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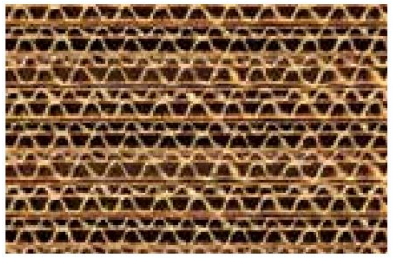
INTRODUCTION TO LANTIER SOLUTIONS

Pulp

Paper



Board

Tissue

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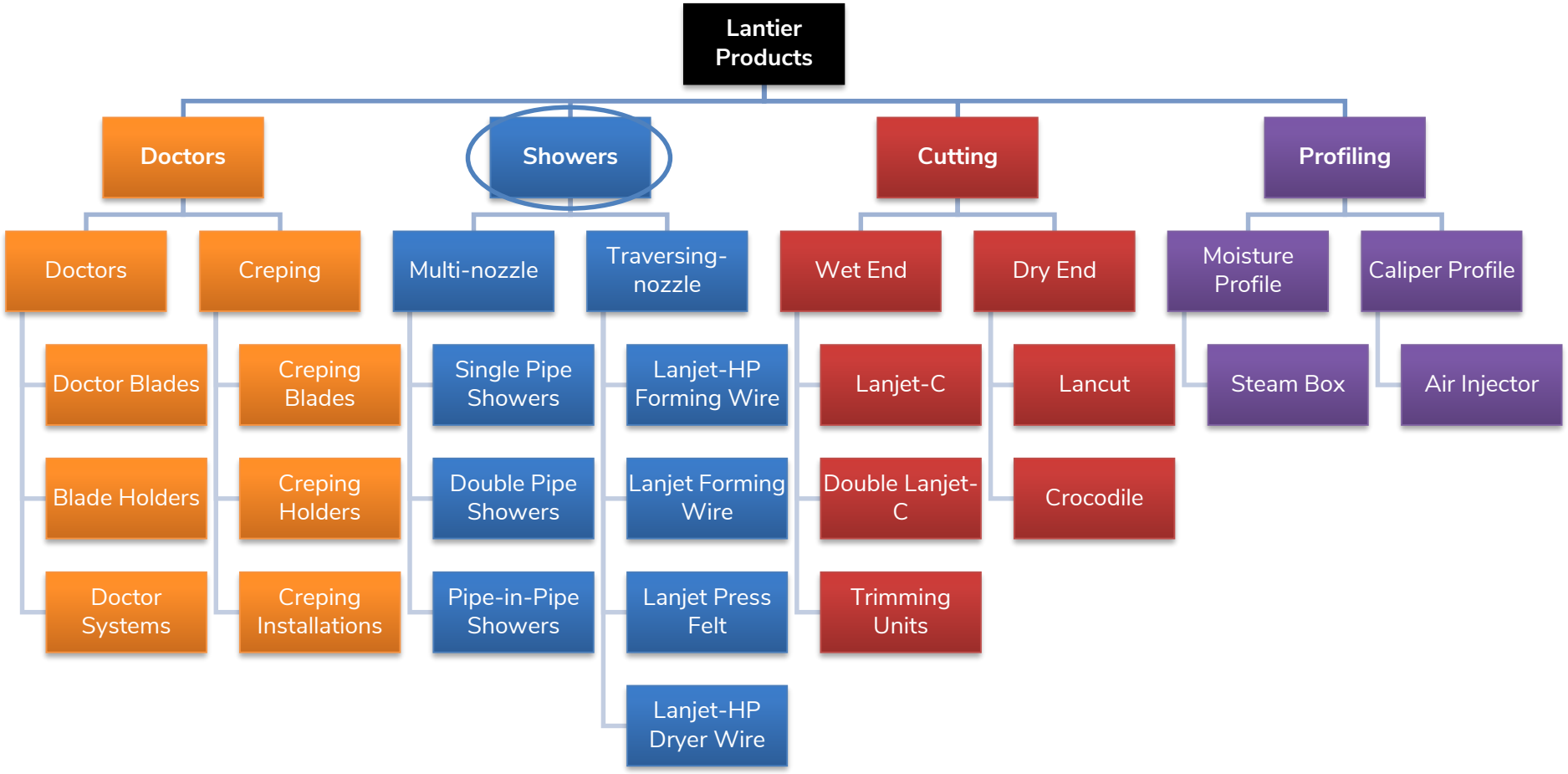

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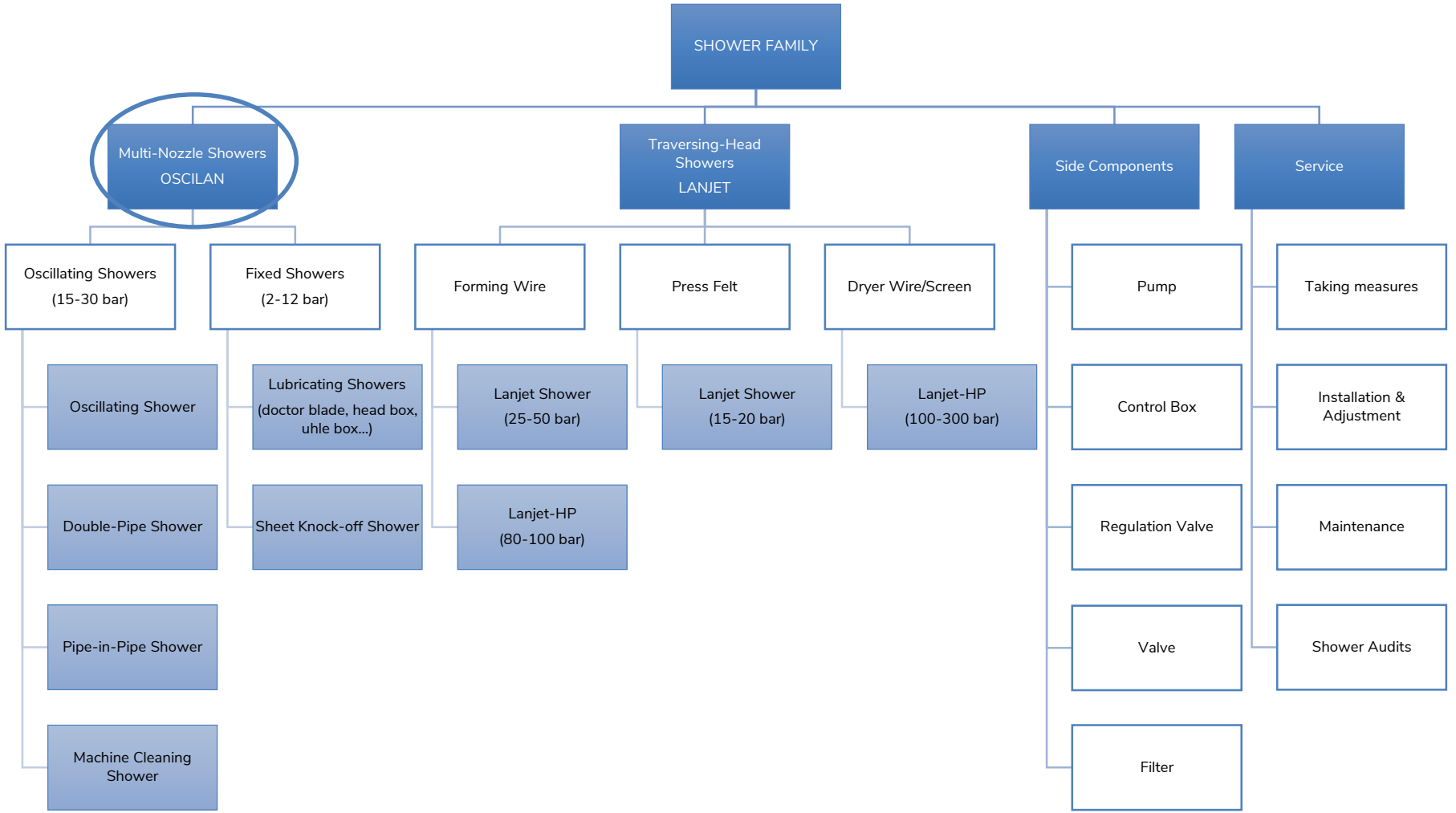

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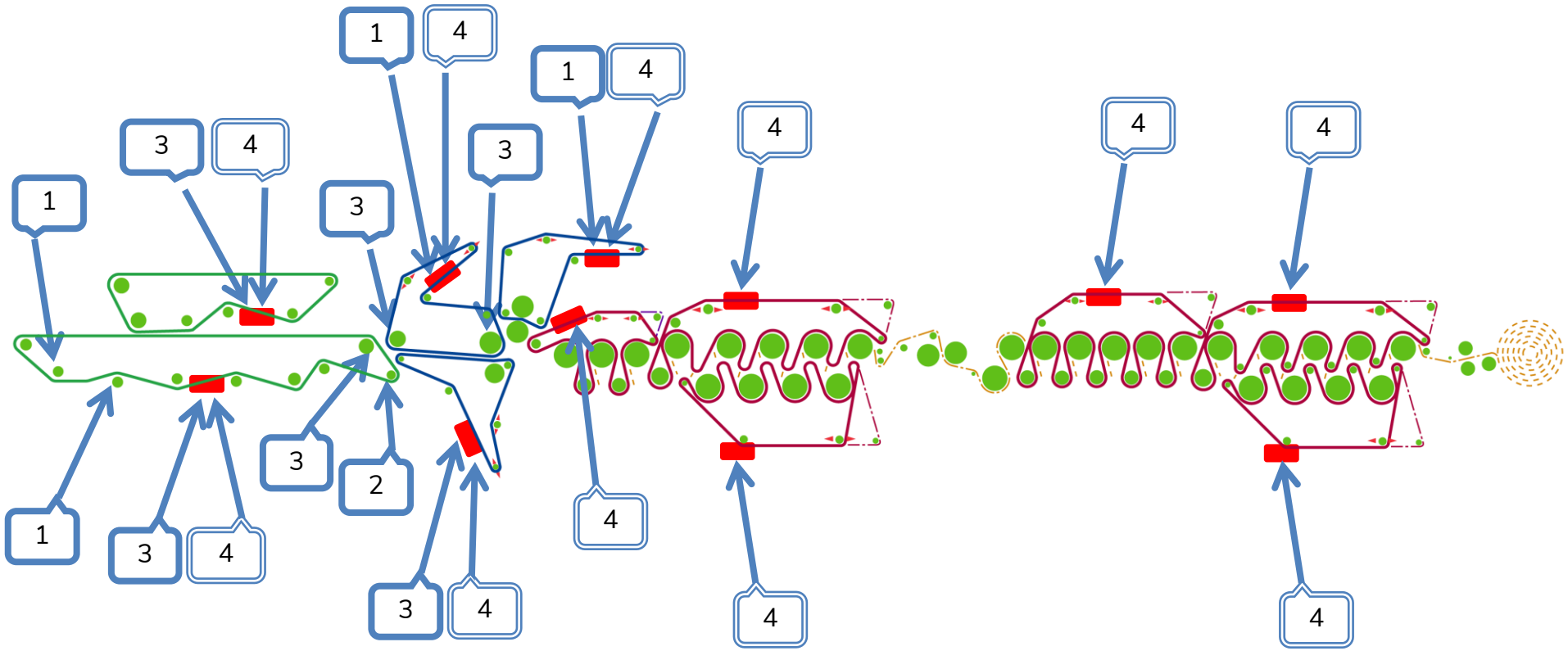
Lantier showers in the paper machine



