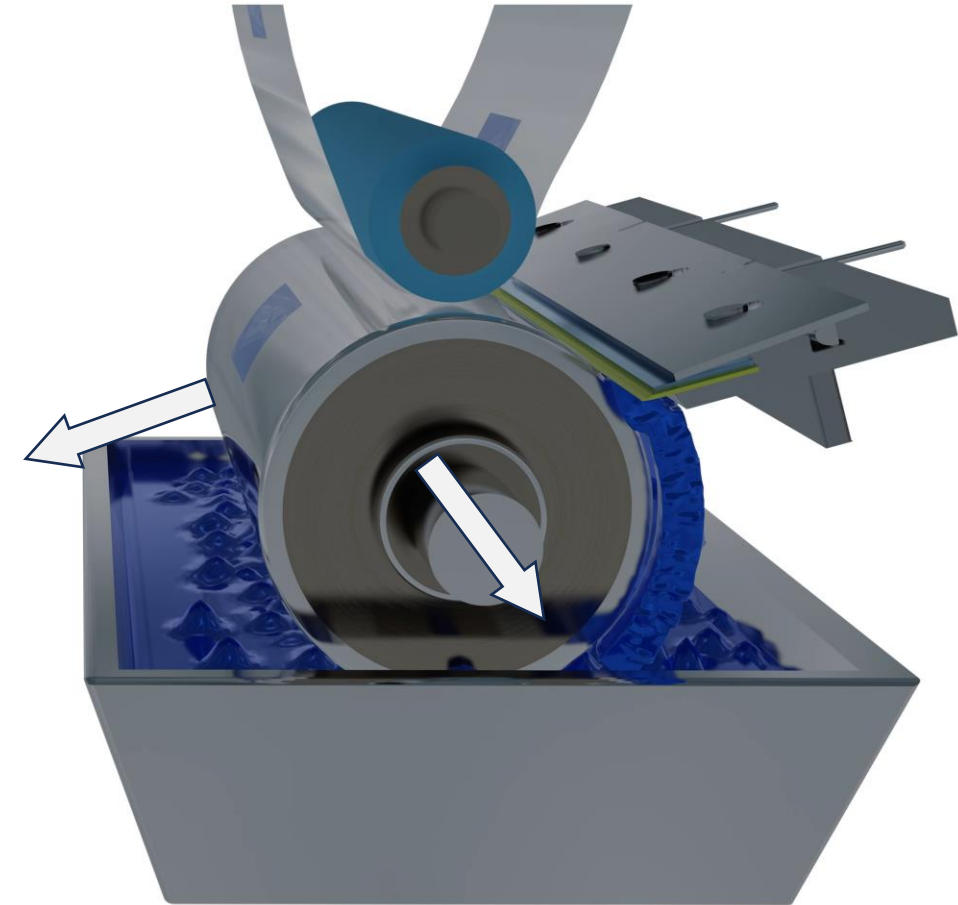
- 1.0 - 1.5 Bar ideal start pressure
- Excessive pressure increases the contact zone on cylinder





# ON PRESS SETTINGS

- When excessive blade pressure is applied, the Lamella tip bends
- This increases the contact area on cylinder dramatically
- End result - hazing, streaking!!
- Cylinder chrome damage
- Shorter blade life



# ON PRESS SETTINGS

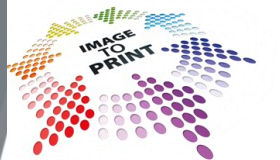
- Hazing / Fogging can be seen on printed roll
- This is an indication that adjustments are needed to Cylinder, Blade, Ink relationship

- Doctor Blade height can be adjusted frequently
- Creating register movement and quality issues

