

POLY  
**H.E.L.D.**<sup>®</sup> **HIGH**  
**EFFICIENCY**  
**LOW**  
**DUST**

***Innovative combustion technology  
with extreme air staging control***





The background of the entire page is a photograph of a forest. The left side of the image is covered by a large, semi-transparent purple triangle that points towards the bottom right corner. The text is overlaid on this purple area. The forest scene shows tall, thin trees with green foliage, and a patch of bright green grass is visible in the bottom right corner, partially obscured by the purple overlay.

# *POLY H.E.L.D.®*

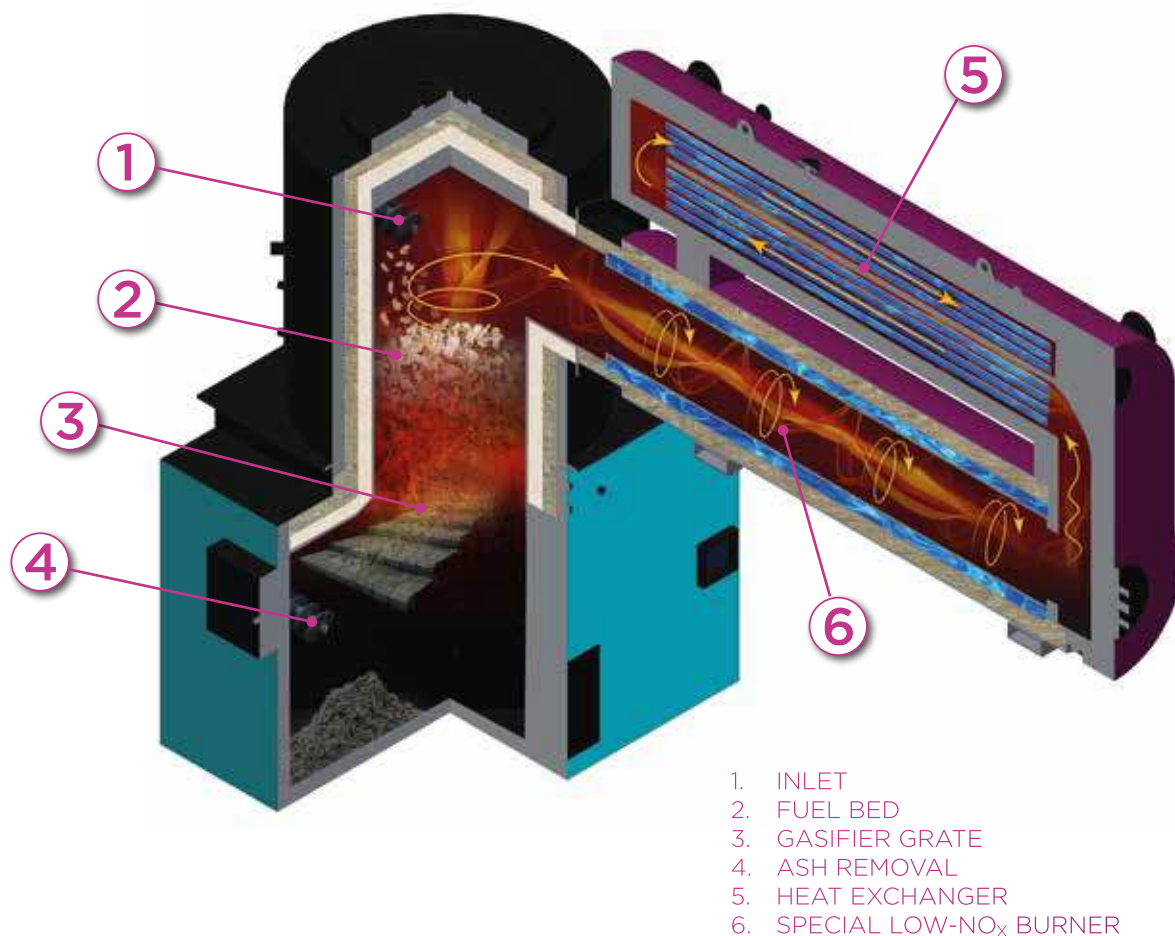
Resource and energy efficiency as well as low emissions are the main challenges that national and international climate and renewable energy strategies are facing.

