

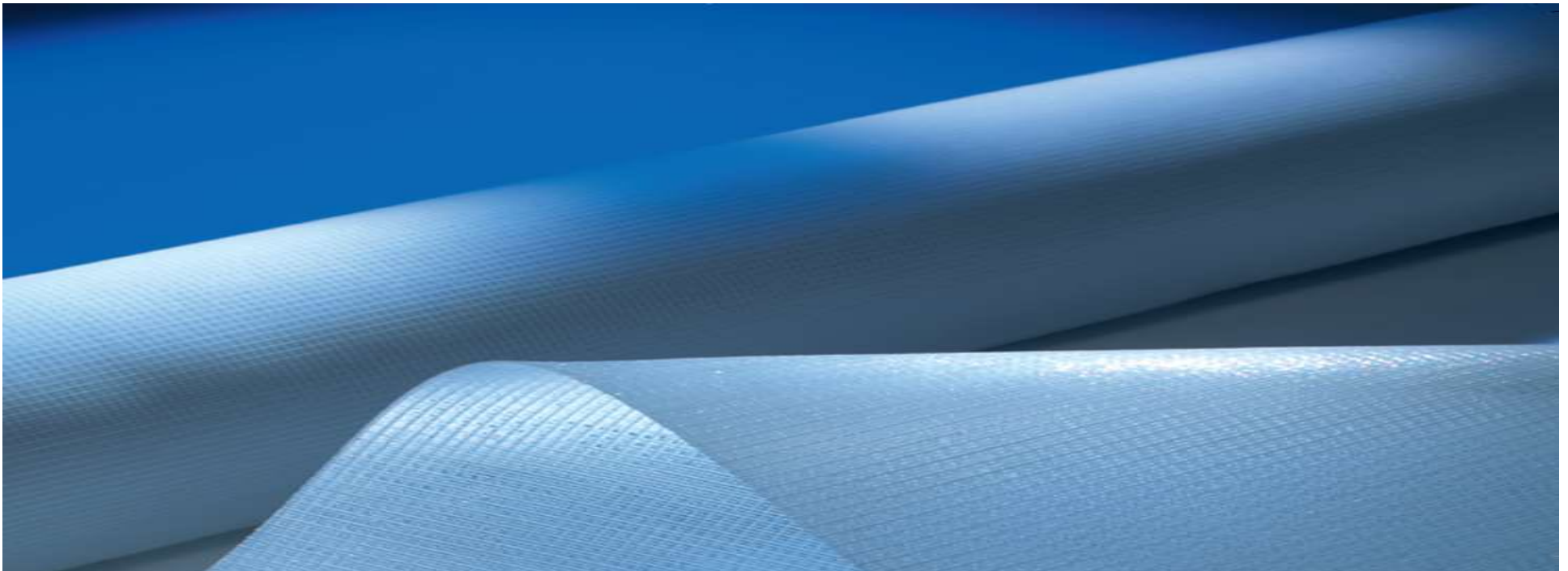
**VOITH**

# **VOITH 低碳生產技術介紹**

## **HydroSeal**

主講人: 右昇貿易有限公司林俊良 **Eddie Lin**

14<sup>th</sup> Feb 2020



## VOITH Group - Milestones

右昇貿易股份有限公司創辦人林昇平先生於1985年開始與Scapa合作紙機織物服務於造紙業至今



1867

Johann  
Matthäus Voith  
1803 – 1874



1899

Voith delivery  
the first paper  
machine to  
Russia



1910

Voith delivers  
turbines for the  
first Chinese  
hydro power  
station in the  
world (雲南省石  
龍壩水電站)



1934

The year 1934 sees  
the delivery of the  
first Voith turbo  
transmission for a  
diesel-hydraulic  
railbus operated by  
Austrian Railways.



1997

Voith Hydro gets  
six turbines for  
one of the world's  
largest hydro  
power stations at  
the Three Gorges  
Dam in China (長江  
三峽大壩).



1999

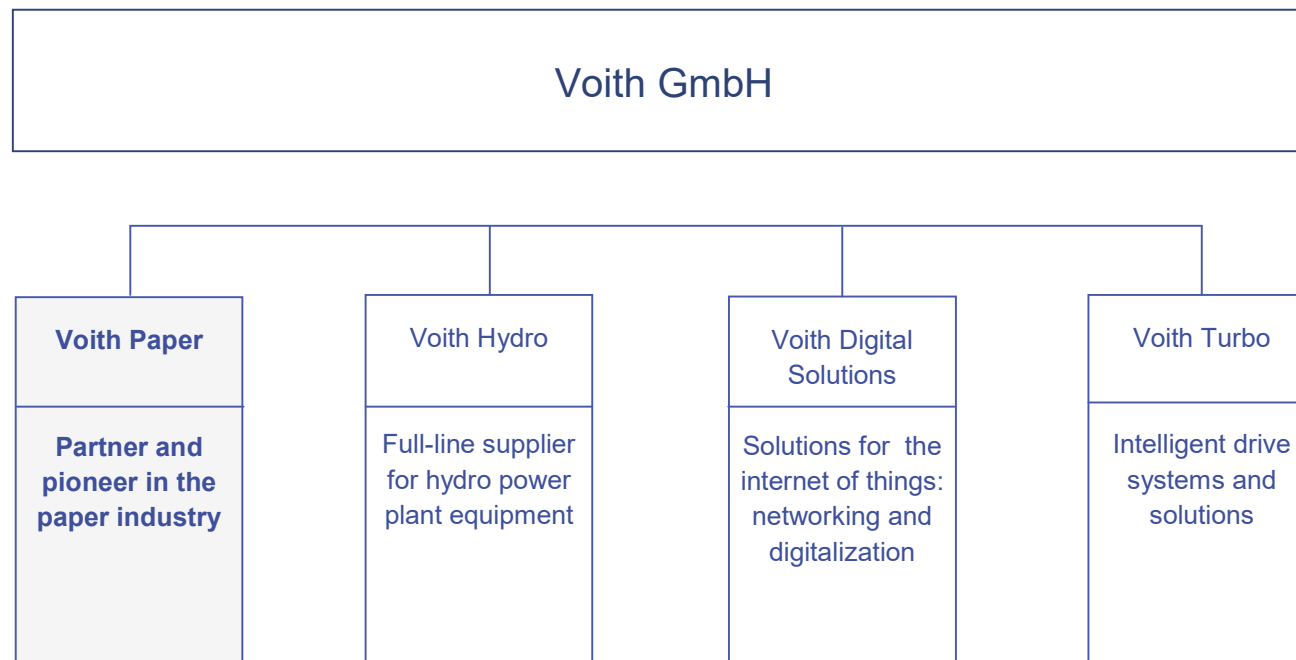
In the largest  
acquisition in the  
company's history,  
Voith takes over the  
paper technology  
business of the  
British Scapa Group  
plc. and becomes a  
leading supplier of  
wires and felts for  
the paper industry

## Voith Group Figures in 2018/19




Stand on the link: <https://www.voith.com/corp-en/about-us/voith-by-the-numbers.html>

## Four Divisions – a well positioned company



# Paper



Technologies from Voith are used in all sectors of the paper industry. A large proportion of the world's paper is produced on Voith paper machines. One among three piece of paper is made by Voith equipment worldwide.

