

Fine screening of pulp and paper effluent

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When it comes to water usage, the Atlantic Packaging paper mill is no exception when compared to other paper mills, especially those recycling paper or cardboard. Their water flow is heavily loaded with all kinds of solids such as paper fibre, shredded plastic bags, wood chips, backing strips, staples, broken CDs, etc.

During the various phases of recycling and production, these materials find their way to the wastewater collection system. Prior to wastewater treatment, these debris must be removed.



*Discharge side of the screens, including
dewatering compactor.*

If these materials are not removed they could wreak havoc on the pumping station, the clarifier, the aeration tank and then on the sand filter.

The solution came when H2Flow Equipment Inc. proposed an FS style continuously self-cleaning fine screen, previously utilized by many other pulp and paper customers.

The screen needed to handle up to 22,680 m³/day (6 USMGD) of hydraulic flow. A two foot wide screen with 6mm opening size and four foot discharge height was designed and ordered.

The main features of the FS screen that Atlantic really liked were:

- An all stainless steel construction.
- A continuously rotating screen to carry the screenings up to discharge and to continuously offer a clean grid to the water flow. The grid's speed can be adjusted manually or automatically.
- No sprockets or other maintenance items under the water.
- All intervention points are at the head section easily reached by the operator.

- Ease of removal out of the channel.

The two foot wide FS screen was put in an existing channel.

The new screen performed exactly to its expectations. It was pulling out larger quantities of screenings, relieving the pumping station, the clarifier, the aeration tank and the sand filter of undesirable solids. To deal with the unloaded wet screened material, H2Flow also supplied Atlantic with a screw compactor to greatly dewater the screenings; the squeezed water is directed back to the channel. The screenings dryness is in the range of 60-70% dry solids.

Even though the FS screen performed very well, the instantaneous peak flows, combined with extremely high concentration of solids, proved to be too much for the screen's capacity. The solution was simple, increase the speed of the rotating grid to keep up with the flow. After replacing the motor and the gear reducer to allow for a higher speed, the screen was able to handle the flow in all conditions.

Having proven that 6mm was the right screen opening and having shown that the FS type screen performed very well for this type of waste, a second but wider FS screen, again with 6mm openings, was ordered to replace an old 13mm rake type screen that was finally de-commissioned.

The second FS screen is in operation now and is doing a great job, running at a slower speed than the first FS screen which is now kept as a stand-by. Both screens are fitted with variable frequency drives that allow for grid speed changes. Those speed changes are now performed manually but a combination of level sensors could automate the system by linking the grid's speed with the water levels in the channel ahead and after the screen.

The choice of the FS type screens brought savings to Atlantic by cutting down on operation, maintenance, down time and by allowing for the reuse of the effluent water.
