

# a closer look...

## Another Power Smart Success Story — Partners Demonstrate New High-capacity, Low-energy Pulp Screen Rotor Technology



“Installing the new AFT Gladiator HC™ rotor has substantially reduced our electricity consumption while increasing our screen throughput and maintaining overall pulp quality.”

*Ed Dylke, Manager of Technical Development, Canadian Forest Products.*

### The Situation

Pulp and paper manufacturing is an energy-intensive industry. Therefore, any improvement in energy efficiency at one of British Columbia’s 20 pulp and paper mills can not only offer significant energy savings to individual facilities, but can also reduce the province’s overall industrial energy consumption.

One high-energy process in pulp and paper mills is the use of pulp screens to remove contaminants from the pulp. A rotor inside the cylindrical screen spins the pulp at high velocity, forcing it through narrow apertures in the screen, which serves as a barrier to debris, contaminants and uncooked or undeveloped wood fibre bundles (shives). This makes shive-free pulp available for further processing. The screens are critical in ensuring the quality of the pulp, which in turn affects the quality of the resulting paper products.

There are an estimated 300 pulp screens in the province. For some time, mill managers and energy experts have been looking at the potential for energy savings by reducing rotor speed. However, this must be done in a way that does not compromise the screens’ performance in removing contaminants. Searching for a more energy-efficient screening method was the focus of a recent demonstration project at Canfor’s Northwood Kraft Pulp Mill in Prince George.

### The Solution

Advanced Fiber Technologies (AFT) of Montreal, Quebec, is the world’s leading producer of customized screening solutions for the pulp and paper industry, and has been in operation for more than 100 years. In collaboration with researchers at UBC, AFT developed a new high-capacity, low-energy pulp screen rotor technology called the Gladiator HC™ rotor. To demonstrate the performance of the new technology in the field, Canfor, AFT, UBC, BC Hydro and Natural Resources Canada partnered to test and demonstrate the new screen operation at the Canfor mill. Started in the fall of 2005, this very successful project was completed in early 2006.

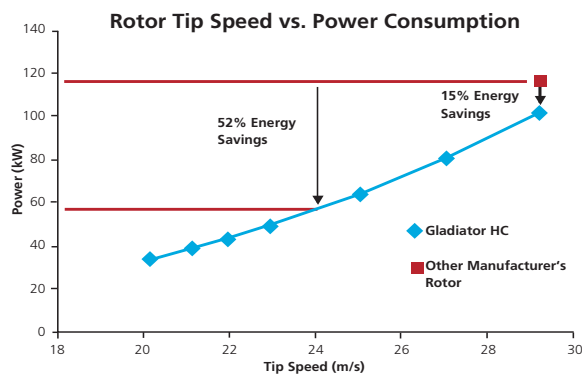


*Two new AFT rotor designs: The EP™ rotor (left) and the Gladiator HC™ rotor (right)*

The aerodynamic design of the Gladiator HC™ rotor has less drag than most rotor designs, and therefore has lower power requirements than conventional rotors, even when run at the same speed. The high

negative pressure pulse allows the Gladiator HC™ rotor to operate at lower speeds, while still effectively clearing the screen apertures and maintaining capacity. The combination of these two elements – the aerodynamic shape and the ability to slow the rotational speed – results in substantial electricity savings.

During the trial, the speed of the Gladiator HC™ rotor was varied from 29 metres/second (the speed of the existing rotor) to the lowest possible speed before the screen started to plug, while keeping the screen feed flow rate constant.



### The Benefits

#### Energy savings and productivity

The trial found that the Gladiator HC™ rotor showed results well beyond expectations, reducing electricity consumption by 52 per cent – achieving 60.8 kilowatts of electricity savings – while producing the same or higher tonnage with similar shive removal efficiency. Over the course of a year, the mill could save 3.58 gigawatt hours (GWh) – or about \$193,000 – if all its screen rotors were replaced. If all 300 pulp screens used in B.C. mills

were converted to these rotors, estimates are that 153 GWh of electricity could be saved province-wide each year. This represents over \$8 million dollars of electricity cost savings.

#### Competitive cost

The cost of the Gladiator HC™ rotor is similar to that of other rotors currently in use.

#### Maintenance and life cycle cost savings

Maintenance costs on the screen assembly should be reduced because the Gladiator™ rotor allows the screen to run at a slower speed. This should reduce rotor and screen wear due to abrasion and extend the life of the rotor and cylinder, as well as the bearings, seals and drive belts. In some applications in other countries, the Gladiator HC™ rotor has lengthened the life of the rotor and cylinder by 20 per cent. Also, the larger gap between the rotor and cylinder should help prevent failure of the cylinder when large rocks or metals enter the screen.

### A Growing Province. A Growing Challenge.

In the next twenty years, British Columbia will require between 25 and 40 per cent more electricity than we use today. While it's not the whole answer, conservation is the first and best choice for starting to meet that need. There are dozens of ways we can all be more Power Smart.

### Contact Us

Find out how Power Smart can energize your bottom line. Call us today at **604 453-6400** in the Lower Mainland or **1 866 453-6400** elsewhere in B.C.