## PM locations Globally positioned, near the customer

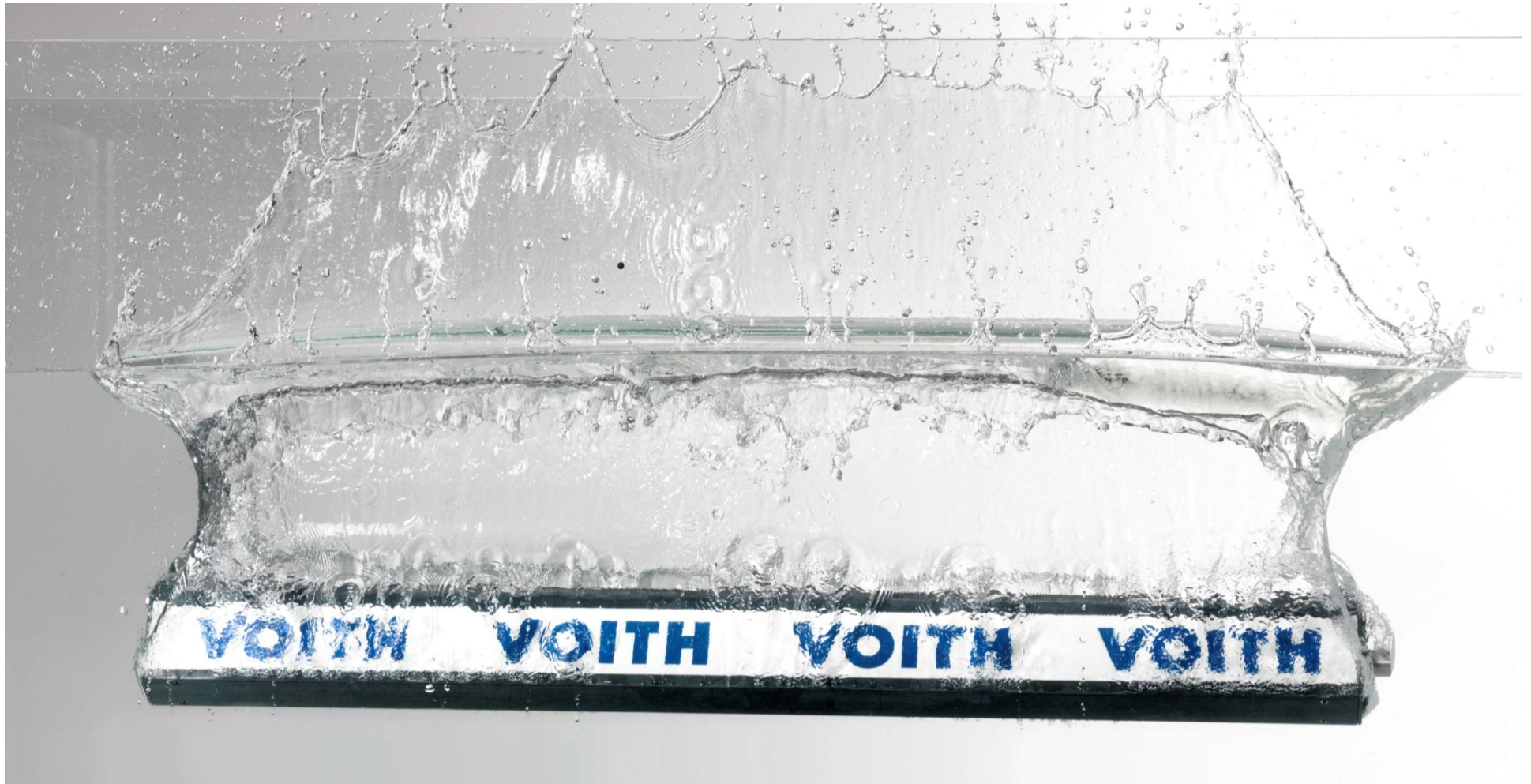




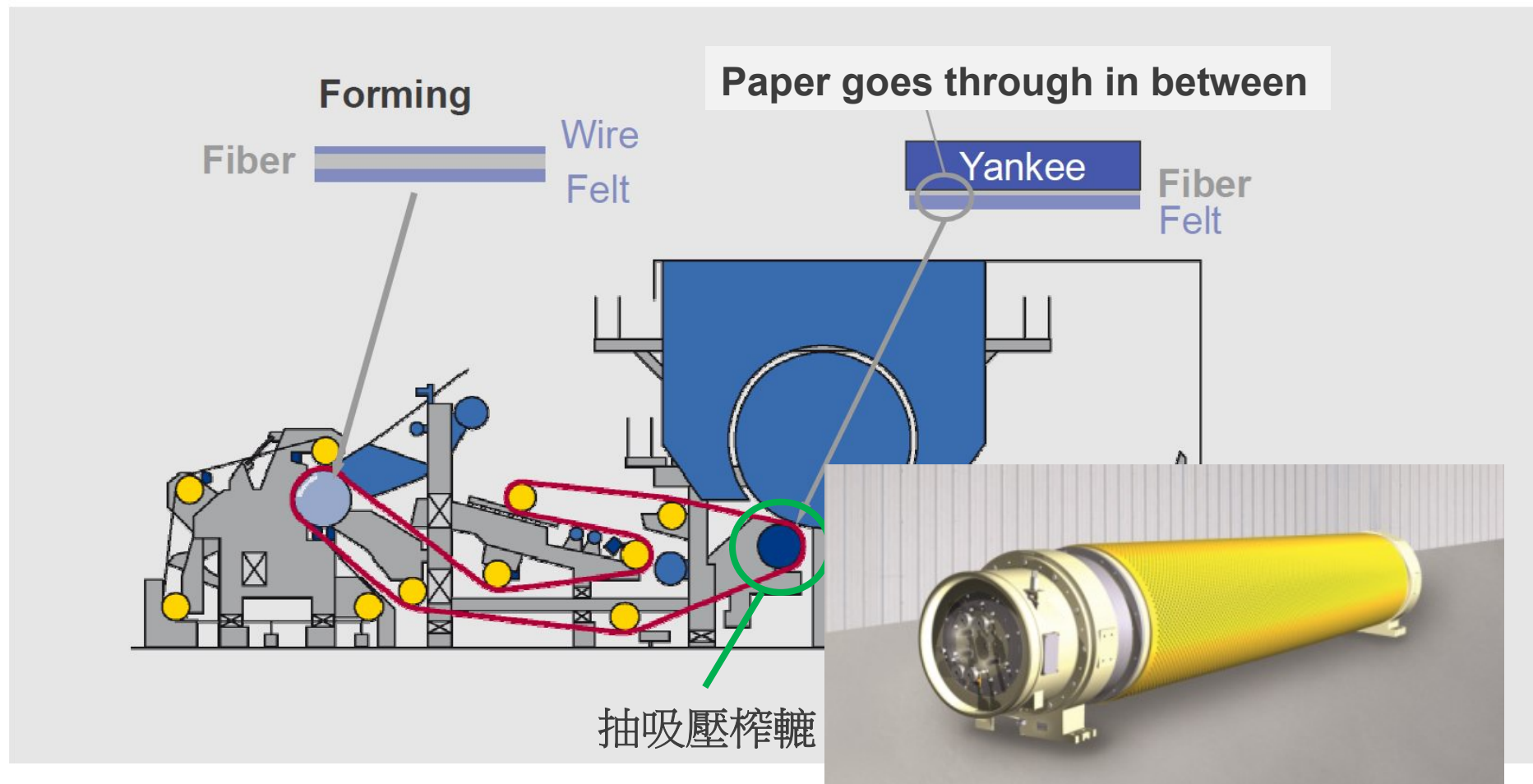
**VOITH**

# HydroSeal

適用於所有抽吸輥的自潤滑密封條



# Standard Dry Crepe technology Highlights

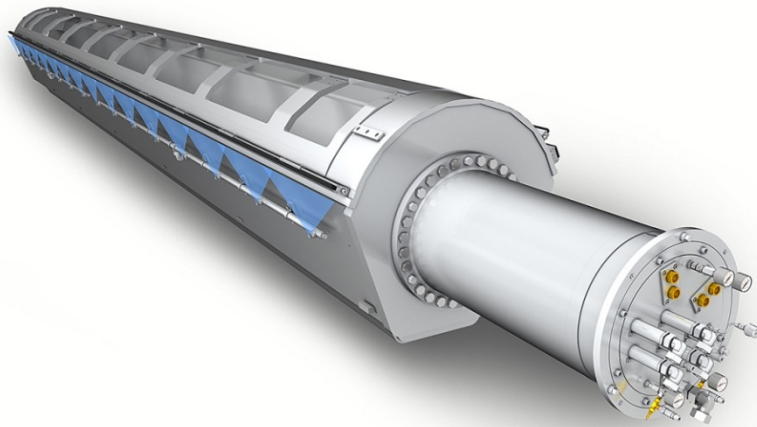




## 早期密封條的潤滑方式 脆弱的噴嘴技術

### 傳統的噴淋水管

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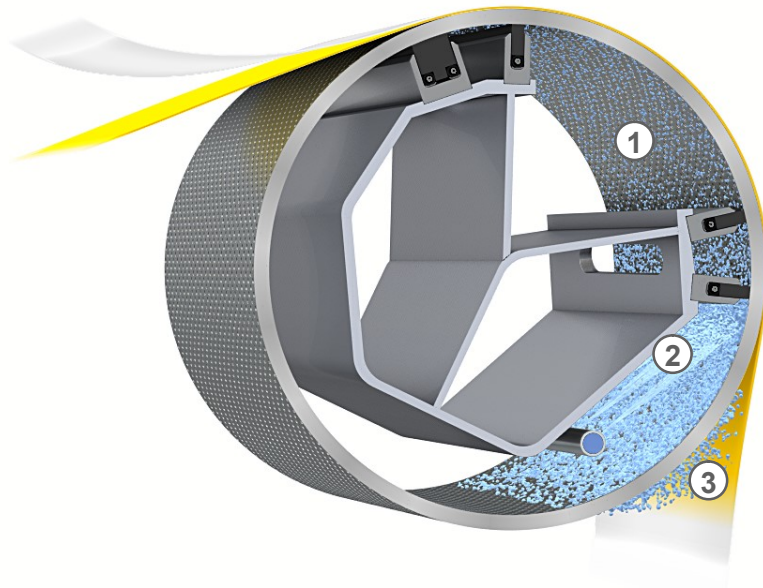