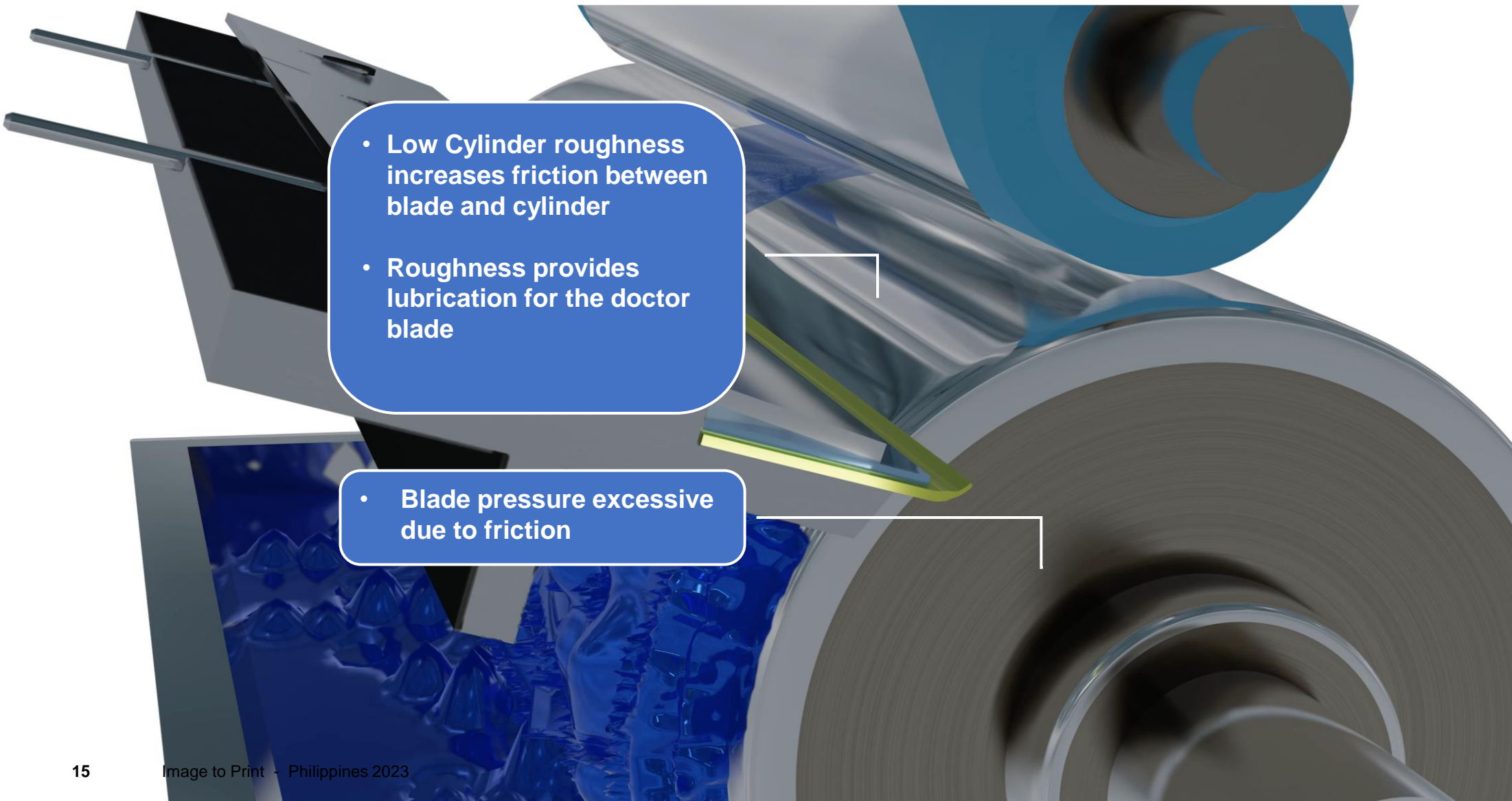
contact point  
leads to print

on

icles have  
of being  
for the Doctor



# CYLINDER ROUGHNESS

- 
- Low Cylinder roughness increases friction between blade and cylinder
  - Roughness provides lubrication for the doctor blade
- 
- Blade pressure excessive due to friction



# CYLINDER ROUGHNESS

## SUBSTRATE

Surface Treatment Level  
Press Speed

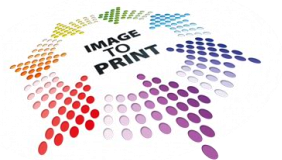
Cylinder surface roughness is  
determined by different variables

