

## How to choose the right shower / oscillator

### STAMM High-Pressure Nozzle-Spray Showers with STAMM Oscillators

The cleaning and conditioning of wires, felts, and rolls is of critical importance in paper manufacturing. Sufficient dewatering and sheet formation can only be assured if wires, felts, and rolls are clean. STAMM high-pressure showers guarantee efficient cleaning.

With more than 80,000 showers delivered to date – including more than 7,500 oscillating showers – STAMM has developed a mature design that surpasses the high requirements of the paper industry. STAMM high-pressure showers with STAMM oscillating devices have proven successful for years on the world's largest and fastest paper machines.

#### Cleaning Requirements:

- Effective, gentle and streak-free cleaning of wires, felts and rolls
- Nozzles with high quality jets
- Nozzle flow rates in accordance with specifications
- Minimum water consumption
- Low energy consumption
- Optimum operational safety and availability
- Low maintenance and service requirements

#### High-Pressure Shower Locations:

- Forming wires
- Press felts
- Forming rolls
- Suction and press rolls
- Dryer screens

#### High-Pressure shower features:

- Shower sizes: 2", 2 1/2", 3", 4", 5", and 6"
- All stainless steel construction. (Special materials are available upon request.)
- Needle jet nozzles (standard or with ruby orifice) or flat jet nozzles
- Interchangeable nozzle plates
- Optional cleaning device (The device may be automated.)
- Stainless steel bushings
- "Tube in tube" designs

#### Oscillating Devices

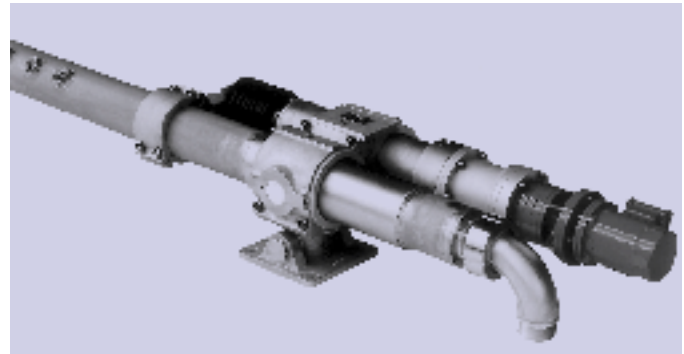
Lechler offers a wide variety of STAMM oscillator types:

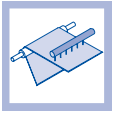
- Pneumatic oscillators 10.170 S, 10.363
- Electro-mechanical oscillator 10.200 E
- Oil-hydraulic oscillator 10.591 S with micro-flow control valve
- Linear oscillator 10.510 LSE-R with double screw spindle
- Oil-hydraulic oscillator 10.691 S with electronic control unit
- Oil-hydraulic oscillator 10.403 (reversing cylinder)
- Linear oscillator 10.510 EC with electronic control unit

The oscillator and shower bearing form a compact system. As a result of the patented arrangement of the

oscillator and the shower bearing, no harmful transverse forces can act on the oscillator (piston rod or thrust pipe).

- A cardanic bearing on the oscillator side and a spherical bearing at the counter-bearing compensate for pipe deflection on all planes (i.e. weight of the shower and nozzle recoil forces).
- Rapid exchange of oscillator units, for maintenance work, can be done while the paper machine is running; the shower pipe remains within the bearing.
- All parts that come into contact with pulp or water are made of corrosion-proof materials.
- All electrical drives have a protective system