安裝有扇形噴嘴的逆流潤滑水管負責供應紙機方向2至5根密封條的潤滑水。

由於潤滑水呈噴霧狀及部分重疊, 有些不需潤滑的區域也被覆蓋到了。

## 早期密封條的潤滑方式

### 傳統低效率的潤滑

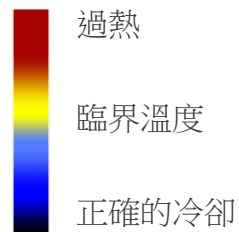
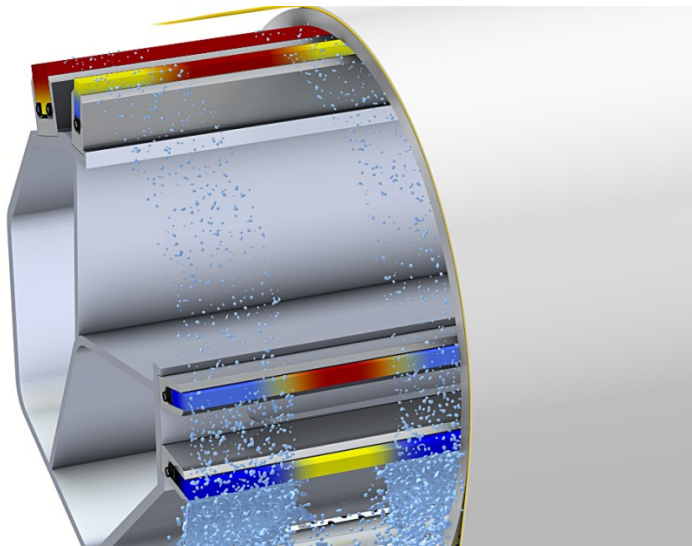


傳統方式, 第一根密封條會刮去超過 90% 潤滑水; 隨後的密封條只得到少量的潤滑水。

- ① 低效率的潤滑
- ② 不必要的耗水量
- ③ 由於在第一密封條之前水的積累回濕織物, 導致影響紙頁的水分分佈。

## 早期密封條的潤滑方式 脆弱的噴嘴技術

傳統扇形噴嘴重疊及堵塞



傳統扇形噴嘴重疊區域不規則的水分分佈

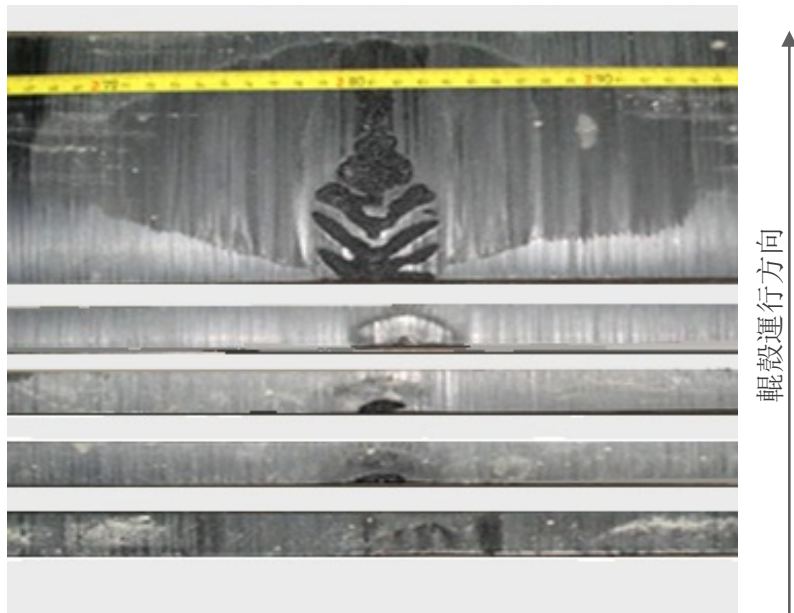
當某一噴嘴發生問題, 整個區域不再被潤滑水冷卻

導致:

- 在密封條相應位置過熱及高磨損
- 非計畫的停工及高成本

## 早期密封條的潤滑方式 磨損及損壞

### 傳統密封條損壞



刮除潤滑水的結果:

