Cleaning: concepts definitions

1. Curative cleaning: to extract contaminants from clothing
   – These deposits decrease the paper machine runability (paper defects, clothing plugged),
   – These deposits must be taken out from clothing.

2. Preventive cleaning: to protect clothing from contaminants.
   – Contaminants are pushed to the paper sheet (ionic charge),
   – Contaminants are treated to avoid dirt built up.
# Cleaning: main chemical products

<table>
<thead>
<tr>
<th>Component</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Mechanical washing</td>
</tr>
<tr>
<td>Tensio-active</td>
<td>To wet, to disperse</td>
</tr>
<tr>
<td>Acid</td>
<td>To dissolve inorganic deposits (carbonates)</td>
</tr>
<tr>
<td>Alkaline</td>
<td>To saponify organic deposits</td>
</tr>
<tr>
<td>Solvents</td>
<td>To dissolve organic deposits</td>
</tr>
</tbody>
</table>
Cleaning: who vs who

Alkaline extractable

Solvent extractable

Amide
Asphalt
Grease
Latex
Polyethylene
Oil
Wax

Fatty acid salt
Calcium carbonate
Alkaline size
Wet strength
Aluminium hydroxide
Rosin Size
Fatty acid
Fatty ester

Starch
Biological slime
Lignin
Glue

Clay
Talc
Silica
Titanium-dioxide

Ash

Cleaning: who vs who
比较高量的水分 / m²
- 分割脱水
- 不可压缩的 felts
- 空间体积

高量水分 / s
- 限口脱水
- 压缩 felts
- 流速

Cleaning
Cleaning: felts compressibility

Compressible felt  Standard felt  Uncompressible felt

Wear batt changes the «batt/base» ratio and can move to uncompressible an initially compressible felt.
Cleaning : compaction

- Pre-compaction
- Start-up

Production

On paper machine working

CFM vs. time
# Cleaning

## Key parameters for flows

<table>
<thead>
<tr>
<th></th>
<th>Classical nip</th>
<th>Shoe</th>
<th>Suction box</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width (mm)</strong></td>
<td>15 - 25</td>
<td>150 - 250</td>
<td>10 – 12</td>
</tr>
<tr>
<td><strong>MPM</strong></td>
<td>⇔</td>
<td>⇔</td>
<td>⇔</td>
</tr>
<tr>
<td><strong>Pressure (bar)</strong></td>
<td>30 - 55</td>
<td>30 - 45</td>
<td>0,3 – 0,6</td>
</tr>
<tr>
<td><strong>Felt thickness %</strong></td>
<td>60 - 70</td>
<td>60 - 70</td>
<td>100</td>
</tr>
</tbody>
</table>
Cleaning: what can be measured

PresScan
MD or CMD water content profile of the working felt.

FeltPerm
MD or CMD porosity profile of the working felt.

Lab analysis:
nature and concentration of contaminent content in the felt.
Residual physical parameter of the felt: strength, thickness, CFM...

Record: as well as instantaneous measurements, plugging data is essential to understand clothing dynamical behaviouring.
Permanent cleaning locations

→ Application points

lığ Suction boxes
Cleaning

Out of PM: to know the contaminants and their concentration.

To set up a treatment (chemicals + process + equipment):
- to know the contaminants and the corresponding treatment,
- to know the hydraulic flows in the felt.

To know what measurements are possible on PM:

To know the pulp (fibres, T°, basic chemicals used...)

To know the felt conditioning:
- showers
- suction boxes

To know the paper sheet runability details

To know the pressing conditions:
- press details
- felts designs
- working parameters
- nip dewatering/ divised dewatering

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• Sulfuric acid to be avoided to eliminate calcium carbonate as Ca\textsubscript{2}CO\textsubscript{3} + H\textsubscript{2}SO\textsubscript{4} promptly precipitate in calcium sulfate and plugg the felt !!!

• 1\% of organic plugging leads to the same level of problems than a 3\% mineral plugging, as on top of direct plugging it contributes to build up with other contaminants.

• ASA : take care to all paper grades using this product as it changes a lot the global paper chemical environment.

• DS for PM 100\% PPO : PROLONGYN LA makes the stickies "non gluing" and avoid the stickies transfer from paper to DS.

• PROLONGYN DS10 can reduce dyer cylinders deposits – take care to the installation for both thermical and mechanical environment.

• Automatical installations for chemical products application: to check automatical flow adjustment in order to preserve a correct concentration whatever are the volumes.

• To preserve WF soupleness during PM stops, tensio active PROLONGYN NS can be used, or, cheaper, IMBELAN NS and IMBELAN L4038.