POLY H.E.L.D.® is the combustion technology of the future. This combustion system with extreme air staging allows for low-emission and efficient combustion of various fuels. Dust emissions for wood-based biomass remain lower than 20 mg/Nm<sup>3</sup> at 11% O<sub>2</sub>. A value of 10 mg/Nm<sup>3</sup> can be reached with quality wood chips. Additionally, POLY H.E.L.D. is able to combust or gasify high-ash fuels with relatively low ash melting points. The system accomplishes these low emission values without additional flue gas purification, which makes it a highly economical solution. As a unique design, this system achieves 20-30% lower NO<sub>x</sub> emissions compared to grate firing without the need for secondary measures (SNCR or SCR).





## OPERATING PRINCIPLES LOW EMISSION BURNER



Fuel is supplied via an inclined screw stoker. The fuel height is controlled by a redundant radar system. The produced gas is initially ignited by a propane gas burner with a nominal output of 35 kW. The gasifier is ignited automatically by a hot-air blower.

The grate is a gasification grate, specifically developed by POLYTECHNIK for this gasification technology. The new grate is aligned symmetrically below the gasifier and is cleaned of ashes simultaneously to the left and right. In this process, the ash is discarded onto two horizontal screws at both ends of the grate and from there it is transported to another ash screw which transfers all of the ashes to an air-tight container.

The grate is cooled by a grate frame cooling system. The produced gas is combusted in a multi-stage gas burner after the gasifier. After the gas burner, the flue gas flows through the heat exchanger and the energy can be used for various purposes.

The plant can be operated with warm water, hot water, thermal oil and steam boilers.



# HIGHLIGHTS



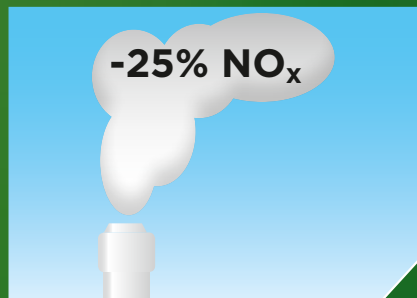
## Fuel flexibility:

Wood chips up to M45, corncobs, straw pellets, and various agricultural residues



## Efficiency > 92%

(+5% compared to conventional combustion)



## NO<sub>x</sub>: -25%

(compared to conventional combustion)



## Dust: < 20mg/Nm<sup>3</sup>

(without flue gas purification)



## Output range

25-100%  
(also with M45)



## START-STOP

within just a few minutes





## TECHNICAL DATA

POLY H.E.L.D	Unit	Poly HELD 400	Poly HELD 600	Poly HELD 1000	Poly HELD 1500
Nominal output	kW	400	600	1000	1500
Effective output range	kW	100 - 420	150 - 630	250 - 1050	350 - 1600
Fuel type (wood, straw, sunflower, miscanthus pellets, etc.)		Wood chips up to M45	Wood chips up to M45	Wood chips up to M45	Wood chips up to M45
Efficiency full load/partial load	%	92/93	92/93	92/93	92/93
Fuel consumption*	kg/h approx. m³/h	129 0,50	193 0,75	320 1,24	478 1,85
Fuel type (wood, straw, sunflower, miscanthus pellets, etc.)		Pellets M10	Pellets M10	Pellets M10	Pellets M10
Efficiency full load/partial load	%	93/94	93/94	93/94	93/94
Fuel consumption**	kg/h	90 0,14	134 0,21	224 0,34	335 0,52
<b>BOILER</b>					
Heat medium		Warm water other heat media (steam, thermal oil, air) available upon request			
Max. permitted operating pressure	bar	6			
Max. permitted operating temperature	°C	110			
Inlet temperature	°C	< 105			
Min. return temperature	°C	60			
Electrical auxiliary power					
Electrical load	kVA	400 V AC / 50 Hz / 3P + N + PE 5,0      7,5      11      15			
El. power consumption full load/partial load *	kWh/h	1,25 / 0,6	2,0 / 1,0	3,5 / 1,8	5,5 / 2,8
<b>START-UP BURNER</b>					
Gas type		Natural gas, propane, biogas			
Flow pressure	mbar	200			
Installed burner output	kW	35	35	85	85
Consumption of electricity per start-up procedure from cold start	kWh	100	125	160	200
<b>WATER CONNECTION</b>					
Quality		Drinking water			
Flow pressure	bar	2 - 6			
Connected capacity required	m³/h	2,0	2,0	3,0	3,0
<b>EMISSIONS</b>					
<b>Guaranteed emissions</b> as per Ordinance on Firing Installations (at 11% O <sub>2</sub> , dry flue gas)***					
Carbon monoxide CO		250			
Nitrogen oxides NO <sub>x</sub> (as NO <sub>2</sub> )	mg/m³N	250			
Dust		20			