- 隨後的密封條受到更高的摩擦係數
- 增強的制動導致能量消耗增大
- 噴嘴故障加速密封條的磨損
- 非計畫停機風險

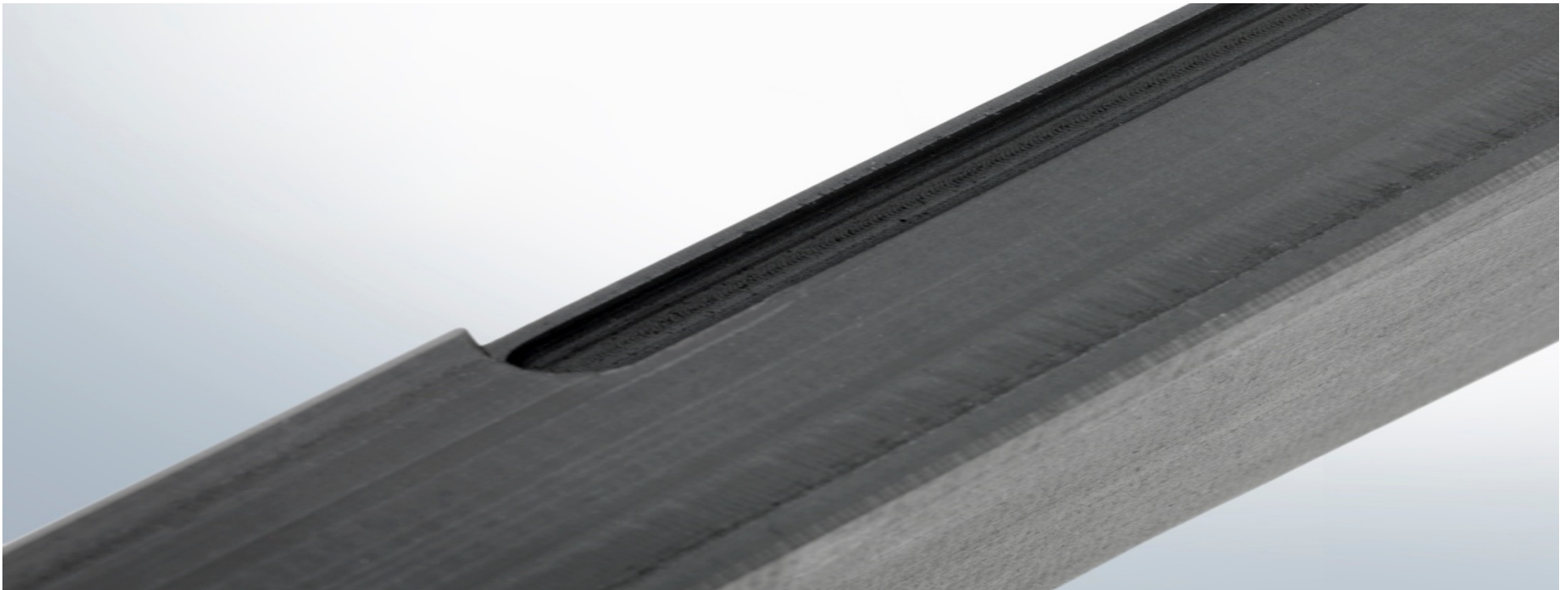


Voith專利 – HydroSeal密封條



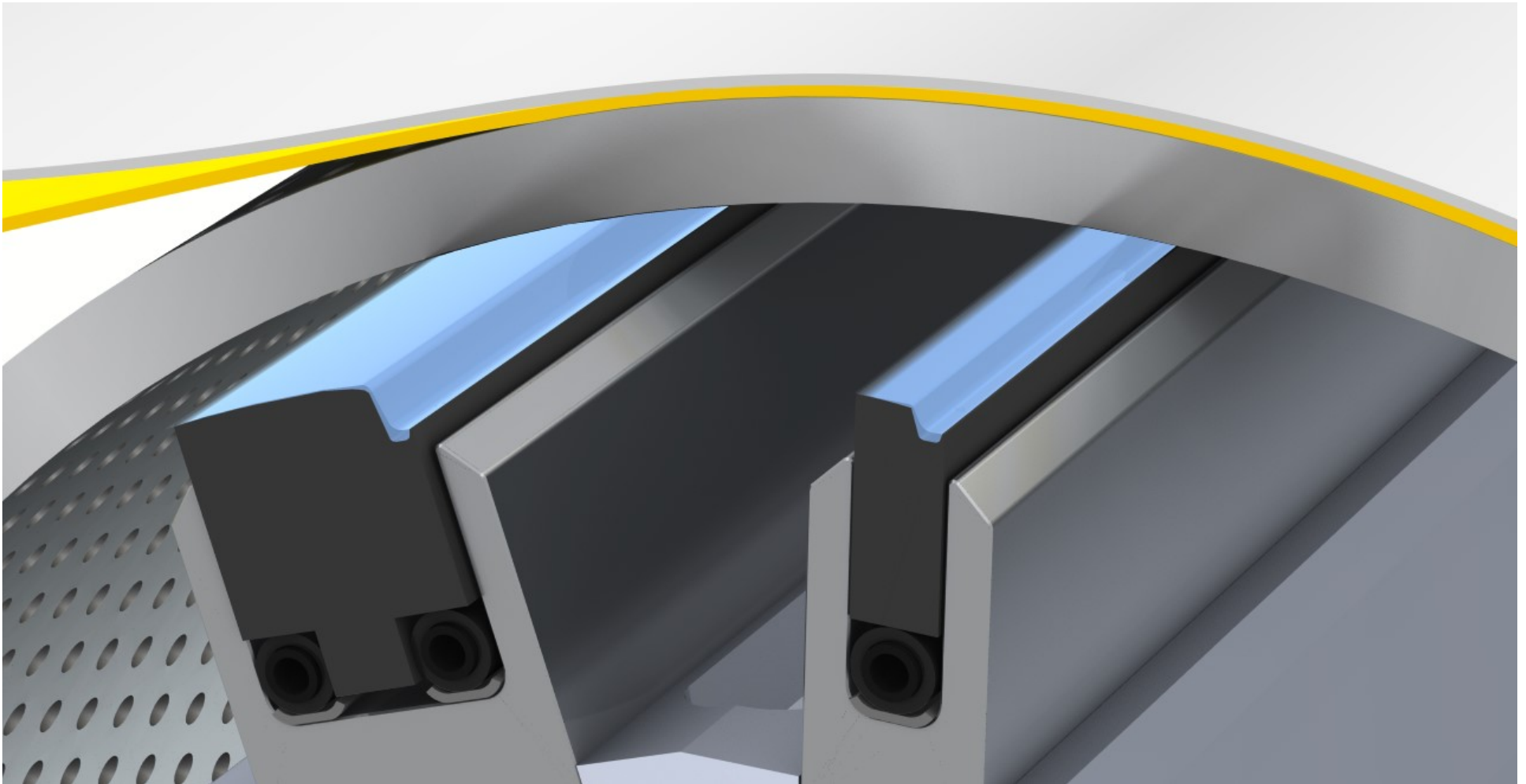
## 解決方案 每一根密封條集成的潤滑方式

新型專利的Voith HydroSeal能潤滑需潤滑的區域：  
直接潤滑在每根密封條的全幅寬度

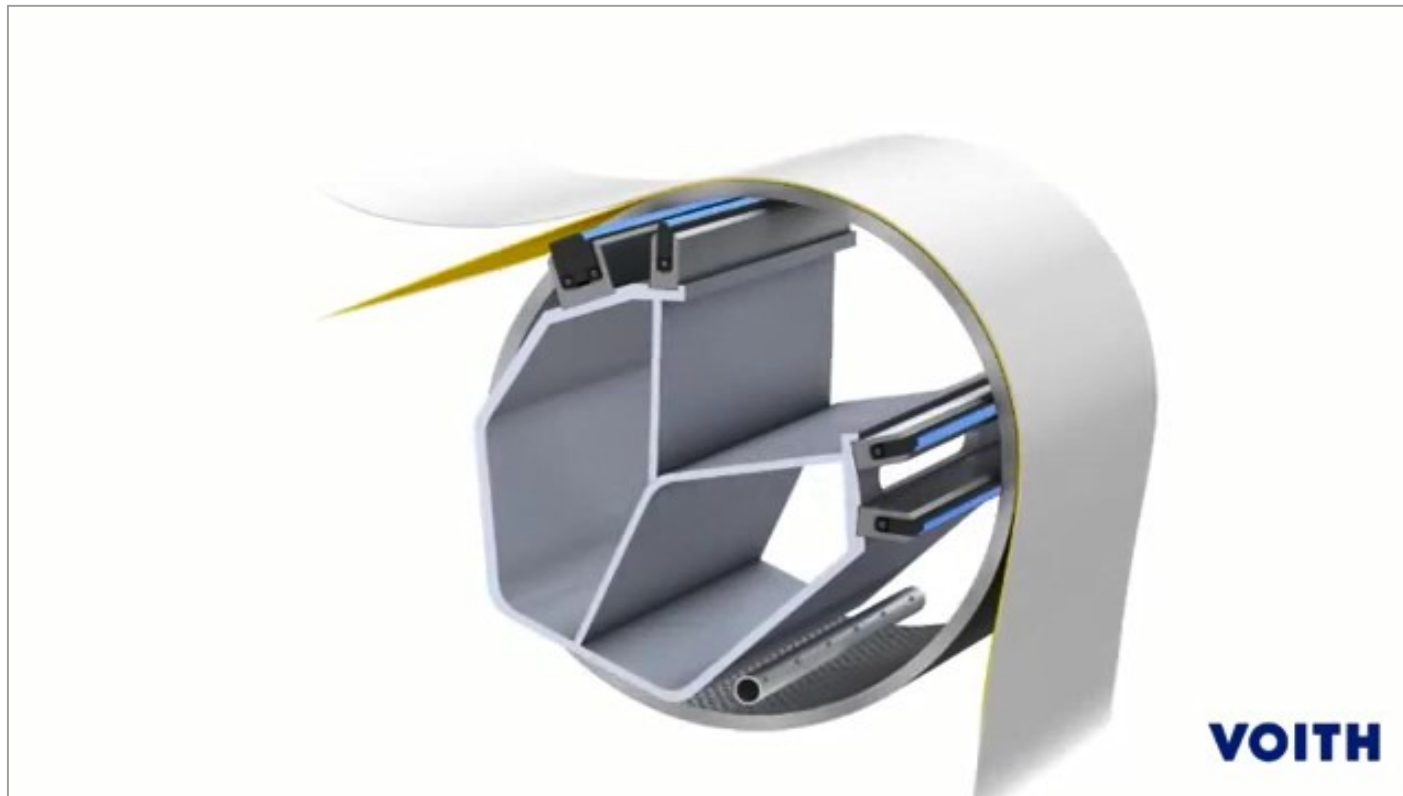


HydroSeal

先進的密封條技術



## HydroSeal Video

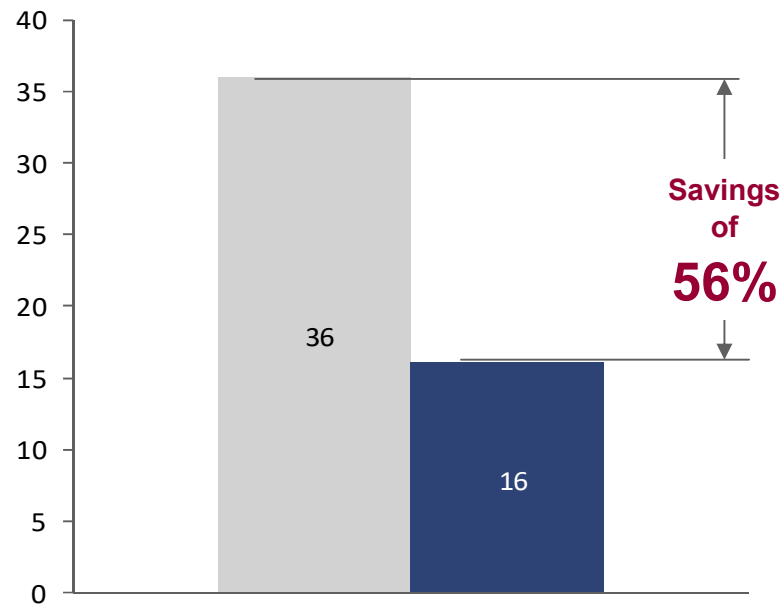


# HydroSeal @ Tissue Producer

## Seal Lubrication Water Consumption

Lubrication water consumption in l/min

Std. Lubrication vs. **HydroSeal**