## INK

Resins  
Solvent  
Chemistry

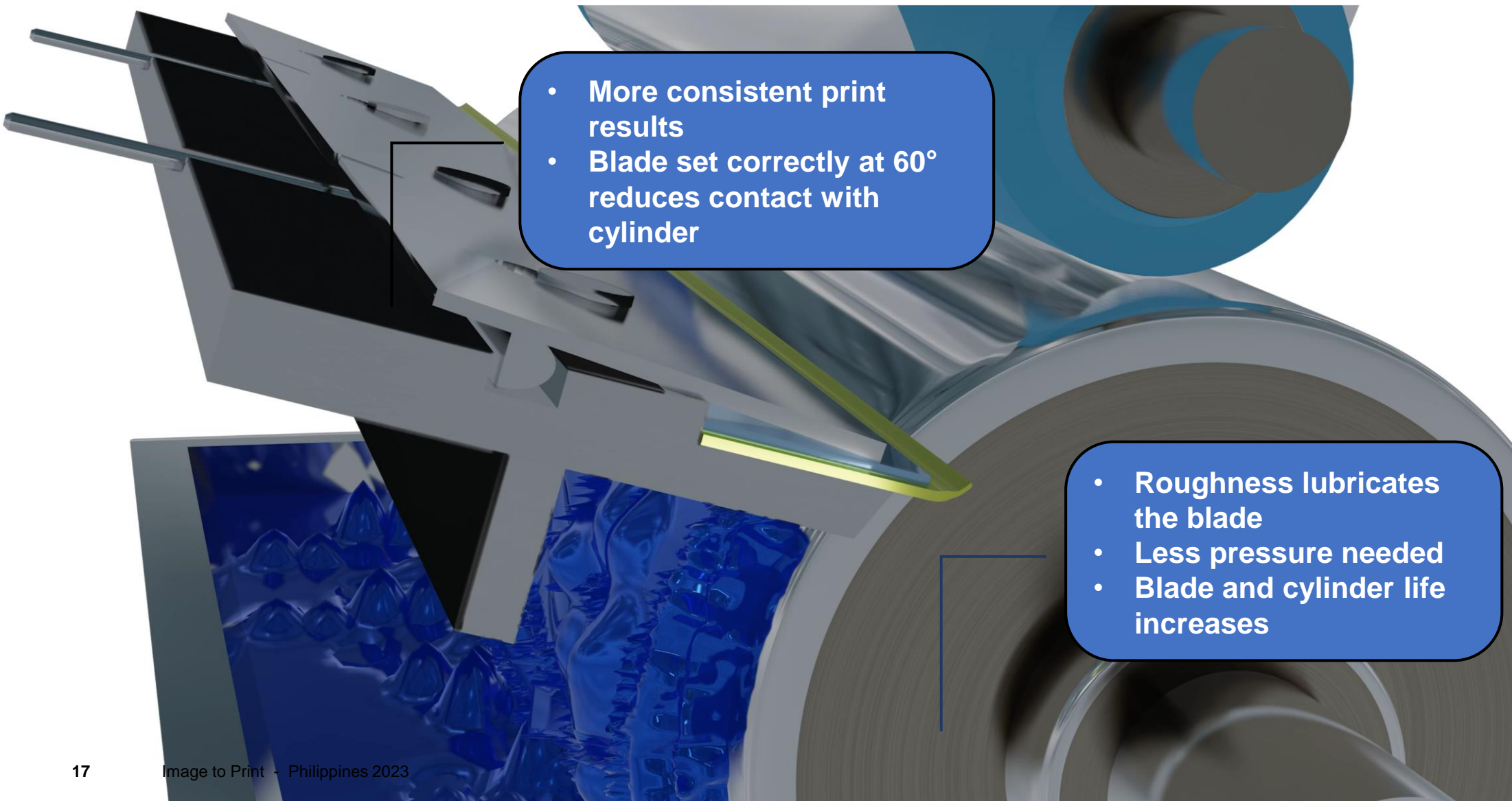
## BLADE

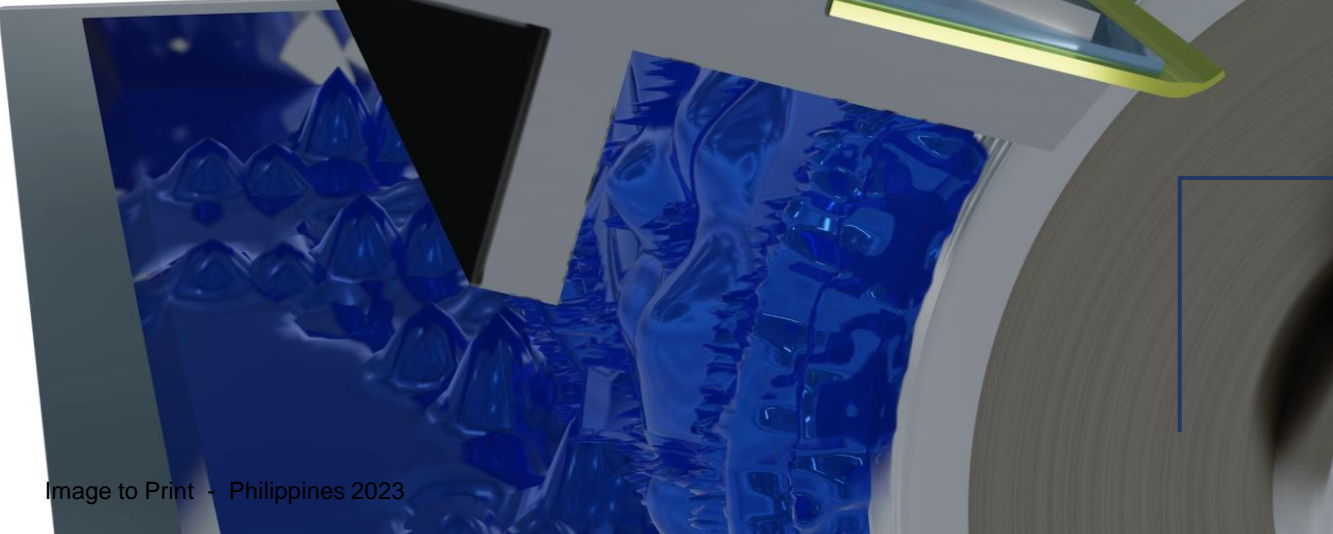
Blade choice  
Machine settings  
Air Gap