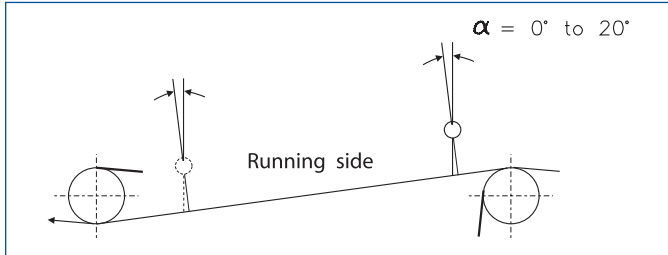




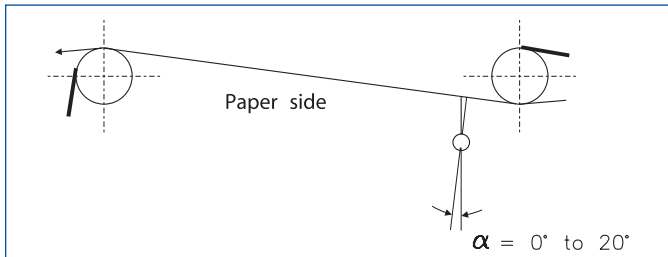
## Installation Locations of High-Pressure Showers

### Wire cleaning

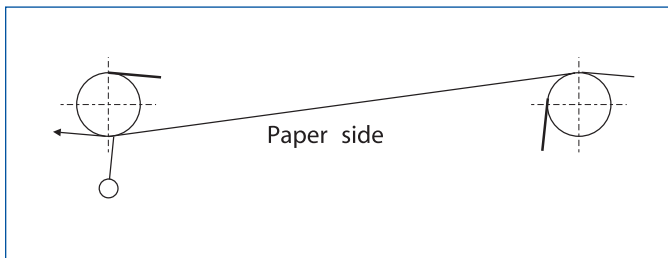
Install the shower close to the wire return in the vicinity of a fixed guide roll.



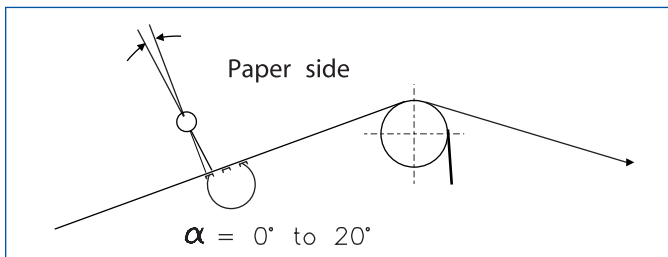
- Single wires and compound wires – clean from the running side



- Double and multi-layer wires – clean from the paper side



- The jet is directed into a guide roll



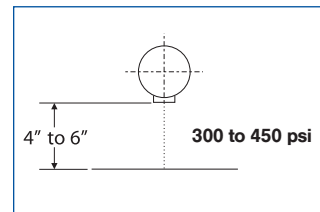
- High-pressure shower with suction box on the inside, for top and bottom wires, will reduce mist.

### Technical data for high-pressure showers for wire cleaning:

Nozzle size ( $\varnothing$ ):  
0.8, 0.9, and 1.0 mm

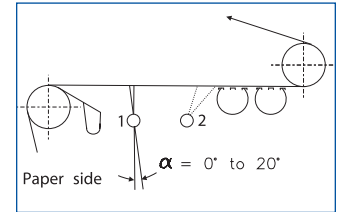
Nozzle Pitch:  
2", 4", and 8" (stroke = 8")  
3", 6", and 12" (stroke = 12")

Distance: nozzle/wire  
4" – 6"

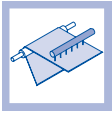


Water Pressure:  
Up to 450 psi (higher pressure may damage the wire)

### Felt cleaning



High pressure (1) and low pressure (2) showers for the cleaning, conditioning, and moistening of the felt are installed on the paper side in front of the felt suction boxes. The showers are usually installed in a tandem arrangement and moved by a single oscillating device. The spraying jet of the high-pressure shower is either directed vertically onto the felt or slightly inclined against the running direction.



