

# PAPER TECHNOLOGY INTERNATIONAL

THE JOURNAL OF THE BIOFOREST PRODUCTS SECTOR



## PITA PAPER *matters!* 2018 Conference & Exhibition at Lancaster University

The “Aoki Cleaner”

Mike Mason (Papermachine Consultancy Services Ltd)

# PAPERmatters 2018!

## The Presentations

### **Michael Mason**

#### **Papermachine Consultancy Services Ltd**

Michael has been actively engaged in the paper industry since 1982, working for two of the largest machine clothing suppliers in both technical and marketing roles. Later specialising in Intellectual Property Management within the industry, he is now engaged primarily in providing a broad range of consultancy services to the industry with an independent team of paper-related professionals.



The author may be contacted via the **PITA Office**  
**Telephone: 0300 3020 150 or E-mail: [info@pita.co.uk](mailto:info@pita.co.uk)**



Papermachine Consultancy  
Services

**Mike Mason** - **Director**

**John McGill** - **Associate Consultant**



Papermachine Consultancy  
Services

## The "AOKI Cleaner"

Foil Type Dryer Fabric Cleaning System

Distributed by  
Matsubo Corporation

Manufactured by  
AOKI Machinery Co. Ltd.

### Typical Conventional Cleaner High Pressure Water Type



### Potential issues with high pressure water cleaning

- Use of water
  - Water induces corrosion on the fabric rolls, shortening fabric life.
- High pressure – (up to 60MPa)
  - Unsafe
  - Possibility of fabric damage
- Uneven and inconsistent cleaning due to oscillation of the cleaning nozzle.



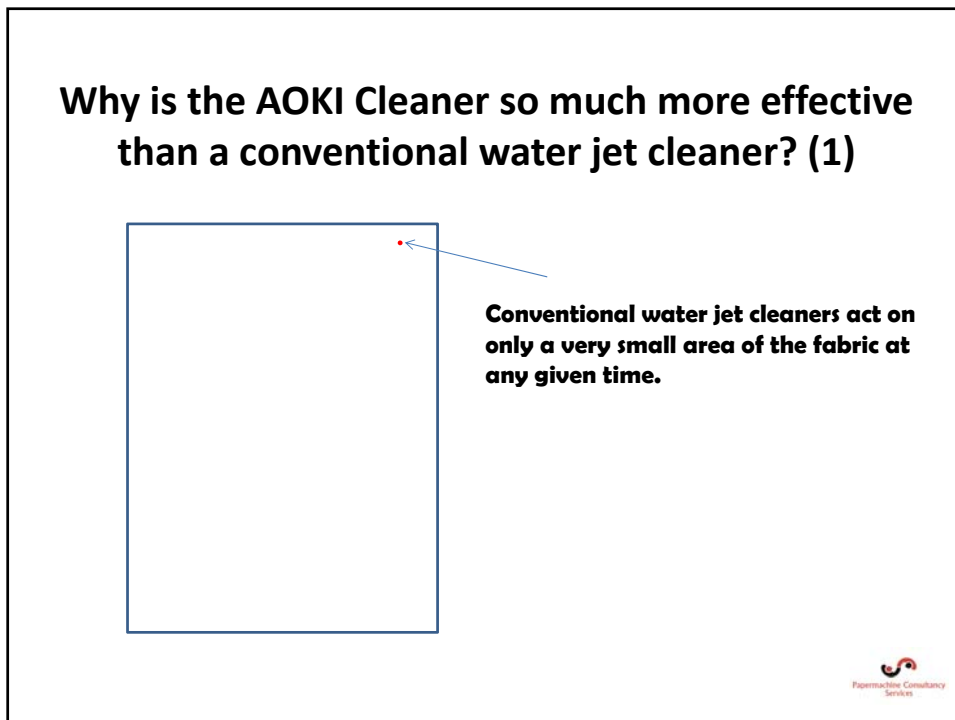
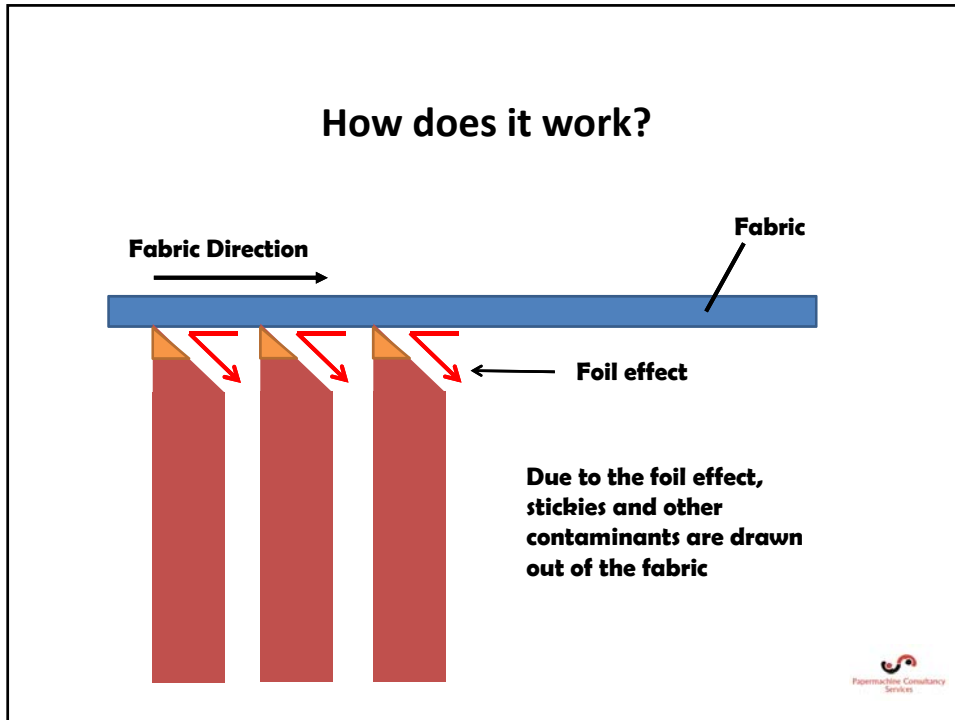
## AOKI Cleaner – Novel “Foil Type” Cleaner



