MDC DOCTORBLADES. THE ORIGINAL.

DAETWYLER SWISSTEC

Daetwyler
SwissTec

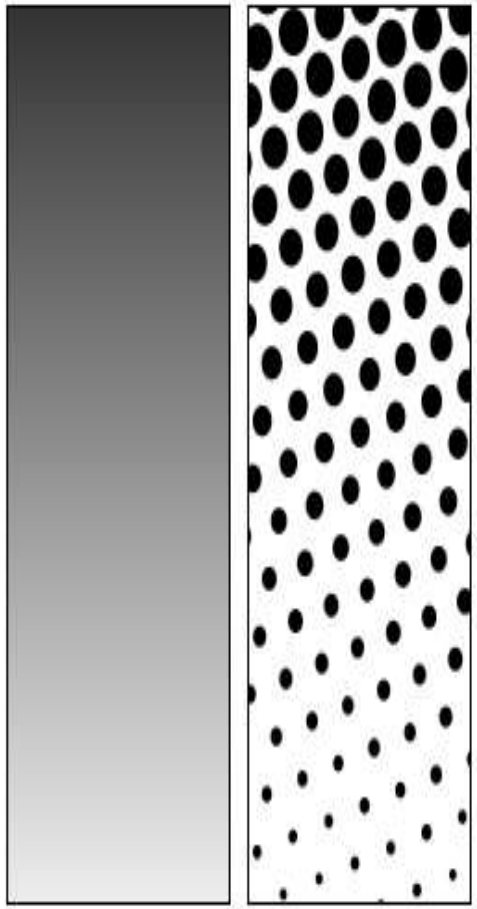
Doctor Blade Selection

What blade will work best for my process?

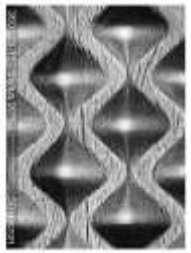
Daetwyler SwissTec

Tip Thickness

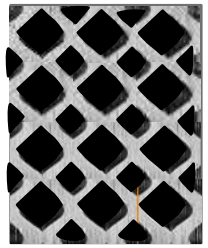
The main consideration, when selecting your blade, is matching your Blade tip to the cell size., Or the design to be printed.



Solid colours



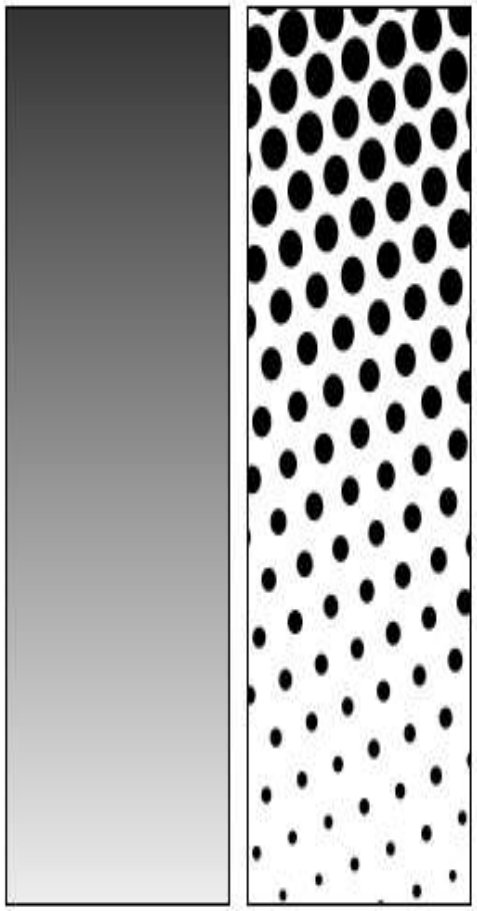
Cell widths vary depending on dot percentage



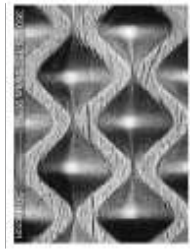
Tone work more contact surface.

Tip Thickness

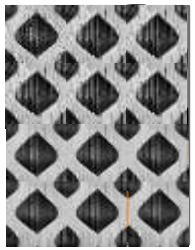
Solid and process colours have different support area for the blade



Less contact surface.



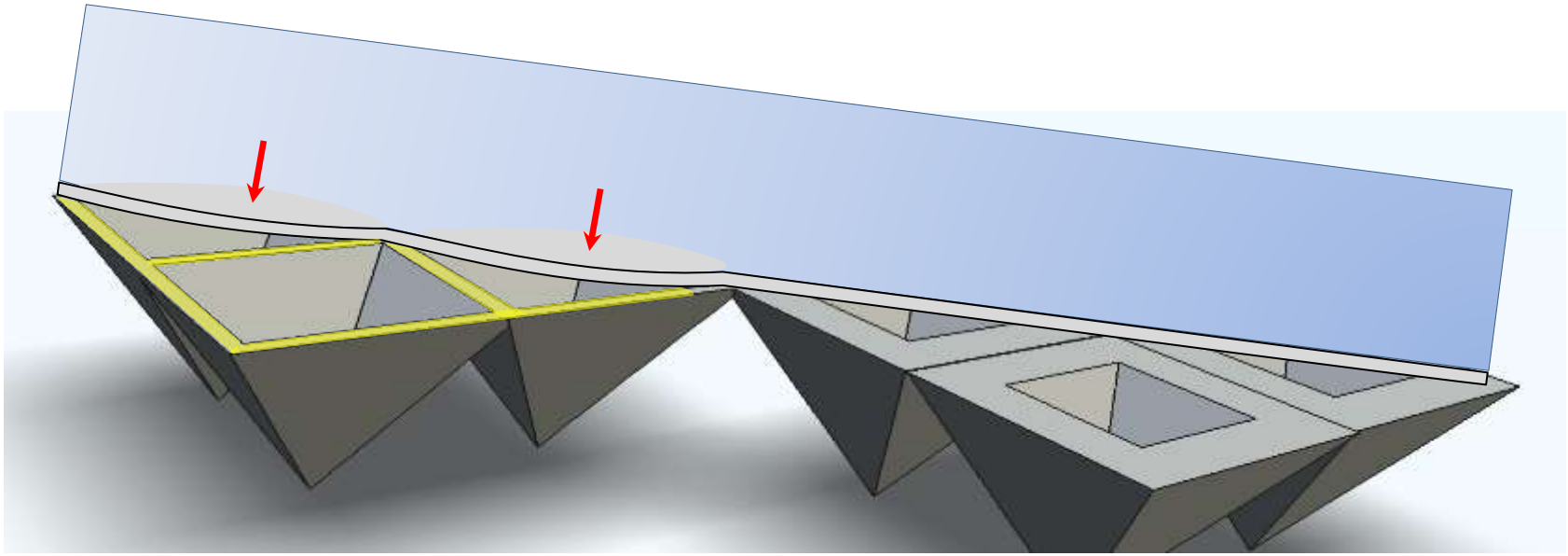
Cell widths vary depending on dot percentage



More contact surface.

Tip Thickness

Doctor blades distort (flex) under pressure. With a larger cell sizes, blade flex increases!

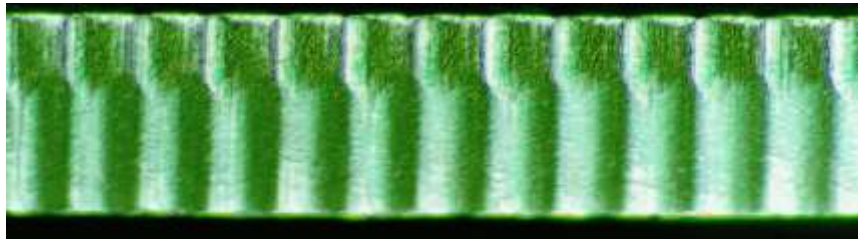


Solid Colour Cells

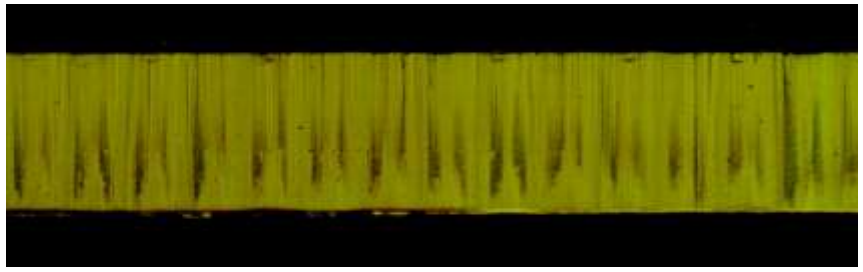
Process Colour Cells

Tip Thickness

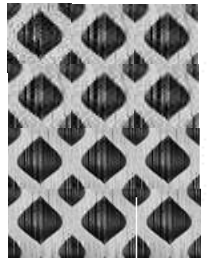
Different size cells will determine how your blade wears
Metallographic pictures from our QC laboratory in Switzerland

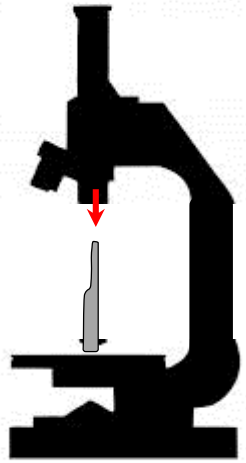


Solid Colour Cells



Process Colour Cells

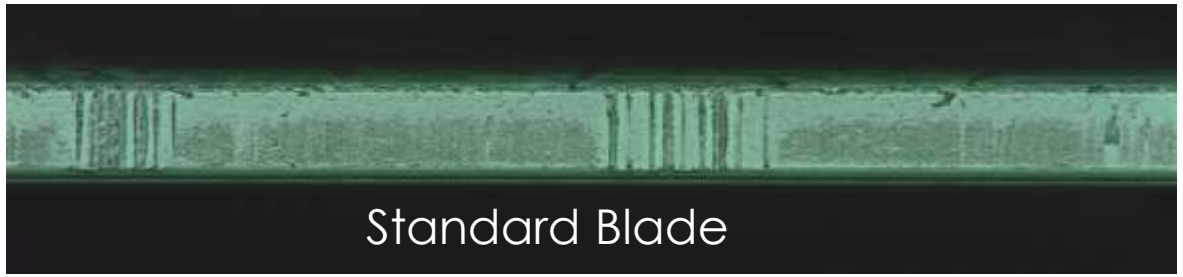


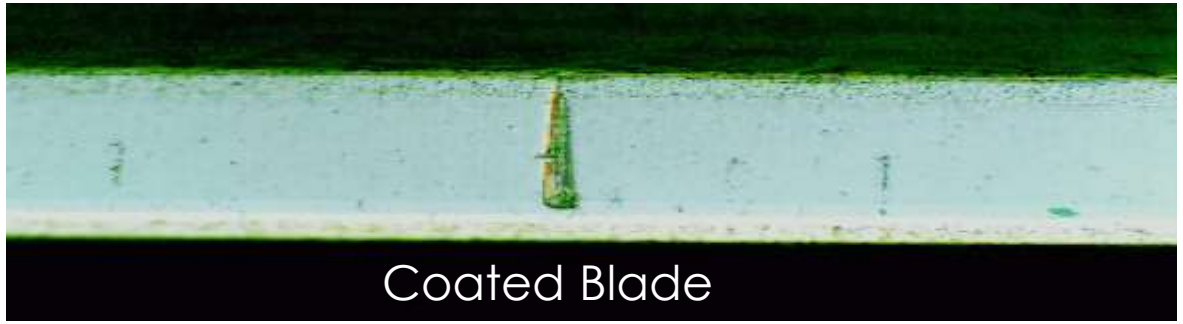


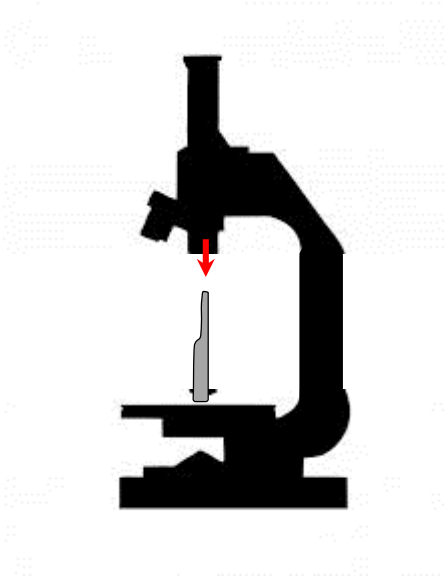
Tip Thickness

A 0.075mm (75 micron) Doctor blade tip is the width of a human hair, and put under extreme pressure during production.