\* based on woodchips quality M30, P45, A3.0 and N0,5

\*\* based on wood pellets – quality class A1

\*\*\* emission values for various production limits achieved without additional emission control equipment (e.g.: KPC) available upon request



# FUELS

## MOST COMMON FUELS



WOOD PELLETS



WOOD SHAVINGS



SAWDUST



WOOD BRIQUETTES



SUNFLOWER  
HUSK PELLETS



SHREDDED WOOD



WOOD CHIPS,  
SIZE UP TO P45



SHREDDED BARK



FORESTAL  
BIOMASS



BAMBOO



STRAW PELLETS



ELEPHANT GRASS  
PELLETS



AGRICULTURAL  
RESIDUES  
AS PELLETS



COCONUT FIBER

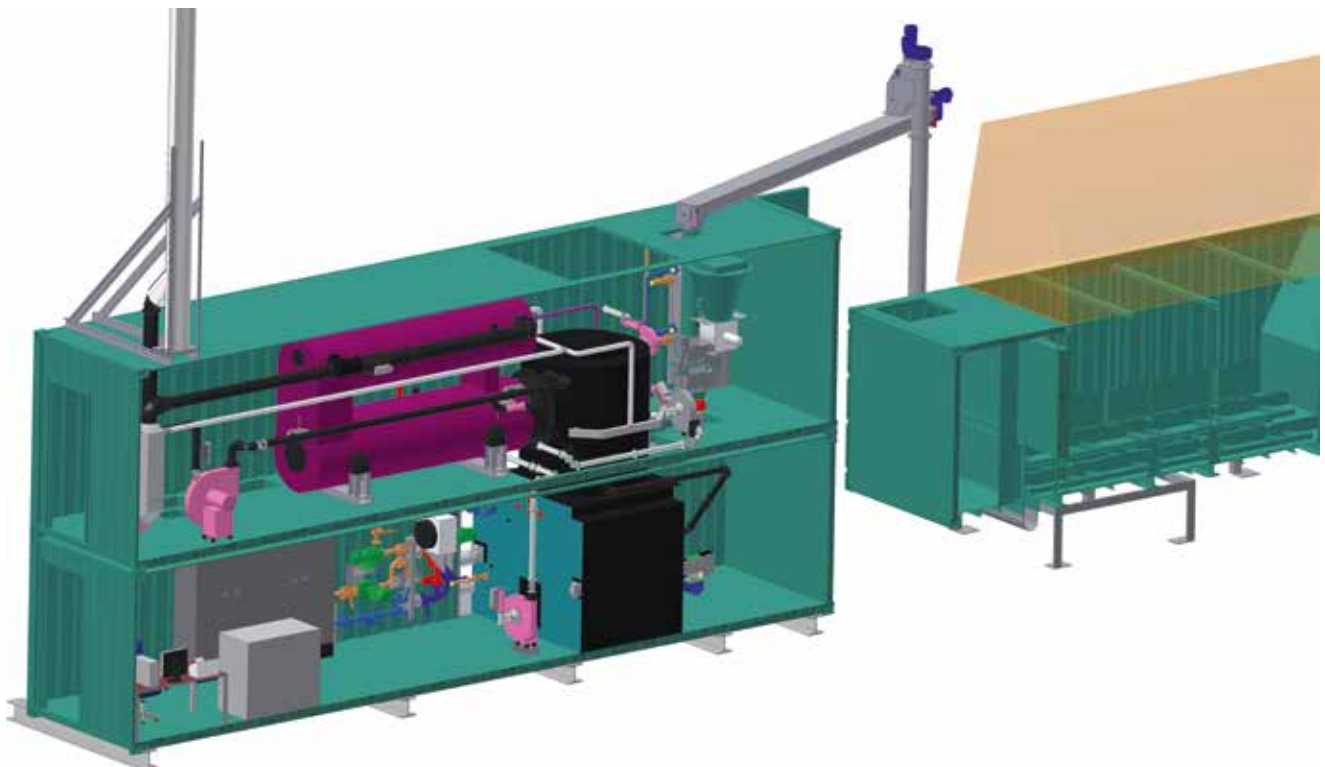
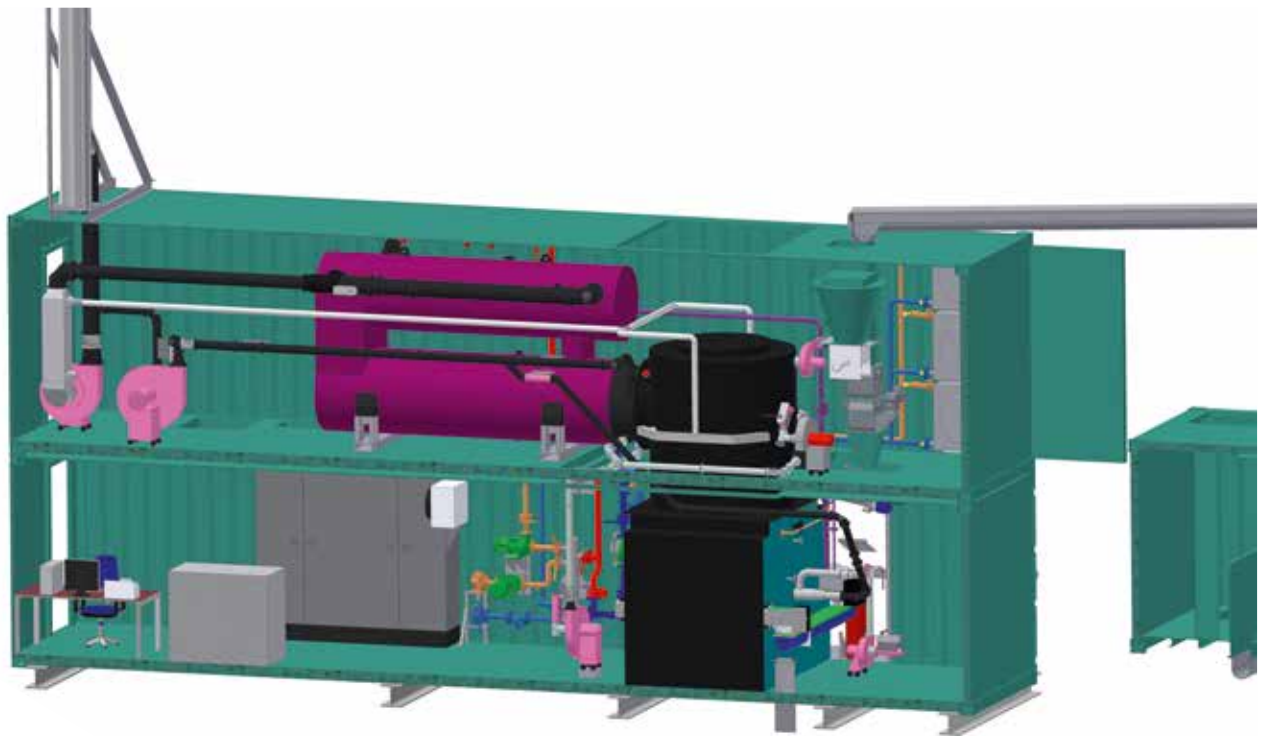
... as well as most wood-based fuels