### Features

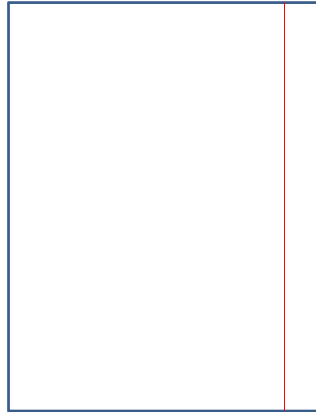
- No water or steam employed
- Continuous Cleaning
- Always at full fabric width
  - Even profile
  - Few stickies pass through







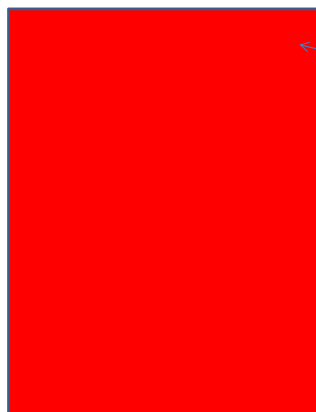
### Why is the AOKI Cleaner so much more effective than a conventional water jet cleaner? (2)



**The water-jet cleans only one narrow band of the fabric in each revolution.**



### Why is the AOKI Cleaner so much more effective than a conventional water jet cleaner? (3)



**The AOKI Cleaner acts over the entire fabric surface : preventing contaminant build-up**



## AOKI Cleaner

- The **AOKI Cleaner** cleans the surface every 2-3 sec.

The stickies are taken out before they become stuck fast.



## Hardware





## Specialised Foil Material



**AOKI** has spent almost two years developing a special material for foils in order to achieve two important factors:

- 1 foils that last for 6 to 12 months, even with 24/7 operation.
- 2 foils that do not damage the fabric.