Daetwyler SwissTec is the pioneer in producing coated blades to extend blade life.





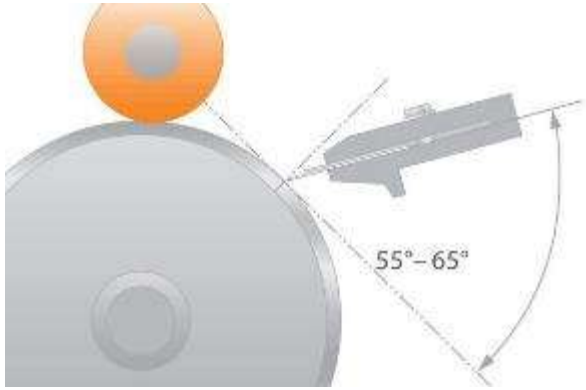


Blade Thickness

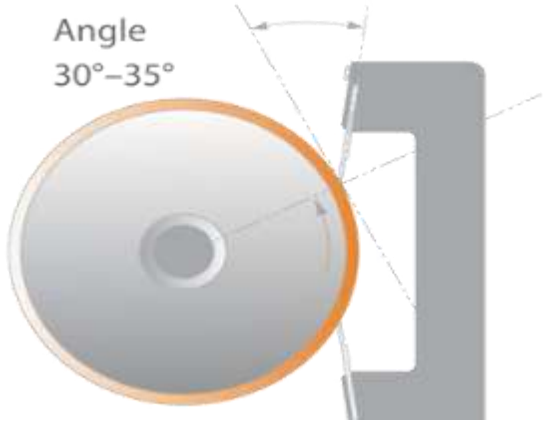
Blade thickness will depend on the amount of blade pressure being used.

Thicker blade material will not flex (distort) as much under excessive pressure

Gravure

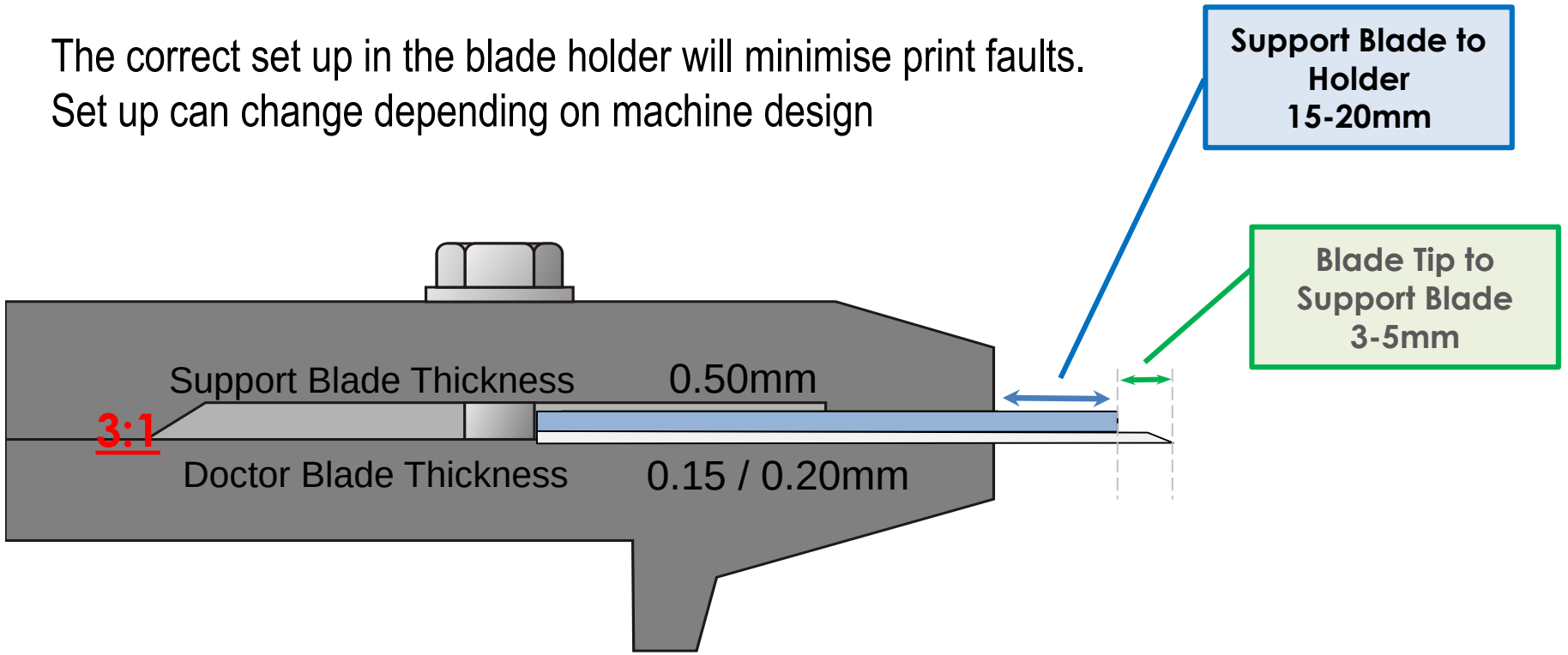


Flexography



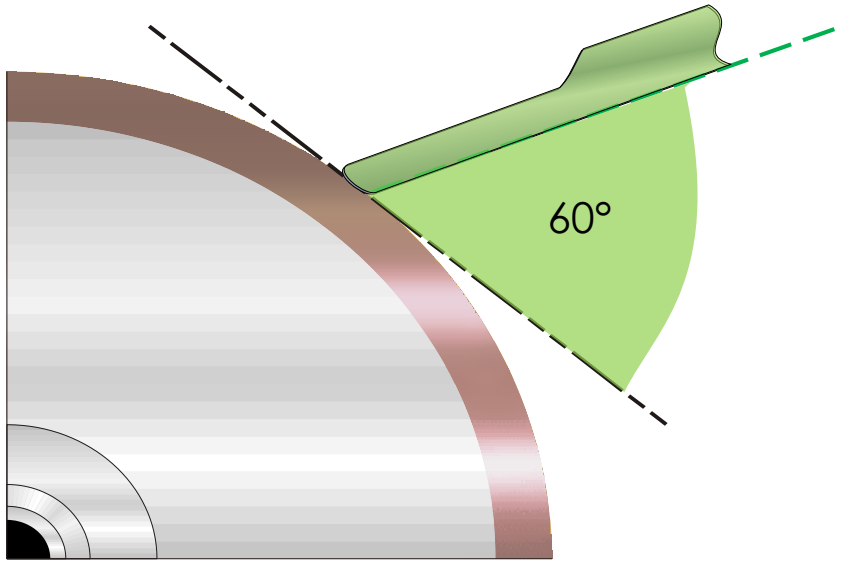
Blade Set-up

The correct set up in the blade holder will minimise print faults.
Set up can change depending on machine design



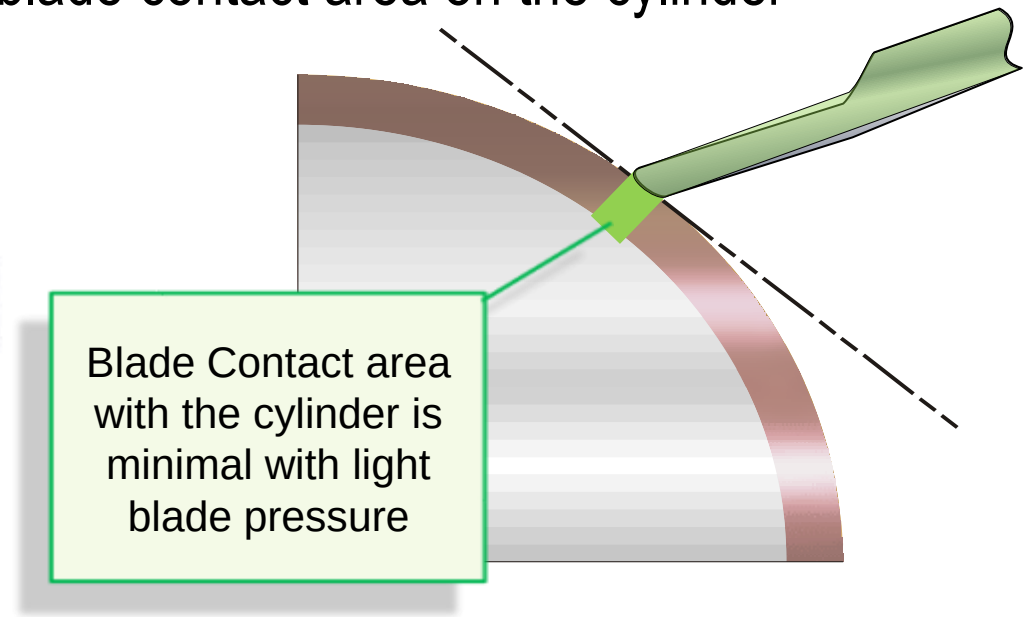
Blade Pressure/ Angle

The amount of air pressure used, will determine the performance and life time of the blade. Equally important is the angle you set it at.
60 Degrees is to optimum setting.



