

CHIPTEC_o

WOOD ENERGY SYSTEMS

Bio-Fuel Specifications

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| Moisture Content: | 6% to 60% Moisture Content, (wet Basis.) |
| Mineral Content: | Less than 10%, (with exceptions.) |
| Particle size; | 2 1/2" or smaller. (with exceptions.) |
| Fines: | Less than 5% sander dust and wood flour. |
| Fuel Value: | Minimum of around 2,500 BTU/Lb. +/- |

All carbon based biomass fuels can be gasified. The following characteristics determine equipment selection, and performance.

Species: Clean wood species does not vary the fuel value of fuel material significantly.

Moisture Content: Moisture greatly varies the fuel value of the material. We will agree on a contractual fuel specification. All systems can be adjusted up to the ultimate capacity of the systems, depending on the fuel moisture.

Mineral Content: Minerals are any inert, non organic material in the fuel. Adding minerals to any given fuel will reduce its fuel value. The mineral fusion temperature is also important to system performance. Chiptec's relatively cool gasifier box, allows usage of many "marginal" materials with excessive minerals, or low fusion temperatures.

Contaminants: Contaminants have a variety of consequences to the equipment and performance depending on the mix. Many chemicals cause accelerated degradation in refractory, grate issues, or air quality issues. Contaminated fuels need to be evaluated on a case by case basis.

Chiptec has either used or analyzed and accepted the following materials:

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| Whole tree chips, (screened) | Wood pellets. |
| Green hardwood or softwood mill residue. (Mill chips.) | Mesquite and juniper. |
| Dry hardwood or softwood chips. (Planer shavings, etc.) | Corn cobs and stover. |
| Crushed, magnetized, clean pallets. | Cotton plants. |
| Cleaned and sorted construction and demolition waste. | Certain Seeds. |
| Rail road ties and telephone poles. | Nut shells and husks. |
| Paper and cardboard cubes and extrusions. | Coconut shells. |
| Certain vegetable vines and wastes. | African palm waste. |
| Particle board, M.D.F., plywood. | Olive and fruit pit. |
| Chicken litter mix. | Certain sludge. |



48 Helen Avenue
So. Burlington,
Vermont, 05403
802-658-0956
Fax: 802-660-8904
www.chiptec.com