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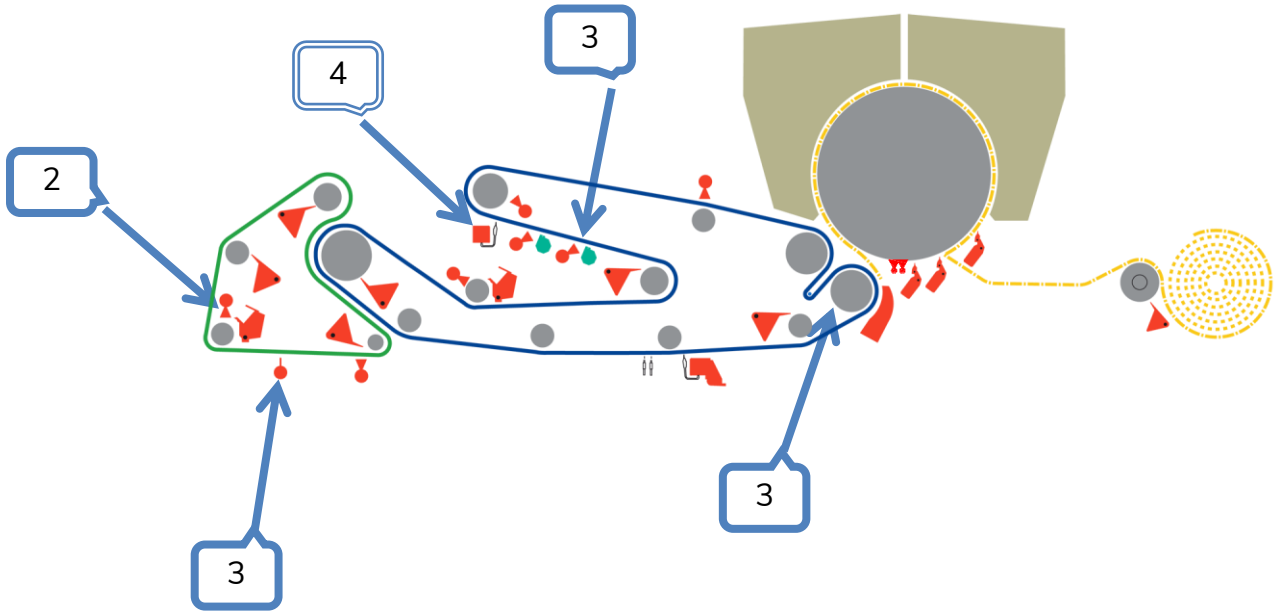
Lantier showers in the tissue machine



Multi-nozzle Showers

Traversing-head Showers

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Lantier showers

1) Fixed Lubricating Showers
2) Sheet Knock-Off Showers
3) Multi-nozzle Oscillating Showers for Wire/Felt/Suction Roll Cleaning
    a) Oscillating Shower
    b) Double-Pipe Shower
    c) Pipe-in-Pipe Shower
    d) Machine Cleaning Shower
4) Traversing-head Showers for Wire/Felt Cleaning
    a) Lanjet Shower (15-50 bar) – Forming Wire, Press Felt
    b) Lanjet HP Shower (80-100 bar) – Forming Wire
    c) Lanjet HP Shower (100-300 bar) – Dryer Wires/Screen

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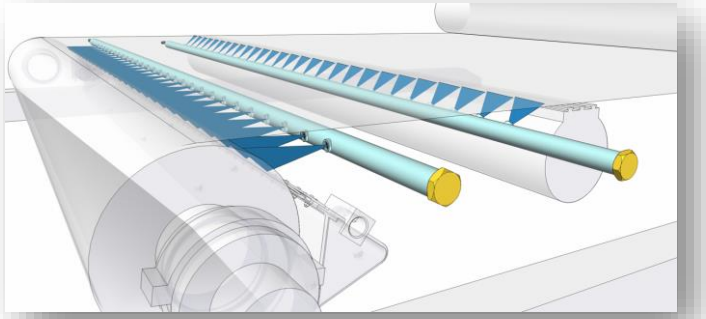
1) Fixed Lubricating Showers

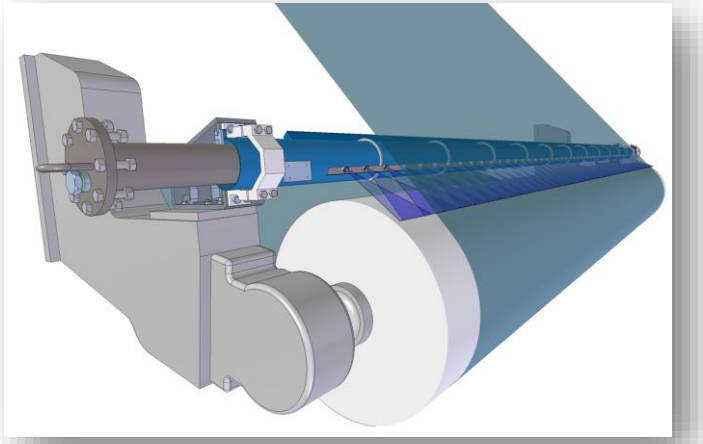
- Doctor blade lubrication, wire or felt lubrication and edge lubrication
- Working pressure 2-3 Bar
- Fan jet nozzles in Stainless Steel
- Cleaning system as an option



BENEFITS
Increase Doctor Blades lifetime
Increase Rolls lifetime
Increase wires/felts lifetime
Increase foils, covers, seal strips, ceramic... lifetime

2) Sheet Knock-off Showers

- Paper knock off by flooded-nip
- Working pressure 10-12 Bar
- High volume ø 3-6 mm fan jet nozzles in stainless steel
- Double-Pipe design available for nozzle maintenance



BENEFITS
Reduce paper jam risk ⇓ Increase Machine efficiency
Reduce wire breaks risk

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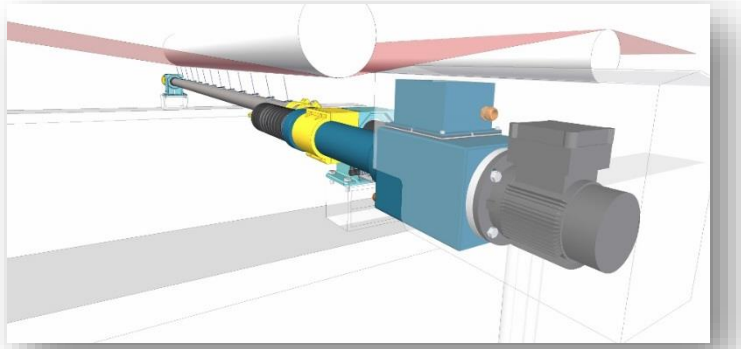
3) Multi-nozzle Oscillating Showers for Wire/Felt/Suction Rolls

a) Oscillating Shower

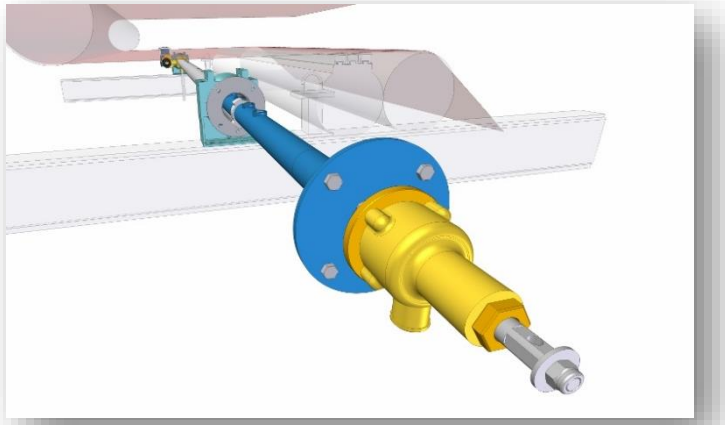
- Wire or felt cleaning
- Working pressure 15-30 Bar
- Nozzles in stainless steel, ruby or ceramic
- Cleaning system as an option



b) Double-Pipe Shower

- Wire, felt or roll cleaning
- Special design that permits the change of nozzles while machine is running.
- Working pressure 15-30 Bar
- Nozzles in stainless steel or ruby
- Cleaning system as an option

	Water consumption	Water consumption
Nozzle D= 1 mm Qty= 60	Q_{total}=132 l/min (20 bar)	Q_{total}=162 l/min (30 bar)



BENEFITS

- Increase Wire/Felts efficiency → Increase Machine efficiency
- Increase Press Section efficiency → Increase Machine efficiency
- Increase wires/felts lifetime
- Increase sheet formation
- Improve paper CD profile
- Increase paper quality
- Avoid marks on the paper

BENEFITS

- Reduce maintenance time in the machine → Increase Machine efficiency

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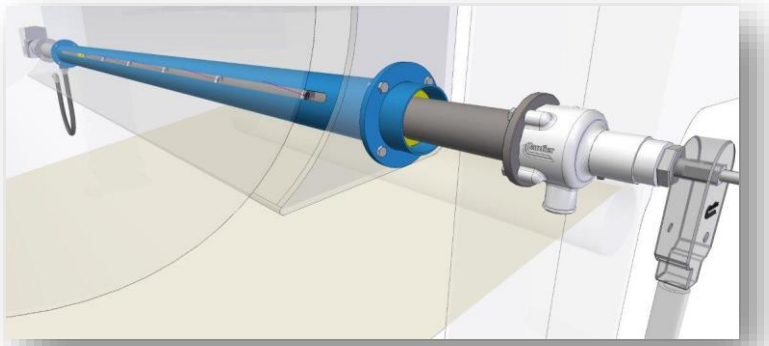
c) Pipe-in-Pipe Shower

- Wire, felt or roll cleaning
- Special design for outside cleaning of suction rolls
- Special design that permits the change of nozzles while machine is running
- Working pressure 15-30 Bar
- Nozzles in stainless steel, ruby or ceramic
- Cleaning system as an option

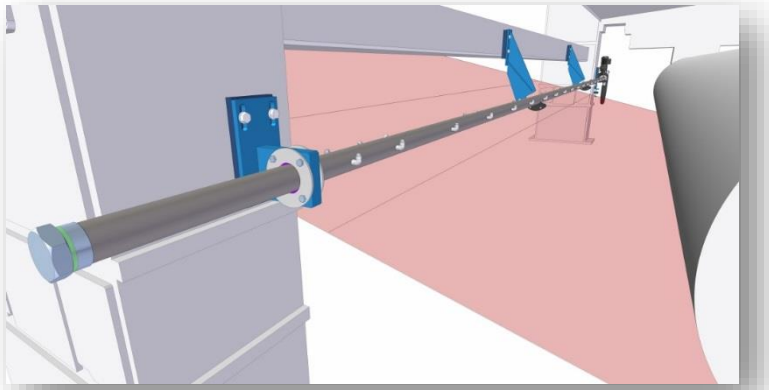


BENEFITS

Same Benefits as Double Pipe Shower

d) Machine Cleaning Showers

- Machine frame cleaning
- Special design for cleaning the complete frame
- Adjustable covering angle
- Working pressure 10-12 Bar
- Nozzles in stainless steel
- Possible to use during production