Blade Pressure/ Angle

As blade pressure is applied to the doctor blade, the blade will distort (bend) and change the set angle.
This also increases the blade contact area on the cylinder

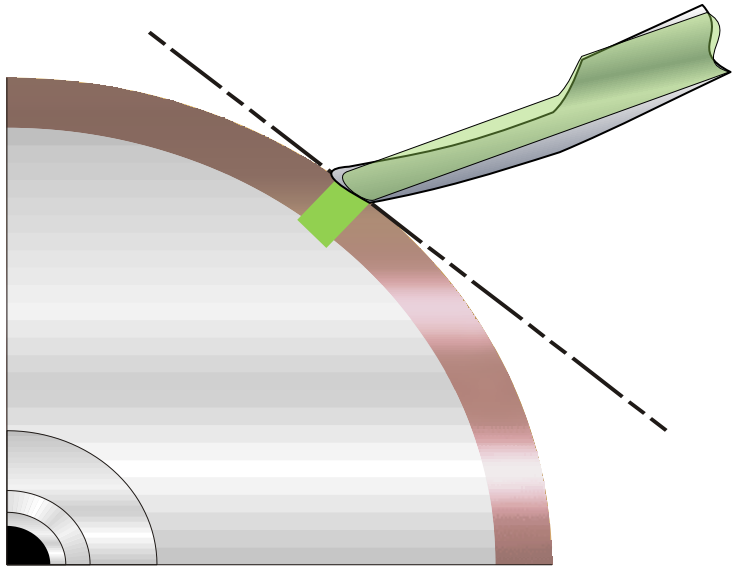


1 Bar pressure is the ideal starting point
(1 KG/cm2 / 0.10 MPa / 14.5 PSI)

Blade Pressure/Angle

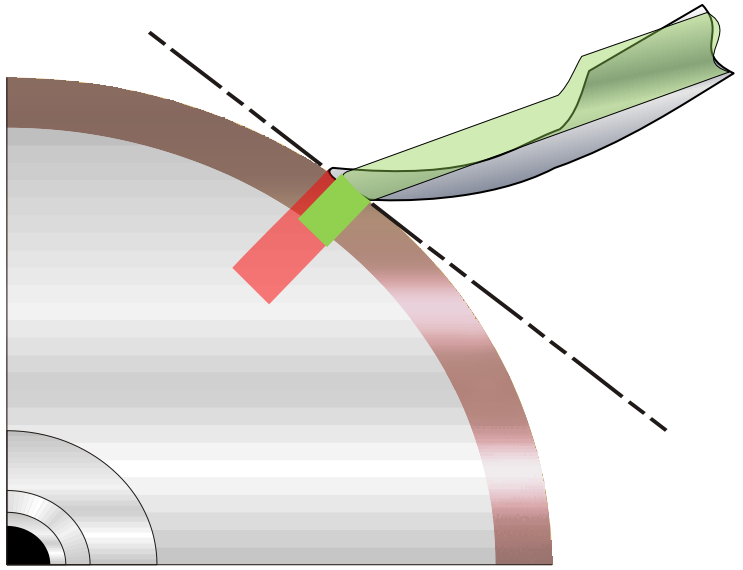
As blade pressure is increased the contact area increases also.

This reduces the performance of the blade to wipe the cylinder cleanly.



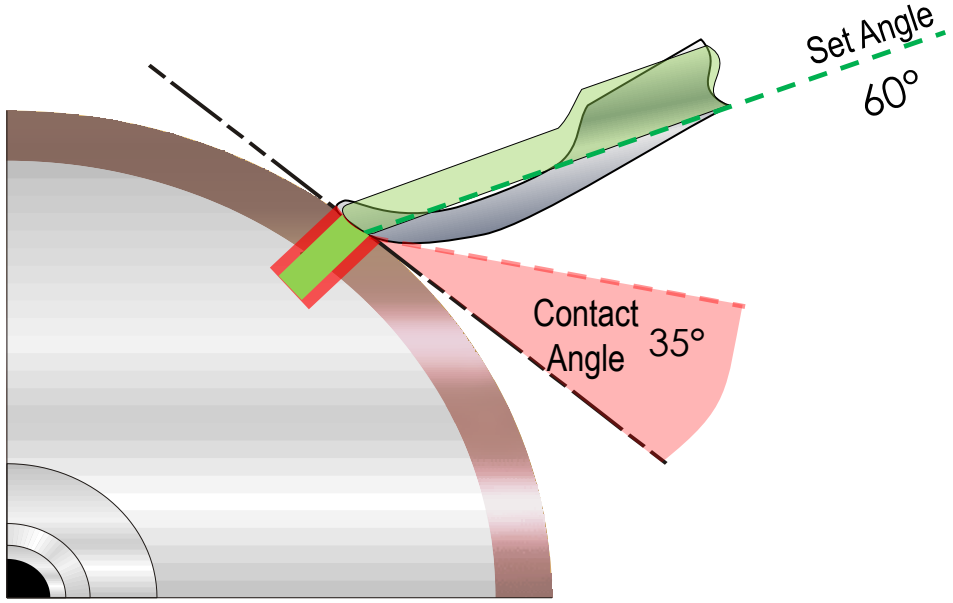
Blade Pressure/Angle

As blade pressure is increased the angle changes



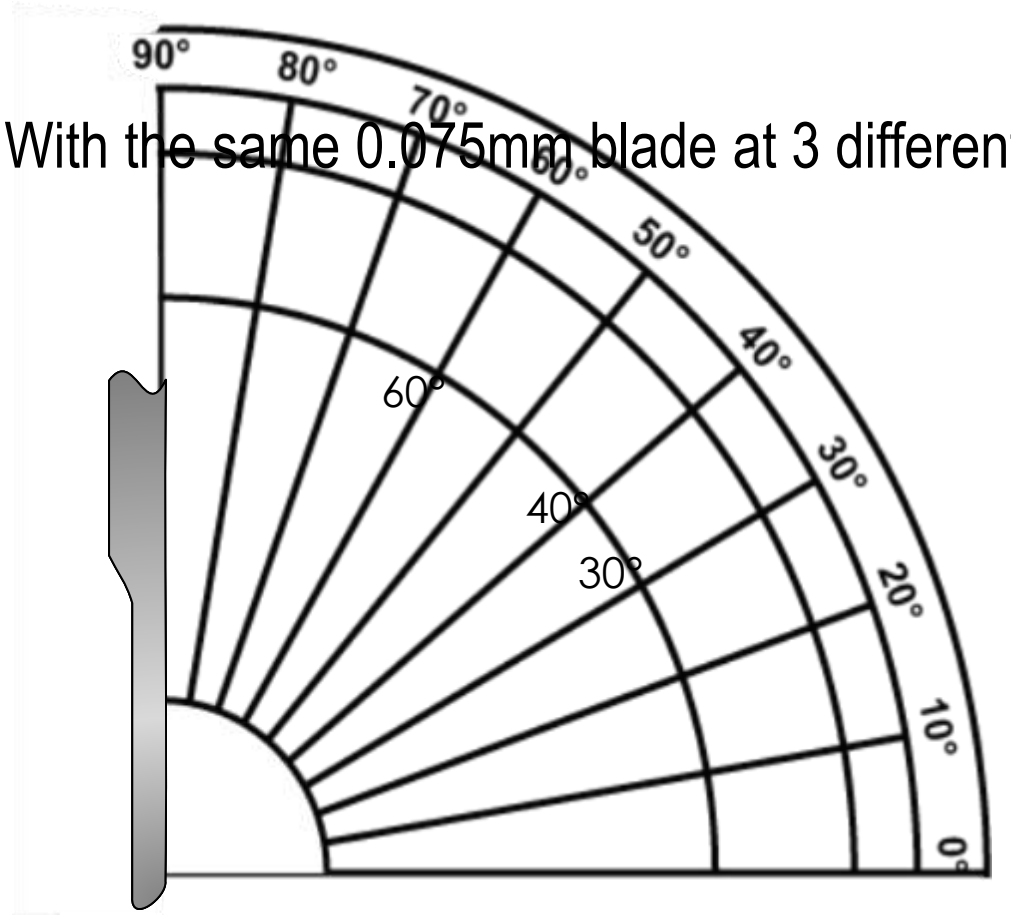
Blade Pressure/Angle

This angle change also will increase the contact area on the cylinder surface.



Blade Angle

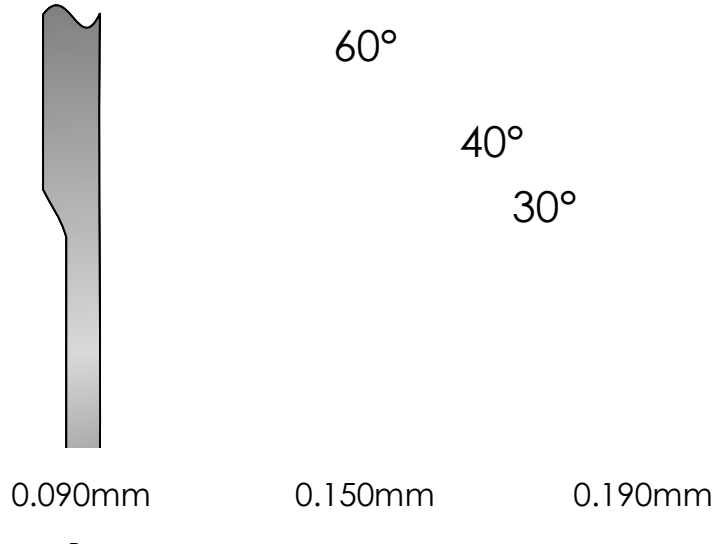
With the same 0.075mm blade at 3 different angles



Blade Angle

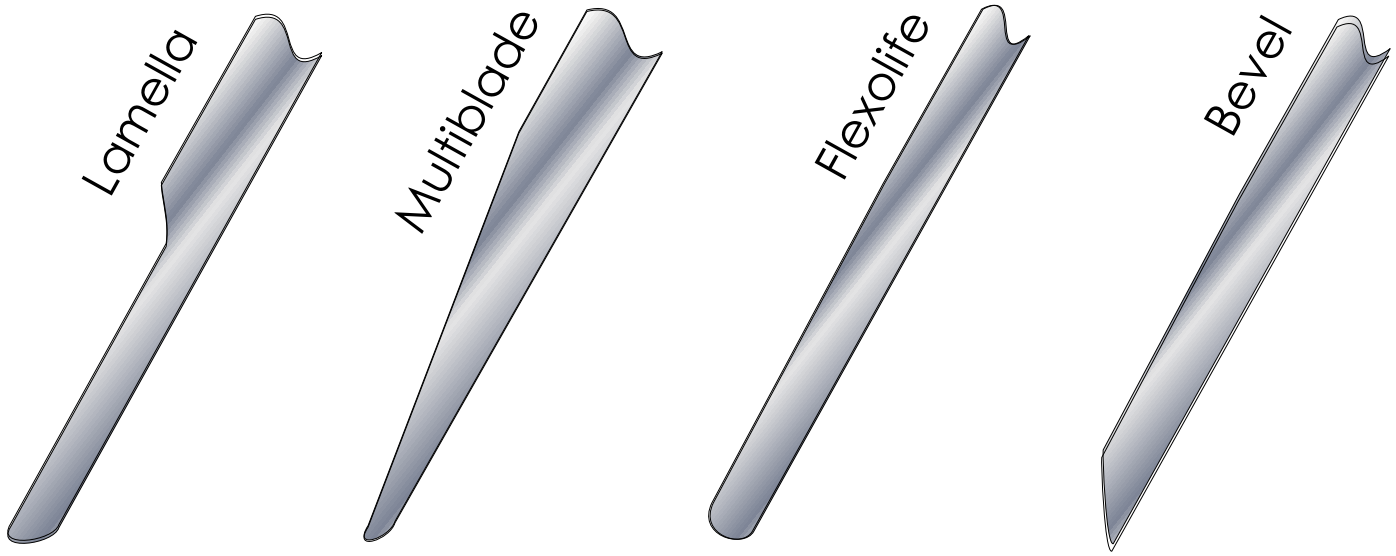
One key analysis in our Switzerland laboratory is contact area on used blades

For example the average contact area on a 0.075mm tip for the vary greatly with angle.



