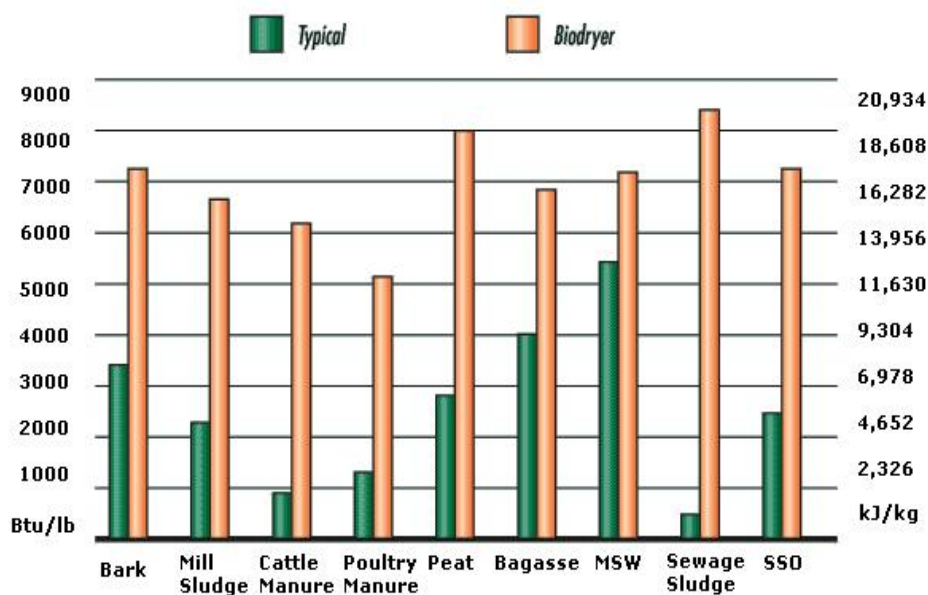


Biological Dryers Improve Performance/Economics of Biomass Projects

Greater use of biomass for power generation is often constrained by the high moisture content of these fuels. As water content increases, heating value drops, hampering the economics of the biomass utilization. Dryers can be used, but most traditional dryer designs require a large amount of energy to dry the biomass and are expensive to maintain and operate. As a result, much of the organic waste from industrial processes, agriculture, municipal solid waste and sewage sludge (i.e. biosolids), and farming typically end up as landfill or soil amendment.

“Drying the biomass or organic waste to 15 to 20 percent moisture content or less would improve the performance and economics of energy-based applications,” says Russ Blades, vice president of Wright Tech Systems Inc (www.wrighttech.ca). “Drier biomass has a greater heating value and burns hotter, more vigorously and more efficiently.”



Wright Tech Systems has developed a biological dryer, called Biodryer, which uses the exothermic heat (7450 Btu/lb dry organic matter) produced from the aerobic decomposition process instead of fossil fuels to cost-effectively dry biomass. In other words, instead of using natural gas or other fossil fuels to dry and improve the renewable energy potential of wet organic waste or biomass, the Biodryer takes advantage of Mother Nature to effectively dry the material.

The Biodryer consists of an insulated double-walled tunnel (stainless steel interior) with a complete heat recovery system that fully utilizes the heat produced during aerobic decomposition (heating zone). This heat instead of being exhausted to the biofilter - is now piped to the drying section (drying zone) of the Biodryer to accelerate the creation of a dried biomass product. The dried fuel can then be used in direct combustion, as a cofiring fuel, such as with coal, in gasification processes and for cement kilns.

Unlike typical thermal dryers, such as rotary devices, the Biodryer is a non-combustion process, which simplifies air permitting and siting requirements. In addition, since the Biodryer operates under a slight negative pressure and exhausts to a biofilter, process odors such as volatile organic compounds and ammonia are eliminated.

The Biodryer has demonstrated significant moisture reduction capabilities across a wide range of biomass feedstocks (figure). The organic fraction of MSW, for example, can be improved through biological drying from a heating value of about 2,550 Btu/lb to more than 7,225 Btu/lb. Pulp sludge can increase from less than 2,400 Btu/lb to more than 6,000 Btu/lb. And biosolids (sewage sludge), a major disposal problem for municipalities, can be converted from a wet waste stream to a dry biomass fuel with a heating value of around 8,000 Btu/lb.

With this accelerated drying process, the moisture, airflow, temperature, oxygen and carbon-to-nitrogen ratios are maintained within ideal ranges for maximum microbial and drying activity and minimal loss of CO₂, a greenhouse gas.

The Biodryer technology has been selected as one of two finalists by the Solid Waste Authority of Central Ohio to develop a system that could process 9,000 tons per day of sewage sludge from the City of Columbus. Wright Tech systems Inc, which has teamed with the Shaw Group on this project, also proposes production of a pelletized biofuel that could be cofired with coal in a conventional power plant. Wright has received letters of interest from both AEP and AMP-Ohio to investigate the use of such a fuel in their Columbus-area coal power plants. Wright is presently commissioning a facility in Dublin, Ireland (Panda) that will convert the wet organic fraction of municipal solid waste to dry biomass fuel.

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