BENEFITS

Reduce paper breaks → Increase Machine efficiency

Reduce chemical/biological attack risk → Increase Machine lifetime

Reduce maintenance time in the machine → Increase Machine efficiency

Improve Machine operator security

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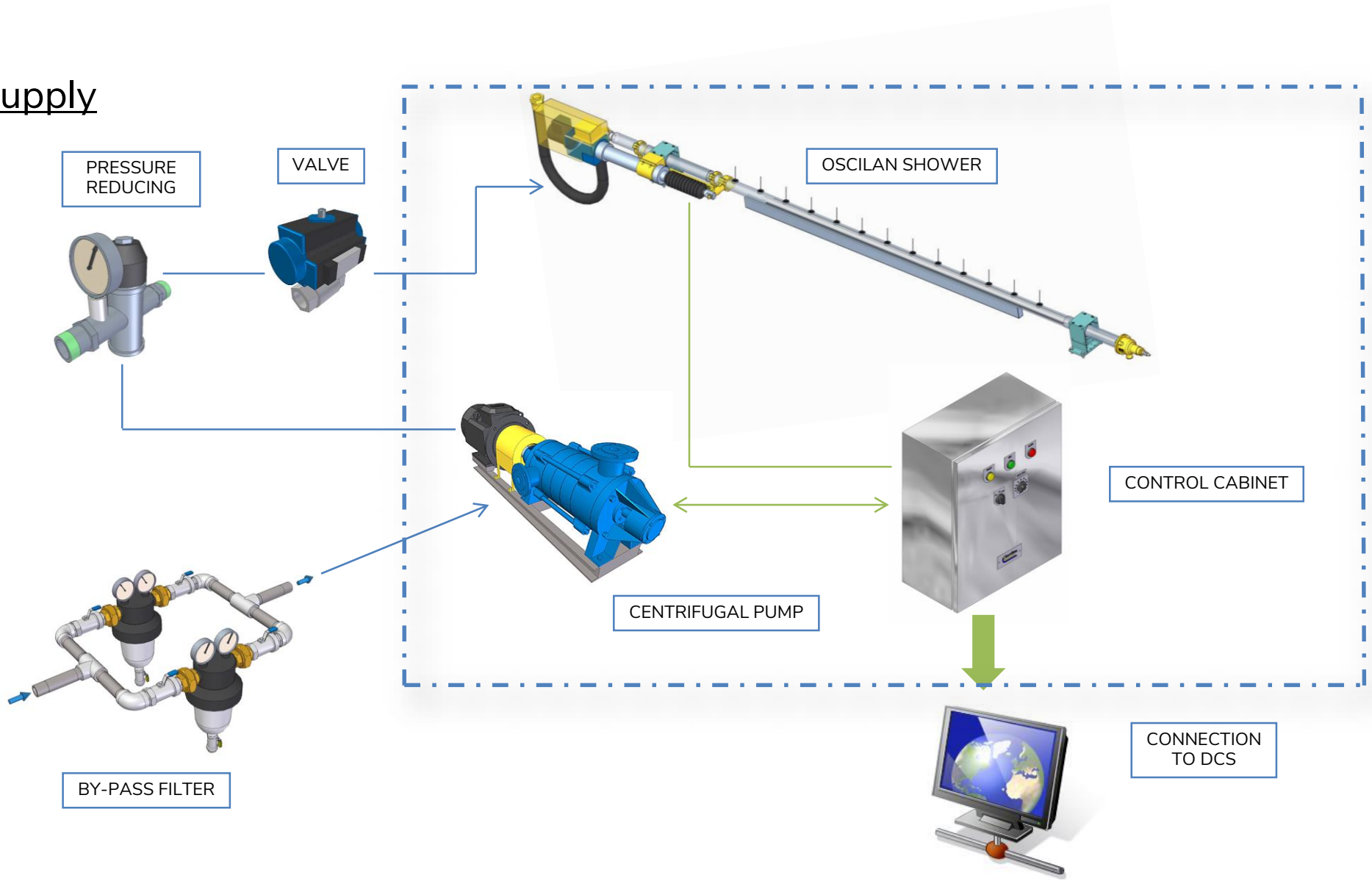
Scope of supply



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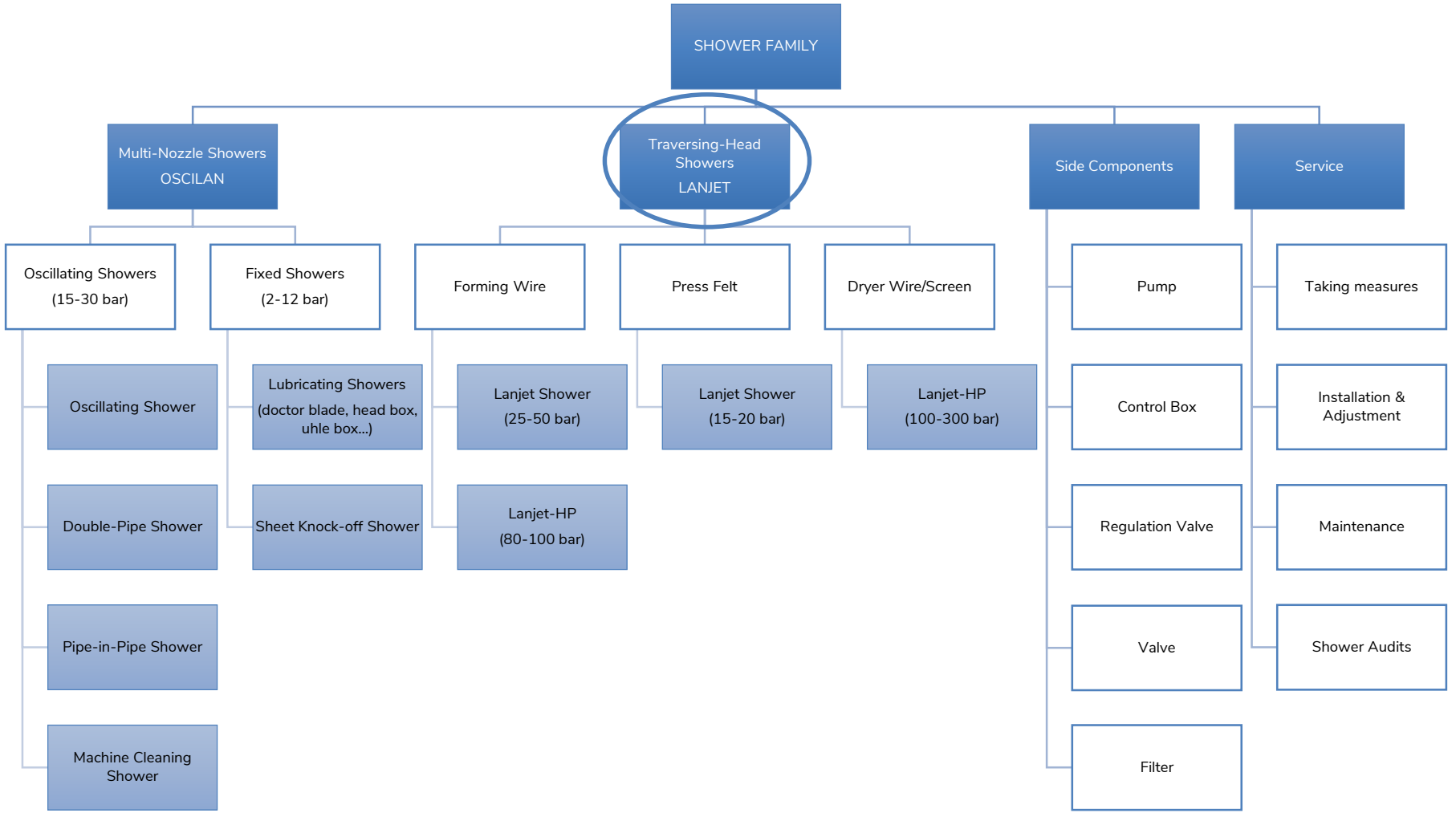

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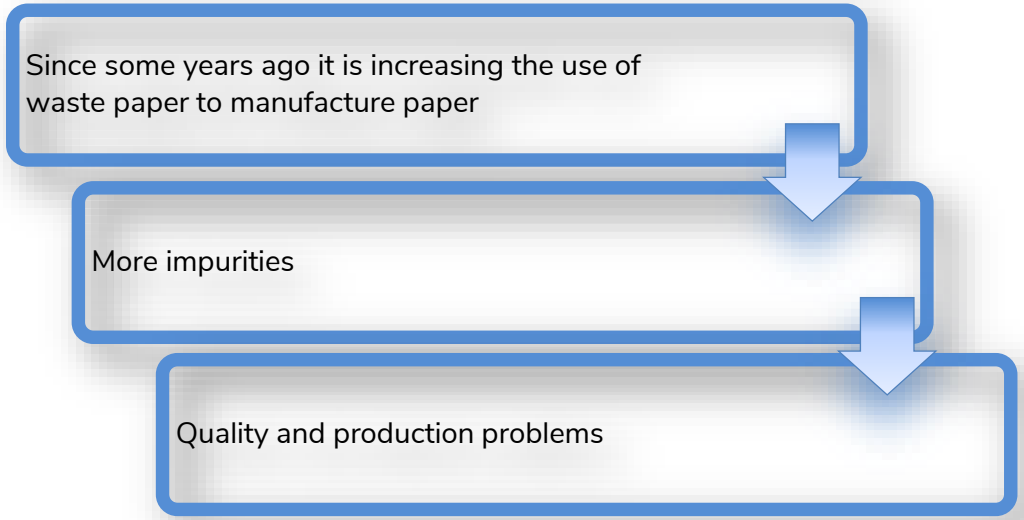
Why to install Lanjet Shower



- Cleaning methods,
  - Chemicals
  - Manual
  - Discontinuous
  - Continuous

Continuous cleaning

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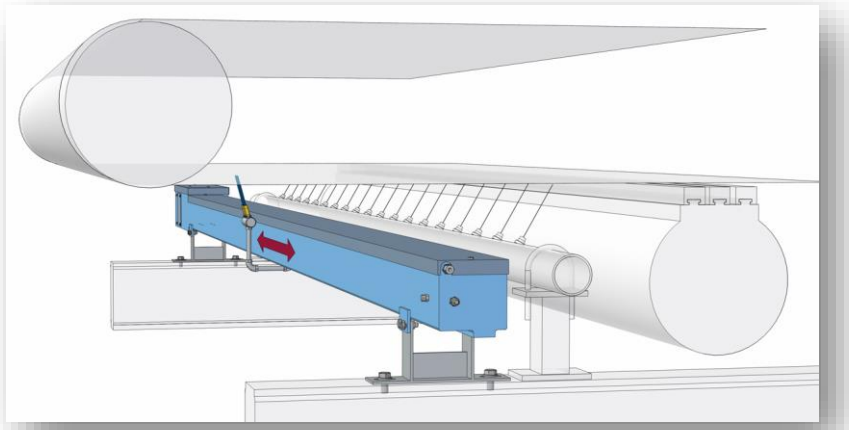
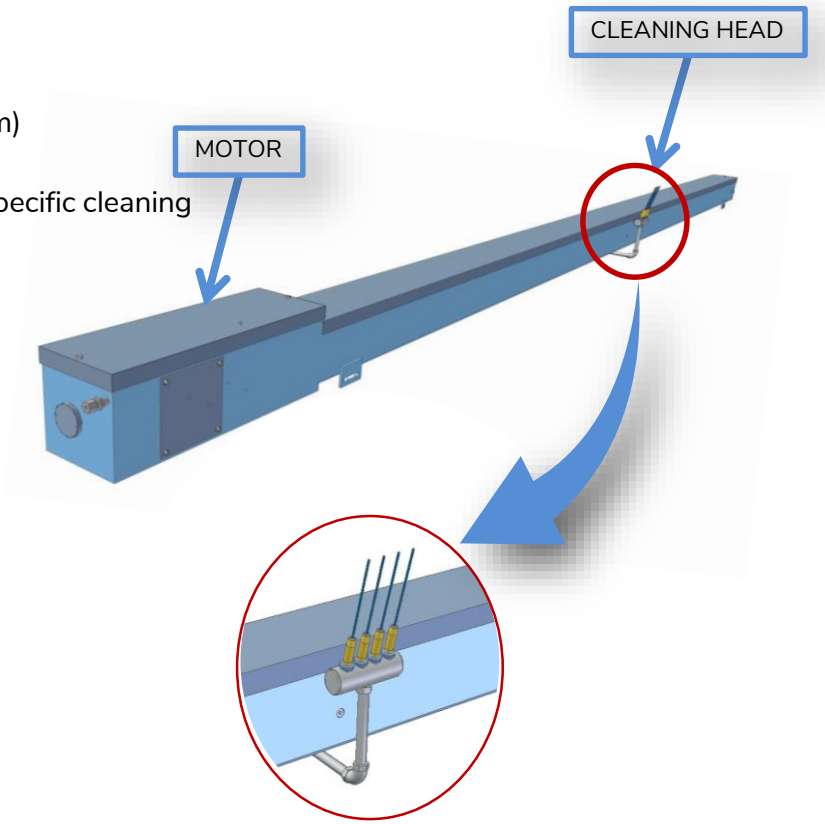
4) Traversing-head Showers for Wire/Felt/Dryer-Wire cleaning

a) Lanjet Shower – Forming Wire (15-50 bar)