Blade Tip Configurations

Blade tip configurations maintain different contact area growth.



Excessive Blade Pressure

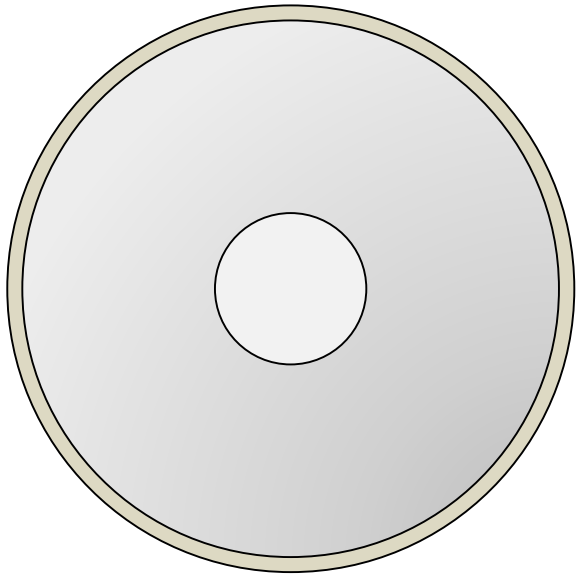
Excessive blade pressure is the most common problem we see in the market.

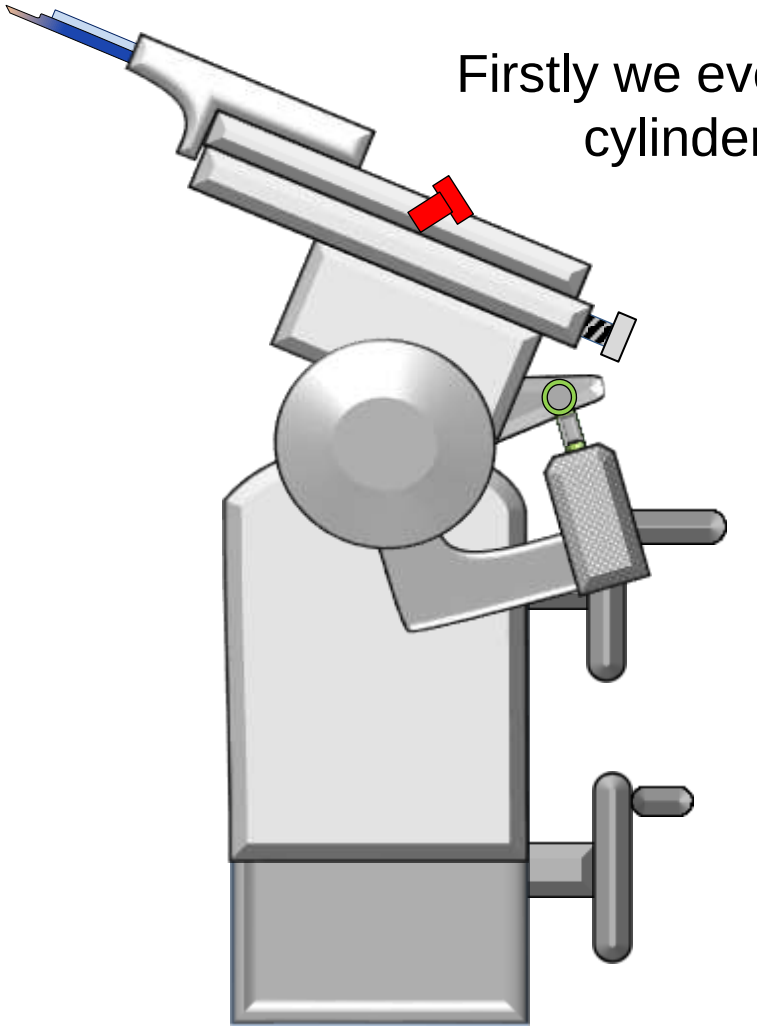
Knowing your process and settings will greatly reduce these.

Correct Blade Setting

A correct Doctor Blade setting improves performance and lifetime.

Correct Blade Setting

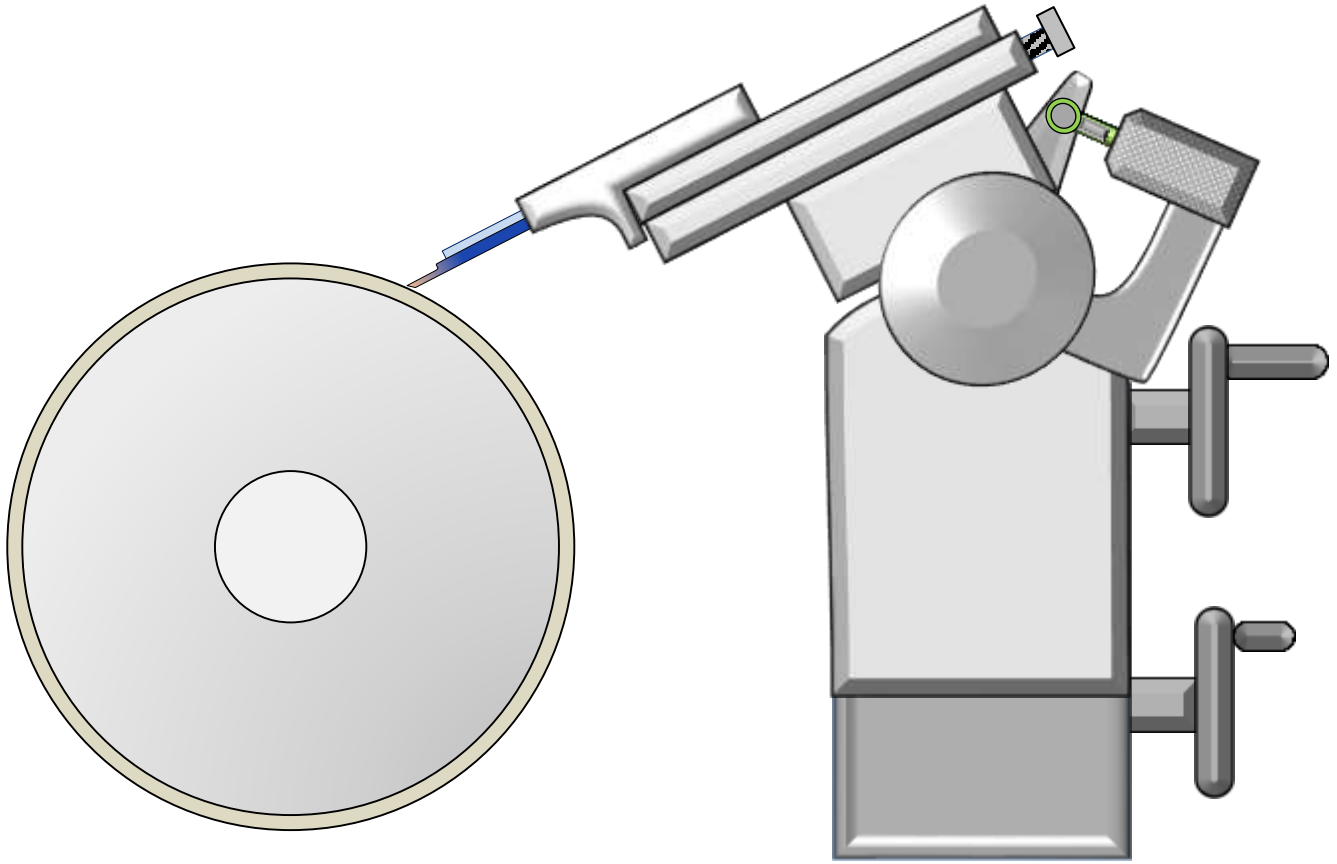




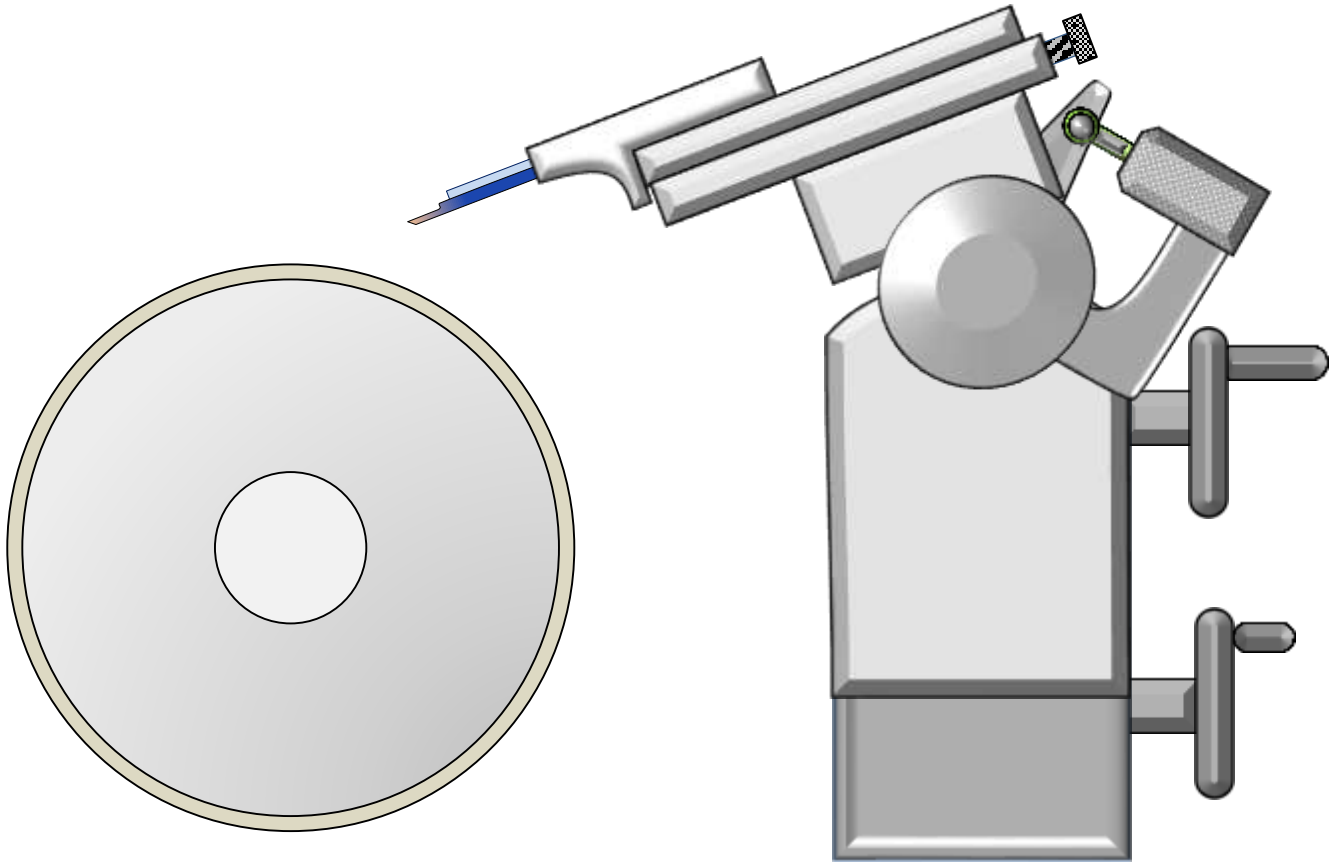
Firstly we even the blade to the cylinder side to side.

