HEATEN

Steam generating heat pumps 21st October 2025

André Bechem // VP

Sales & Product Management

AGENDA

- **HEATEN & HeatBooster Technology**
- High Temperature Heat Pumps in Action
- Wrap Up

STRATEGIC PARTNERSHIP

Between HEATEN, ADVENT and INNIO

- Leading Gas Engine Manufacturer
- ~ €2.5bn sales
- ~ 4´500 employees

Advent
Financial Support

- Leading Private Equity Fund
- Providing Growth Financing

INNIO

Combustion Gas Engine

Gas-to-Power

JENBACHER Waukesha

Strategic Partnership

HEATEN

High Temperature Heat Pump

Power-to-Heat

Kristiansand (origin)
› Technology

Remscheid
› Global Headquarter
› R&D / Test Center
› Sales
› Training / Service

INNIO GROUP
Jenbach
› Engineering
› Assembly
› Service
› Test Center

HeatBooster TECHNOLOGY

Efficient. Flexible. Scalable. Powerful.

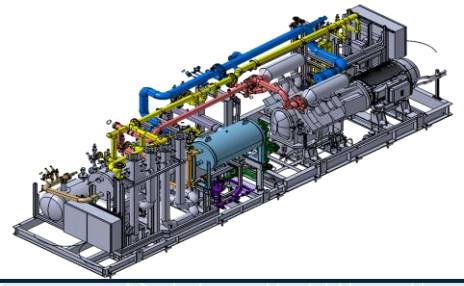
HEATEN

PRODUCT PORTFOLIO	TEMPERATURE RANGE	MODULAR & FLEXIBLE CAPACITY	FLEXIBLE LOAD HANDLING	MULTI-USE DESIGN
HBL 4 • 0.8–2.5 MW_{th} • perfect for mid-scale industrial applications **HBL 16** • 3.2–10.0 MW_{th} • large-scale performance with unmatched flexibility	• **Heat sink: 90-200°C** / water or steam • **Heat source: 10-150°C** / water or steam • Up to 80°C temperature lift per stage	• Scalable for future needs from **pilot** to **full industrial rollout** • Product scalability from **1 to 50 MW_{th}** through parallel or cascaded installation	• Flexible load handling & **high part-load efficiency**, even at 20% load • Handles fluctuating industrial conditions effortlessly • Grid balancing	• **Multi-source/sink compatibility** • Compatible with a wide range of working fluids: all common **HFOs and HCs** ONE HARDWARE HC & HFO COMPATIBLE

PRODUCT PORTFOLIO

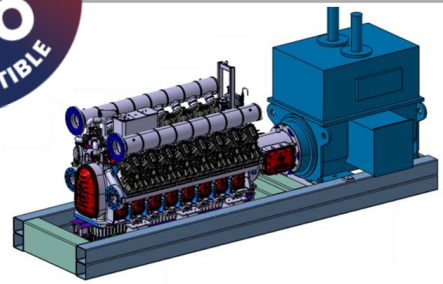
HBL4 & HBL 16

HBL4 (4-cylinders)



ONE HARDWARE HC & HFO COMPATIBLE

HBL16 (16-cylinders)



Operating range	
Temperature heat source	10–150°C
Temperature heat sink	90–200°C (HC), 90–165°C (HFO)
Thermal power range	0.8–2.5 MW_{th}

Dimensions		
Length	mm	9,000
Width	mm	2,400
Hight	mm	2,500

Datasheets

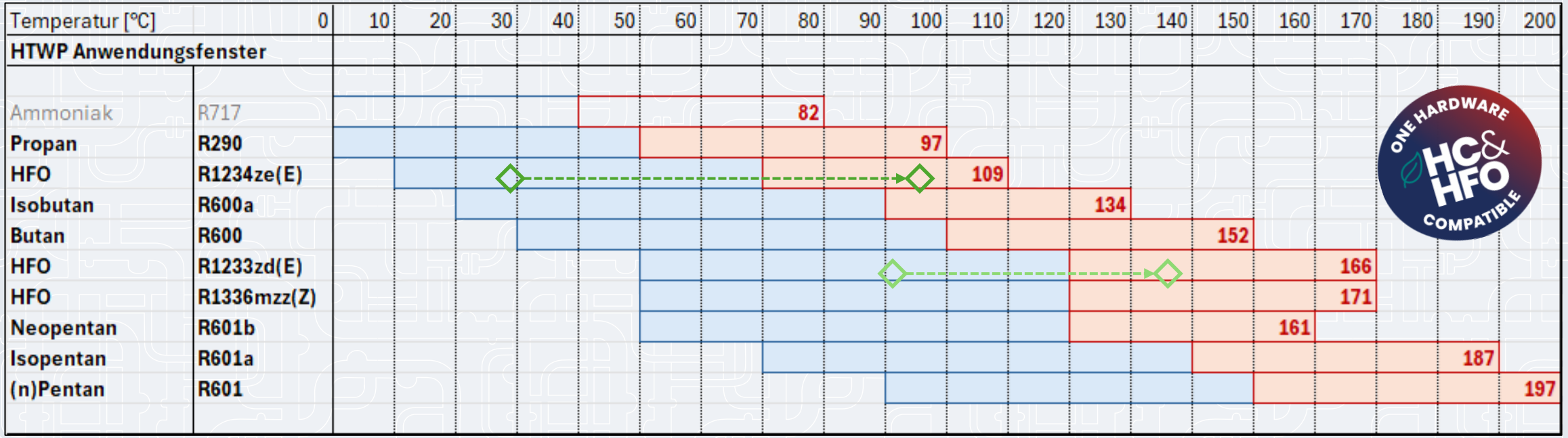
Operating range	
Temperature heat source	10–150 °C
Temperature heat sink	90–200 °C
Thermal power	3.2–10 MW_{th}