- Wire and felt cleaning
- Working pressure 15-50 bar (up to 70 bar mechanically possible)
- Up to 5 nozzles in stainless steel or ruby (diameter Ø 0,7 – 1,2 mm)
- Impingement angle 8-10° against wire/felt direction
- Optional: special drive program that permits selecting zones for specific cleaning

	Water consumption	Air consumption
Cleaning head D= 1 mm Qty= 4	Q_{total}=8,8 l/min (20 bar)	----





BENEFITS

- Increase Wire/Felts efficiency → Increase Machine efficiency
- Increase Press Section efficiency → Increase Machine efficiency
- Increase wires/felts lifetime
- Increase sheet formation
- Improve paper CD profile
- Increase paper quality
- Avoid marks on the paper
- Improve Machine operator security

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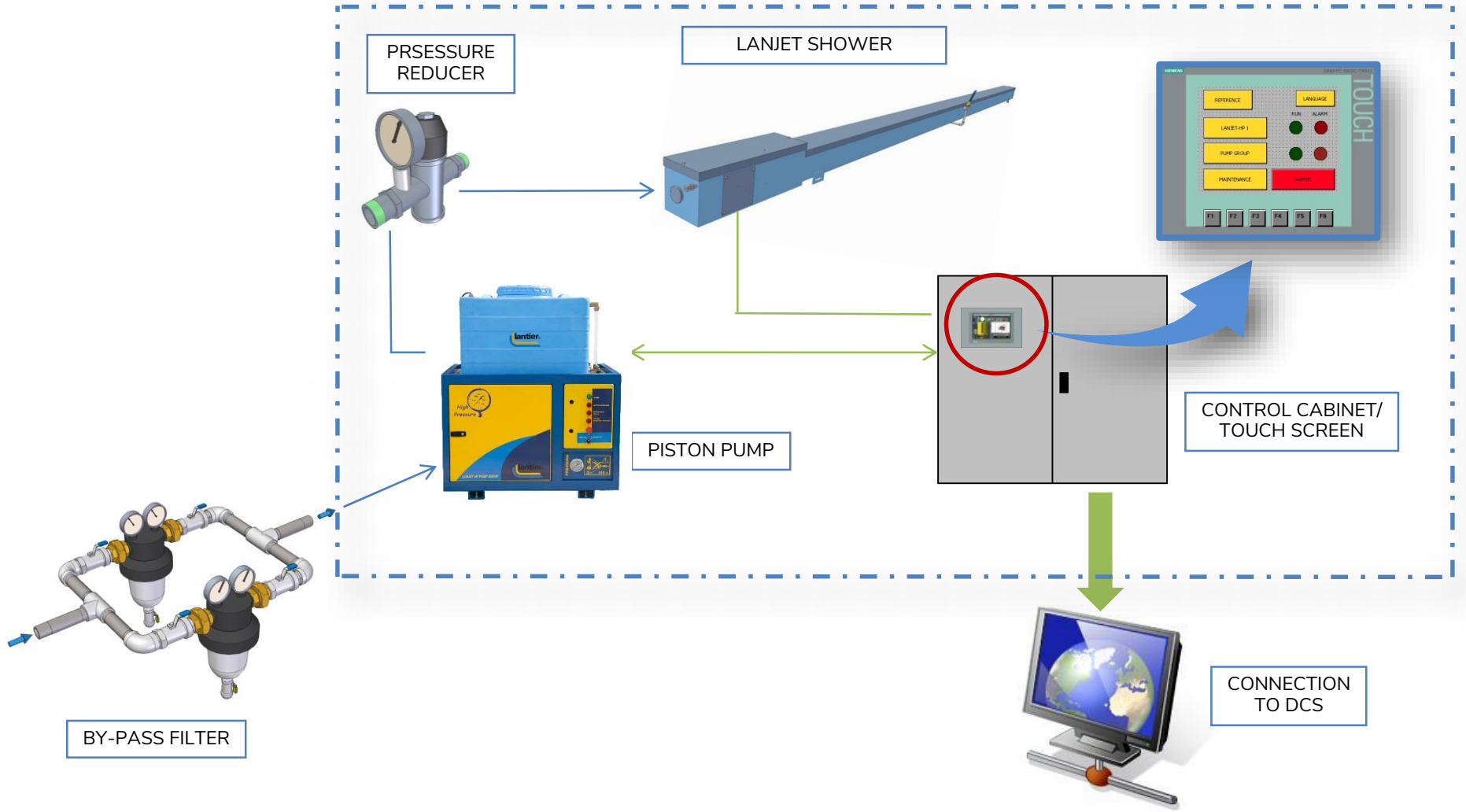
Scope of supply



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Benefits of installing a LANJET Shower

(considering a 200.000 Tn/year P&W PM – 6 m – 600 m/min)

Lanjet Shower		
Dryness increase	Up to 1% (= 5% production)	200.000 + 5% = 10.000 Tn x 860 €/Tn = 8.600.000 € x 5% Profit = 430.000 €/year
Reduction of steam consumption	Up to 1% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 1% = 4.000 Tn_{steam} x 30 €/Tn_{steam} = 120.000 €/year
Reduction of water consumption	Up to 80% (Osc.Shower = 8,28 m^3/h)	8,28 m^3/h x 24h x350d x80% = .600 m^3/year x 1,62 €/m^3 = 90.000 €/year
Reduction of energy consumption	Up to 70% (Osc.Shower pump = 30 kW)	30 kW x 70% = 21KW x 24 x 360 x 0,07 €/Kw = 12.700,8 €/year
Increase press felt life	Up to 50% (180 sqm – 4,5 felt year)	4,5 x 50%= 2,25 x 9.000 €/felt 20.250 €/year
Reduction of sheet breaks due to unequal felt cleaning	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Printing & Writing	242.950,8 €/year	460.000 €/year

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Benefits of installing a LANJET Shower

(considering a 200.000 Tn/year Packaging PM – 6 m – 600 m/min)

Lanjet Shower		
Dryness increase	Up to 1% (= 5% production)	200.000 + 5% = 10.000 Tn x 435 €/Tn = 4.350.000 € x 5% Profit = 217.500 €/year
Reduction of steam consumption	Up to 1% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 1% = 4.000 Tn_{steam} x 30 €/Tn_{steam} = 120.000 €/year
Reduction of water consumption	Up to 80% (Osc.Shower = 8,28 m^3/h)	8,28 m^3/h x 24h x350d x80% = 55.600 m^3/year x 1,62 €/m^3 = 90.000 €/year
Reduction of energy consumption	Up to 70% (Osc.Shower pump = 30 kW)	30 kW x 70% = 21KW x 24 x 360 x 0,07 €/Kw = 12.700,8 €/year
Increase press felt life	Up to 50% (180 sqm – 5,5 felt year)	5,5 x 50%= 2,75 x 9.000 €/felt 24.750 €/year
Reduction of sheet breaks due to unequal felt cleaning	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Packaging	247.450,8 €/year	247.500 €/year

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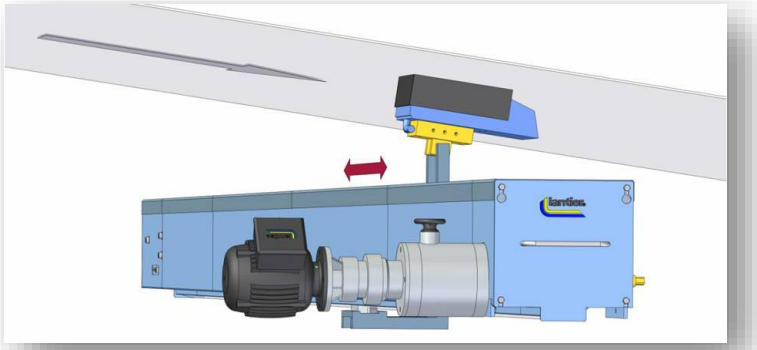
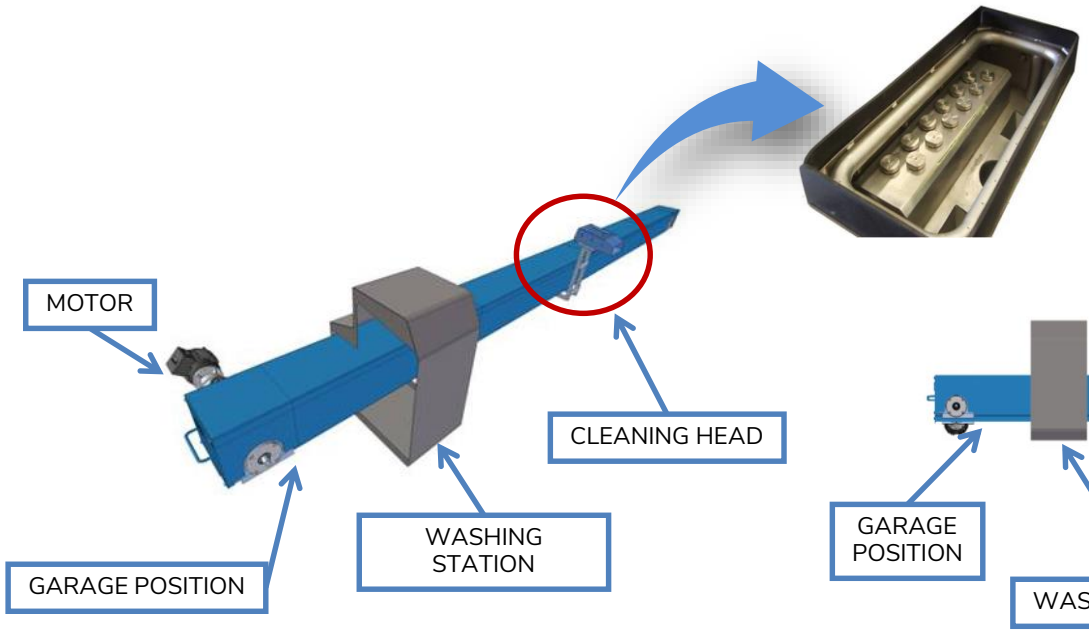
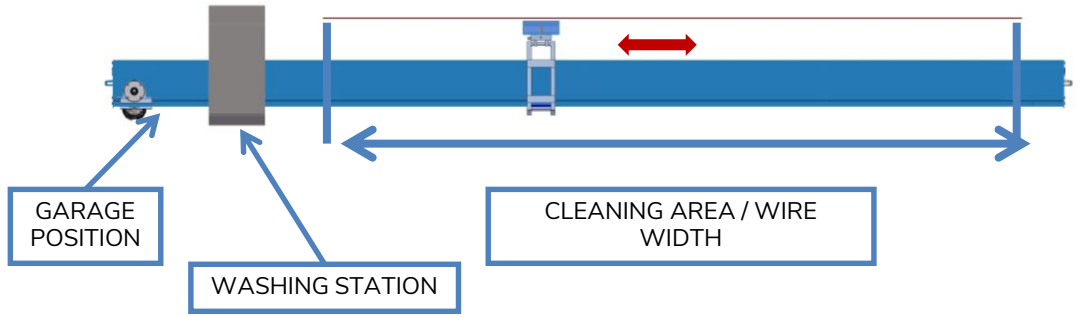
b) Lanjet-HP Shower – Forming Wire (80-100 bar)

- Continuous HP forming wire cleaning
- Working pressure 80-100 bar (depending on type of forming wire – always check with wire supplier)
- If pressure < 80 bar use Lanjet Shower
- Up to 12 Nozzles in ruby diameter Ø 0,25 mm
- Impingement angle perpendicular to wire
- Mist free operation because of air knives.
- Optional: special drive program that permits selecting zones for specific cleaning



	Water consumption	Air consumption
Cleaning head D= 0,25 mm Qty= 12	Q_{total}=5,1 l/min (100 bar)	Q_{total}=0,0442 m³/min (6 bar)
Washing station (casual use)	Q_{total}= 53,5 l/min (20 bar)	----