Correct Blade Setting

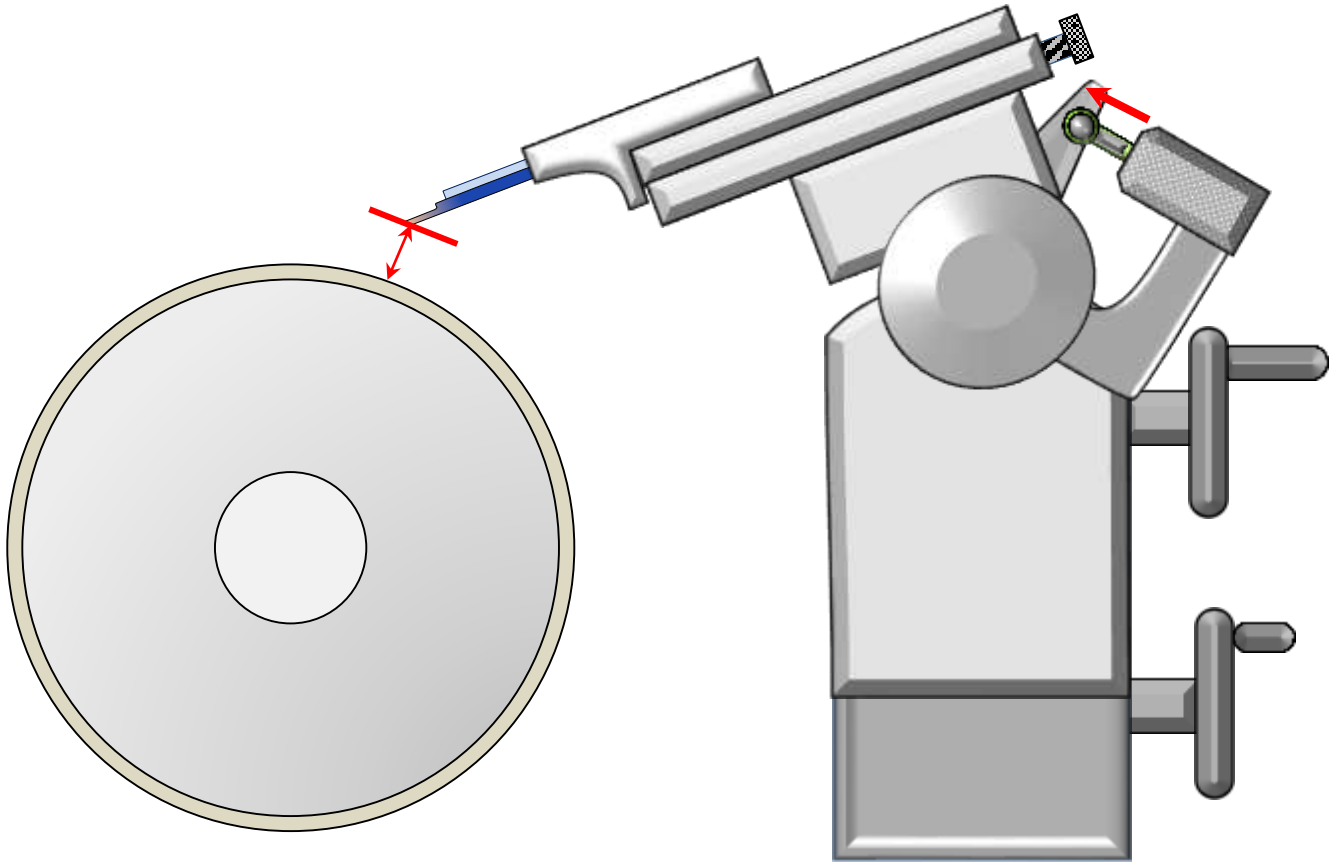
Secondly we allow space for our air piston to engage.



Correct Blade Setting

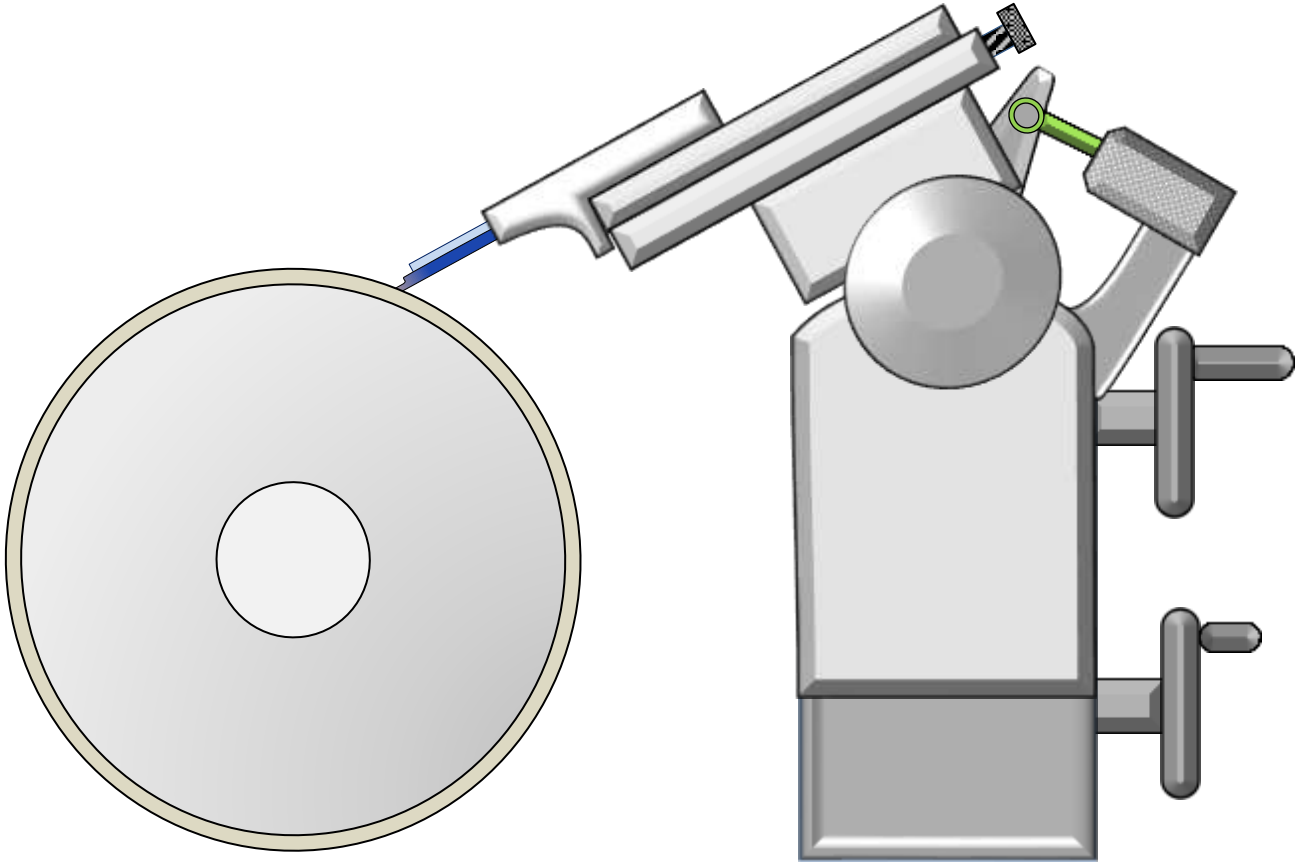


Correct Blade Setting



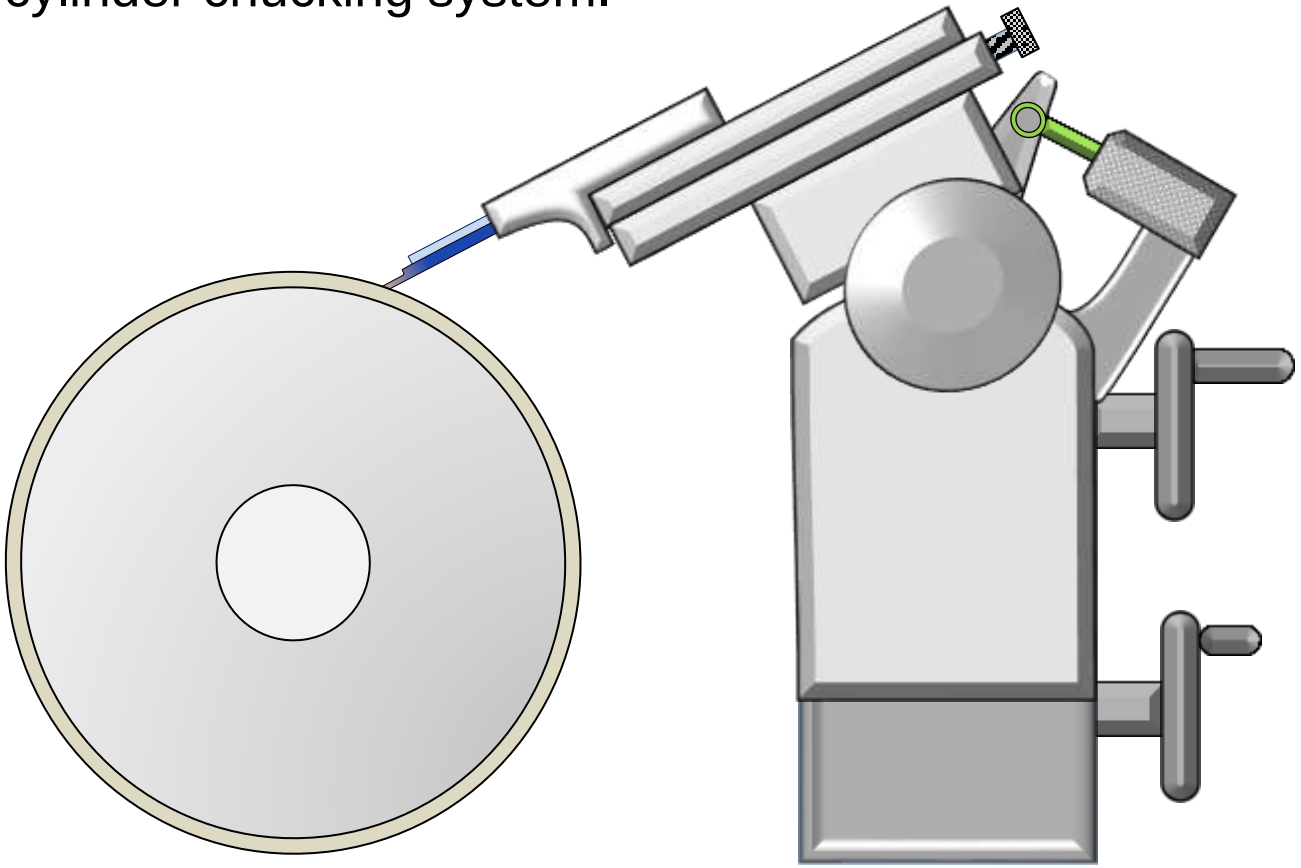
Correct Blade Setting

By allowing the air piston to engage, blade pressure is consistent.
Any runout in the cylinder will be compensated