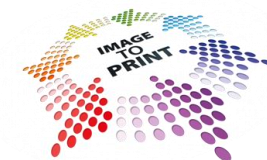




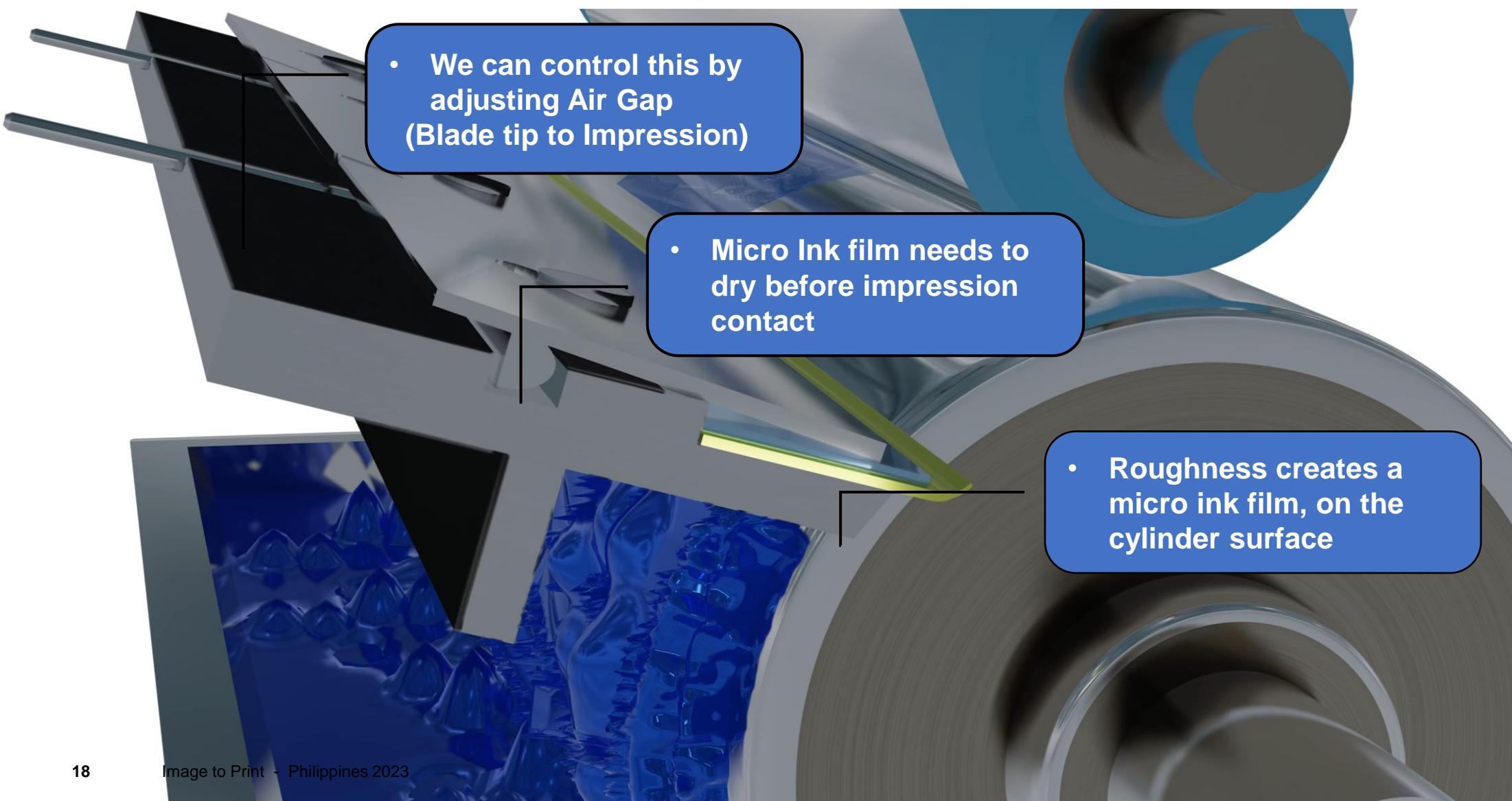
# CYLINDER ROUGHNESS

- 
- More consistent print results
  - Blade set correctly at 60° reduces contact with cylinder

- 
