



Wood Pellet Manufacturing

The emerging pellet fuel industry proves tempting for lumber companies hoping to expand their markets. Many smaller companies are always looking to increase business and are entering into the wood pellet manufacturing business.

Pellet manufacturing systems are composed of pellet mills, dryers, coolers, conveyor systems and control panels. The average cost for completely installed start-up mill runs \$2.5-3 million, depending on the size and design of the pellet mill. Most existing mills already have storage facilities available, that can significantly reduce start-up costs by several hundred thousand dollars.

Pellet manufacturing is a fairly simple process, but does require considerable coordination. The process begins when materials such as sawdust and wood chips are delivered to a mill. Usually, the material is stored in piles, preferably protected from the elements, until it is transported via a front-end loader to an in-feed system. The in-feed system then separates chips from sawdust. Chips are then ground and recombined with the sawdust and transferred to a silo which is metered into a dryer. Air is fanned into the dryer to separate water vapor from material; the moist air is then exhausted. Fine and course sawdust are again separated, and the course sawdust travels through a hammer mill to compress the material. Fine sawdust is recombined with the compressed and then sent through a pellet mill, where pellets are actually formed in various sizes depending on the die size used. Pellets then cool and are conveyed to a storage facility, where they await packaging and transport.

The wood pellet manufacturing process involves receiving pulp wood that is initially debarked and converted into wood chips (chipper machine). The wood chips are dried (large rotating steel drum dryer that is heated by a bark-fired furnace system). The dried chips go into a hammer-mill for pulverization into powder form. High-pressure pellet mill lines then extrude the wood pellets. The wood pellets are cooled (high velocity air movement inside a steel bin) and are loaded onto rail cars.

Much of the production processes at pellet plants are located within fully enclosed manufacturing operations creating a very clean environment. Fire protection for these manufacturing operations typically include pre-action sprinkler systems, deluge sprinklers and spark detection systems. Plant fire systems can include an on-site, alarm monitoring control room as well as devices signaling to remote monitored fire alarm networks. This prospective insured had learned a valuable fire safety lesson from a similar plant that was operated overseas. The chip drying process includes an elaborate system for emissions control. A prior plant location had used a dry- precipitator design for the emissions control equipment. There had been several fire incidents with that design. Since that time, management has switched to a wet precipitator design (flushes water on the system electrodes) that is more costly but more fire safe.



Equipment Dynamics is an authorized dealer of Bliss Industries, Inc. Currently, the B-200A-141 pellet mill is in popular demand for companies joining the pellet fuel business. Total drive power peaks at 300 hp, and the motor shaft runs at 1200 rpm, enough power to produce four tons an hour. Even if pellet prices dropped back down to only \$80 per ton, a small mill could still make \$2.8 million in its first year if it operates every day. That means a pellet mill system could pay for itself in its first year of around the clock operation.

Sprout-Matador, a division of Andritz, Inc., offers the Model 26 LM Pellet Mill which produces anywhere between four and six tons per hour, depending on variables like die size. Its 400 hp variation is considered the most universal and economical, producing on average 3-5 tons per hour for a base price of \$350,000. That price, of course, does not include dryers, control systems, conveyors, or storage facilities.

A senior systems engineer with Sprout-Matador, advises potential buyers to consider maintenance costs, which may lead to roughly \$2.50 per ton just for the individual pellet mill.

“Die life on wood waste will vary from a good life of approximately 3,000 tons downward, depending upon the amount of abrasive material,” said Earl. He adds that replacement costs depend on variables like wheel size, and die thickness. The average 26” replacement die typically runs \$3,000.

This is the first winter season that Nature’s Earth Pellet has sold wood pellet fuel, and presently they maintain production of 100 tons a week. As a result, gross profits have increased by nearly \$75,000 a month. Phil says he intends to expand next year based on the initial success by adding another line in the warehouse.

The industry will enjoy at least another few years of expansions, “[the industry] expects to be adding over 300,000 tons of available pellet fuel for retailers by next winter, and new plants are opening constantly.” Consumer popularity has the pellet fuel market booming, and taking advantage of the fledgling market could be a wise decision for some lumber and pallet companies.