Previous sealing strip

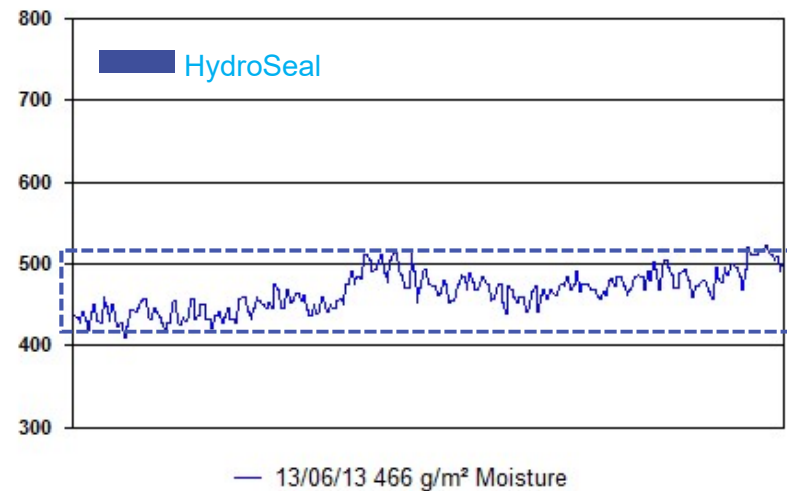
**HydroSeal**

# HydroSeal @ Tissue Producer

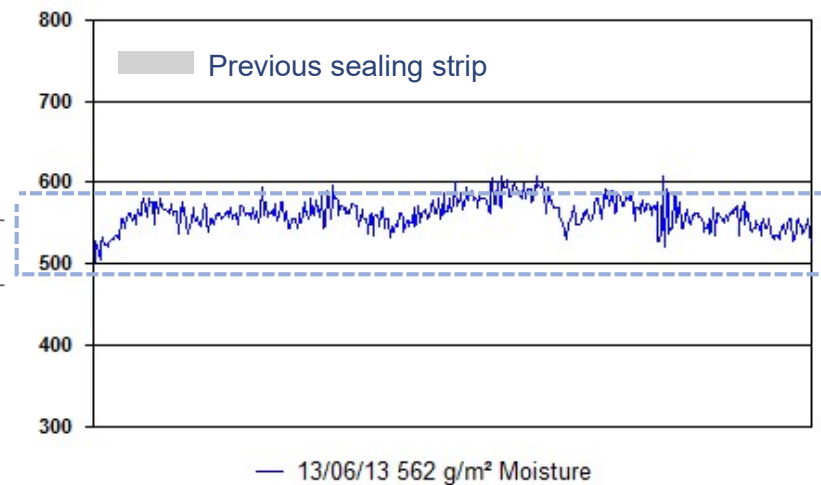
## Moisture Content within Press Felt

**ScanPro Felt Moisture** in g/m<sup>2</sup>

Machine Direction after Suction Pressure Roll



Improve-  
ment of  
**17%**

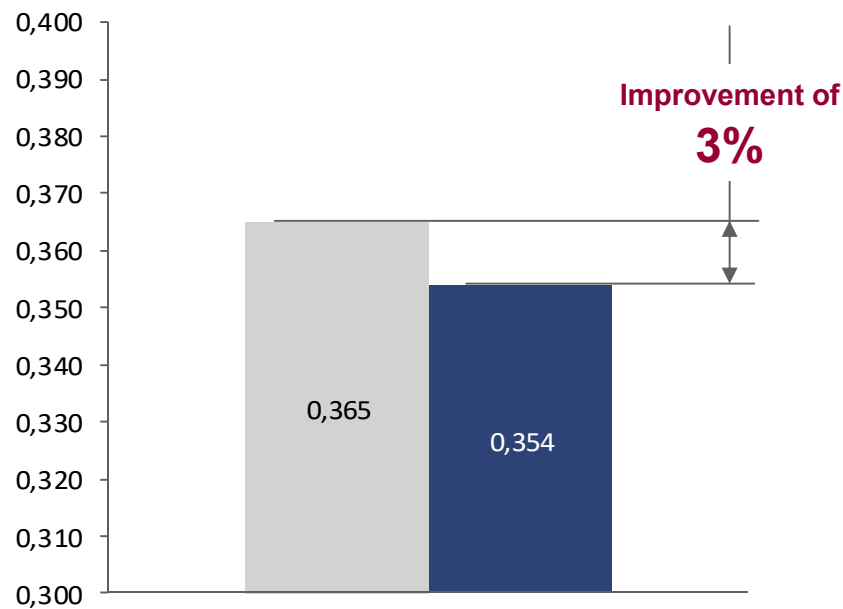




## HydroSeal @ Tissue Producer 2 Sigma Moisture Profile

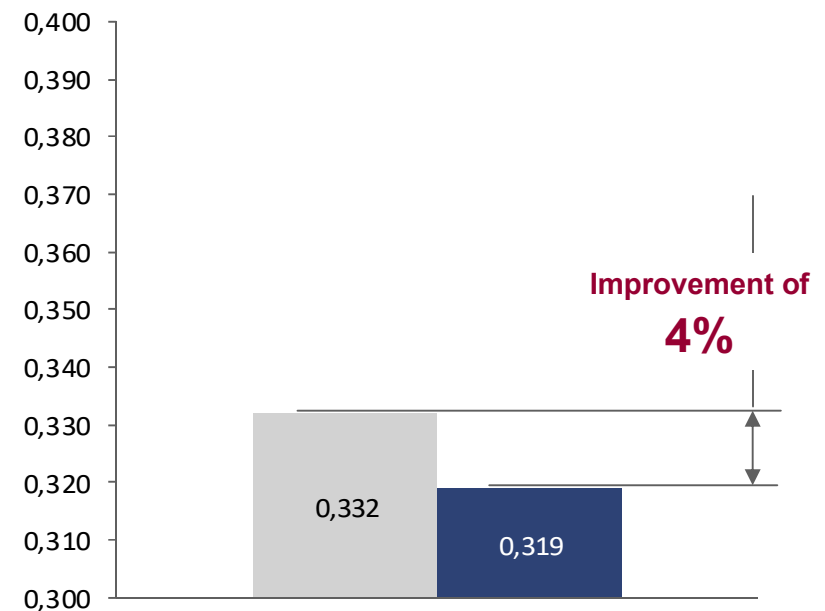
### 2-Sigma Profile HydroSeal vs. Standard Lubrication

