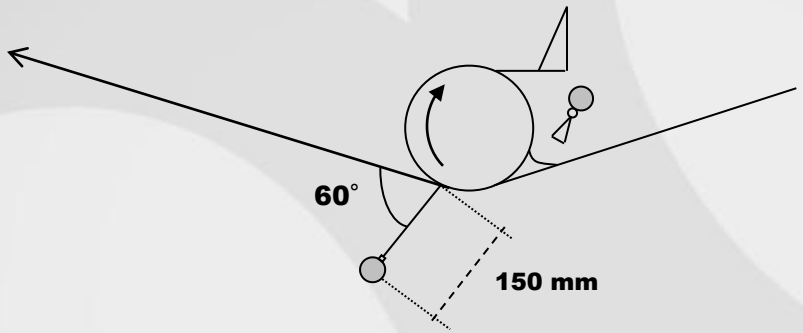
Forming Fabrics Cleaning

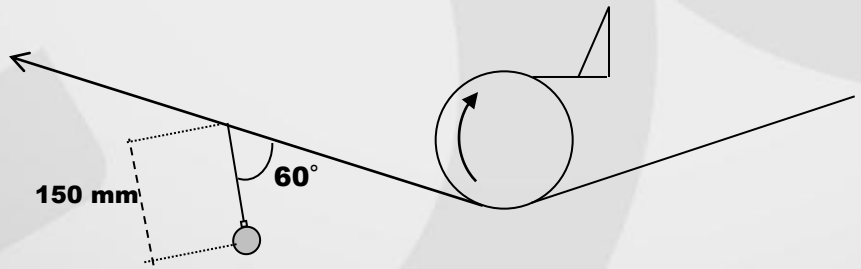
HPS Positioning Solutions

Solution 1 (recommended): against a roll



150 mm is a maximum distance

Solution 2



Nozzle Diameter

Recommendation → *1mm*

- *Smaller diameter* → *Risk of nozzle plugging*
  Water consumption increase without an increase of the cleaning effect

- *Larger diameter* → *Higher risk of damaging the fabric*

Water Pressure

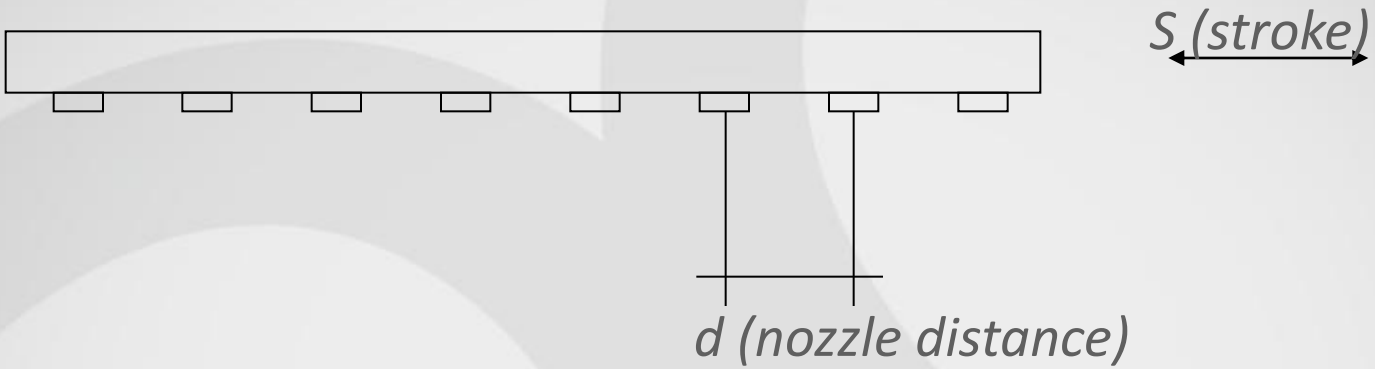
Recommendation:

- *25 bar on paper side*
- *30 bar on machine side*

Higher than 30 bar → *high risk of damaging the fabric*

Lower than 20-25 bar → *poor cleaning effect*

HPS Geometry

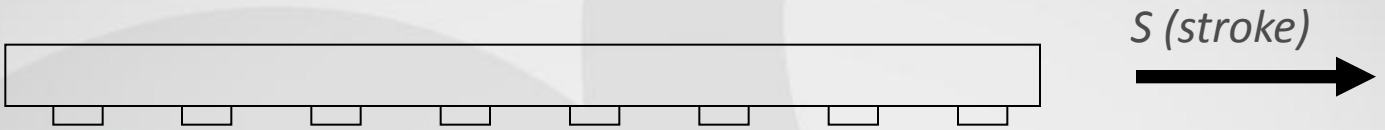


Recommendation:

Nozzle distance (d)	→	*75 – 100 mm*
Stroke (S)	→	*150 – 200 mm*

Oscillator Speed

Movement of the nozzle during one fabric revolution



S = nozzle movement
T = fabric revolution time

Speed = s/T

Recommendation

s = N • nozzle diameter (N = prime number)

S ≠ K • s (K = integer)