Dimensions		
Length	mm	11,000 (2 skids)
Width	mm	2,400
Hight	mm	2,500

REFRIGERANT & MULTI-STAGE FLEXIBILITY

HEATEN

HC & HFO compatible



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HEATEN REFERENCES

Selection

Food (typ. Drying)

- Drying application for rice ingredients
- Water source temperature 20°C
- Water output temperature 95°C

Food (Sugar)

Offenau

- Crystallization process
- Steam source temperature 60°C
- Steam output temperature 100°C

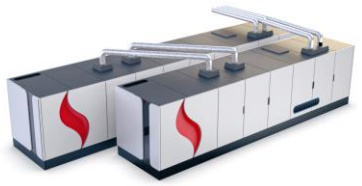
Food (Sugar)

Rain

- Evaporation process
- Steam source temperature 100°C
- Steam output temperature 130°C

Pulp & Paper

- Drying process
- Water source temperature 40°C
- Steam output temperature 120°C



District heating

- District heating
- Water source temperature 55°C
- Water output temperature 125°C

Case overview – Beneo – Typical drying process – food industry

Location: Wijgmaal, Belgium

Case Highlights	Values
COP	3.2
Thermal power Output	Up to 1 MW_{th}
Working fluid	R-515b
Cooling water savings	Up to 20,000 m^3/a
CO_2 savings	1900 t/a

Cooling of effluent water

25°C

Cooling water

20°C

Cooling water

HBL4-W/W

95°C

Hot water

45°C

Hot water

Preheating of drying air

Case overview – Südzucker – Evaporation Station

Location: Rain, Germany

Case Highlights	Values
COP	6.0
Thermal power Output	4 MW_{th}
Steam output	6.6 t/h
Working fluid	R-1233zdE
CO_2 savings	2.660 t/a

102°C

Saturated steam

100°C

Hot water/ Condensate

2 x HBL4-S/S

130°C

Saturated steam

128°C

Hot water/ Condensate

Case overview – Südzucker – Crystallization

Location: Offenau, Germany

Case Highlights	Values
COP	3.8
Thermal power Output	2.8 MW_{th}
Steam output	4.2 t/h
Working fluid	R-1234zeE
CO_2 savings	1.358 t/a