- Roughness lubricates the blade
  - Less pressure needed
  - Blade and cylinder life increases



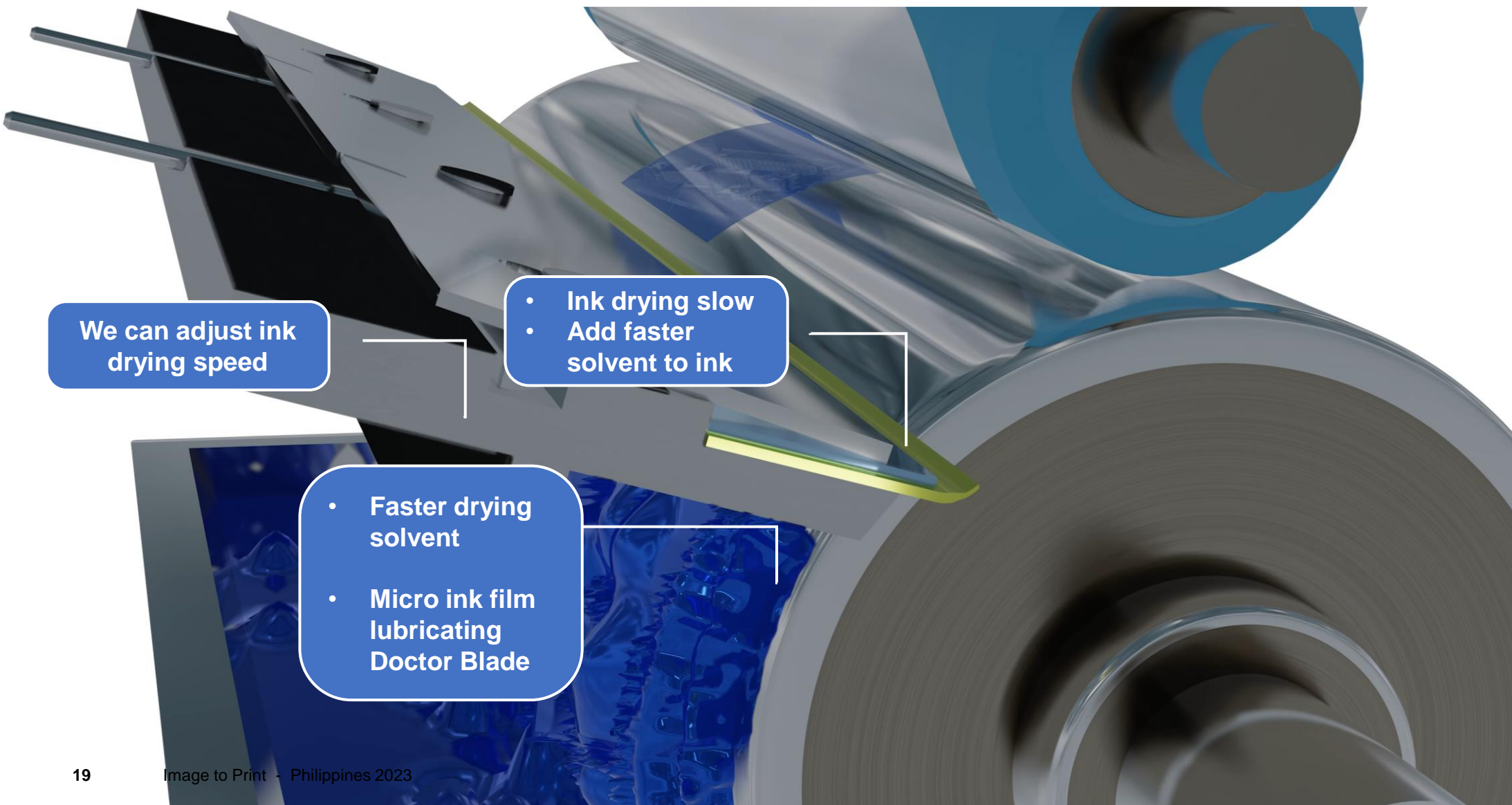
# CYLINDER ROUGHNESS

- 
- We can control this by adjusting Air Gap (Blade tip to Impression)