### Technical data for high-pressure showers for felt cleaning:

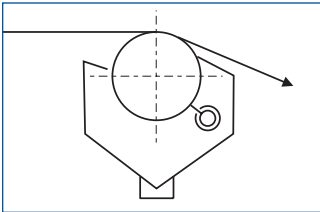
Nozzle size (Ø):  
0.7, 0.8, 0.9, and 1.0 mm

Nozzle Pitch:  
2", 4", and 8" (stroke = 8")  
3", 6", and 12" (stroke = 12")

Distance: nozzle/felt  
4" – 6"

Water Pressure:  
Up to 225 psi (higher pressure may damage the felt)

### Roll cleaning



Because of difficult installation conditions in the vicinity of wire suction rolls, take-off suction rolls, suction press rolls and forming rolls, showers and oscillators should be designed to minimize space. STAMM high-pressure showers with guide pipe meet these requirements. Oscillation is achieved with an oil-hydraulic or pneumatic cylinder or a linear oscillator. The high-pressure shower oscillates inside a slotted guide pipe.

### Technical data for high-pressure showers for roll cleaning:

Nozzle size (Ø):  
1.0 to 1.5 mm

Nozzle Pitch:  
4", 8", and 20"

Distance: nozzle/felt  
2" – 4"

Water Pressure:  
450 psi – 1000 psi (maximum pressure 3000 psi)

### Cleaning of dryer screens

Oscillating high-pressure showers are used for cleaning of dryer screens during production downtimes and cleaning intervals. "Jet to jet" cleaning ensures that the entire area is cleaned within a short period of time.

The shower is usually installed on the paper side, and the jet is directed against a guide roll, dryer screen suction roll, or drying cylinder. Oscillation is achieved with the linear oscillator 10.510 LSE-R, specifically designed for the high temperatures in the drying section.

### Technical data for high-pressure showers for dryer screen cleaning:

Nozzle size (Ø):  
1.0 to 1.5 mm

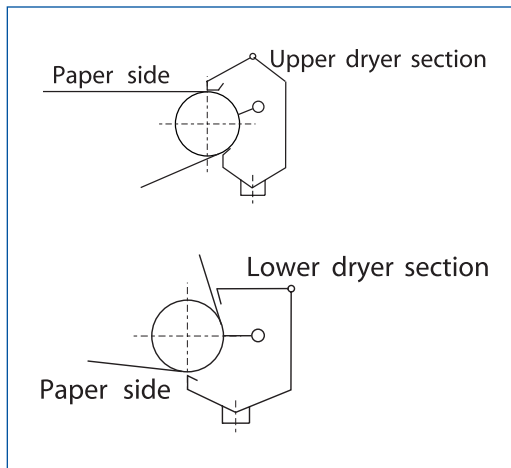
Nozzle Pitch:  
4", 8", 20"

Distance: nozzle/felt  
2" – 4"

Water Pressure:  
450 psi – 1000 psi (maximum pressure 3000 psi)

### Cleaning principle of linear oscillators and oscillators with electronic control unit

- Controlled "jet to jet" covering the entire surface
- Effective, gentle, and streak-free cleaning of wires, felts and rolls
- Linear, smooth oscillation movement with instant reversal at the end positions



### Calculation of oscillator speed $V_B$ according to formula

$$V_B = \frac{V_s}{L_{SF}} * e_b$$

$V_B$  = oscillator speed (in/min)

$V_s$  = machine speed (ft/min)

$L_{SF}$  = length of wire/felt (ft)

$e_b$  = width of cleaned strip (in)

### Calculation of the cleaning time $t_R$

A shower that operates in accordance with the above principle cleans the entire surface (wire, felt, roll) within a minimum period of time.

The cleaning time is calculated according to the formula:

$$t_R = \frac{L_{SF}}{V_s} * \frac{k}{e_b}$$

$L_{SF}$  = length of wire/felt (ft)

$k$  = nozzle pitch (in)

$V_s$  = machine speed (ft/min)

$e_b$  = width of cleaned strip (in)