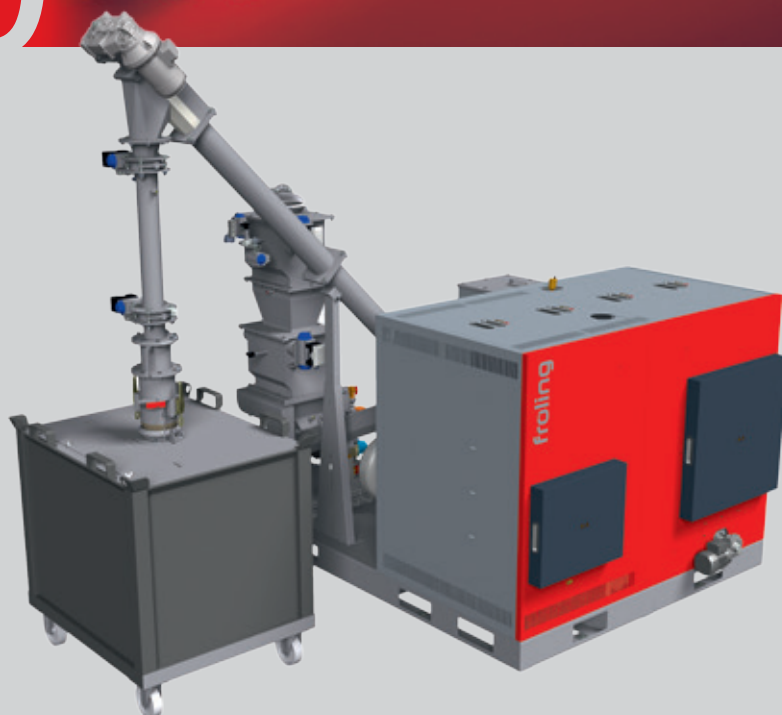
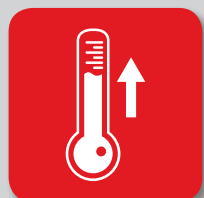


HEAT AND
POWER
from wood

CHP 50





For more than 50 years Froling has specialised in the efficient use of wood as a source of energy. Today, the name Froling stands for modern biomass heating technology. Froling firewood, wood chip and pellet boilers are successfully in operation all over Europe. All of our products are manufactured in our factories in Austria and Germany. Our extensive service network guarantees full coverage and reliability.

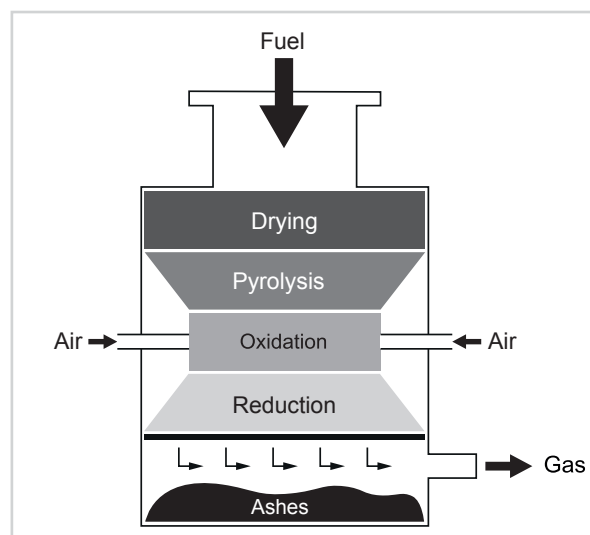
The principle of wood gasification

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 a 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 $\sim 200\text{ }^{\circ}\text{C}$)
- Pyrolysis ($\sim 200\text{ }^{\circ}\text{C}$ to $600\text{ }^{\circ}\text{C}$)
- Oxidation (up to $\sim 1200\text{ }^{\circ}\text{C}$)
- Reduction ($\sim 900\text{ }^{\circ}\text{C}$)

During the pyrolysis stage, chemical products (such as tar, coke, CO , CO_2 , H_2 , CH_4) are created and partially burnt or cracked 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.

