



Bio-Fuel Technology

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Grinding & Drying Technology

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KDS
Micronex™

Clean Burning Bio-Fuel Powder From Wood and Energy Crops



Innovative Bio-Fuel Technology

The innovative and patented KDS biomass fuel preparation system facilitates the immediate replacement of solid fossil fuels in existing industrial and utility boilers with biomass fuel. Existing solid fuel boilers can utilize the KDS-processed fuel with few, if any, boiler changes.

The patented **KDS Micronex™** extreme velocity impact mill simultaneously grinds and dries a wide range of biomass (wood, biomass energy crops and agricultural waste) into a fine, dry, powdered fuel with excellent combustion characteristics in a single process. The fine biomass powder produced by the KDS process burns in suspension in a high intensity flame and fuel flow is easily controlled to accommodate changing boiler loads. Operator controls on the **KDS Micronex™** allow real time adjustments in particle size, moisture content and rate of production of the final product.



Advantages of Powder Burning to Create Power

Fine, dry biomass powders burn with the characteristics of a liquid fuel. The **KDS Micronex™** converts an extremely wide variety of heterogeneous biomass raw materials (wood, bark, nut shells, etc.) into bio-fuel powders with uniform combustion characteristics.

Profitable

Conversion of existing fossil fueled boilers and furnaces to biomass combustion utilizing the KDS technology can be accomplished at a fraction of the cost of the construction of a new biomass boiler. In addition, the combustion of dry biomass powders delivers a dramatic increase in the efficiency of the combustion of biomass fuels in comparison to traditional wet biomass combustion systems. Less and higher-Btu fuel is fed to the boiler and boiler efficiency increases because no fuel energy is wasted to vaporize the water in the fuel.

Simple

The **KDS Micronex™** has few moving parts and low maintenance requirements.

Convenient

The **KDS Micronex™** is easy to install and integrate with other existing fuel handling systems.

Flexible

The **KDS Micronex™** allows flexibility of biomass fuel choice. A wide variety of biomass feedstocks can be efficiently processed by the **KDS Micronex™** and, due to the fine, uniform nature of the fuel product produced, it is possible to co-combust the KDS-processed fuel with coal or liquid fuels utilizing multi-fuel burners.



Overview of the KDS Micronex™



The KDS Micronex™ grinder-dryer employs intense kinetic energy to simultaneously pulverize and dewater a wide variety of virgin and recovered materials into fine dry powders. The innovative vertical shaft impact mill design incorporates high rotational speed and high velocity airflows to achieve superior grinding and drying results without requiring supplemental heat. Addition of supplemental or waste heat may be used to increase machine throughput. The energy used for drying can be as low as one-third the energy used by a drum dryer and no secondary grinding process is required. An internal

classifier in the unit controls the output particle size to between 100–2,000 microns. The production rate ranges between 1–4 tonnes per hour depending on the raw material characteristics and moisture removal required. While many conventional grinding or milling systems require dried feed material, the KDS Micronex™ can process materials containing up to 70% moisture and can reduce them to less than 10% moisture. For some applications, supplemental drying with a flash dryer or heated pneumatic conveyor can enhance drying efficiency.



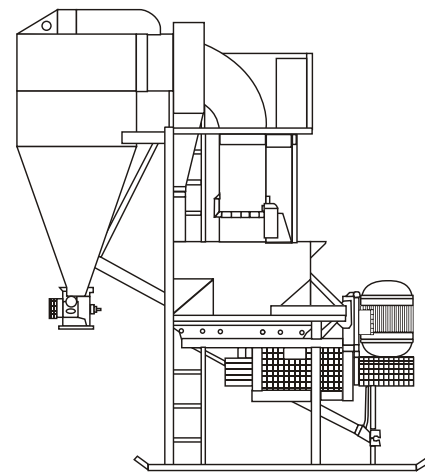
Complete Installation and Operational Support

CTI Micro-Reduction Technologies is committed to providing full installation and operational services to ensure that all of our customer's renewable energy production goals are achieved or exceeded.

Contact us for a confidential evaluation of your green energy potential and for a free sample of biomass powder fuel.

Machine Specifications

KDS S-8



Feed Rate:
1–4 tonnes per hour

Feed Size:
Up to 15 cm (6") in length

Output Size:
100 to 2,000 microns (biomass)

Machine Size:
25' H x 15' D x 12' W

Machine Weight:
20,000 lbs.

Motors:
HP 250–500, 50–100, 10, 2, 2, 2
Electric or other power

Power Consumption:
175–500 kW

Operation:
System can be fully automated or run with one to two staff



KDS
Micronex™

Energy Efficient Grinding & Drying Adding Value to Biomass Resources



Innovative Grinding & Drying Technology

The **KDS Micronex™** system efficiently and economically converts virtually any organic material into homogenous, fine, dry powders ideal for use in renewable energy production, biomass pellets, bio-based products manufacture, fertilizer, and animal feed.

The patented **KDS Micronex™** extreme velocity impact mill simultaneously grinds and dries a wide range of biomass (wood, biomass energy crops, paper mill residuals, animal manures and agricultural waste) into fine, dry powders with excellent handling, absorption and combustion characteristics in a single step process. Operator controls on the **KDS Micronex™** allow real-time adjustments in particle size, moisture content and rate of production of the final product, providing for the ability to customize production to meet the end users' specifications.

Advantages of Grinding & Drying Biomass

Grinding and drying biomass adds value to the material. Fine, dry biomass powders have numerous valuable reuse applications that are not viable for coarse heterogeneous materials with high moisture content. Biomass powders are stable, easily stored and handled and they can be cost effectively transported to end user markets. As a fuel, dry biomass powders have an increased BTU value and burn with the characteristics of a liquid fuel, making them an attractive renewable energy option for biological or chemical conversion or co-firing at existing fossil fuel boilers.

Profitable

Reduction of the moisture content and the improvement of the uniformity of biomass increases the value of biomass. Biomass powders can be efficiently transported and incorporated into existing industrial, energy and agricultural operations. Farmers can use the material as animal bedding. Cement kilns can use the material as a process feedstock. Fossil fueled boilers and furnaces can be converted to biomass combustion systems at a fraction of the cost of the construction of a new biomass boiler. In addition, the combustion of dry biomass powders delivers a dramatic increase in the efficiency of the combustion of biomass fuels in comparison to traditional wet biomass combustion systems. Less and higher-Btu fuel is fed to the boiler and boiler efficiency increases because no fuel energy is wasted to vaporize the water in the fuel.

Simple

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Convenient

The **KDS Micronex™** is easy to install and integrate with other existing biomass handling systems.

Flexible

The **KDS Micronex™** is flexible. A wide variety of biomass feed stocks can be efficiently processed by the **KDS Micronex™** and, due to the fine, uniform nature of the final product produced, it is possible to co-combust the KDS-processed fuel with coal or liquid fuels utilizing multi-fuel burners.



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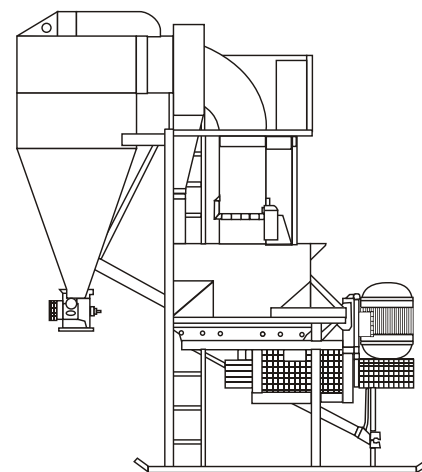


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