BENEFITS

- Increase Wire/Felts efficiency → Increase Machine efficiency
- Increase Press Section efficiency → Increase Machine efficiency
- Increase wires/felts lifetime
- Increase sheet formation
- Improve paper CD profile
- Increase paper quality
- Avoid marks on the paper
- Improve Machine operator security

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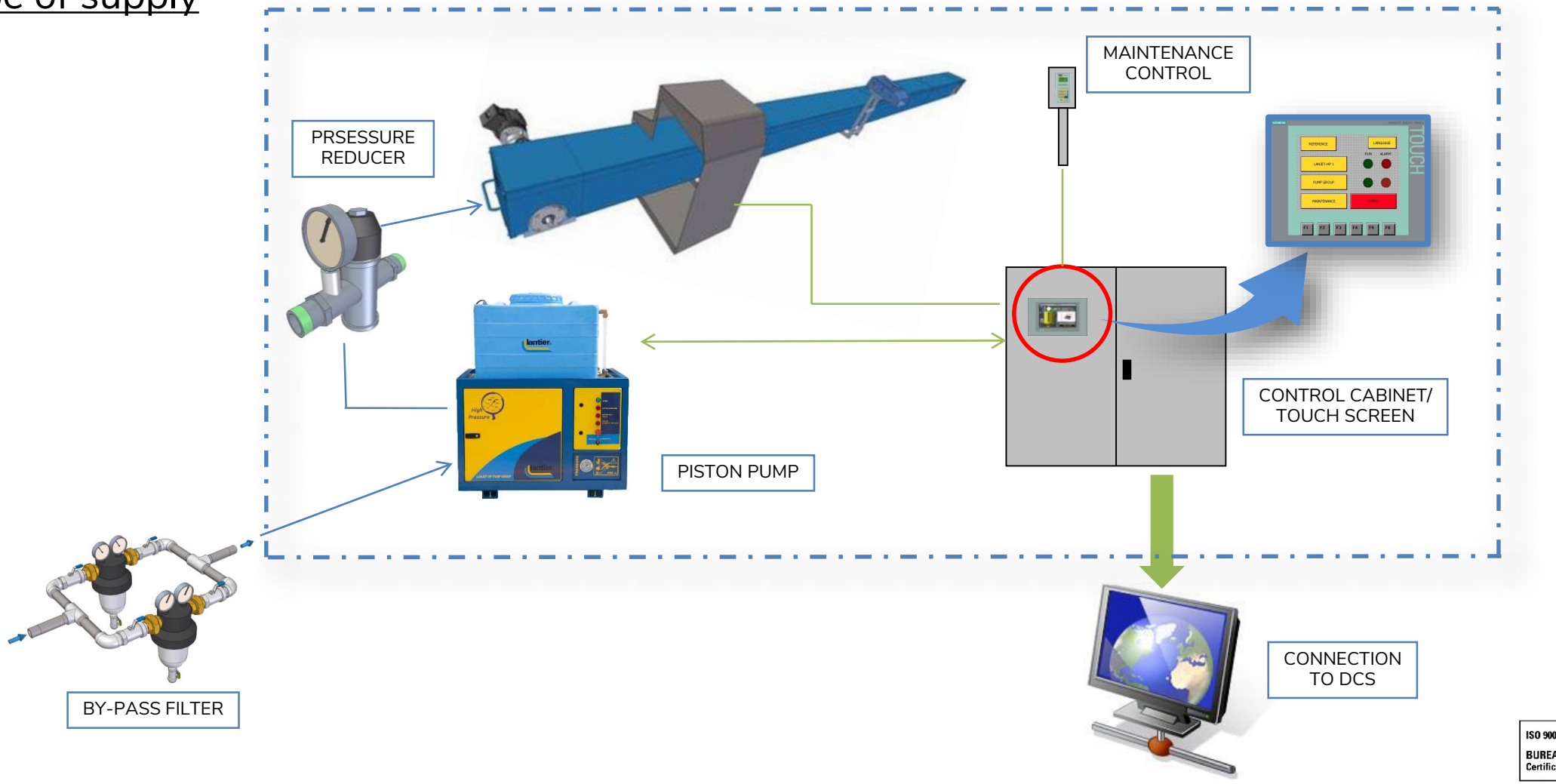
Scope of supply



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Benefits of installing a LANJET HP

(considering a 200.000 Tn/year P&W PM – 6 m – 600 m/min)

Lanjet HP		
Dryness increase	Up to 0,6% (= 3% production)	200.000 + 3% = 6.000 Tn x 860 €/Tn = 5.160.000 € x 5% Profit = 258.000 €/year
Reduction of steam consumption	Up to 0,7% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 0,7% = 2.800 Tn_{steam} x 30 €/Tn_{steam} = 84.000 €/year
Reduction of water consumption	Up to 85% (Osc.Shower = 8,28 m^3/h)	8,28 m^3/h x 24h x350d x85% = 59.119,2 m^3/year x 1,62 €/m^3 = 95.773,1 €/year
Reduction of energy consumption	Up to 75% (Osc.Shower pump = 30 kW)	30 kW x 75% = 22,5KW x 24 x 360 x 0,07 €/Kw = 13.608 €/year
Increase press forming fabric	Up to 70% (200 sqm – 8 forming fabric/year)	8 x 70%= 6 x 22.000 €/felt 132.000 €/year
Reduction of sheet breaks due to unequal forming fabric cleaning	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Printing & Writing	325.381,1 €/year	288.000 €/year

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Benefits of installingA LANJET HP

(considering a 200.000 Tn/year Packaging PM – 6 m – 600 m/min)

Lanjet HP		
Dryness increase	Up to 0,6% (= 3% production)	200.000 + 3% = 6.000 Tn x 435 €/Tn = 2.610.000 € x 5% Profit = 130.500 €/year
Reduction of steam consumption	Up to 0,7% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 0,7% = 2.800 Tn_{steam} x 30 €/Tn_{steam} = 84.000 €/year
Reduction of water consumption	Up to 85% (Osc.Shower = 8,28 m^3/h)	8,28 m^3/h x 24h x350d x85% = 59.119,2 m^3/year x 1,62 €/m^3 = 95.773,1 €/year
Reduction of energy consumption	Up to 75% (Osc.Shower pump = 30 kW)	30 kW x 75% = 22,5KW x 24 x 360 x 0,07 €/Kw = 13.608 €/year
Increase press forming fabric	Up to 70% (200 sqm – 3 forming fabric/year)	3 x 70%= 2,1 x 22.000 €/felt 46.000 €/year
Reduction of sheet breaks due to unequal forming fabric cleaning	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Packaging	239.381,1 €/year	160.500 €/year

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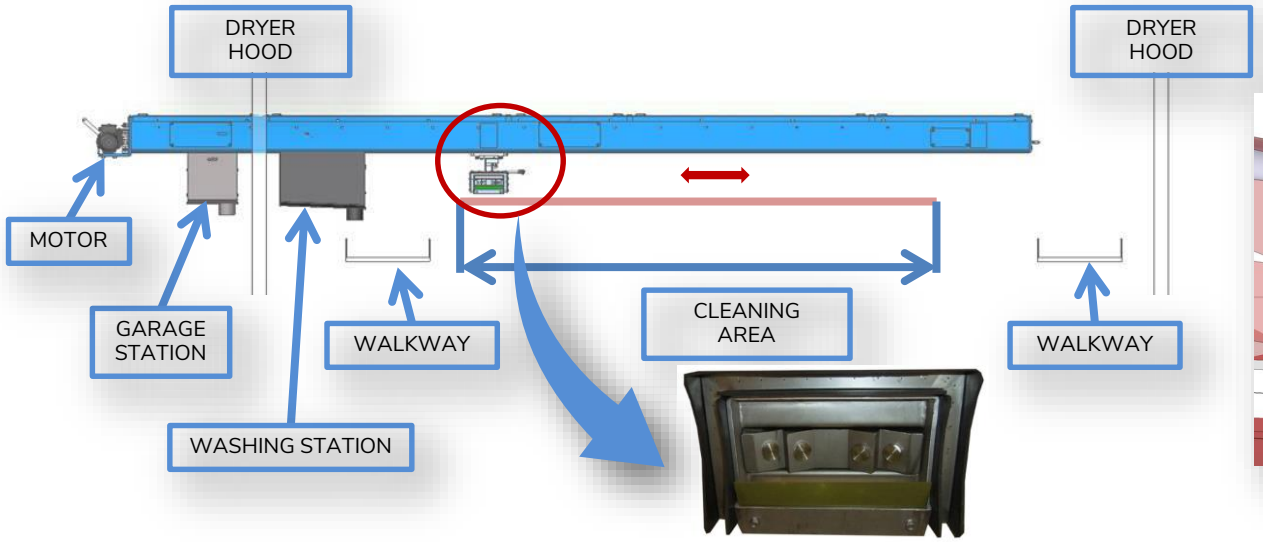
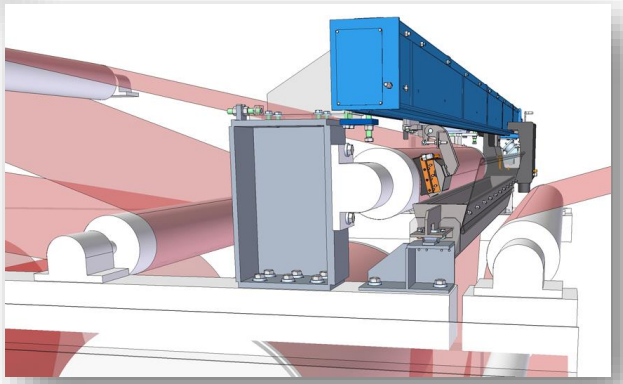
c) Lanjet-HP Shower – Dryer Wire/Screen (100-300 bar)

- Continuous HP dryer wire/screen cleaning
- Working pressure 100-300 bar (depending on type of dryer wire/screen – always check with wire supplier)
- Up to 4 Nozzles in Ruby diameter Ø 0,25 mm
- Impingement angle adjustable
- Mist free operation because of air knives.
- Optional: special drive program that permits selecting zones for specific cleaning

	Water consumption	Air consumption
Cleaning head D= 0,25 mm Qty= 4	Q_{total}=2,9 l/min (300 bar)	Q_{total}=0,0143 m^3/min (6 bar)
Washing station (casual use)	Q_{total}= 53,5 l/min (20 bar)	Q_{total}=0,033 m^3/min (6 bar)





BENEFITS

- Increase Wire/Felts efficiency
  ↓
  Increase Machine efficiency
- Improve Dryer Cylinders cleaning
- Increase Dry Wires lifetime
- Increase sheet formation
- Improve paper CD profile
- Increase paper quality
- Avoid marks on the paper
- Improve Doctor Blade wearing-out
- Improve Doctor operation
- Improve Machine operator security