## Foil Contact with Fabric



The unit is installed so that each foil pushes only 1mm into the fabric run. Once installed there is no need for adjustment, even after foil replacement.

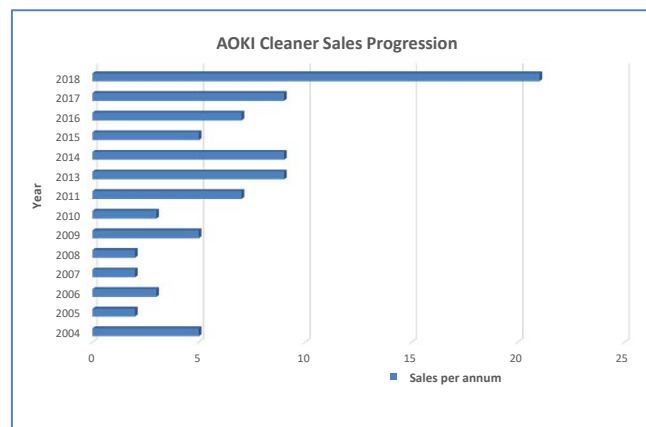


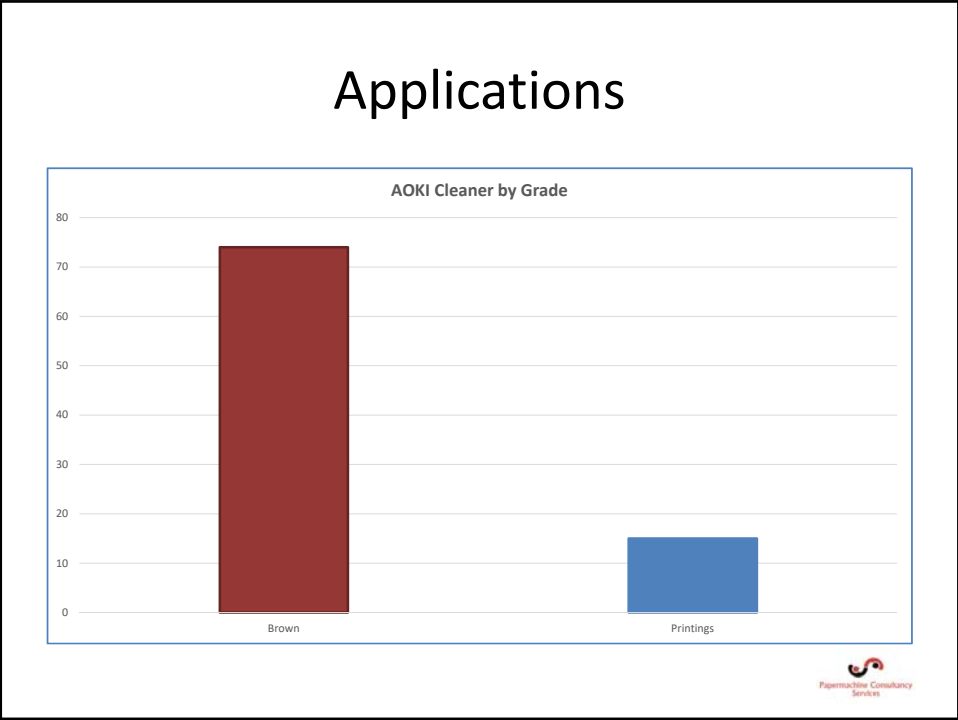
### Important Features

- **AOKI** Cleaner foils create a “foil effect” to extract stickies from the fabric.
- They are NOT doctor blades.
- The foils barely touch the fabric surface and do not damage it.
- The system can easily cope with machine speeds up to 2000m/min.



### Popularity





# Case Studies

A logo for "Papermatters Consultancy Services" is located in the bottom right corner of the slide.