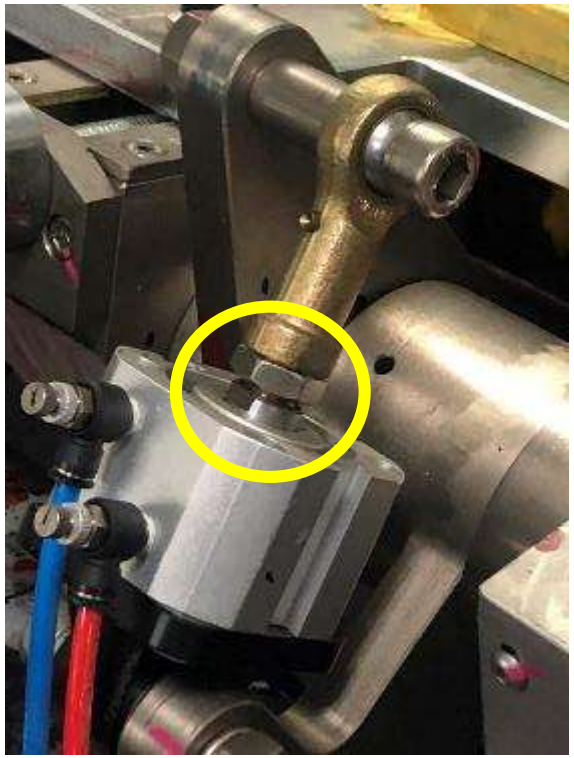
Correct Blade Setting

Consistent air pressure is transferred to the blade, and allows for the air piston to compensate any cylinder circumference runout (T.I.R), or a dirty cylinder chucking system.



Air Pressure

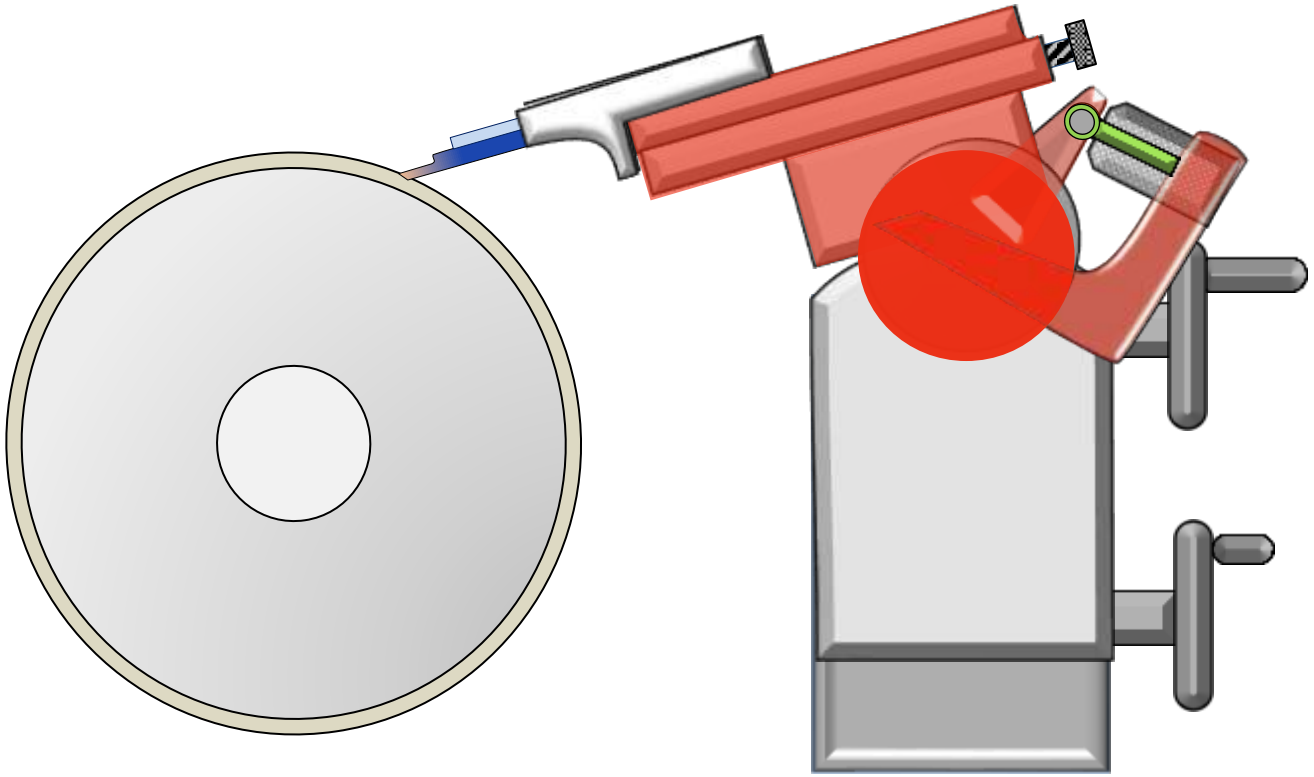
This is a common sight, in the field !!
Air pistons aren’t activated and blade pressures are not consistent.

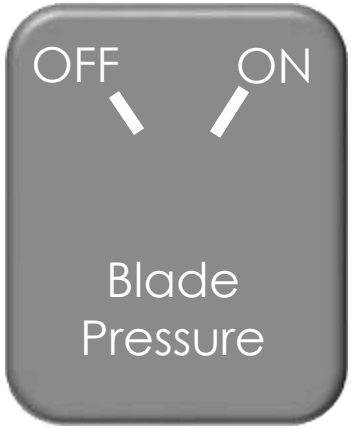


Correct Blade Setting

When the piston isn’t activated, the blade unit becomes locked.

Extra pressure is then put on the blade, and creates print problems.

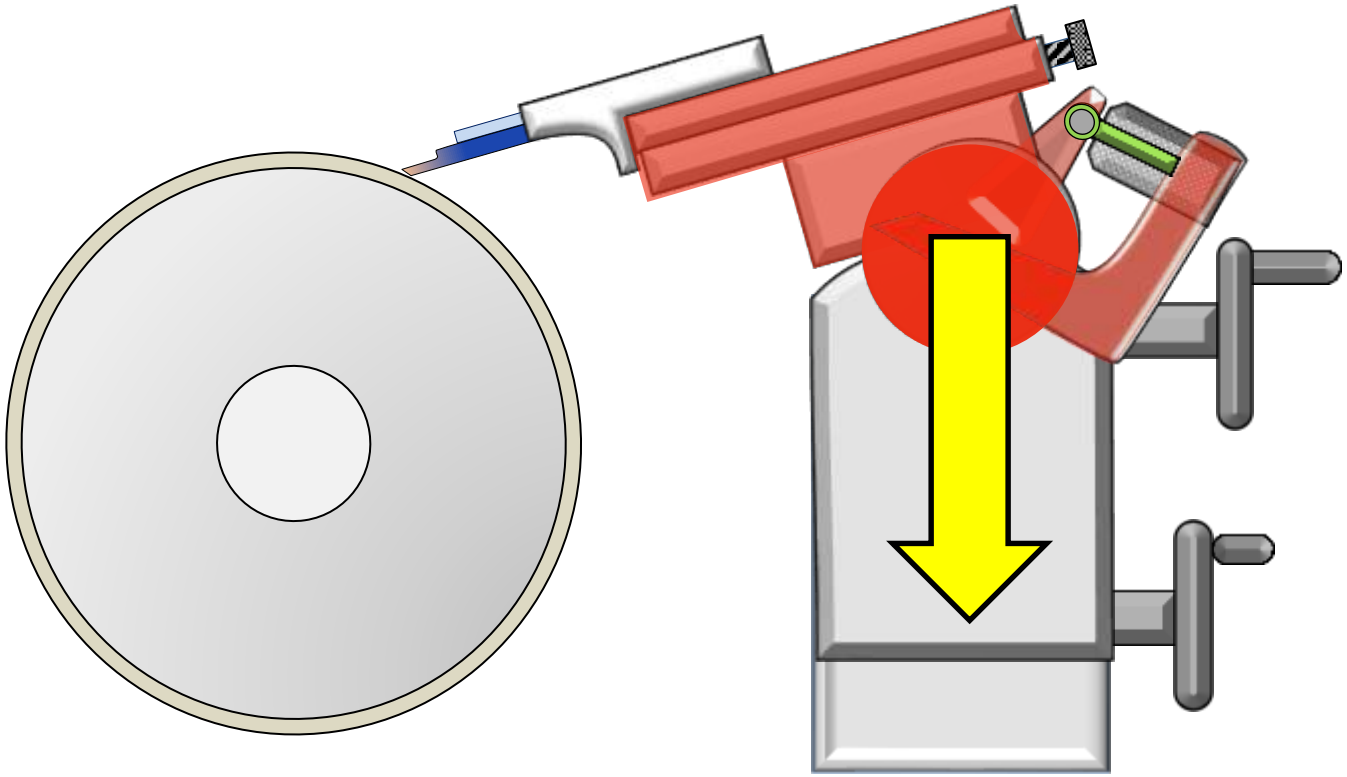




Air Pressure

The blade pressure now becomes a mechanical force. Instead of using the air pressure, the internal gears and housing of the blade unit become locked.

Air pressure readings aren’t true, and blade pressure will be higher than indicated.



The Result

When blades are set incorrectly, wear and tear on your printing press will be your next printing headache! With worn gearing blade units get sloppy.