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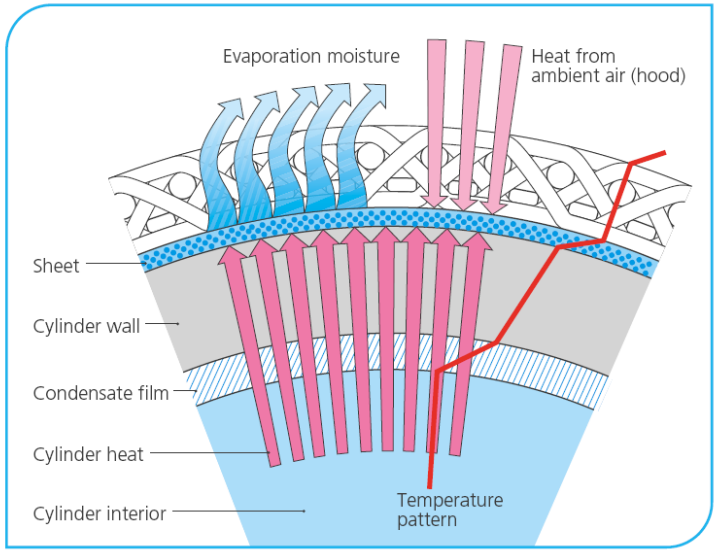
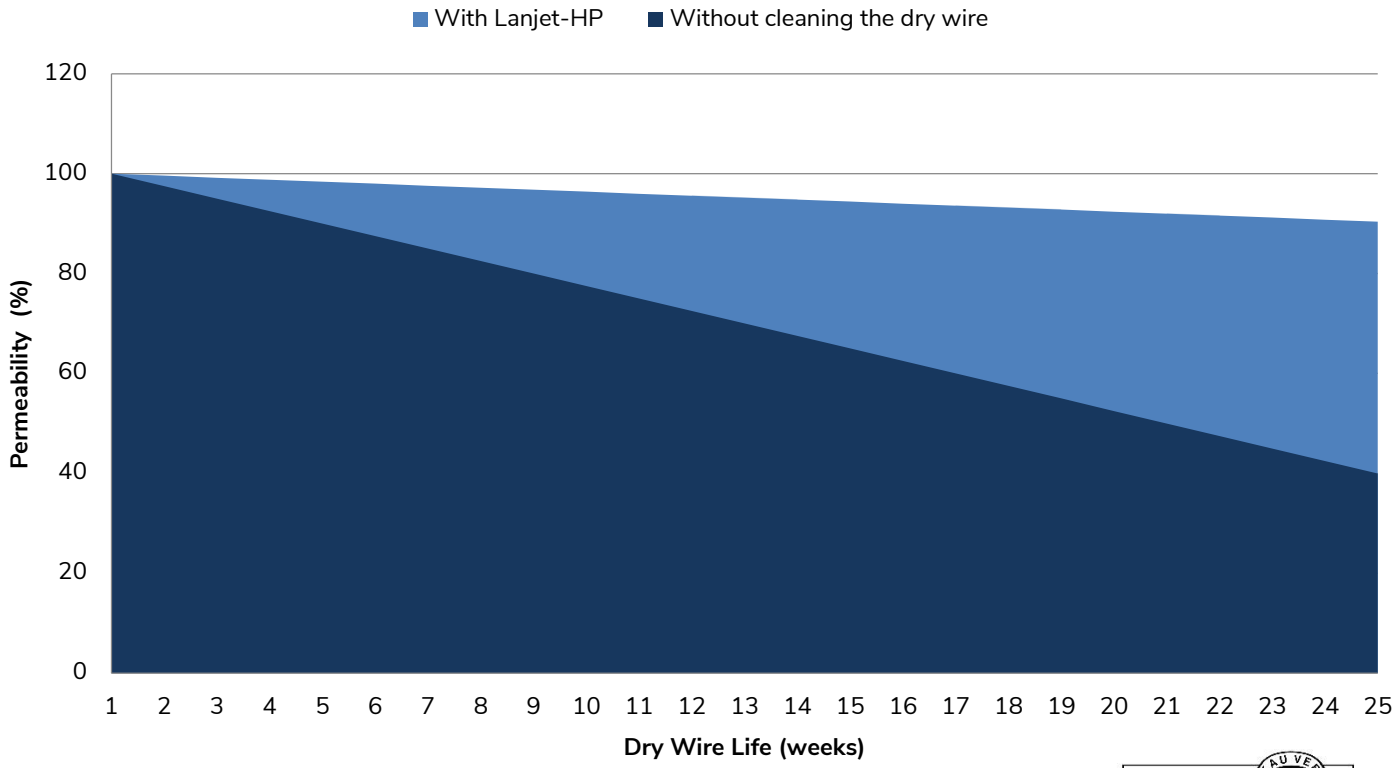
Importance of keeping clean the dryer wire/screen

High pressure cleaning in Dryer Section becomes a helpful tool to remove deposits on fabrics surface.



Removal of Evaporation Moisture

Heimbach source



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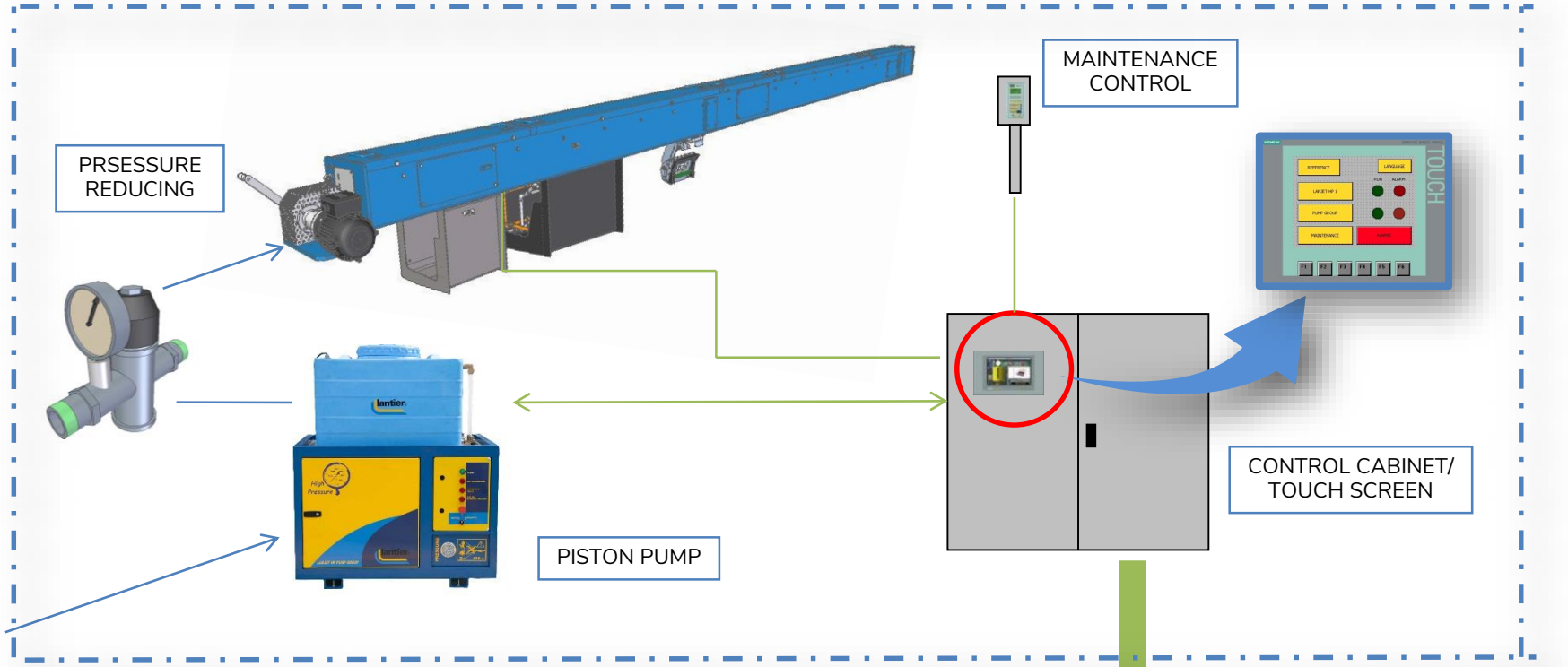
Scope of supply



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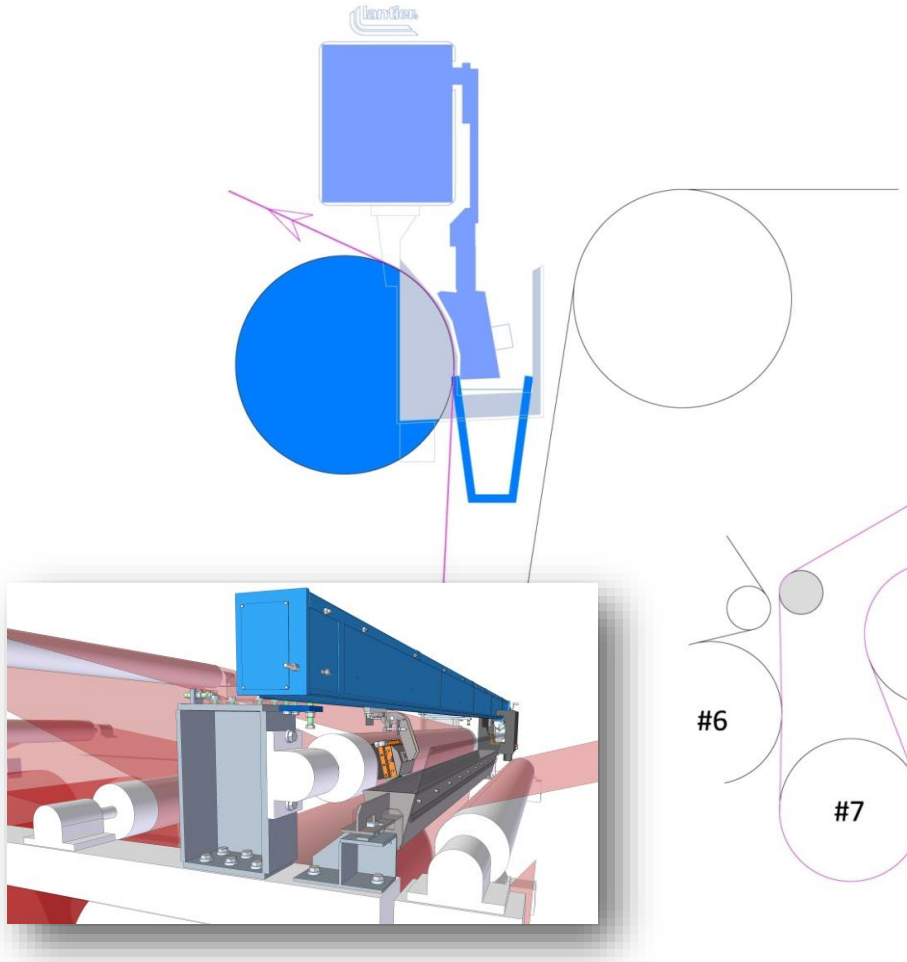
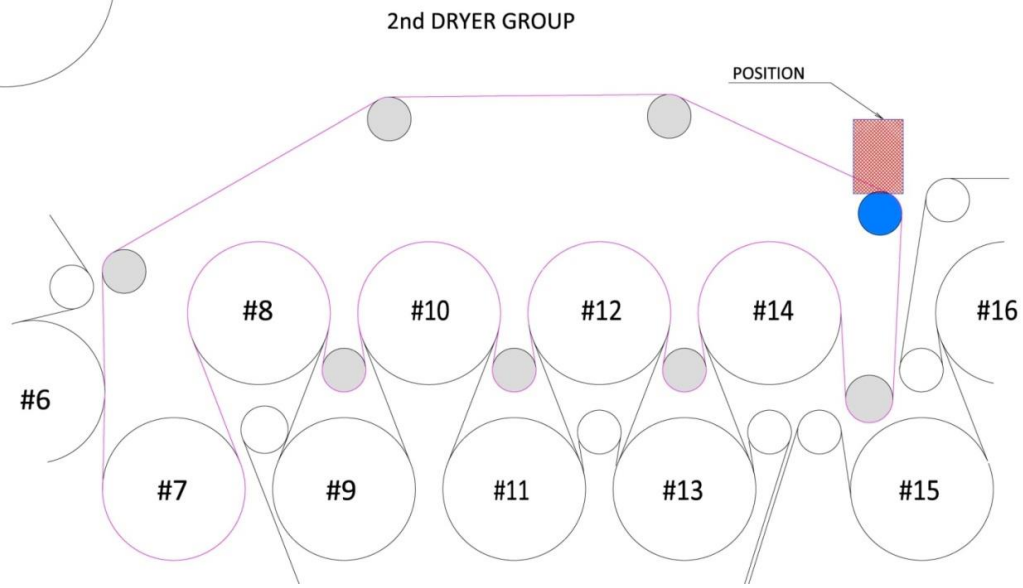
Lanjet-HP – continuous dry wire cleaning (Position 1)