## Real Benefits ....

.... In Sheet Quality

.... In Productivity Levels

.... In Runnability

.... In Lower Maintenance Costs

.... In Lower Clothing Costs



### Case Study 1 : Corrugating Medium Machine

5130mm @ 600m/min

Before AOKI:      1) High pressure (70kg/cm) water nozzle type cleaner  
                          2) Wire net type cleaning

Situation:            1) Rust on fabric rolls  
                          2) Rust transferred on to the fabric  
                          3) Fabric became clogged by fine pitch and paper dust

After commissioning of AOKI Cleaner :



Pitch removed by foil



Accumulated pitch



Collected waste (3.5kg for 5 days)

**Comparison of Fabric Surface**

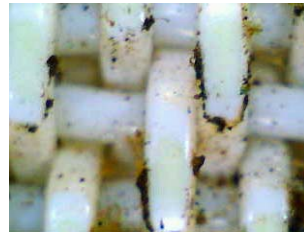
A new fabric was installed at start up with the AOKI Cleaner. It was found that amount of pitch attached on the fabric was significantly reduced, even allowing for the running time difference.



Before installation  
8 month use



14 days  
after  
installation



1 month  
after  
installation



**The best result was found in the winder process :**

- Number of paper breaks on the winder (times / month)
  - Before installation - 23.5 times / month (average in 6 months)
  - After installation - 11.3 times / month (average in 6 months)

↓  
**52% reduction**

- Splice ratio in the winder process (%)
  - Before installation - 0.88% ( average in 6 months)
  - After installation - 0.37% ( average in 6 months)

↓  
**42% reduction**

- Paper broke caused by defects - **24% reduction**
- Additional finishing work caused by defects - **36% reduction**

**These results from the 6 months period after installation**




### Case Study 2 : Corrugating Medium Machine

**5210mm @ 1000m/min**


Before introduction : High pressure water nozzle type cleaner  
Dirt and sticky pitch which could not be removed by high pressure nozzle equipment severely clogging the fabrics

Before AOKI installation  
23 days running




Air permeability:  
Reduced from 3000cc to 1500cc

After AOKI installation  
2 days running (the same Fabric)



Air permeability:  
**Recovered from 1500cc to 2500cc**



### Case Study 3 : Corrugating Medium Machine

**4280mm @ 700m/min**

➤ Reduction of chemical cost


No.1 & No.2 Cleaner	1 day	1month	1 L = 1,000yen
Fabric cleaning chemical consumption	32 litres	25 days	6000 euros /month

**6000 euros × 12month = 72,000 euros / year saved**  
Now the chemical is used only at the machine start-ups

➤ Paper breaks in the dryer part

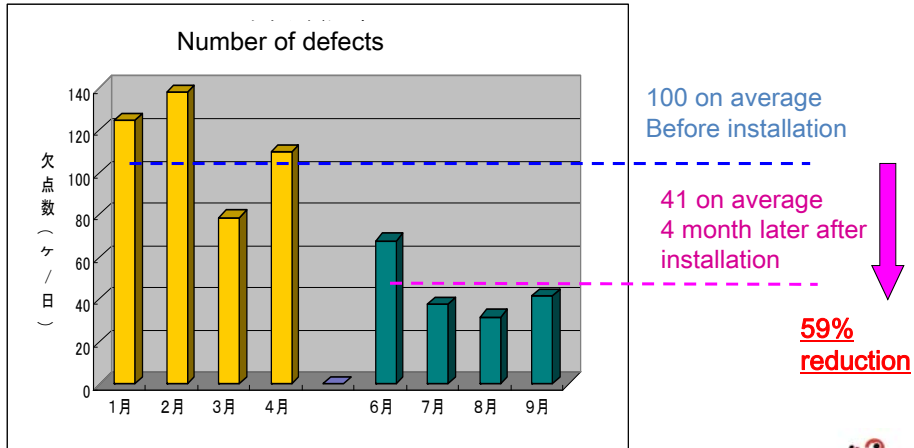
No.1 & No.2 Cleaner	<b>【Before】</b> /month	<b>【After】</b> /per month
Paper breaks inside the dryer part	Approx. 10 times	0 to 3 times