Minimum Cleaning Time (Tc)

$$Tc = T \cdot \frac{Nozzle\_spacing}{Nozzle\_projection} \cdot 2,7$$

Es. *Machine speed* = 600 m/min
Fabric length = 40 m
Nozzle spacing = 100 mm
Nozzle projection = 1mm • 1,905

$$Tc = \frac{40}{600} \cdot \frac{100}{1,905} \cdot 2,7 = 9,45 \text{ min}$$

Chemical Cleaning

Alkaline Cleaning (NaOH)	• *resins and pitches from chemical pulp* • *fibre lumps* • *some kind of latex*
Acid Cleaning (HCl)	• *mineral deposits (CaCO3, clay)* • *resins for wet strength resistance*
Organic Solvents	• *only for local spots*
Detergents	• *as additives to alkaline and acid products to improve the cleaning action*

Chemical Cleaning Operations

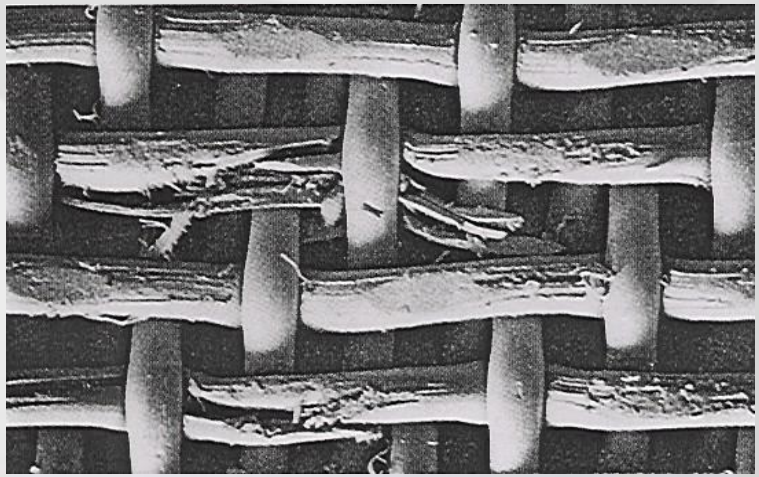
- *Shower with 1,5mm holes at a distance of 5 mm*
- *The jet has to be orianted against an inside return roll which will distrubute the jet all over the fabric*
- *Machine speed at its minimum*
- *All showers closed*

- *Caustic soda* → *Solution at 10% for 20-30'*
- *Hydrocloric acid* → *Solution at 5% for 10-15'*

The Risk of the Chemical Cleaning

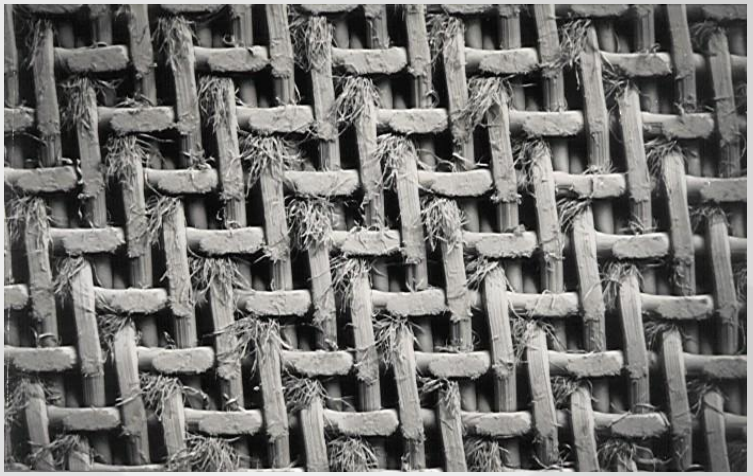
Fabrics containing PA Yarns are damaged by strong acid cleaning

PES Yarns are damaged by strong alkaline cleaning



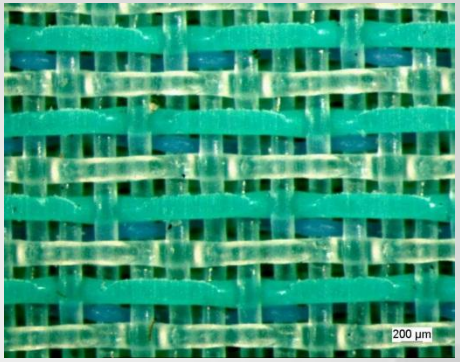
Damaged by High Pressure Showers

A too intensive high pressure shower cleaning can easily damage the fabric yarns and fibrillate them

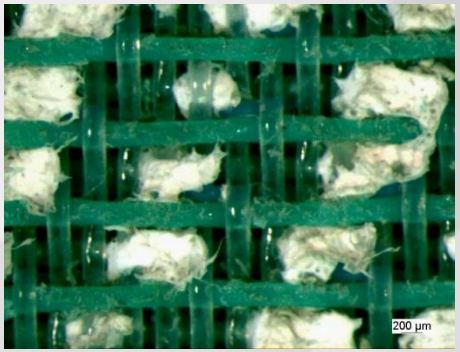


Acid Cleaning Polyamide at Risk

New Fabric



Polyamide yarns are damaged acid improper cleaning



<u>Polyamide</u> yarns have been completely removed no damage of the <u>Polyester</u> yarns