The Printing process

Cylinder ***Inks*** ***Doctor Blades***

Factors that determine performance

Chrome Hardness	Resin System	Tip Configuration
Chrome Roughness	Pigment Concentration	Coated/ Uncoated
Engraving Technique	Solvent Blend/Viscosity	Setting technique

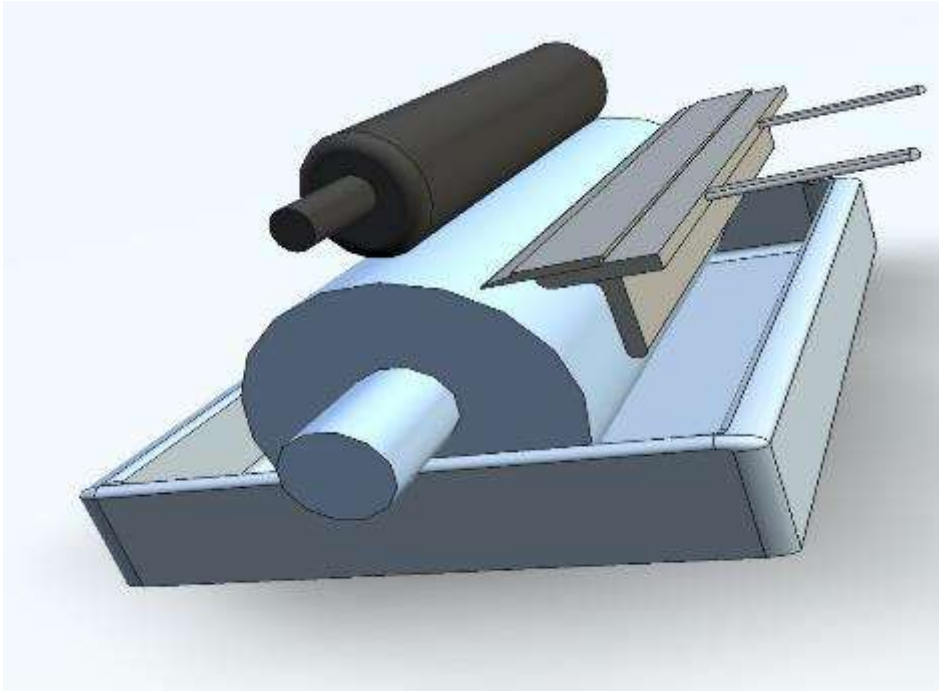
The Challenge

A lot of Printing faults seen in South East Asia relate directly to the Tropical climate.

- *Hazing/Scumming*
- *Bladelines*
- *Poor ink transfer*

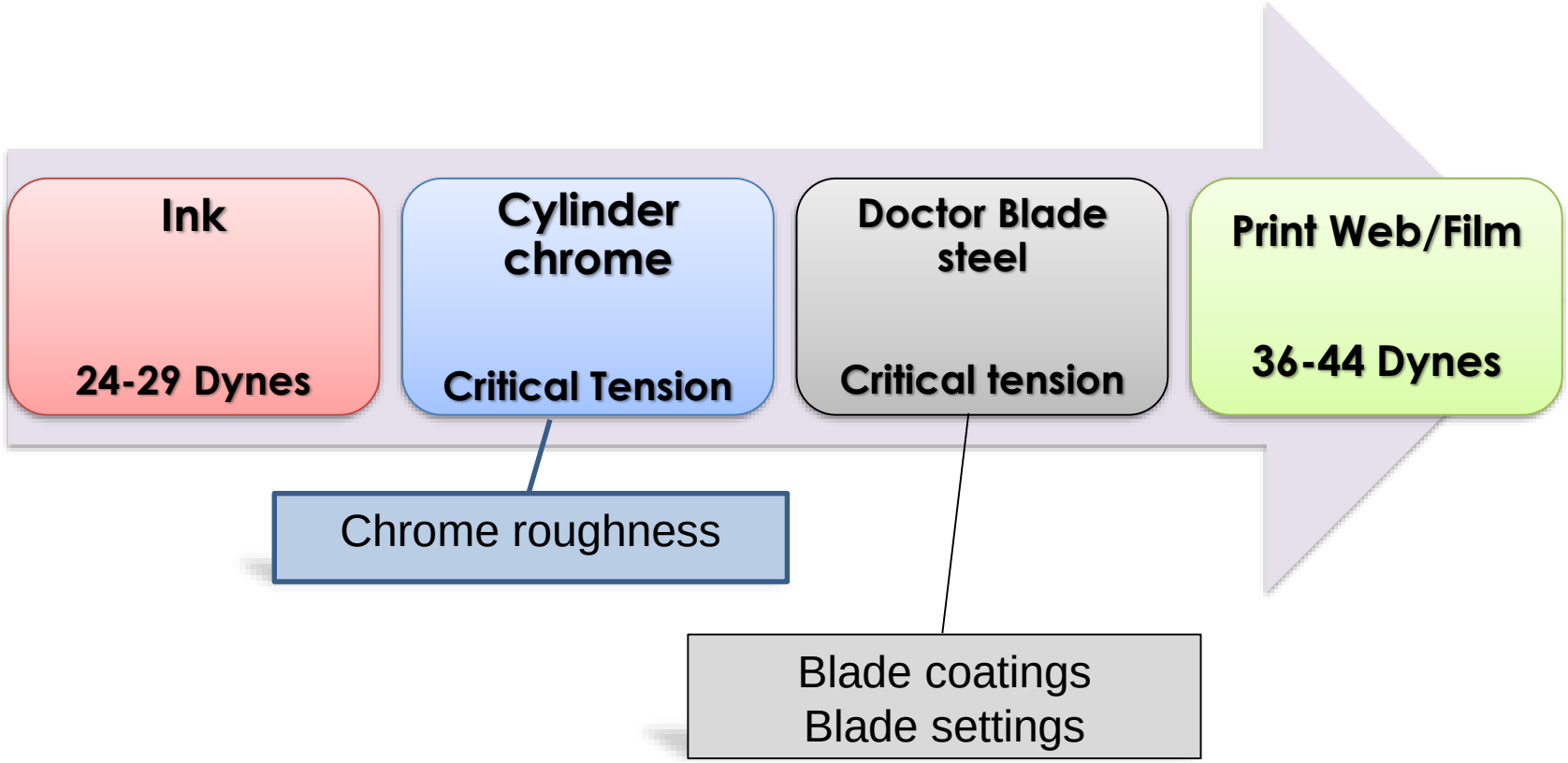
Surface Tension

The Gravure print process follows a surface tension theory !
Surface tension always increasing through the process!



Surface Tension

Maintaining the surface tension increasing throughout the process will ensure a good print result with fewer print problems.



Solvents

Solvent	Dyne level
Ethanol (Alcohol)	*22.6*
Acetone	*23.32*
Normal Propyl Alcohol (NPAL)	*23.70*
Ethyl Acetate (EA)	*23.75*
Normal Propyl Acetate (NPA)	*23.9*
Methyl Ethyl Ketone (MEK)	*24*
Toluene	*28.5*
Water	*72.8*

Common Solvent Blends

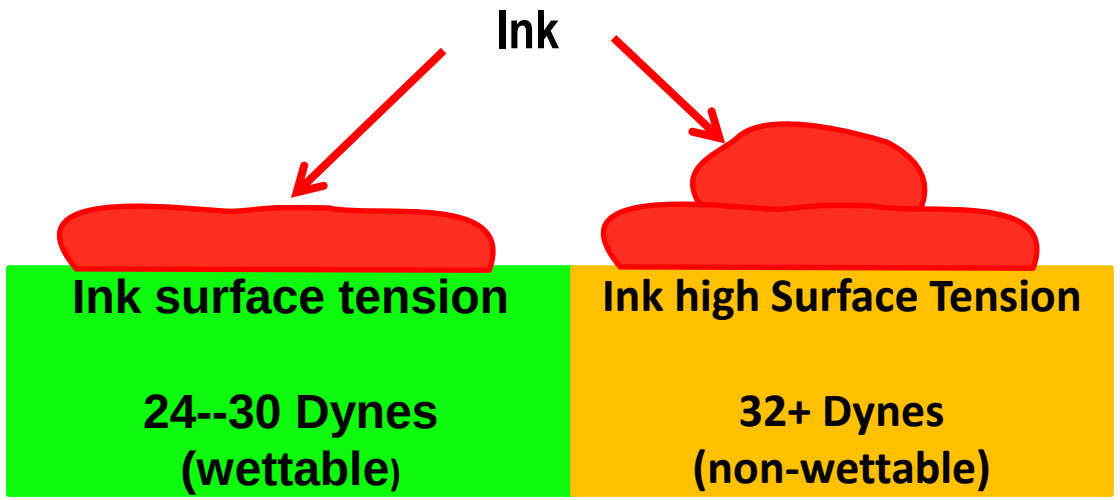
Uniflex Philippines Process Colours	Toluene 65%	MEK 15%	IPA 20%
Uniflex Philippines White	MEK 10%	EA 25%	IPA 55%
Sakata Inks Japan Process Colours	Toluene 50%	MEK 30%	EA 20%
Ink tech Chemical Japan White	Toluene 60%	IPA 30%	EA 10%

Gravure Inks

Gravure Solvent Based Ink Components		
Carrier	**Solvent**	**Additives**
Resin/Pigment System	Dilutant	Wax / Plasticisers
Emulsion	Dilute Resins Regulate Viscosity	Solve printing problems Improve Ink performance
Nitrocellulose Polyamide Poly Vinyl Buytl	Toluene Ethyl Acetate Methyl Ethyl Ketone Iso Propyl Alcohol	Parafin wax Adhesion promoters

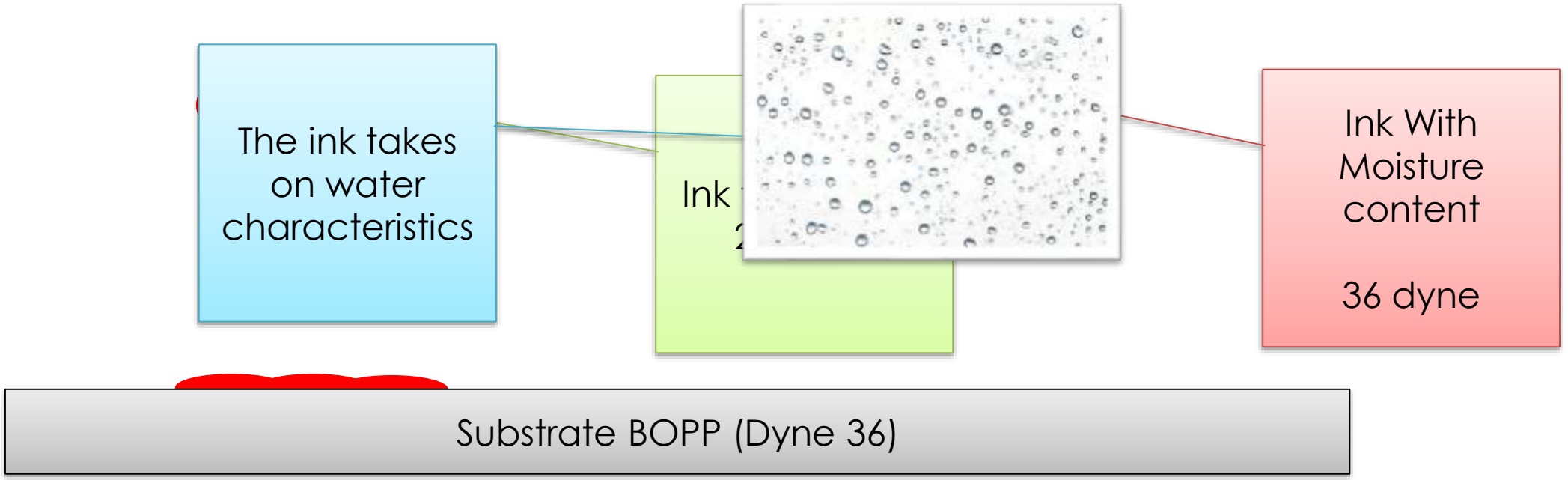
Ink Surface Tension

When ink attracts water (Humidity), wettability decreases, ink transfer decreases.