Achieved **Zero paper breaks in 1 month**



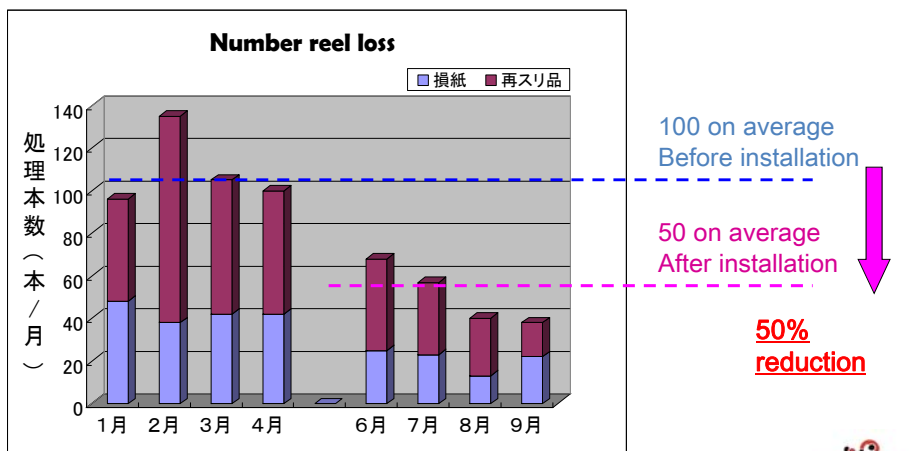
**Case Study 4 : Linerboard Machine 4450mm @ 590m/min**

**Reduction of Defects** : Comparing before and after the AOKI Cleaner installation, and with the number of defects before installation defined as 100, **average defects reduced to 41 over 4 months.**



**Reduction of Paper Losses**

Comparing before and after the AOKI Cleaner installation, and with the earlier number of lost reels defined as 100, losses reduced down to 50.





### Case Study 5 : Linerboard Machine

4140mm @ 700m/min

Installation on a bottom dryer section of a linerboard machine

- Before installation:
- 1) High pressure shower during shut ( 20 to 30kg/cm2 )
  - 2) Wire net cleaning and chemical cleaning (contamination prevention chemical)
  - 3) Fabric removed and cleaned every 2 months.

- Situation:
- 1) Many sticky materials attached to the fabric rolls
  - 2) Many lost reels at the rewinder due to sticky material defects



AOKI Cleaner during operation



View of the foils (during stop)



### Comparison of Fabric Roll Surfaces

Approx. 1 hour had to be spent to clean each fabric roll every 10 days. After the installation of the **AOKI Cleaner**, this work is almost eliminated and the customer can use shutdowns for other activities.

The photos below show the state of the fabric rolls 10 days after cleaning - before and then after installation of the **AOKI Cleaner**.



Fabric roll before installation



Fabric roll after installation



## Summary of AOKI Cleaner Benefits

- Fewer paper breaks due to pitch or stickies issues
- Reduced use of pitch prevention chemicals
- No need for fabric removal for cleaning
- Minimal fabric “spot” contamination
- Less downtime for fabric roll cleaning
- Fewer sticky material defects
- Improvement of moisture profiles and hence sheet quality
- Improvement in productivity due to improved runnability



## Summary of AOKI Cleaner Benefits

- Fewer paper breaks due to pitch or stickies issues
- Reduced use of pitch prevention chemicals
- No need for fabric removal for cleaning
- Minimal fabric “spot” contamination
- Less downtime for fabric roll cleaning
- Fewer sticky material defects
- Improvement of moisture profiles and hence sheet quality
- Improvement in productivity due to improved runnability
- Oh ..... and a **much reduced clothing spend !!**





Papermachine Consultancy  
Services



The "AOKI Cleaner"

**Thank you for your attention ...**

**Any questions?**