- Micro Ink film needs to dry before impression contact

- Roughness creates a micro ink film, on the cylinder surface

# CYLINDER ROUGHNESS



We can adjust ink drying speed

- Ink drying slow
- Add faster solvent to ink

- Faster drying solvent
- Micro ink film lubricating Doctor Blade

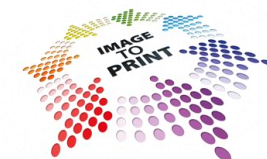




# CYLINDER ROUGHNESS

- Substrates have different surface tension
- Dyne levels
- Higher Dyne levels attract more of the non-image area to the substrate
- Hazing / Fogging is more frequent on polyester / nylon substrates

SUBSTRATE	UNTREATED	TREATED	Rz Value
<i>POLYESTER/ NYON</i>	<i>42 DYNES</i>	<i>50+ DYNES</i>	<i>0.27 – 0.30</i>
<i>BOPP / OPP</i>	<i>30-31 DYNES</i>	<i>38-40 DYNES</i>	<i>0.35 – 0.40</i>
<i>PAPER/BOARD</i>	<i>ROUGH FIBRE STRUCTURE LOW SURFACE TENSION</i>		<i>0.45 – 0.50</i>





# PRESS SETTINGS

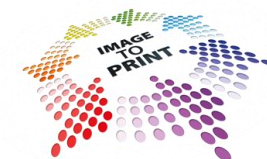
## 3 Key settings for optimum blade performance

**Blade Oscillation**  
Clean sweeping  
action

**Blade Pressure**  
1.0 – 2.0 Bar

**Air piston exposed**

**Blade should lift off  
cylinder when disengaged**



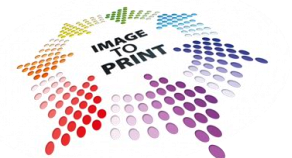
# CONTACT AREA

## BLADE ANALYSIS BLEIENBACH SWITZERLAND

- This is an analysis done on a South East Asian customers used blade
- Complaint of printing problems, Hazing (Toning), and ink streaking
- There are 3 Different contact angles **50° / 43° / 32°**
- ***More contact area, more friction and More damage to the blade!***