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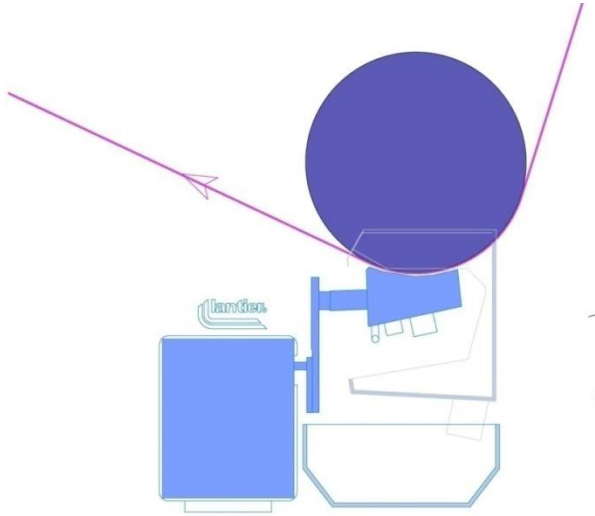
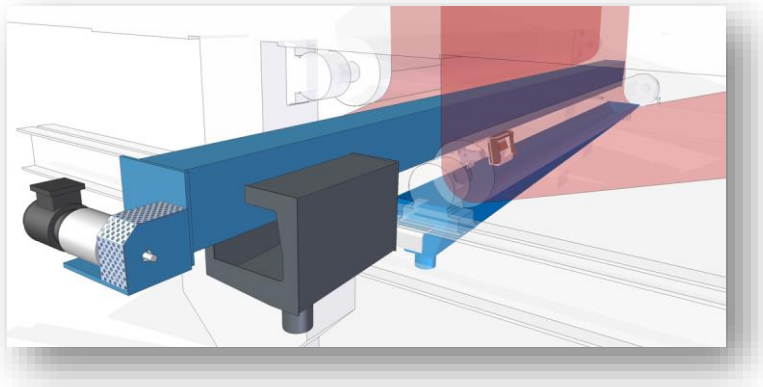
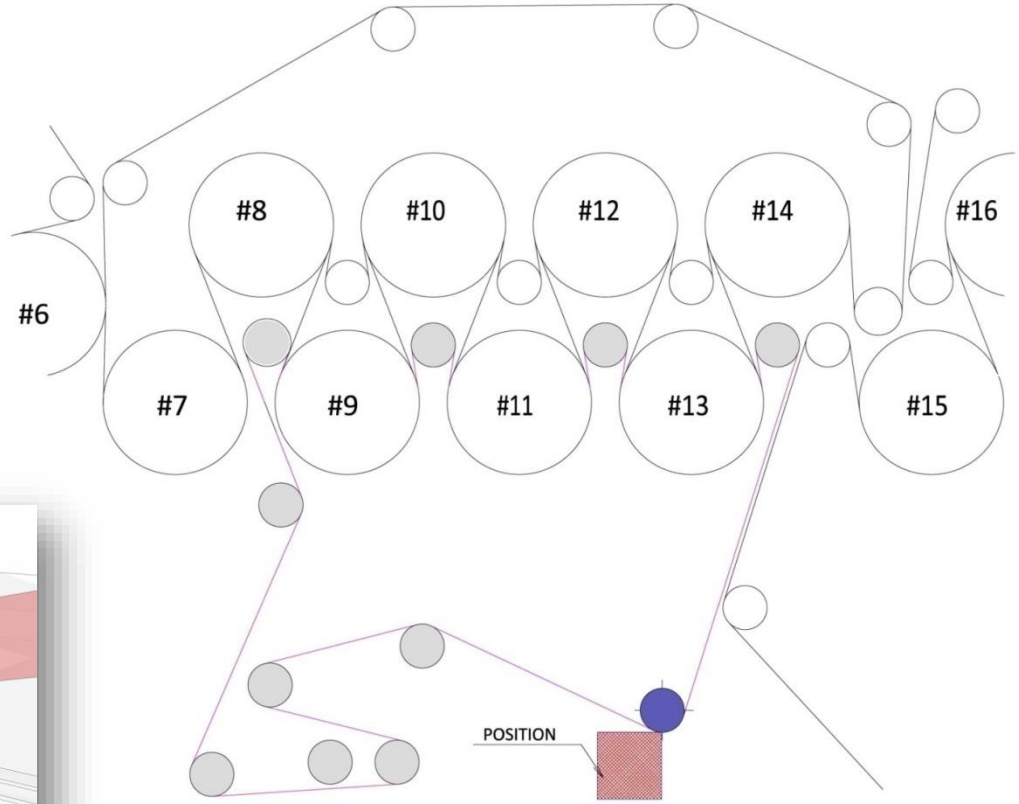
Lanjet-HP – continuous dry wire cleaning (Position 2)







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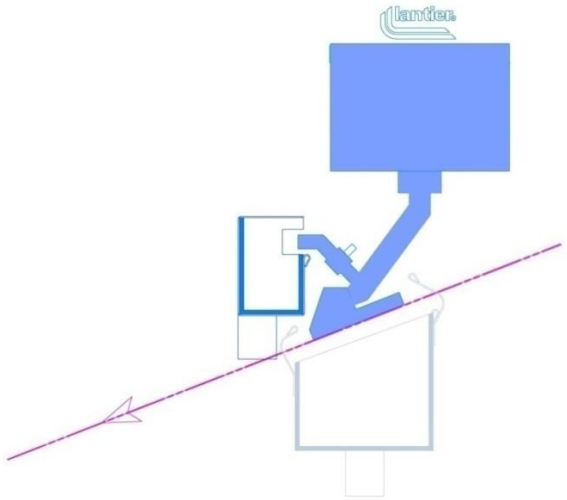
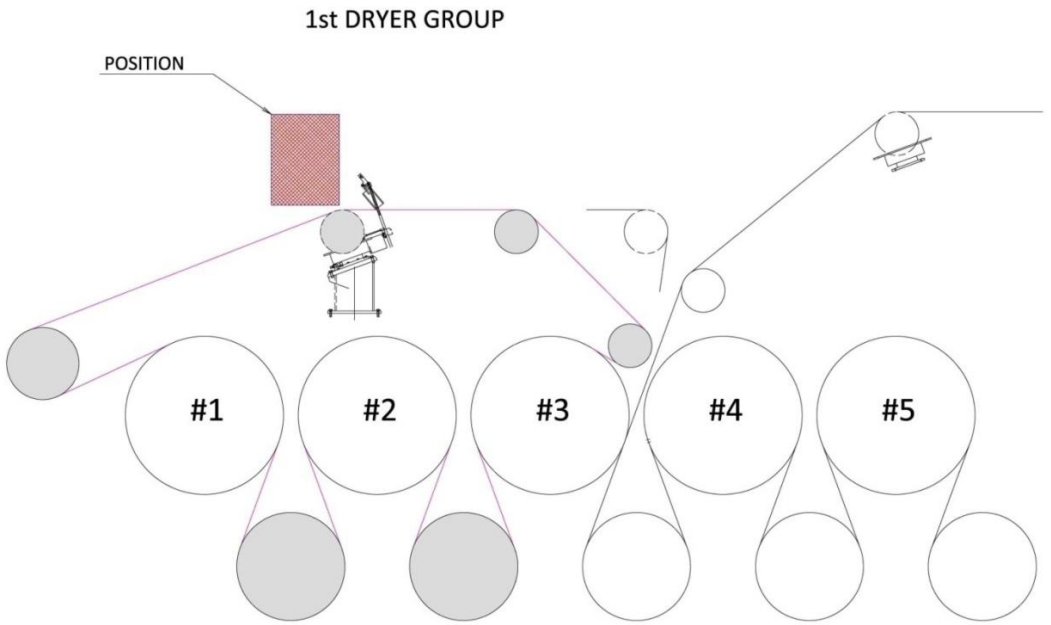
Lanjet-HP – continuous dry wire cleaning (Position 3)





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Solutions inside

Benefits of installing a LANJET HP

(considering a 200.000 Tn/year P&W PM – 6 m – 600 m/min)

Lanjet HP		
Increase machine speed	Up to 5% (= 5% production)	200.000 + 5% = 10.000 Tn x 860 €/Tn = 8.600.000 € x 5% Profit = 430.000 €/year
Reduction of steam consumption	Up to 5% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 5% = 20.000 Tn_{steam} x 30 €/Tn_{steam} = 600.000 €/year
Increase dryer wire/screen	Up to 70% (200 sqm – 0,9/year)	0,9 x 70%= 0,63 x 7.000 €/wire 4.410 €/year
Reduction of sheet breaks due to contaminants	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Printing & Writing	604.410 €/year	460.000 €/year

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Benefits of installing a LANJET HP

(considering a 200.000 Tn/year Packaging PM – 6 m – 600 m/min)

Lanjet HP		
Increase machine speed	Up to 5% (= 5% production)	200.000 + 5% = 10.000 Tn x 435 €/Tn = 4.350.000 € x 5% Profit = 217.500 €/year
Reduction of steam consumption	Up to 5% (2 Tn_{steam}/Tn_{paper})	2 x 200.000 x 5% = 20.000 Tn_{steam} x 30 €/Tn_{steam} = 600.000 €/year
Increase dryer wire/screen	Up to 70% (200 sqm – 1,2/year)	1,2 x 70%= 0,84 x 7.000 €/wire 5.880 €/year
Reduction of sheet breaks due to contaminants	100% (10 breaks/month - downtime cost 1.500 €/h)	10 breaks/month x 10 min x 12 months / 60 = 20 h/year x 1.500 €/h = 30.000 €/year
No need shutdowns for forming wire manual cleaning	100%	---

PAPER GRADE	SAVING	EXTRA SALES
Packaging	605.880 €/year	247.500 €/year

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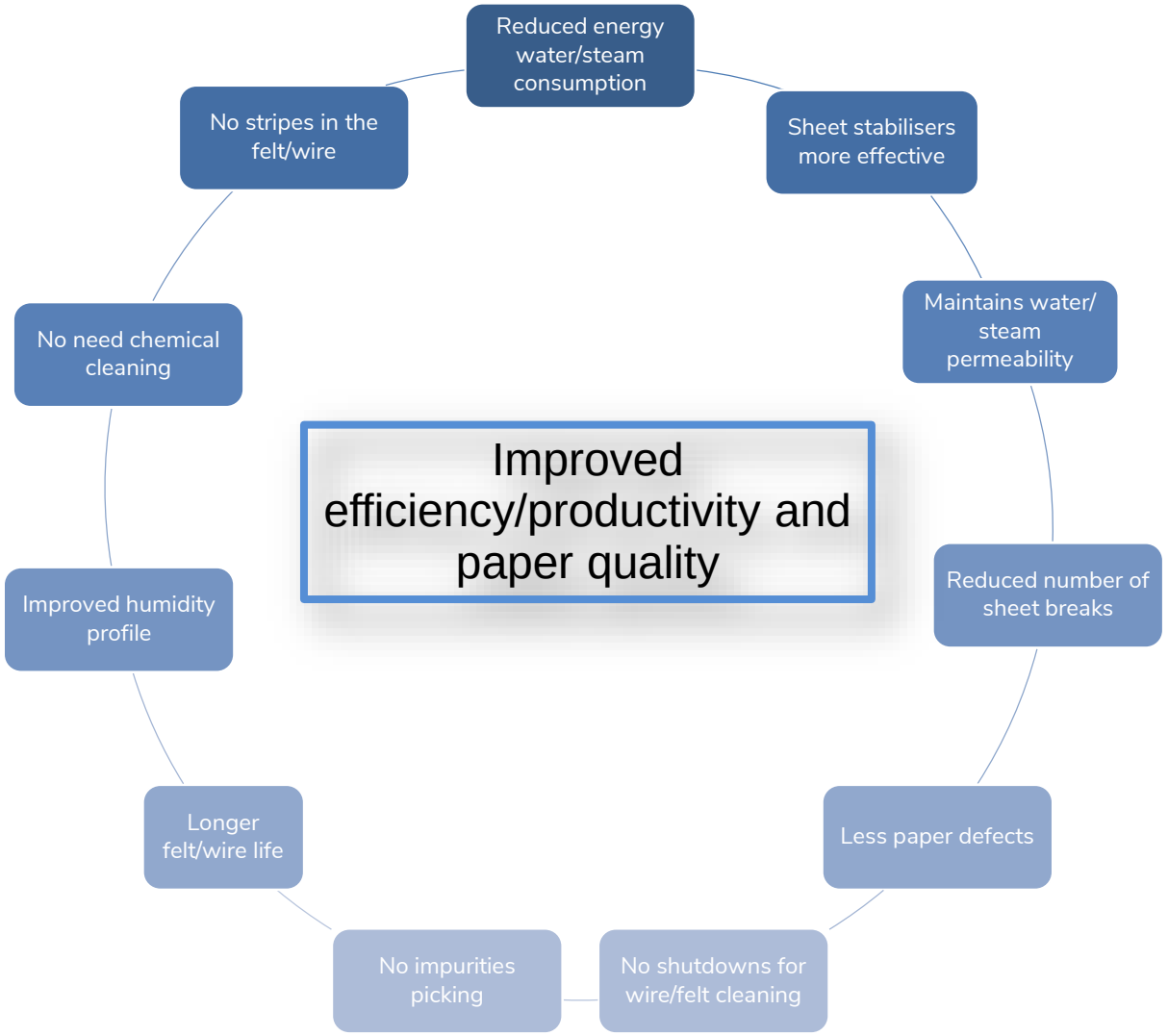
Solutions inside

