

THE OPPORTUNITY

Wausau Paper, located in Rhinelander, uses 50 percent hardwood and 50 percent softwood in its process-furnish mix. The mix consists of all virgin fiber (non-recycled) purchased in the form of dried pulp bales. The mill wanted to cut repulping costs without compromising production. The company considered installing a new energy-efficient Voith HM repulper rotor, but had questions about the energy-savings claims and the potential risk to product quality.

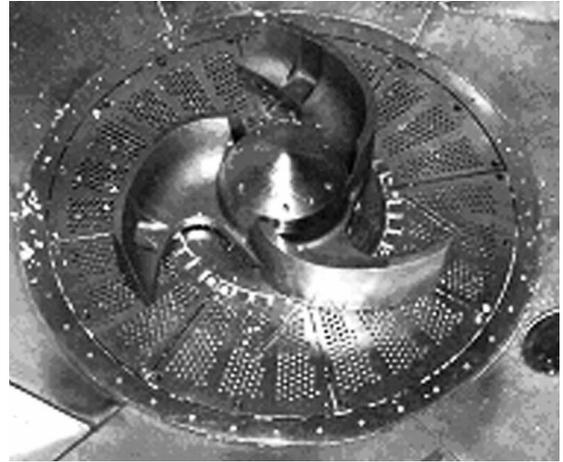
THE SOLUTION

Focus on Energy, Wisconsin's energy-efficiency and renewable energy program, provided technical support and financial assistance to help Wausau paper verify the energy savings of the new energy-efficient repulper rotor. Wausau Paper installed and tested the new rotor. The project was metered with the assistance of Wisconsin Public Service Corporation, the utility serving Rhinelander, to verify energy savings.

The new 500 hp HM rotor reduced the demand and energy by an estimated 23 percent when compared with a new conventional HOG rotor under similar process situations (see **Figure 1**).

Typically, repulpers run continuously, 24 hours per day, with little or no downtime. The repulper at Wausau Paper runs an estimated 60 percent of the time. Based on the metered data of this study, a typical mill can expect similar savings that will likely result in a one- to two-year payback. See **Figure 3** for this analysis. Savings values are extrapolated by assuming continuous batch operation at 24 hours per day.

Voith and Wausau Paper also closely examined defibering time, freeness, and final product attributes. The same size batch was used for both pre and post testing and the defibering time was the same for each test. The new



Courtesy of Voith Paper

Figure 1. Energy-saving repulper rotor blade

energy-efficient rotor defibered the pulp furnish to the same degree as the conventional rotor, with no effect on fiber quality.

REPULPING

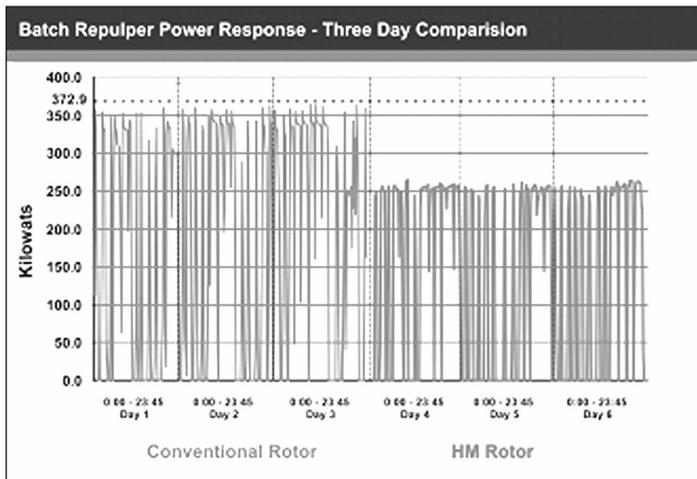
A repulper is a giant blender—a big tank with a mixer on the bottom. As dried pulp bales are added to water in the tank, the mixer, or rotor, agitates the material. Using a process similar to a washing machine, the rotor blades draw the dried pulp below the water's surface to defiber the pulp mix.

Non-integrated mills must purchase their raw paper-making fibers, which are delivered in the form of dried pulp bales. The mills re-pulp the bales to prepare the pulp fibers for the paper-making process.

ENERGY EFFICIENT REPULPER ROTOR

Because rotors are rebuilt or replaced periodically, facility managers have the opportunity to investigate new repulper rotors for their facility. Manufacturers of paper process equipment have recently designed new energy-efficient repulper rotors to help mills offset rising energy costs (see **Figure 2**).

For more information,
call **800.762.7077** or
visit focusonenergy.com.



Courtesy: Voith Paper and Wisconsin Public Service Corporation

Figure 2. Pulper power draw at Wausau Paper

WHERE TO USE THE REPULPER ROTORS

The new energy-efficient repulper rotors can be used for both virgin pulp and recycled pulp in the secondary processing area and on the paper machine.

Metered Data		
	Conventional Rotor	HM Rotor
Average kW*	187	146
Peak kW	368	265
Estimate for Continuous Operation (extrapolated from metered data)		
Average Consumption (kW)	336	259
Motor Operation (hrs/day)	20.8	20.8
Daily Consumption (kWh)	6,989	5,387
kWh / year (350 days)	2,446,150	1,885,450
Energy Savings (kWh/Year)	-	560,700
Annual Cost Savings	-	\$28,035
Payback Range (years)	-	1 - 2

* Includes off-times - see Figure 1 graph.

Figure 3. Expected energy savings for typical mill

WHAT IS THE ECONOMIC RETURN?

Energy-efficient repulper rotors can cut repulping energy by 20 to 30 percent for an estimated annual savings of \$30,000 for a 500 hp repulper.

The payback for an energy-efficient repulper rotor that runs constantly is estimated to be between one and two years. The payback is even attractive for a rotor that runs 50 percent of the time. Since the technology is not considered capital intensive—a new energy-efficient rotor can be installed in an existing repulper—the simple payback is often less than one year.

Focus on Energy can assist you in advance by performing an economic analysis to consider the effects of actual site conditions, hours of operation, and process controls.

Focus on Energy provides specialized Best Practice support for Wisconsin pulp and paper mills, including project evaluation assistance and financial incentives.

To improve process efficiency at your mill, contact Focus on Energy at **800.762.7077**.