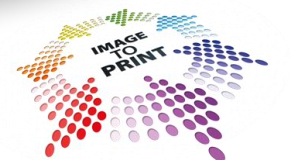


**This analysis helped us solve our customers process problems**



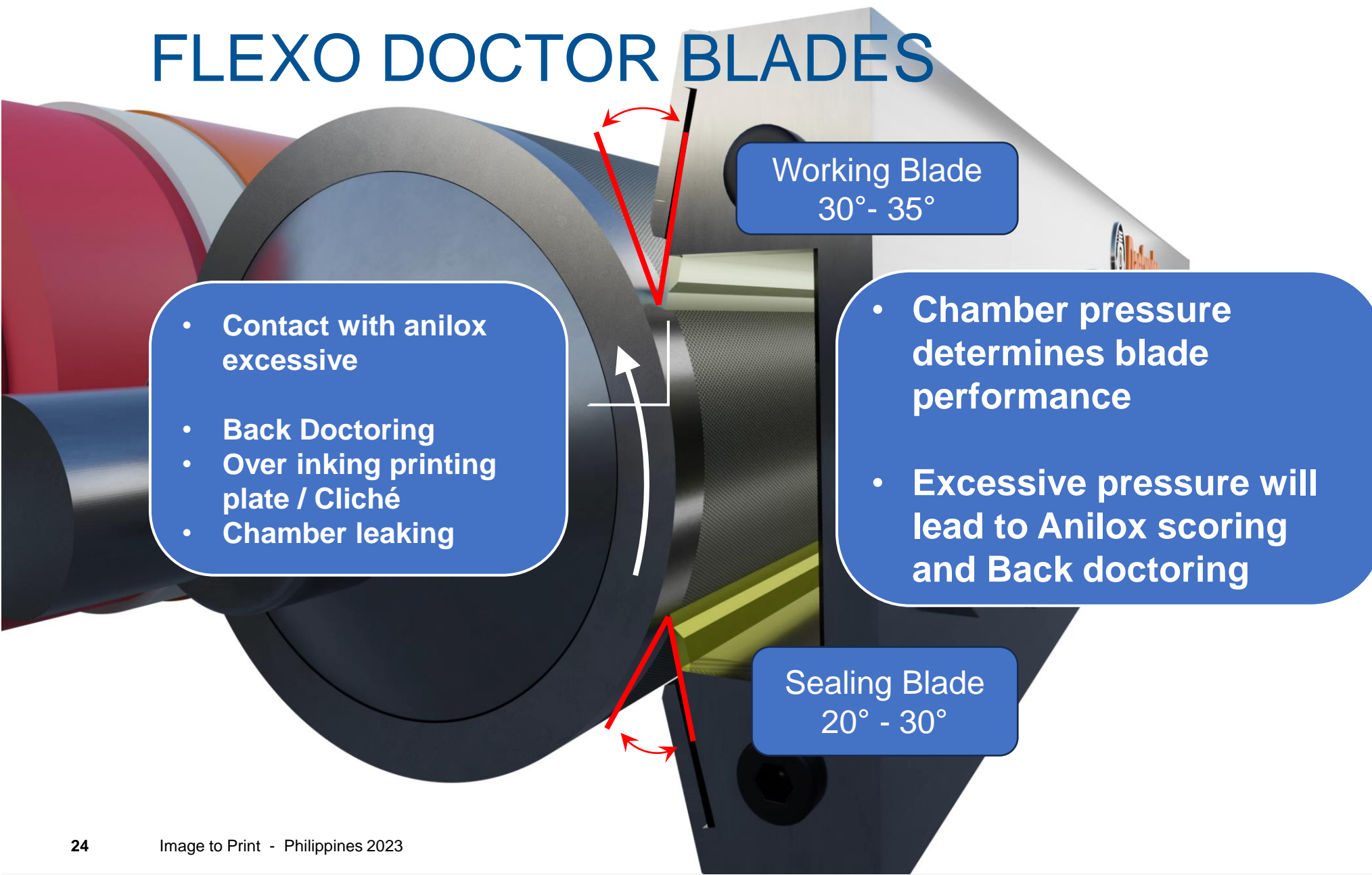
# FLEXO DOCTOR BLADES

- The development of the Lamella blade advanced the Flexo printing process
- Laser technology also played a big part in the advancement of print resolution, through laser engraved anilox rollers
- Daetwyler with our innovative approach to the printing industry, developed a coated blade specifically for ECG printing.....MDC GAMUTSTAR