Machine Speed: 1,550 m/min, Production: 17.5 g/m<sup>2</sup>



### 2-Sigma Profile HydroSeal vs. Standard Lubrication

Machine Speed: 1,850 m/min, Production: 15.5 g/m<sup>2</sup>

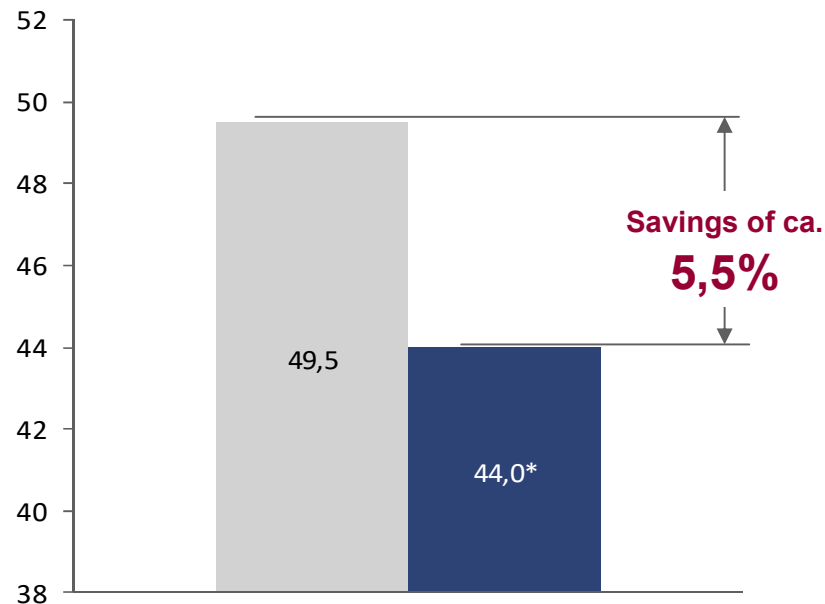


Previous sealing strip      HydroSeal

## HydroSeal @ Tissue Producer Drive Load, Before vs. After Rebuild

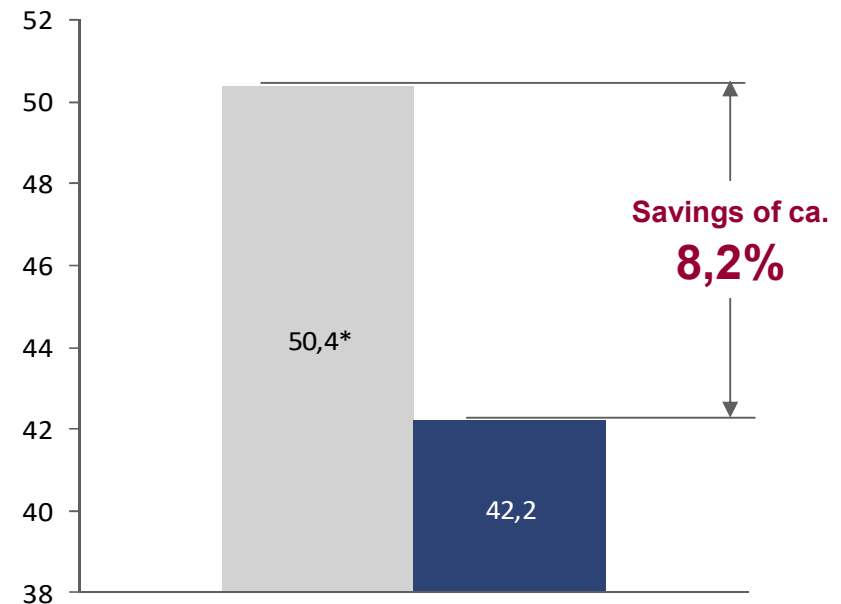
Drive Load Suction Pressure Roll in %

Grade: 15,5g/m<sup>2</sup> , Speed 1,950 m/min



Drive Load Suction Pressure Roll in %

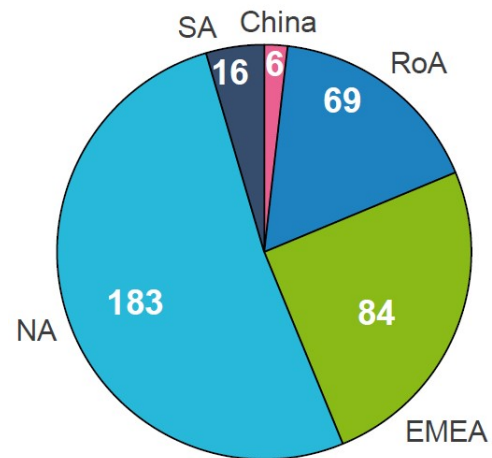
Grade: 17,5g/m<sup>2</sup> , Speed: 1,550 m/min



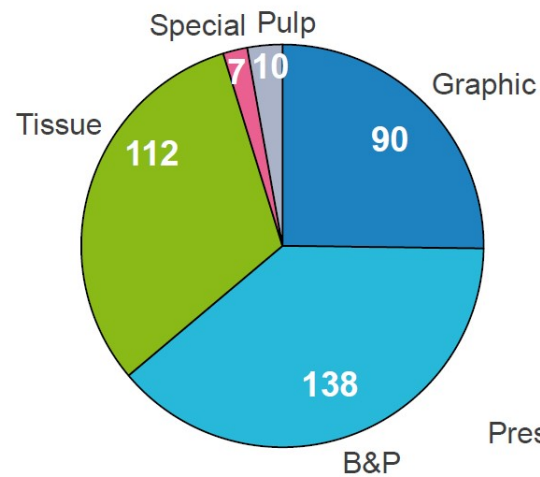
Previous sealing strip      HydroSeal

# HydroSeal Reference List 2019

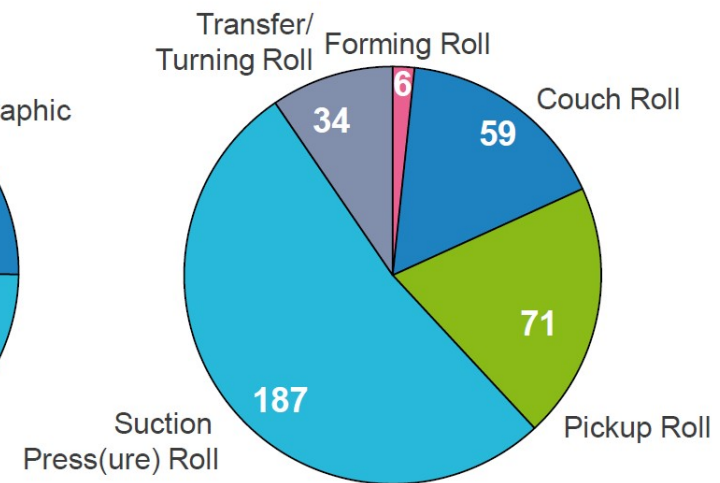
Regional distribution:



Grade distribution:



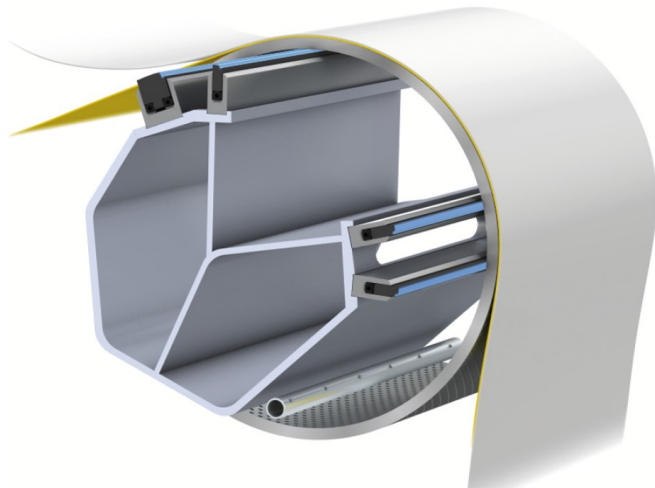
Roll Type distribution:



## 獲獎紀錄

### HydroSeal – Winner of **Baden-Württemberg Environmental Award 2015**

HydroSeal sealing strips 3D-illustration



From left: Franz Untersteller (Environment Minister of Baden-Wuerttemberg) with Frank Opletal (CTO, Voith), Marc Erkelenz (R&D, Voith) and Jochen Honold (Global Productmanager, Voith)

## HydroSeal 優勢

1. 大幅減少用水量達至少**50%**以上。
2. 避免回濕，第一根密封條前水的積累造成織物的回濕。
3. 潤滑水膜對水分橫幅分佈曲線提供正面影響。
4. 減少傳統潤滑方式因較高摩擦係數所增加的驅動負載能耗約**10%**。
5. 預防因扇形噴嘴阻塞造成異常摩擦熱損壞，減少非計畫停機與維修成本。



