



Modular mill for pellet production

A B.C. company, SBC Firemaster International, has started marketing a new modular wood pellet mill that can be delivered--and producing pellets--within a six month time frame.

By Paul MacDonald

The future of the forest industry is in wood pellets--at least part of its future, anyway.

A British Columbia company, SBC Firemaster International, is looking to be a part of that future, and is marketing a new modular pellet mill that it can have on site and operating in six months for customers. The company recently set up its own modular pellet operation with this equipment in the B.C. Interior, at Kamloops.

Though the company's PelletMaster Mod-Mill may be new, SBC Firemaster actually has plenty of experience in the pellet business.

The company originally started out as a supplier of packaged firewood bundles in the 1980s, and continues with that business today. It produces and distributes a large volume of packaged firewood products to numerous, major retail outlets, in western Canada and the United States.

It was one of these large retail outlets that first approached SBC Firemaster about producing wood pellets. Acting on that request and market demand, SBC Firemaster initially contracted to have wood pellets produced under their own name, but eventually built their own their own large scale plant in 1993, in Princeton, B.C. The pellet plant was set up next to the Weyerhaeuser sawmill, which supplied the plant with wood fibre for pellets. The Princeton operation and another pellet operation in B.C. were later sold to another company.

"Back then, we were able to lock in the fibre on a long term contract," says Paul Adams, SBC Firemaster's general manager. "But these days, with the changing nature of the forest industry, that is almost impossible."

No stranger to maximizing all fibre resources from the forest industry, another part of SBC Firemaster's business is producing baled wood shavings for the horse bedding market at a Kamloops plant.

"We looked at doing pellet manufacturing to take the downfall from the baled shavings business," explains Adams. SBC Firemaster's Kamloops pellet mill followed shortly after.

The backstory to the development of the company's Mod-Mill business is that Brent Wiren, one of the company's partners, was on a trip to China in an effort to further develop markets, and noticed the growing interest in biomass energy there.

This led him into looking at the pellet making equipment in place in China, and making recommendations on how it could work better.



“Brent saw that there were a lot of strengths in what they were doing in China, and some weaknesses,” says Adams. “But one thing they did have a lot of was modular pellet plants. These plants have smaller footprints and provide pellets for production of local energy.”

Wiren thought the concept of small to medium size portable pellet plants utilizing whole logs--vs. the conventional North American model of large, fixed location pellet plants using residual wood from a sawmill--had potential, and brought it back for review.

From there, they hired engineers, got some expert consulting on North American pellet production, and started work on the design of the equipment. They also received \$750,000 in Innovative Clean Energy funding from the B.C. government for what the company says is the first modular pellet plant in North America--the Kamloops facility.

The entire pellet plant was shipped, by container, to the Kamloops site this past April. There was a two week assembly period, and they were producing pellets by the beginning of May. The Kamloops mill is currently producing 30,000 tonnes a year, and there are plans to ramp that up to 45,000 tonnes.

While the modular plant is manufactured in China, Adams emphasizes that all of the components meet SBC Firemaster’s stringent engineering and production specs.

“The reason we produce it in China is the price point--we’re able to put in a pellet plant for half the cost of a traditional plant of the same volume. The business model is based on drastically reducing the capital costs of going in and starting pellet production.”

On the electrical side, all of the equipment is purchased in Canada, and is CSA approved. In an interesting reflection of the global market, the motors they buy --from a Canadian supplier--are actually manufactured close to where SBC Firemaster’s mill manufacturing plant is in China.

Adams noted that the company’s Mod Mill plants are easily scalable--if SBC Firemaster or one of their customers wants to increase pellet production, they can add on additional components. “If you want to add production volume, you simply add a module--there are no huge additional infrastructure requirements to accommodate the extra volume.”

And the entire package can be easily moved. “As we all know, fibre streams are not always constant any more,” says Adams. “If a mill shuts down, and you have a permanent pellet making facility right next door, you have a problem. With our equipment, you can take the plant down in a week, load it on a truck, and move it to a new pocket of fibre.”

And if you have a larger plant set-up, say two modules, you could divide the modules and produce from two locations, instead of one location, based on fibre availability.

Because of their more portable nature, the company’s Mod-Mills can be located closer to fibre. It helps to keep log transportation costs low, one of the key elements of a successful pellet operation. “There is only a certain economical distance you can move the logs,” says Adams.