Advantages of Traversing shower LANJET



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Lantier shower components

1) Nozzles
2) Oscillators
    a) OL.6-300 Elec.
    b) OL.6-300 Mec.
3) Cleaning System
    a) Cleaning brush system
    b) Valve with spiral movement
    c) Automatic drive
    d) Support
4) Pump
    a) Piston pumps
    b) Centrifugal pumps

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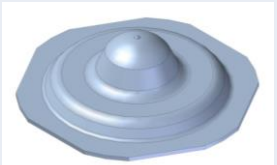
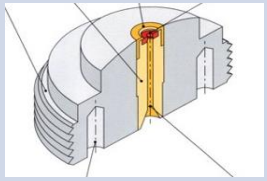
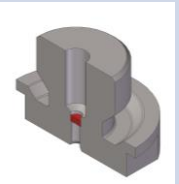
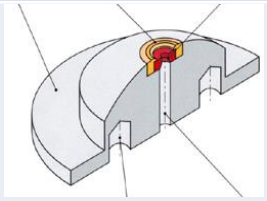
1) Nozzles

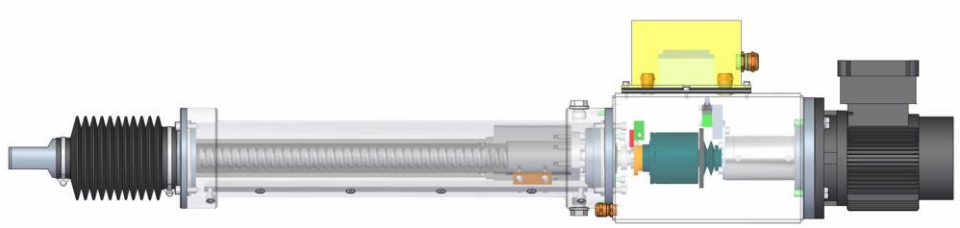
Lantier Nozzles

FAN JET NOZZLES • Angle: 15° / 30° / 60° • Diameter: Ø 1,5 – 6 mm • Minimum pressure: 3 bar		STAINLESS STEEL BODY CERAMIC NOZZLES • Needle jet (0°) • Diameter: Ø 1 – 1,2 mm • Maximum pressure: 70 bar	
NEEDLE JET NOZZLES • Angle: 0° • Diameter: Ø 0,8 – 1,2 mm • Maximum pressure: 100 bar		DUCK NOZZLES • Angle: 15° / 30° / 60°/90° • Diameter: Ø 1,5 – 6 mm • Minimum pressure: 3 bar	
INTEGRATED RUBY NOZZLES • Needle jet (0°) • Diameter: Ø 0,7 – 1,2 mm • Maximum pressure: 30 bar		HIGH PRESSURE RUBY NOZZLES • Needle jet (0°) • Diameter: Ø 0,25 mm • Maximum pressure: 300 bar	
PLATE RUBY NOZZLES • Needle jet (0°) • Diameter: Ø 0,7 – 1,2 mm • Maximum pressure: 30 bar		RUBY/PYRES TIP NOZZLES • Needle jet (0°) • Diameter: Ø 0,25 – 2 mm • Maximum pressure: 70 bar	

2) Shower oscillators

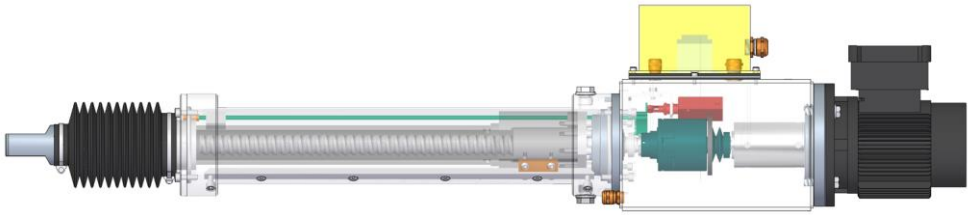
a) OL.6-300 Elec.

- Course: **Electronically adjustable** (1-330 mm).
- Thrust: 1000 kg (self-limited – potentially 3000 kg).
- Speed: electronically adjustable (1-75 mm/min)
- Completely built in stainless steel
- Built in encoder



b) OL.6-300 Mec.

- Course: **Mechanically adjustable** (1-300 mm).
- Thrust: 1000 kg (self-limited – potentially 3000 kg).
- Speed: electronically adjustable (1-75 mm/min)
- Completely built in stainless steel
- Built in mechanical limit switch



Alternative Oscillators	
OLH.80 Hydraulic-Electronic	
OLH. 500	

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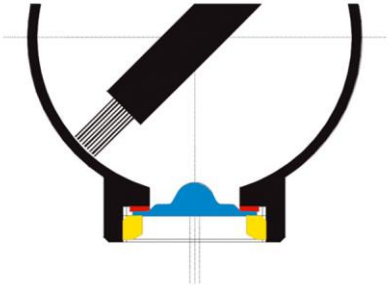
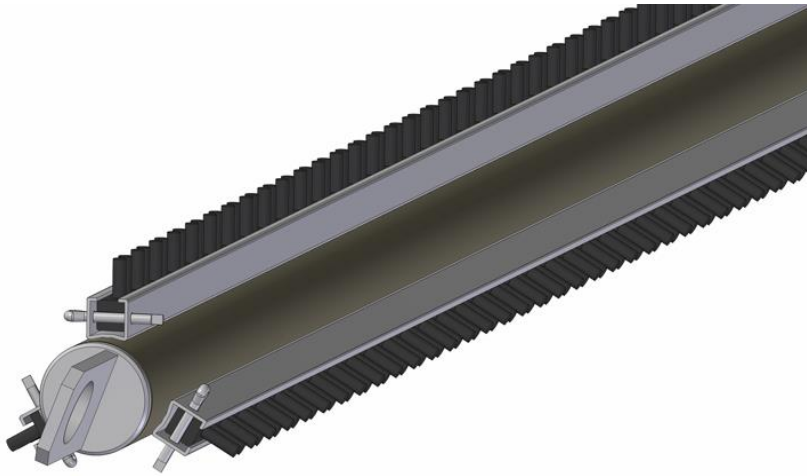
3) Internal Shower Cleaning System

a) Cleaning brush system

The internal cleaning system consists of rotating brushes for cleaning the nozzles and the pipe from the inner side of the shower.

Our special design permits to change the brushes in 1-m-long pieces.

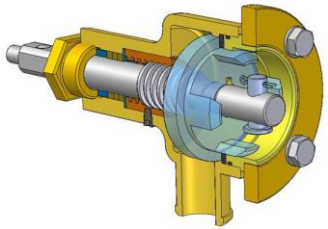


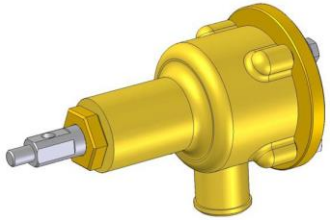


b) Valve with spiral movement

Cleaning brushes are activated by turning a screw-shaft either by means of a hand-wheel, a ratchet-key or an electromechanical drive.

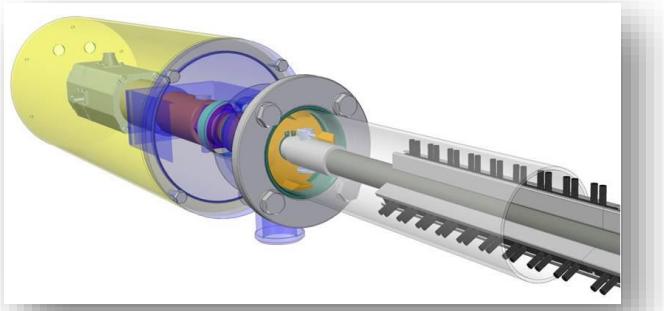
Each time the brushes are activated the valve opens and closes at the same time.





c) Automatic drive

- DC for spiral movement valve and AC for cylindrical movement valve
- Programming possibilities: timing, number of cycles, number of turns per cycle, etc.

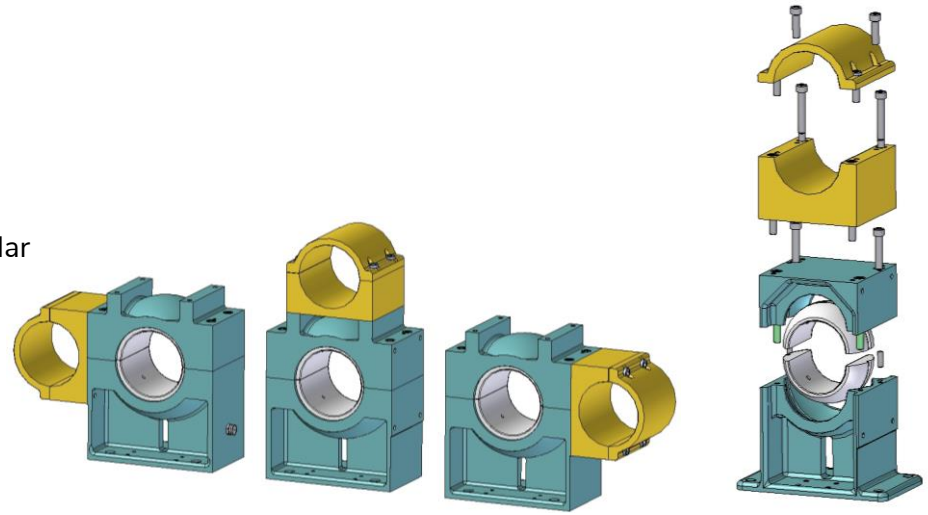


Automatic drive

e) Supports

Spherical support

- For wire width up to 2 ½” (up to 6 m) and 4” (up to 13 m)
- Special design that permits installing the oscillator in any angular positions
- Spherical bushings in TS and DS
- Tested long life wear resistant plastic bushings



4) Pump

a) Piston pump

- Water pressure till 300 bar.
- Possibility of working up to 3x Lanjet Shower
- The control of the pump group is integrated in the control of the Lanjet
- Fresh water needed, filtered with a filter of 40 µm.
- Inlet water pressure needed must be higher than 2 bar.

b) Centrifugal pump

- Water pressure till 30 bar.
- Possibility of working up to 5x Oscilan shower
- The control of the pump group is integrated in the control of the Lanjet
- Fresh water needed, filtered with a filter of 100 µm.
- Inlet water pressure needed must be higher than 2 bar.