# VOITH

Engineered Reliability

# FilmLube

給予抽吸箱更有效率的新型潤滑方式



## Press felts lubrication challenges

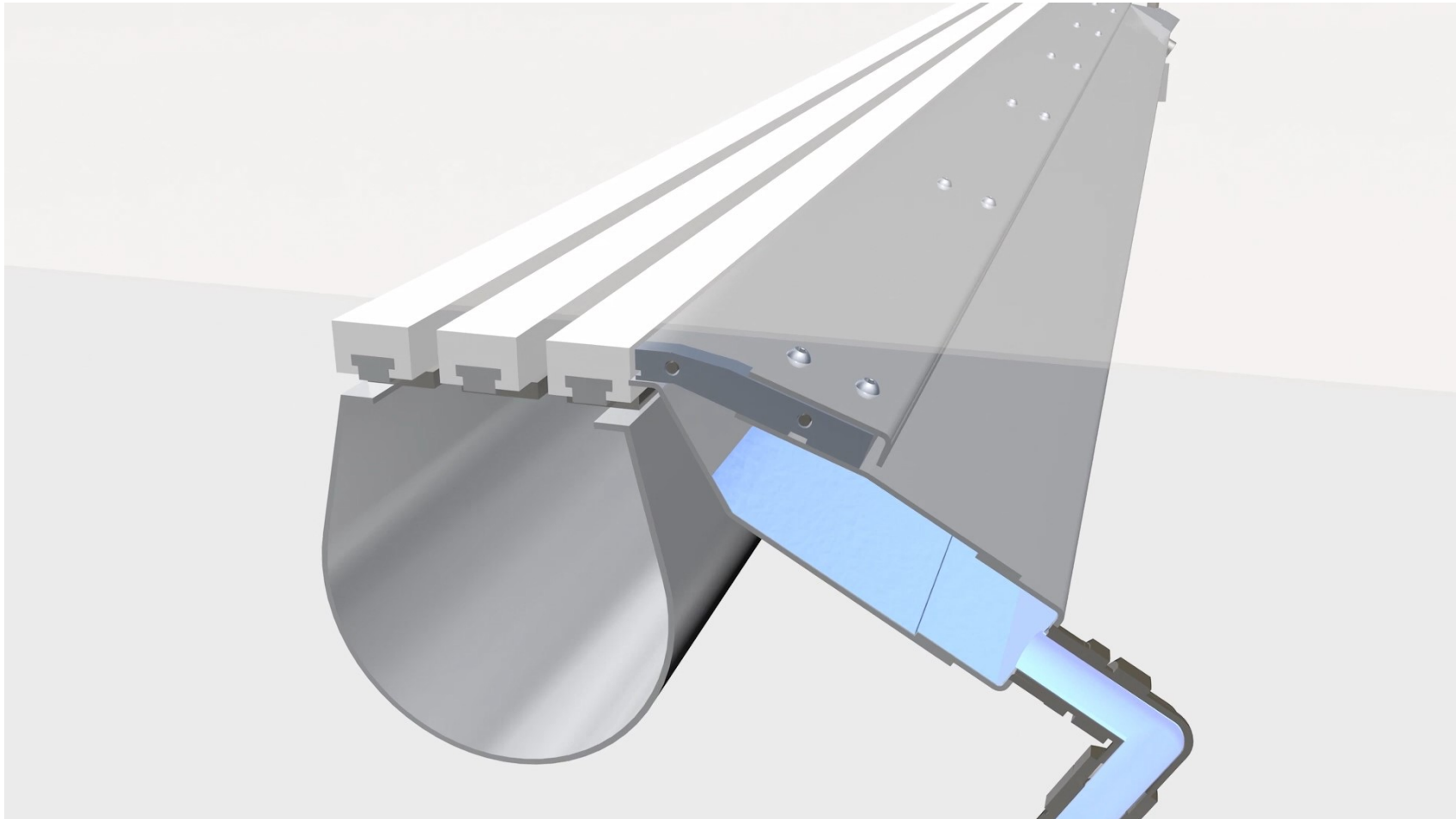
### High speed and low basis weight grade



#### Challenges:

- 高速 = 毛毯摩擦 (磨損)
- 低基重 = 對水分 profile 影響大
- 噴嘴阻塞 = 潤滑效果差
- 高耗水量
- 水霧環境 = 不安全

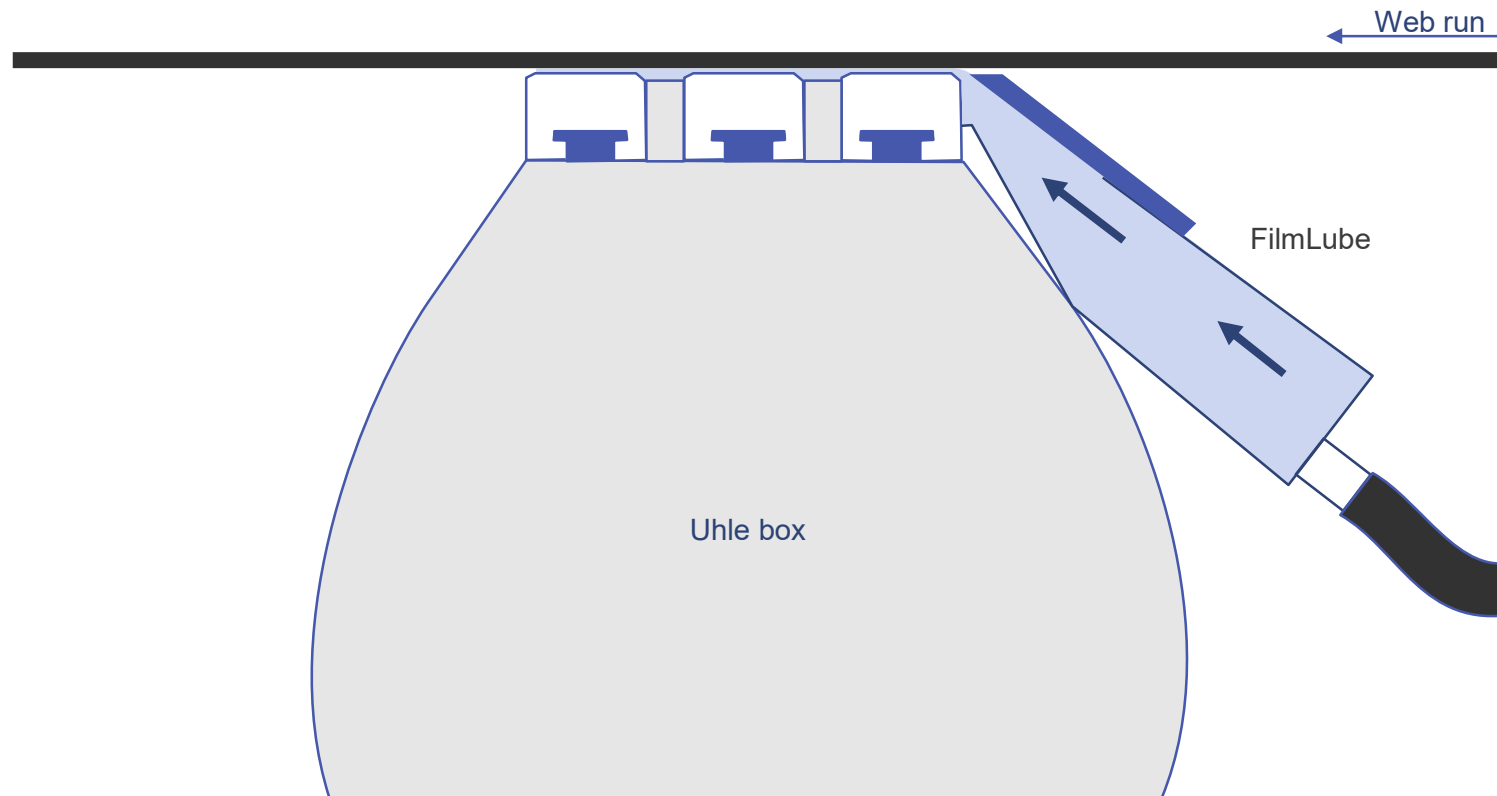
## FilmLube Video



## FilmLube

## Next level of integrated lubrication

Lubrication with FilmLube water channel system





# Maintain felt performance

## Avoiding scorch marks or ragged felt areas



### FilmLube by Voith

#### 潤滑水通道橫跨全幅毛毯

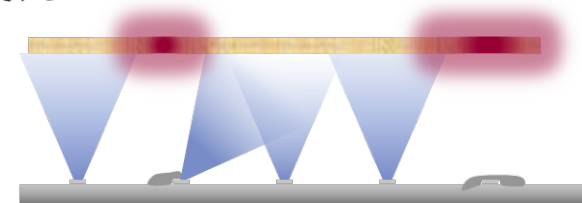
- 均一的冷卻水層保護植毛纖維不因受磨擦熱而磨損
- 恆定均一潤滑，毛毯更少的掉毛，使其保持平順的穩定運行



### LP Shower Comparison

#### 數個扇形噴嘴的潤滑形式

- 噴嘴阻塞導致潤滑不足處發生掉毛或是磨損帶
- 潤滑不夠使毛毯周圍運行時產生空氣擾流



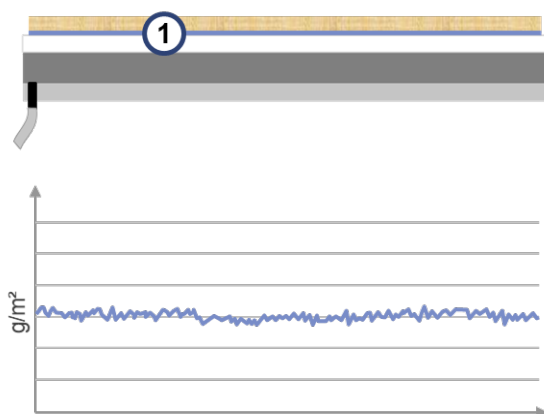
Inconsistent water delivery results in poor moisture distribution and **dry areas** susceptible to damage