Climate and energy targets - The POLY H.E.L.D.<sup>®</sup> system ensures a high fuel flexibility as well as extremely low emissions and high efficiency. This way, the fuel consumption is lowered, which represents a significant contribution to the conservation of resources. The security of supply can be maintained by sustaining the rural supply structures. With POLY H.E.L.D.<sup>®</sup>, dust emissions below 20g/Nm<sup>3</sup> as well as a NO<sub>x</sub> reduction of approx. 25% compared to the current state-of-the-art combustion technology can be achieved.



## SET-UP VERSIONS

Example for a container solution



individual set-ups for boiler rooms are also available

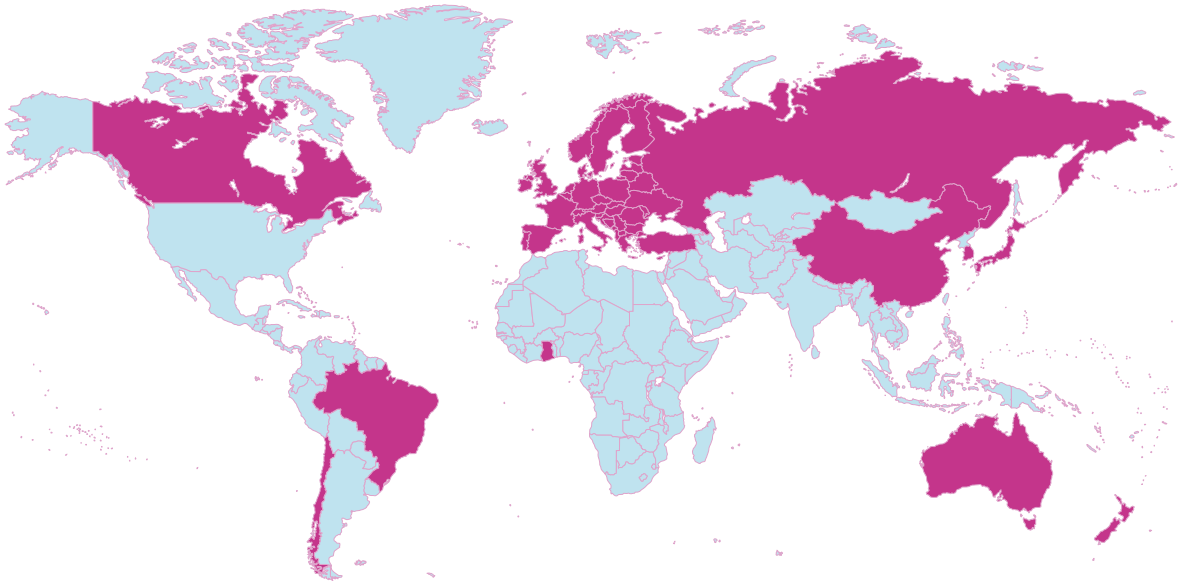


# POLY H.E.L.D.<sup>®</sup> - **H**IGH **E**FFICIENCY **L**OW **D**UST

- Pilot system has been operating for 3 years
- Suitable for all countries and markets
- Fuel flexibility: Wood chips up to M45, corncobs, straw pellets, various agricultural residues
- Efficiency: > 92% (+5% compared to conventional combustion)
- NO<sub>x</sub>: 25% compared to conventional combustion
- Dust: < 20mg/Nm<sup>3</sup> (without flue gas purification)
- Output range: 25-100% (also with M45)
- START-STOP within just a few minutes

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**POLYTECHNIK**  
Biomass Energy  **WORLDWIDE**



[WWW.POLYTECHNIK.COM](http://WWW.POLYTECHNIK.COM)

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**POLYTECHNIK**  
Biomass Energy 

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