62°C

Saturated steam

59°C

Hot water/ Condensate

2 x HBL4-S/S

100°C

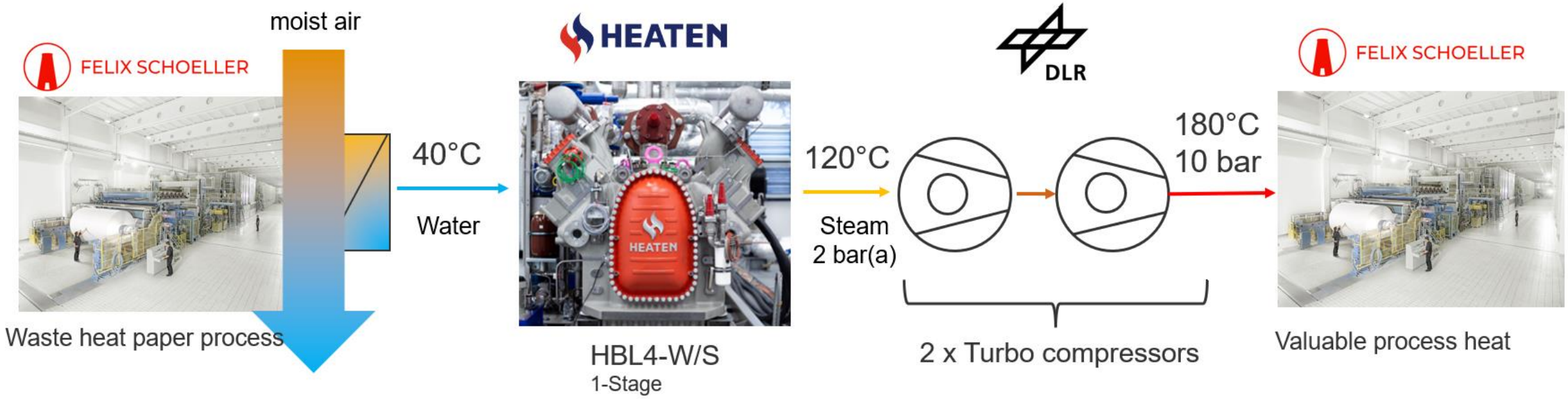
Saturated steam

98°C

Hot water/ Condensate

EEETHOS – Demo III HTHP for Pulp & Paper

Case Highlights	
Application	Pulp & Paper
Location	Felix Schoeller Osnabrück, Germany
Thermal power Output	>1,000 kW_{th} , >1,6 t/h
Steam output temperature	Up to 180°C
Working fluid	Isobutane
Application	Pulp & Paper



Hurricane Project
Industrial Waste Heat to District Heating

Case Highlights	Values
COP	3.6
Thermal power output	3.3 MW_{th}
Thermal power input	2.55 MW_{th}
Working fluid	R-1233zde
CO_2 savings	6,274 t/year

Industrial waste heat

70°C
Hot water

55°C
Hot water

1 x HBL16-W/W

125°C
Hot water

110°C
Hot water

District heating Hub

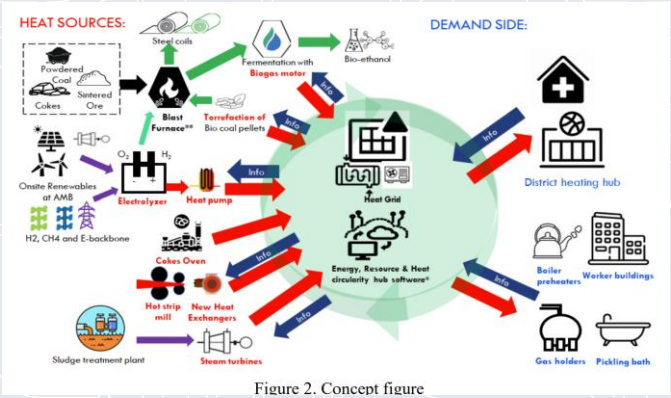


Figure 2. Concept figure

Plasterboard Drying

Publish soon

Case Highlights	Values
COP	5-6,5
Thermal power output	Up to 2.3 MW_{th}
Thermal power input	Up to 2 MW_{th}
Working fluid	R-1234zeE
CO_2 savings	Up to 4,000 t/year

Condensation of wet air

70-60°C

Hot water

65-55°C

Hot water

HBL4-W/W

95-100°C

Hot water

65-85°C

Hot water

Heating up the drying air

Distillery

Publish soon

Case Highlights	Values
COP	5,1-5,5
Thermal power output	Up to 1.2 MW_{th}
Thermal power input	Up to 850 kW_{th}
Working fluid	R-1233zdE
CO_2 savings	Up to 2,000 t/year

82°C
Hot water

70°C
Hot water

HBL4-W/W

120°C
Hot water

90°C
Hot water

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WHY HEATEN?

Proven Experience & Track Record

- In the Organic Rankine Cycle field since 2010, and in High Temperature heat pumps since 2015 – piston based
- Field-tested prototypes with >100,000 operating hours
- First commercial HBL4 installation operational since November 2024

Reliable Partner

- Backed by **Advent International** as a strategic investor
- Partnership with **INNIO Jenbacher** for engineering, supply chain, global service and maintenance network

Future-Proofing

- Compatible with a wide range of working fluids: all common **HFOs and HCs**
- Scalable for future needs - **from pilot to full industrial rollout** - a scalable, modular solution from **1 MW to 50 MW_{th}**
- Long service life (20+ years)

Exceptional Technology

- **Flexible Load Handling & high part-load efficiency, even at 20% load**
- Multi-Use Design - Compatible with volatile/variable industrial processes
- **Flexible operation in day-ahead and intraday markets possible**
- Temperature Range up to 200 °C
- Full IP ownership

Thank you for your attention!

André Bechem // VP Sales and Product Management

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