## More uniform moisture profiles No plugging with the FilmLube



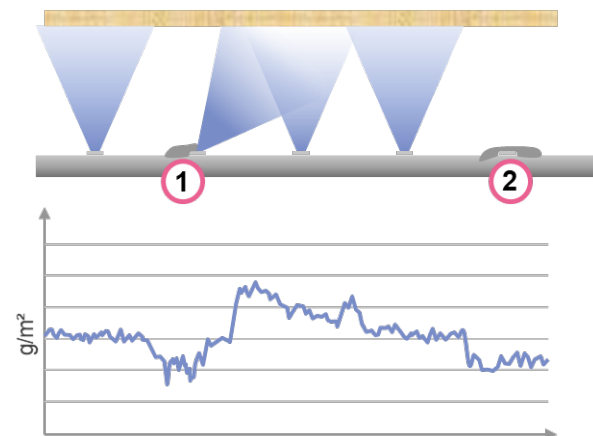
### FilmLube by Voith

- ① 均勻的潤滑薄膜 –  
提供紙張更均一水分分布

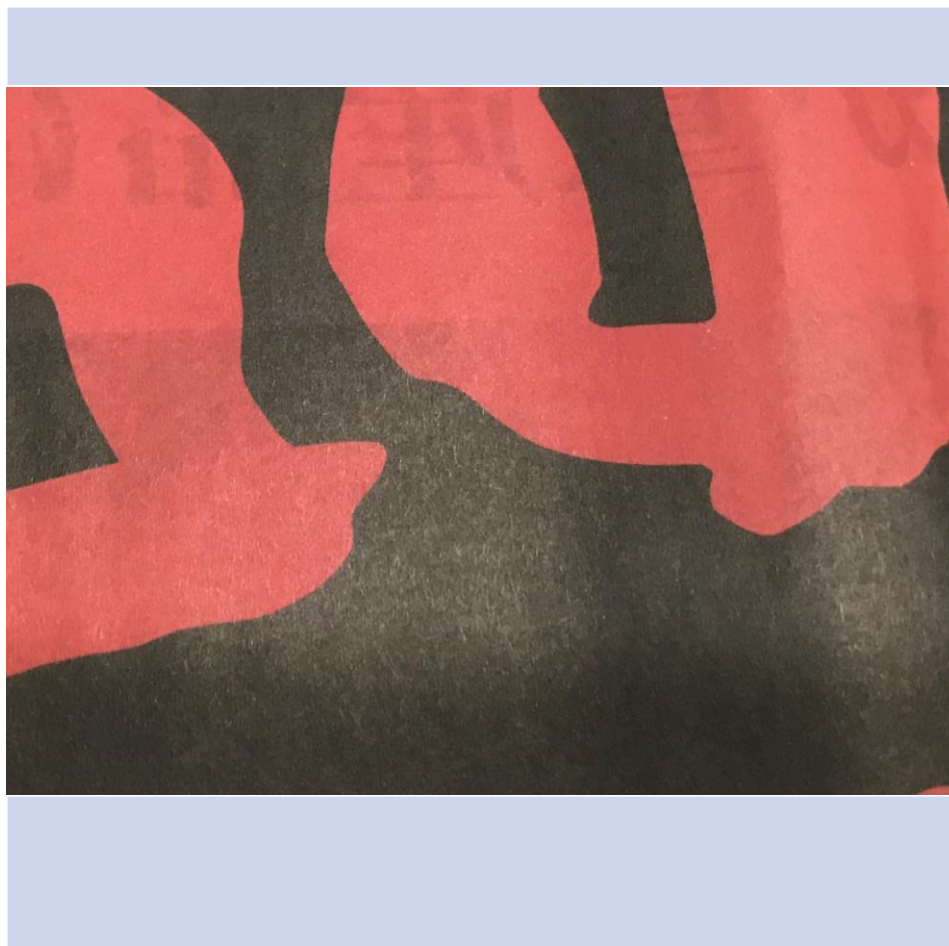


### LP Shower Comparison

- ① 噴嘴部分阻塞，扇形噴淋偏離
- ② 噴嘴完全阻塞



# Improved printing quality Reduced felt wear and batt fiber creation



## FilmLube by Voith

### 潤滑水通道橫跨全幅毛毯

- 維持平滑的毛毯，避免纖維過度流失
- 植毛舒展於潤滑水中，經過真空抽吸箱

## LP Shower Comparison

### 數個扇形噴嘴的潤滑形式

- 熱陶瓷面板如點焊作用，將斷裂植毛沾黏回毛毯表面上
- 若植毛纖維未被抽吸箱帶走，掉毛沾黏在紙面上，影響紙品及後續加工問題，如印刷適性

# Less maintenance Higher reliability and less cleaning



## FilmLube by Voith

- 高壓水清洗快速簡便
- 水直接作用於毛毯 → 最小的環境汙染



## LP shower comparison

- 噴嘴必須手動檢查及更換
- 氣流將水及汙染物帶至附近區域  
→ 清潔工作量大



# Water application and consumption

## 8 l/min per meter



### FilmLube by Voith

- 水直接作用於毛毯。
- 抽吸箱區域無水霧。
- 均勻且穩定的潤滑。



### LP shower comparison

- 因毛毯高速的運行產生的氣流使水分不均，耗水量較高。
- 噴淋分岔，造成環境水霧大



## FilmLube優勢 性能提升而成本降低

### 價值驅動力



維持毛毯性能



更均勻水分分布



改善印刷性



節水



較少維護



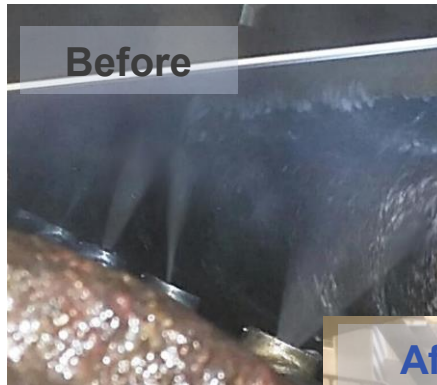
增添環境安全

### 我們的解決方案

- ✓ 避免異常高溫，造成陶瓷面板、毛毯局部壞損或磨耗
- ✓ 紙機全幅均勻分布潤滑水
- ✓ 紙品中無織物掉毛纖維
- ✓ 直接潤滑，不浪費在環境中
- ✓ 集成潤滑，再也不需面對這些堵塞噴嘴
- ✓ 水用對地方，而非走台、走道！



## Case study: Felt lubrication upgrade Felt performance improved during entire life



### Machine production data

Production	2.6 t/h
Felt change time	3 hours
Av. felt life improvement	+ 5 days
Savings (felt + production)	~ 25 TEUR/year

### 額外收益

- 降低水耗
- 改善毛毯水份profile | Av. 1,62% 原2,20%, 預期每年節省 20 TEUR成本
- 周圍環境無水霧

# FilmLube Reference List

#	Customer	PM	Grade	Design Width [mm]	Basis weight [g/m²]	PM Speed [m/min]	Country	Lubrication type (ProLub*/FilmLube)	Start-up	Quantity
1	Perlen	PM4	LWC	5,900	40 - 65	1,600	Switzerland	ProLub	2009	1
2	Perlen	PM7	News	10,465	40 - 55	1,800	Switzerland	ProLub	2010	4
3	Wausau Harrodsburg	TM3	Tissue	6,000	15 - 39	1,650	USA	ProLub	2012	4
4	Palm Lynn UK	PM7	News	11,400	43 - 49	1,850	United Kingdom	ProLub	2014	1
5	BillerudKorsnäs Gruvön	PM6	Fluting	7,290	110 - 175	700	Sweden	ProLub	2015	1
6	Palm Eltmann	PM1	News	5,800	42 - 50	1,550	Germany	ProLub	2016	2
7	Yanzhou	PM24	WFC, LWC	8,000	52 - 105	1,800	China	ProLub	2019	1
8	Taurus	PM3	CM	9,950	90 - 130	1,700	Germany	ProLub	2019	8
9	Yanzhou	PM39	Uncoated Woodfree	10,500	80	1,800	China	ProLub	2020	1
1	Kimberly Clark Mogi das Cruzes	TM4	Tissue	2,950	18 - 24	1,300	Brazil	FilmLube	2017	1
2	An Hoa Paper	PM1	Coated	4,800	60 - 132	1,100	Vietnam	FilmLube	2019	1
3	Kimberly Clark	TM3	Tissue	3,450	13 - 32	1,800	El Salvador	FilmLube	2019	1
4	Kimberly Clark	TM4	Tissue	3,000	11 - 29	1,900	El Salvador	FilmLube	2019	1
5	Essity	TM3	Tissue	3,000	15-28	1,500	Chile	FilmLube	2019	1
6	Metsä	TM7	Tissue	3,000	15-33	2,000	Poland	FilmLube	2019	2

\*ProLub has the same working principle as FilmLube but is for new Uhle boxes

# VOITH

Engineered Reliability