And its smaller production size helps, as well. “With a smaller scale plant you can bring in fibre from a 50 kilometre radius for a longer period of time than if you have a 200,000 tonne plant.”

In terms of the supply for its own pellet operation in Kamloops, it has a variety of sources of material. “We scavenge anything we can, that the other industry players don’t want,” he explains. “We have our fingers in lots of different fibre baskets.” For example, they use trim blocks and planer rejects from local sawmills, and end cuts from the log home market, in addition to using whole logs. Their Mod-mill facility utilizes a 125 h.p. Nicholson 1” chipper at the front end.

“With us using the downfall from the shavings operation, we have a complete circle on fibre utilization--basically we have no waste stream leaving our operation.”

The Kamloops plant that SBC Firemaster owns and operates is a production plant, not a pilot plant, Adams emphasizes. “We took our engineering and piloted a plant in China. What we have in Kamloops is pretty much a duplication of that pilot plant because it went very well.”

One change they made involved strengthening the internal cyclones, going from hardened steel to stainless steel.

They also looked at the specs on the pellet production dies, and the difference in throughput between 7 mm size pellets and 8mm pellets.

“We tested their burning and we found that 8 mm pellets burn better than a 7 mm pellet and we also achieved better production output compared to the 7 mm.” He added that they will size the dies of the Mod Mill to fit client needs, but they found that the 8 mm size generally works better overall.

A Mod-Mill base unit’s potential production capacity is 40,000 tonnes a year, and the company guarantees production capacity of at least 30,000 tonnes per year, subject to species specifications and other variables.

With the company itself operating one of its own Mod-Mills, Adams notes that SBC Firemaster has a very strong interest in having the equipment working well. This will also help in doing any trouble shooting, going forward. “If a client has a problem, we can duplicate the situation with our own Mod-Mill at our site here in Kamloops.”

In addition to being a viable pellet production business, the Kamloops facility will also serve as training centre for customers who purchase pellet making modules. The training is included with the purchase of a Mod-Mill.

Adams likens the Mod-Mill plants to large Lego sets, with parts that can be added or subtracted, depending on customer needs. But a mill includes all the essential core equipment--such as intake hoppers, motors, hammermills ranging in size from 150 to 200 hp and triple pass drying systems. Not included are the infrastructure required, such as a concrete pad and on-site power.

And the Mod-Mills are close to plug and play. “There are things that need to be done in terms of infrastructure prior to the plant’s arrival but the current production rate offers a 150 day window from receiving the down payment to production,”



says Adams. This compares with the 18 months to two years it might take to set up a traditional pellet plant, he says.

Having developed the concept--and now seeing it at work with their own Mod-Mill plant--Adams and the group at SBC Firemaster are excited about marketing the pellet manufacturing equipment.

But they are just as excited about the growing markets for wood pellets. Adams notes that about 90 per cent of the wood pellets produced in B.C. currently go to Europe. He'd like to see growth in more local markets. For example, 100 per cent of the production from the Kamloops plant goes into the premium bagged pellet market for regional sales.

With the Mod-Mill, there is also the potential to provide fuel for smaller and medium sized power plants. Just like there is the much-publicized 100 Mile food diet, there could be a 100 Mile diet for fuel for power plants.

"We've had a lot of interest from First Nations groups in isolated communities across B.C. where they are now getting their power through diesel or from propane that has to be trucked in.

"You could put in a modular power plant and have a community-based heating system, with a pellet boiler. It could create jobs and reduce costs for the community."

And there are markets elsewhere in Canada. Ontario has already said that it is going to phase out all coal powered plants by 2014--and that could require one heck of a lot of wood pellets for fuel.

But the potential for further international sales of Canadian pellets is huge, with the growing recognition of climate change and greenhouse gas.

"The views are changing on carbon, and the pressure being put on Asian countries to change practices is increasing." As that continues, there is going to be a dramatic increase in demand for fuel in China, Korea and Japan. "And right now, they simply don't have the biomass available to meet that demand."

The United Nations recently predicted that world-wide pellet demand is expected to double over the next two four years.

There are currently incentives in Europe to better manage carbon outputs--that include the use of wood pellets--and Adams sees that developing in North America.

"B.C. is starting down that path, and the Obama Administration is geared to the same type of objectives." When major industries switch from fossil fuels, there could be a massive demand for wood pellets and other alternative fuels.