



CHP
Wood Gasifier

HEAT AND
POWER
from wood

CHP



At Wood Energy Solutions (WES) we are passionate about wood as a source of heating. As the most experienced and largest dedicated biomass boiler manufacturer in Britain & Ireland we take great pride in the craftsmanship of our boilers. WES manufactures an outstanding range of biomass boilers under the E-COMPACT Label.



The principle of wood gasification

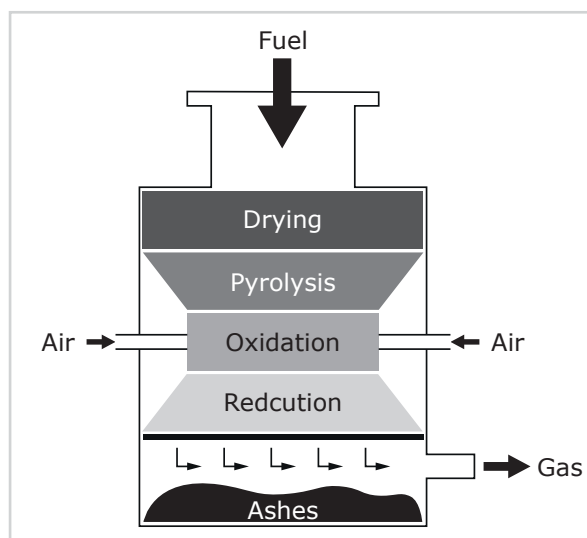
The gasification of wood and as a result the production of wood gas, is a thermo-chemical, multi-stage transformation process, similar to wood combustion. As opposed to combustion however, the gasification process is interrupted intentionally in order to get not only carbon dioxide and water but also combustible gas, which is then transformed into electricity and heat by a gas engine.

The gasifier is fuelled by natural untreated wood chip. Via twin-flap lock, the wood chip is transported by the stoker auger into the reformer. Inside the reformer, the wood is gasified in a downstream procedure consisting of the following stages:

- Drying (up to ~ 200 °C)
- Pyrolysis (~ 200 °C to 600 °C)
- Oxidation (up to ~ 1200 °C)
- Reduction (~ 900 °C)

During the pyrolysis stage, chemical products (such as tar, coke, CO, CO₂, H₂, CH₄) are created and partially burnt in the oxidation zone. In the reduction zone, the wood chip is finally transformed into low-tar wood gas, thanks to the highly developed reformer design and sophisticated controls.

