ALL POWER LABS

personal scale power

GEK GASIFIER KIT

Complete System for Converting Biomass to Syngas

GEK Gasifer - Half Power Pallet

The GEK Gasifier makes it easy for beginners and experts alike to run high-performance solutions in small-scale gasification. Whether you are a DIY enthusiast, university researcher or OEM manufacturer, the GEK will get you over the starting hurdles of gasification, and onto the more rewarding work of making clean gas for power generation or experimental studies.

The GEK Gasifier kit is a complete gas-making system: from biomass fuel feed input through syngas/air mixer output to engine, all controlled by a full automation system (same as used on the Power Pallet). The GEK kit might also be thought of as the complete APL Power Pallet, minus the engine, genhead, and engine governor. We do the hard part of making a gasifier that actually works; you do the "easy" part of connecting it to an engine.

Unlike our historic kits, the new GEK kit comes largely assembled, skidded and commissioned. It arrives ready-to-run, with minimal assembly, not as boxes of raw parts for you to puzzle together.

PERFORMANCE

Maximum Gas Flow Rate:	60 m^3/hr ~20kWe or 380,000 BTU
Minimum Gas Flow Rate:	10 m^3/hr ~3kWe or 60,000 BTU
Gas Energy Density	6.5 MJ/m^3
Gas Composition	CO: 22%, H_2: 20%, CH_4: 3% CO_2: 10%, N_2: 45%
Biomass Consumption:	1.2 kg biomass = 3 m^3 gas = 1 kWhe
Run Time per Hopper Fill: approximate @ 200 kg/m^3 fuel density	5 kW: 15 m^3/hr = 11 hrs 10 kW: 31 m^3/hr = 5.5 hrs 20 kW: 62 m^3/hr = 2.8 hrs
Max. Continuous Operation:	~12 hours
Start Up Time:	5 -20 min.

MAJOR COMPONENTS INCLUDED

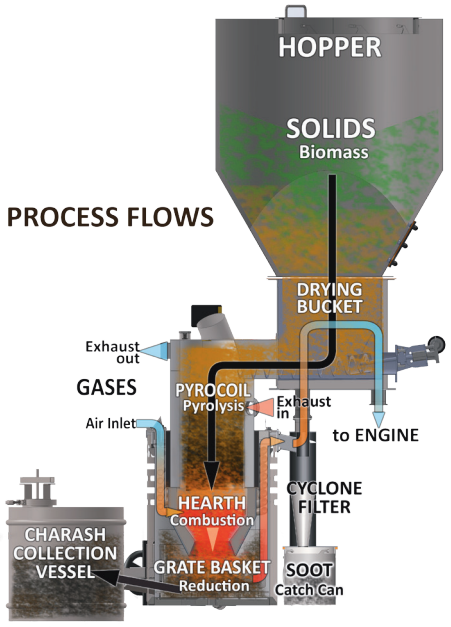
Gasifier	v5 GEK Gasifier with Thermal Recyling
Automation	Arduino Based Microcontroller
Feed System	Batch Hopper with Feedstock Auger
Filtration	Packed Bed
Gas Mixing	Active PID Contolled Wide Band O_2 Sensor
Mounting Skid	Powdercoated Steel
Flare Stack	Premixed, Auto-Igniting
User Kit	Tools Consumables

COMPONENTS NOT INCLUDED

Battery	12 VDC Marine Recommended
Genset Control	Mechanical or Electronic
Exhaust Plumbing	Routing to Gasifier

Note: specifications provided assume connecting engine exhaust gas to the pyroreactor to support pyrolysis.

GASIFICATION PROCESSES & FLOWS



GASIFIER SPECIFICATIONS

Type:	Multistage Downdraft with Thermal Recycling
Materials:	304 SS/310 SS/ 321 SS/mild steel
Ash Removal:	Automated 12 hour batch vessel
Fuel Feed:	Automated
Hopper Capacity:	0.33 m^3/88 gallons
Hopper Filling:	Batch - refill while operating
Maintenance Cycle:	~ 12 hours
Control System:	On-Board Automation

FEEDSTOCK BIOMASS

Size:	12-40 mm/0.5-1.5 in.
Moisture Content:	10-30% dry basis
Approved and Tested w/ normal operating procedures	Large Nut Shells Softwood Chips (e.g. Fir, Pine) Hardwood Chips (e.g. Oak, Ash)
Approved and Tested w/ increased operating effort	Corn Cobs Coconut Shells Palm Kernel Shells
Not Approved dangerous & voids warranty	Coal Tires Plastic Municipal Solid Waste

DIMENSIONS

Shipping	145 x 145 x 140 cm/57 x 57 x 54 in
Operating:	145 x 145 x 223 cm/57 x 57 x 88 in
Weight:	450 kg/990 lbs.

ALL Power Labs

ALL Power Labs is the global leader in small-scale gasification. We make biomass-fueled power generators that are ready for everyday work, to serve real-world distributed energy needs.

Our project started in 2008 with the open-source Gasifier Experimenter's Kit (GEK), supporting research, education and DIY hacking in biomass thermal conversion. Seven years later the GEK has evolved into the Power Pallet, a full solution for personal scale biomass power generation. Today you can find our systems in dozens of countries around the world, and supporting research in over 50 universities.

The APL team is an unusual combination of hands-on fabricators and university-trained scientists and engineers. The result is a powerful combination of technical ability and physical know how for building real things that have impact in the real world.

We invite you to join us for the ongoing collaborative process of refining GEK systems, and proving gasification to be a uniquely powerful solution for individual-scale energy independence.

Our facility is in Berkeley, CA. Please contact us to arrange a visit next time you are in the Bay Area. We'd love to show you around.

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