The common rule is that ink should be 10 dynes below Substrate treatment level to allow good transfer.

Ink Surface Tension



Ink wettability is crucial to good ink transfer!

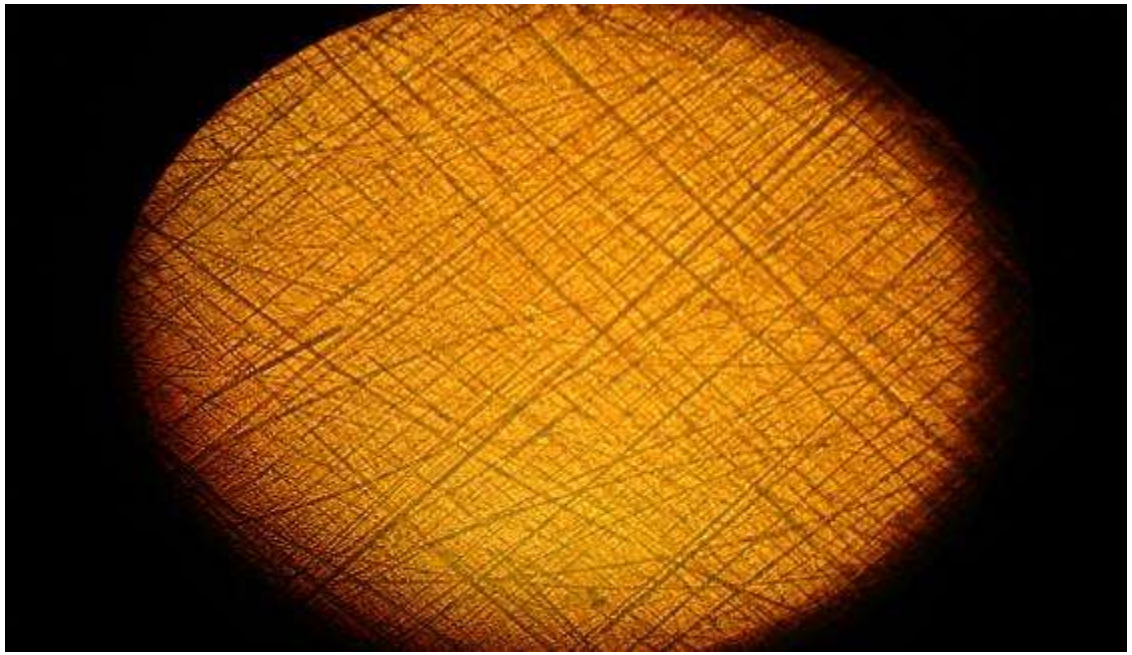
Lubrication

With the principles of engineering. Any metal surfaces coming into contact with each other, create a resistance to motion. In common terms we call this “*Friction*”. To reduce friction, a material is used between the two surfaces to “*Lubricate*” them.

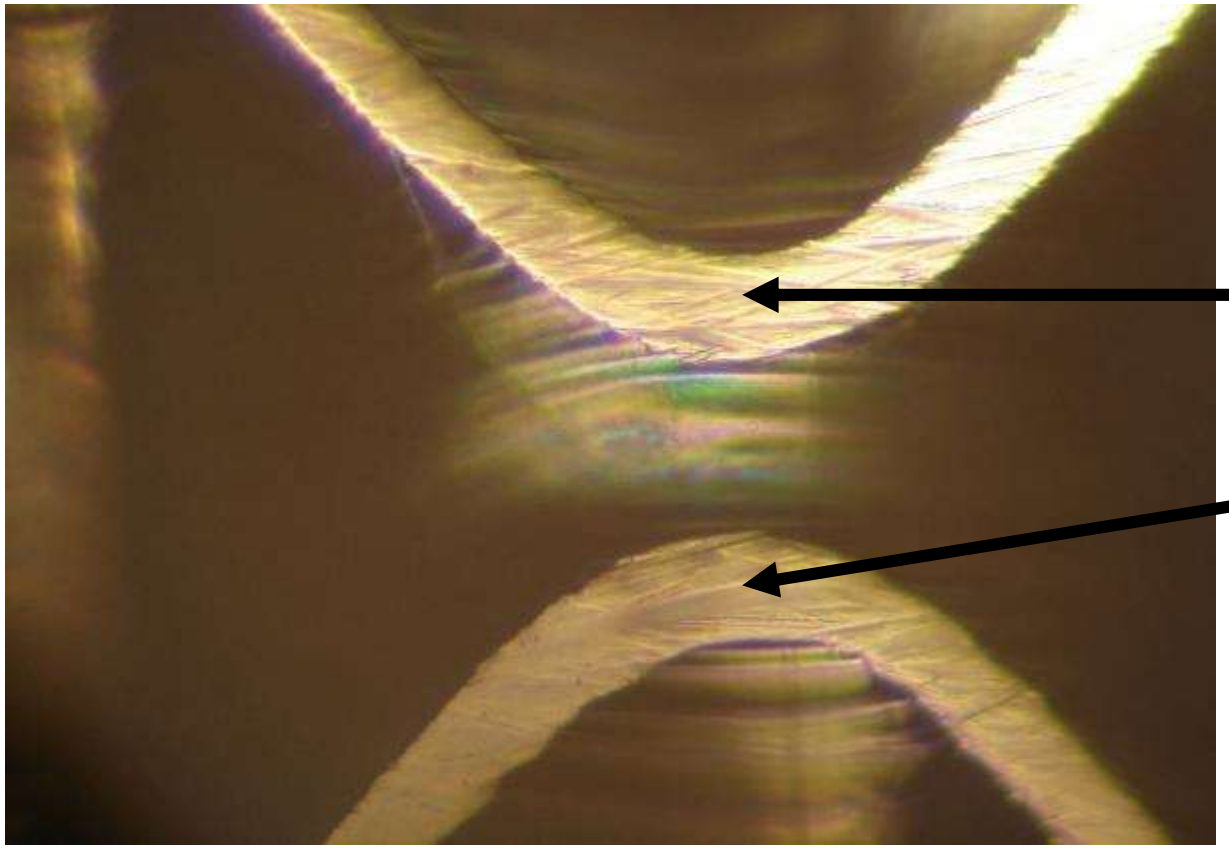
Lubrication

Surface Roughness determines lubrication on your cylinder.

Copper Finish



Copper surface polished before chroming. This determines your surface roughness score or Value.



A good finish on the cell walls helps to build up lubrication

Technical Services

We work with our customers improving their printing process.
If you have any questions please come and talk to us!!

Daetwyler SwissTec

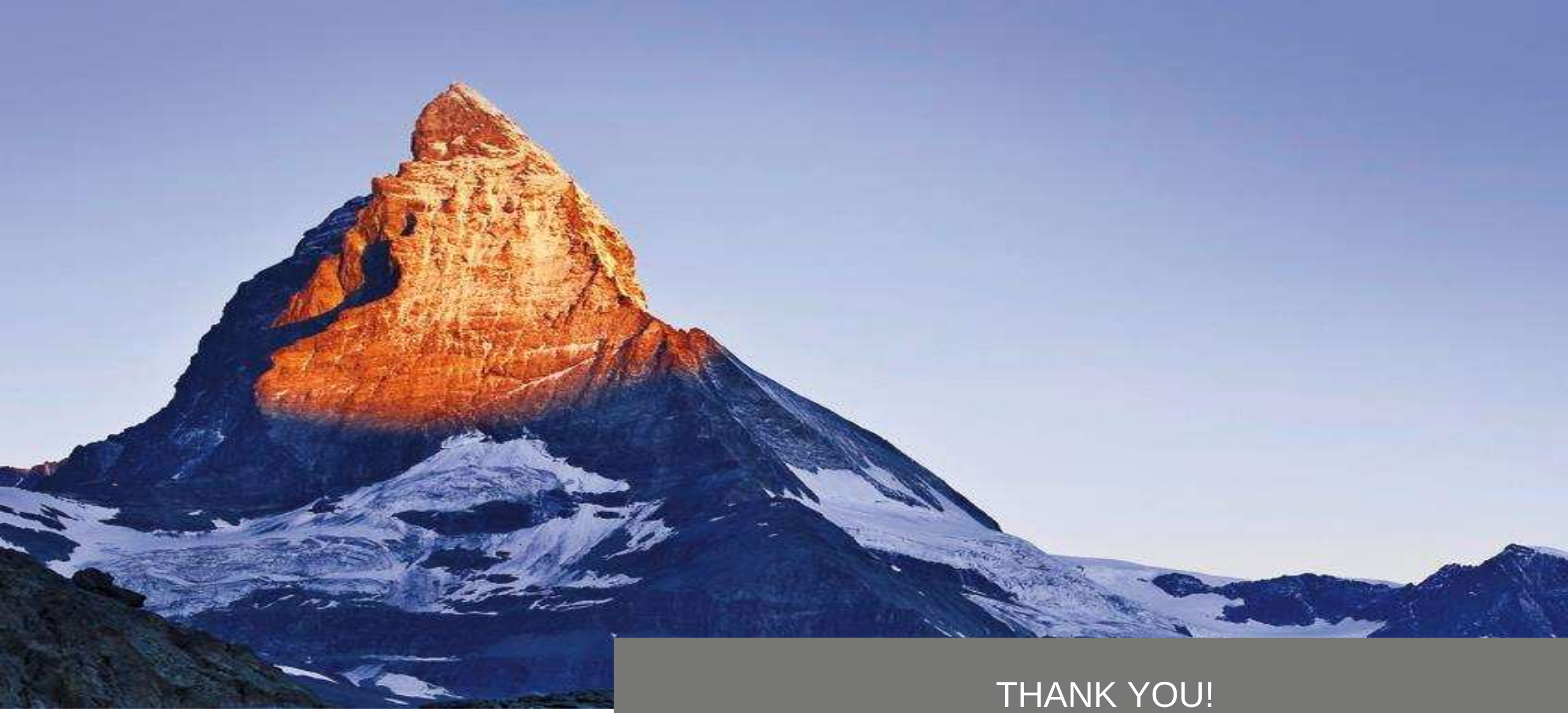
https://swisstec.daetwyler.com

gravure printing

spots.

Hazing	Unsmooth gradient	Drying up	Chattering marks
+	+	+	+
Drag outs	Ink streaks	Missing dots	Voids (spots)
+	+	+	+
Cylinder wear	Other problems?		
+	+		

Daetwyler SwissTec



THANK YOU!

Daetwyler SwissTec