# FLEXO DOCTOR BLADES





# WHAT BLADE DO I NEED?

Environment

Ink Viscosity

Press Speed

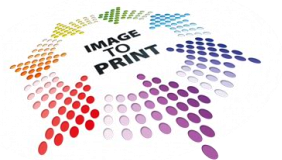
Print Design

Substrate

Ink System

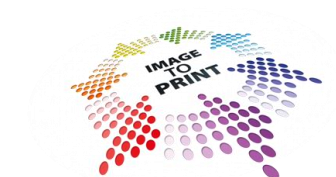
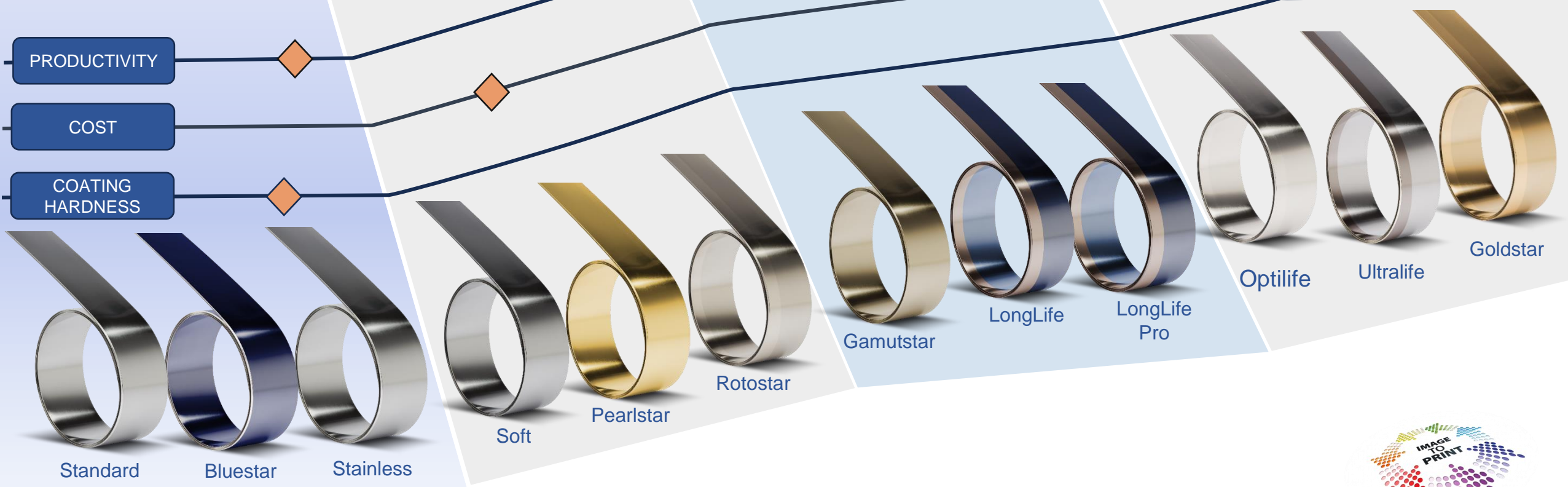


These influence doctor blade performance

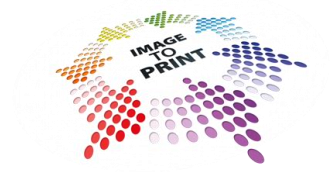
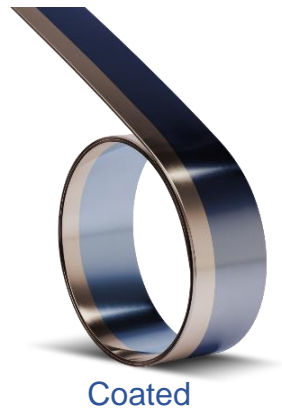


# DOCTOR BLADE SELECTION

## Portfolio

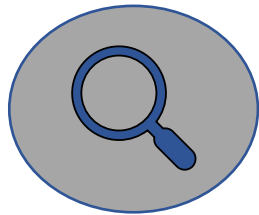


# HIDDEN COSTS



# TECHNICAL SERVICE

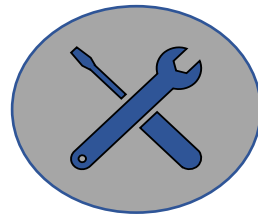
- After sales service is what our business is built upon



**CUSTOMER  
FOCUS**



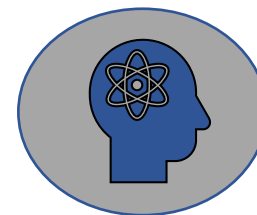
**PRINT FAULT  
ANALYSIS**



**TECHNICAL  
SERVICE**



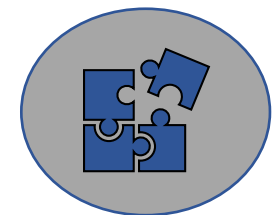
**PROCESS AUDITS**



**ON-SITE  
TRAINING**



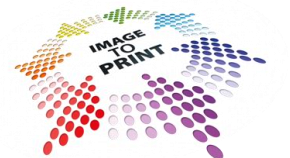
**MAKE READY  
REDUCTION**



**PROCESS  
IMPROVEMENT**



**DOCTOR BLADE  
ANALYSIS**





## Doctor blades for gravure printing

Daetwyler SwissTec offers a wide range of MDC doctor blades for gravure printing, helping you achieve the perfect print result.

*Try our online Doctor blade selector tool*

Gravure



Find the right doctor blade for gravure printing

APPLICATION

What sort of application do you need the MDC doctor blades for?

Illustration








Packaging

Decoration

Coatings

7 matching doctor blades

Reset

 <p>OPTILIFE</p> <p>+</p>	 <p>LOGLIFE PRO</p> <p>+</p>	 <p>LOGLIFE</p> <p>+</p>	 <p>GAMUTSTAR</p> <p>+</p>
 <p>ROTOSTAR</p> <p>+</p>	 <p>STAINLESS STEEL</p> <p>+</p>	 <p>STANDARD STEEL</p> <p>+</p>	

Flexo

