**ULTRA HIGH DISPERSING**

Cleaner stock at the highest level of performance

Due to the contaminants in recycled fiber, dispersion is a key process step. The previous state-of-the-art dispersion operated with an inlet feed consistency of 25–30%. To improve energy efficiency, chemical costs, and removal efficiencies, ANDRITZ engineers have been innovating on an Ultra High Dispersing process and soon will be installing the first units.

When dispersion was first introduced for wastepaper recycling, the goal was to reduce the size of contaminants so that they were no longer visible. Today’s requirements for dispersion are much higher: reduce contaminant size, improve the physical properties of fiber, detach inks so they can be more easily removed in downstream processes, and condition mixing in bleaching chemicals.

Different dispersers are available – from low-speed “kneaders” to high-speed machines with plates similar to a refiner. These machines operate at inlet consistencies up to 30%, with the dewatering accomplished by twin-wire presses or screw presses (most common) installed upstream of the disperser.

**THE ULTRA HIGH DISPERSING SYSTEM**

The system patented by ANDRITZ for Ultra High Dispersing is straightforward and easy to implement. It is effective for compact dispersers (white grades) and pressurized units (brown grades).

**DISPERSION PROCESS**

<table>
<thead>
<tr>
<th>CONSISTENCY (%)</th>
<th>28%</th>
<th>38%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total mass/kg pulp</td>
<td>3.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Specific heat capacity [kJ/kg K]</td>
<td>3.36</td>
<td>3.07</td>
</tr>
<tr>
<td>Specific heat [kJ/kg]</td>
<td>540</td>
<td>364</td>
</tr>
</tbody>
</table>

Table 1. Dispersion process – heating from 45 to 90 °C

- **ADVANTAGES IN BLEACHING**
  - In addition to energy savings cited above, Ultra High Dispersing lowers bleaching chemical costs. This can be seen in Figure 1. A 10% increase in stock inlet consistency increases the H2O2 concentration in bleaching by about 30%. Now, the papermaker has options: a faster bleaching reaction and savings in chemicals to achieve a certain brightness target, or increasing the brightness target for the same chemical cost. If the decision is to keep the brightness target the same, the cost savings in chemicals approaches 140,000 EUR per year (against a line with a capacity of 300 t/d processing MOW).

**STOCK QUALITY**

The increase in inlet consistency increases the apparent viscosity of the stock so that higher shear forces are generated inside the disperser gap, which increases the dirt/stickies removal efficiency. Figures 2 and 3 show the improvements possible in dirt removal and stickies removal respectively.

**SUMMARY**

For many years, there have been only minor improvements to the dispersing process. The advent of Ultra High Dispersing sets a new milestone to save papermakers energy, chemicals, and other operating costs while improving the quality of their stock.

**CONTACT**

Andreas Gorton-Hülgerth
andreas.gorton-huelgerth@andritz.com

**SOURCES**

Figure 1. Peroxide concentration (at 1.5% H2O2 dosage)

Figure 2. Dirt removal

Figure 3. Removal of stickies