



Developing Sustainable Alternatives to Fossil Energy

MicroFueler™ Feedstocks

Epiphergy's MicroFueler™-based solutions support a variety of feedstocks for ethanol fuel production:

The MicroFueler was designed to use E-Fuel's dry, packaged feedstock "EFuel100-FM" (available through Epiphergy). However, the MicroFueler can also effectively utilize a wide range of ethanol feedstocks with appropriate equipment and process modifications. Wastewater from the ethanol production process can be discharged into sewer or septic systems. Residual solids "left-over" from the process can provide additional value as fertilizer, soil amendments, animal feed, etc.

Epiphergy can design and customize a MicroFueler™-based solution for your specific feedstock or waste stream.

Beverage wastes, food wastes, and cellulosic biomass feedstocks:

- **Beverage Wastes:** Discarded alcohol and sugar solutions from brewing, bottling, packaging, distribution, and retail facilities. Examples include: brewery waste, discarded alcoholic beverages, bottling/packaging wastes, off-spec/expired product, etc. Ideal liquid wastes contain at least 5% alcohol or 9% sugars.
- **Food Waste:** Wastes from food processing, packaging, distribution, and retail facilities. Examples include: restaurant food waste, production/packaging wastes, off-spec/expired product, culls, etc. Ideal food wastes contain primarily sugar and starch, including: bread, pasta, potatoes, corn, rice, wheat, etc.
- **Biomass:** Biomass includes almost any kind of plant material such as grass clippings, wood chips, weeds, leaves, energy crops, corn stalks, hay, etc. These materials are often available in significant quantities and at no cost. Generally, 2,000 dry pounds of biomass can yield approximately 75 gallons of ethanol fuel.
- **Grains:** Converting feed grains into ethanol fuel **and** a valuable co-product such as distillers grains with solubles creates a win-win scenario for farms. For example, one bushel (56 pounds, dry) of corn can yield 2.7 gallons of ethanol and 17 pounds (dry) of a high-protein feed supplement.

MicroFueler™-based System Examples:

- **Base Package:** Works with EFuel100-FM packaged feedstock. Also uses brewery waste, discarded alcohol from bars/restaurants, off-spec/expired sugar/alcohol beverages from beverage distributors, and discarded sugar (dry and liquid) from the sugar distribution industry.
- **Starch Package:** Works the same as the "Base Package", but has additional fermentation tank and can utilize enzyme-based processes. Can use all "Base" feedstocks plus solids and liquids that contain starches such as: crushed grains, wastes from vegetable processing facilities, restaurant/cafeteria food waste, etc.
- **Cellulose Package:** Works the same as the "starch package" except that there are two additional fermentation tanks, an included feedstock grinder, and a feedstock sterilizer. Can use any feedstock (sugar, starch, or cellulose).

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