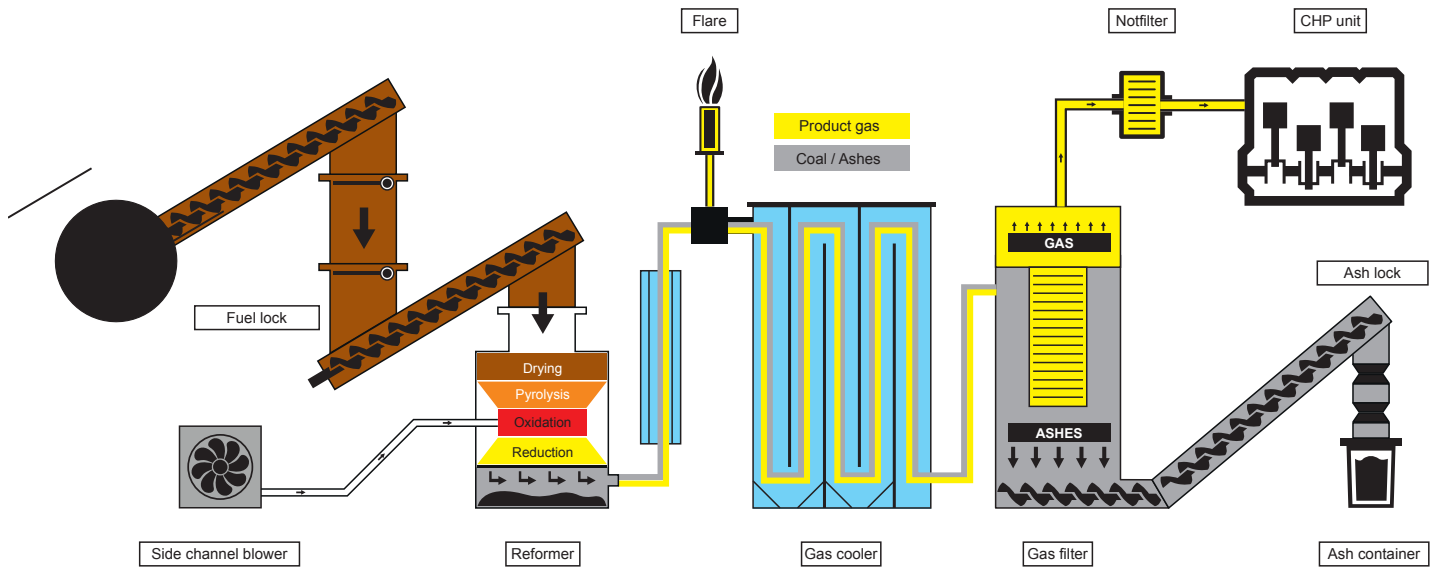
The wood gas is cooled down in a tubular water/gas heat exchanger to 110 °C and dry-cleaned in a fabric filter with mechanical cleaning. The residual coal and ash is transported by transfer augers from the gas filter, through an ash-lock and into the ash container. The cooled and cleaned wood gas is then injected into the gas control line of the engine. The heat from engine-cooling, flue gas and wood gas heat exchanger is recovered and transferred to the heating network. During the starting process, the lower quality gas is burnt-off automatically with a gas flare positioned right after the reformer.



Fixed bed gasifier CHP

Operating Principle:

The WES gasifier is an autotherm fixed bed downstream gasifier. The diagram below shows the operating principle of downstream gasification:



Scope of Supply:

a) Pre-commissioned container solution



b) Wood gasifier + engine pre-assembled for integration into existing buildings



Fixed bed gasifier CHP

Advantages

- Compact and maintenance-friendly design
- Fully automatic operation
- Dry gas cleaning – no condensate
- Modern and robust industry engine (high efficiency)
- Ignition of gas engine with wood gas:
No secondary fuel required
No engine start with generator
- European Quality Product
- WES is System supplier: heating boilers, wood gasifier, fuel feed & transfer systems
- High coverage with service & maintenance network
- Existing TÜV concept for authorities (emissions, machinery safety, noise, explosion safety, process technology,...)
- Container solution is pre-commissioned and ready-to-go



Back Pressure Steam Turbine Generator Specification

Model	Rated Power (kW)	Inlet Stream Parameter		Exhaust Pressure MPa(a)	Rated Speed (r/min)
		Pressure (MPa)	Temperature (°C)		
B1-3	1000-3000	0.9-4.9	260-435	0.1-1.6	3000
B3	3000	1.2-8.89	350-535	0.29-2.0	5600/3000
B4.5	4500	1.2-8.89	350-535	0.29-2.0	3000
B6	6000	1.2-8.89	350-535	0.29-2.0	3000
B7.5	7500	1.2-8.89	350-535	0.29-2.0	3000
B9	9000	1.2-8.89	350-535	0.29-2.0	3000

All illustrations intended as guide only! We reserve the right to make technical changes without prior notice. Errors and omissions expected.



Booths Hall, Chelford Road,
Knutsford, England WA16 8GS
Tel / Fax: 00 44 161 2617497
www.woodenergysolutions.co.uk

Unit D, Cahir Business Park, Cahir,
Co. Tipperary. Ireland • Tel: 00 353 52 7445330
info@woodenergysolutions.com
www.woodenergysolutions.com

MANUFACTURERS OF RENEWABLE HEATING PRODUCTS

www.woodenergysolutions.com