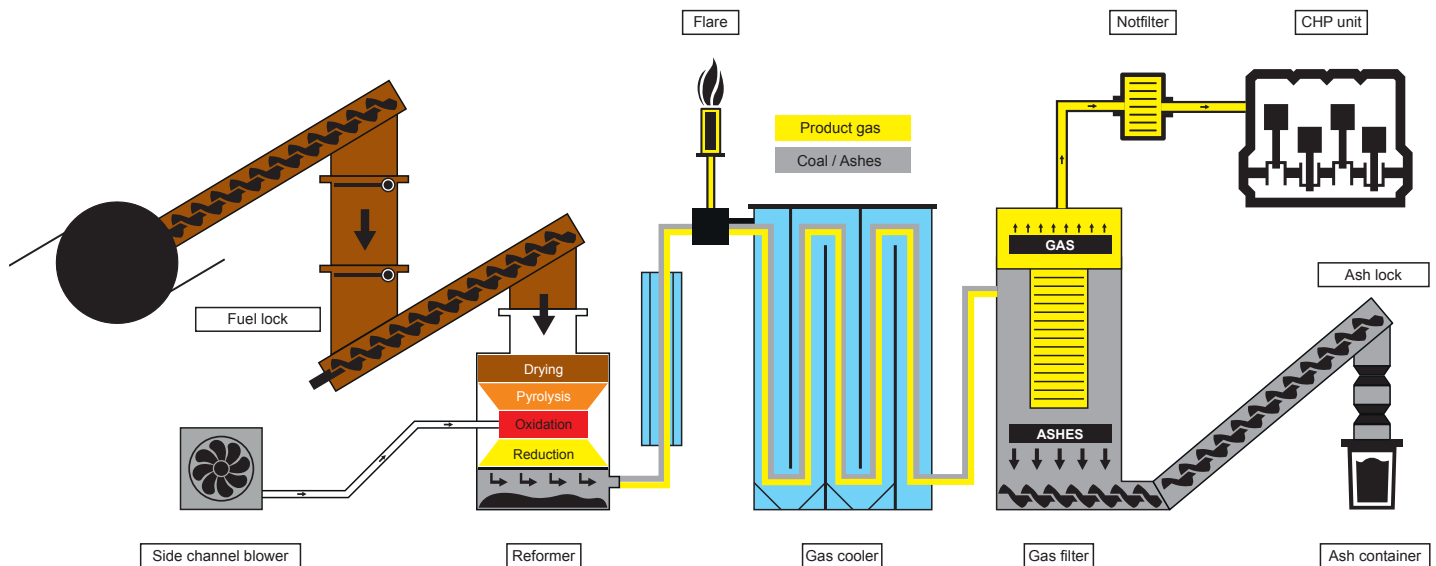


The wood gas is cooled down in a tubular water/gas heat exchanger to $110\text{ }^{\circ}\text{C}$ and dry-cleaned in a fabric filter with mechanical cleaning. The residual coal and ash is transported by transfer augers from the gas filter, through an ash-lock and into the ash container. The cooled and 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 CHP50

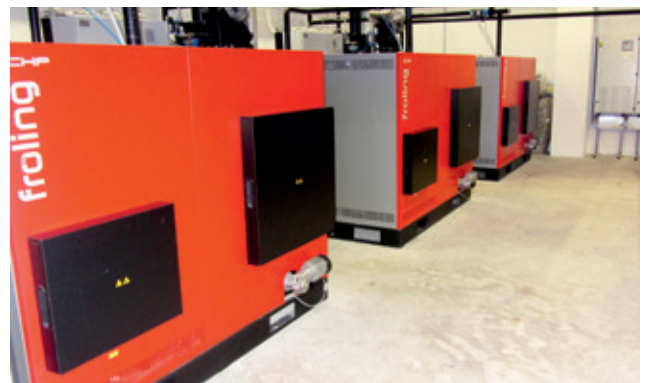
Operating principle:

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



Scope of supply:

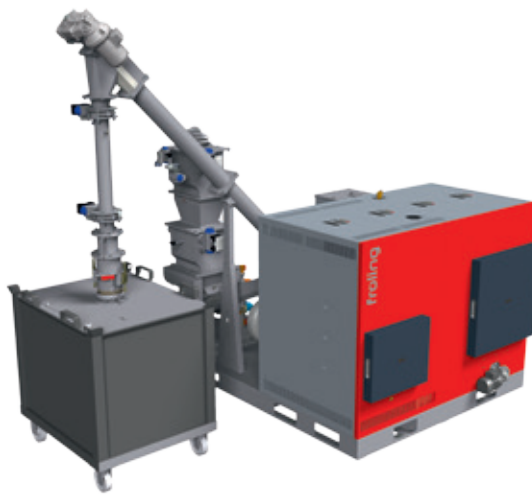
- a) Pre-commissioned container solution
- b) Wood gasifier + engine pre-assembled for integration into existing buildings



Fixed bed gasifier CHP50

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
- Austrian Quality Product
- Fröling 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



Technical data		CHP50
Electrical output	[kW]	49/51*
Thermal output	[kW]	ca. 107*
Fuel consumption wood chip	[kg/h]	ca. 40 - 45**
Annual fuel consumption @ 6.000 operating hours	[t]	ca. 300 t
Wood chip fuel classification		P315 - P45S class A1 - M10 (G30, W10); low fines
Dimensions container	[m]	8 x 3 x 3 (LxWxH)
Weight container (ready for operation)	[t]	ca. 11
Overall efficiency		ca. 83 %**
Electrical efficiency		ca. 27 % (gross)**

* depending on operation

** depending on fuel quality

Your Fröling Partner:



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