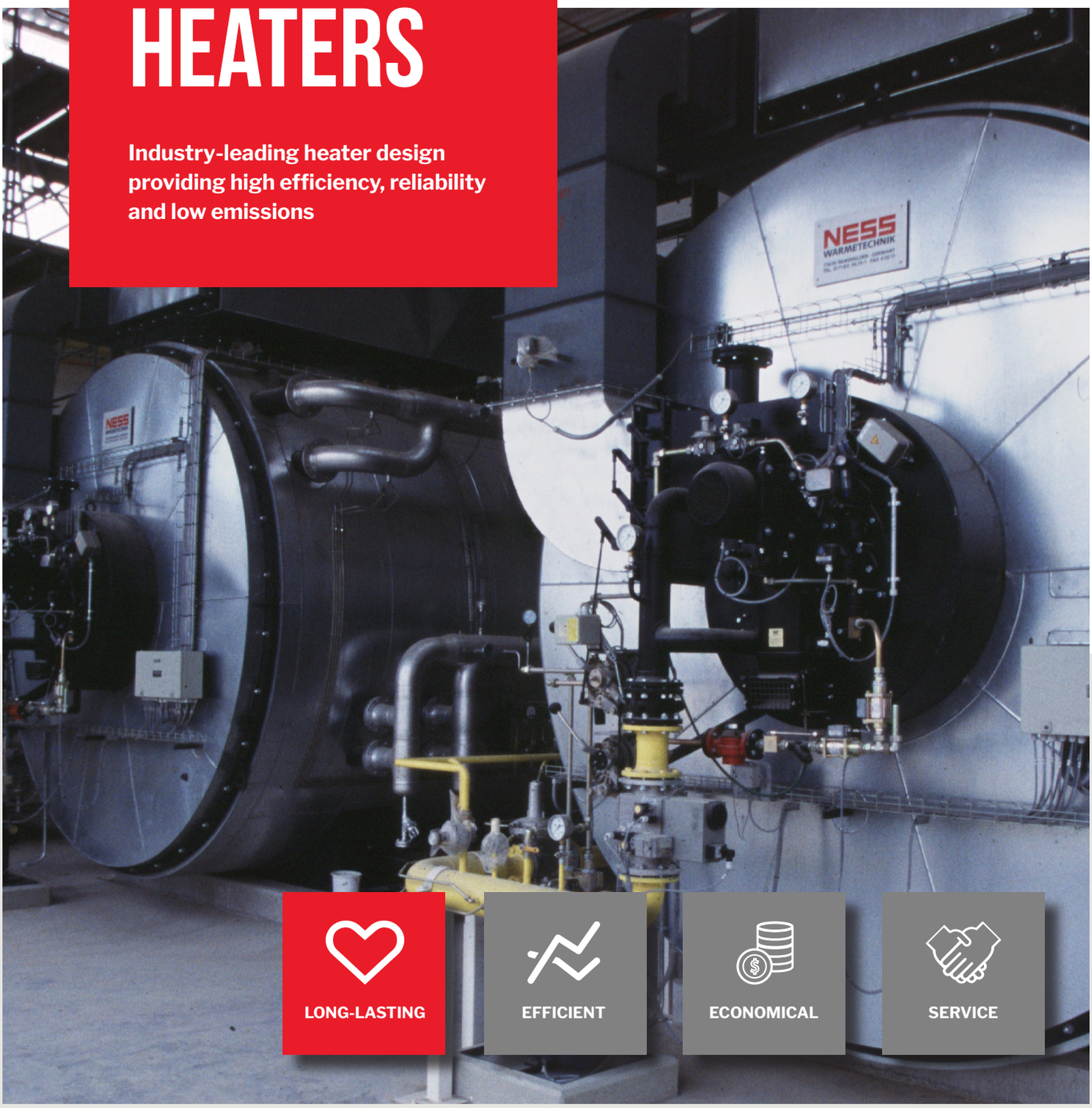
NESS
The Process Heat Company

THERMAL OIL HEATERS

Industry-leading heater design providing high efficiency, reliability and low emissions



LONG-LASTING

EFFICIENT

ECONOMICAL

SERVICE

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HEATER BROCHURE

NESS FIRED HEATERS OFFER CUSTOMERS QUALITY AND PERFORMANCE WORLDWIDE

Innovative development and design with real results



12.5 MW (42.65 MMBtu/h) Thermal oil heater (WEH)

with combustion air preheater, flue gas recirculation, as well as extinguishing and cooling system with water mist.

NESS THERMAL OIL HEATERS - ADVANCED DESIGN AND FUNCTION

Experience the difference with NESS oil heaters by achieving high efficiency, excellent heat transfer and low film temperatures.

Our goal is achieving the highest efficiency which not only saves on fuel costs but also reduces CO2 emissions making operations more sustainable.
NESS thermal oil heaters offer a special design that yields a balanced temperature profile. Doing so actively prevents temperature peaks and with the flow optimized within the heater, dead zones are prevented. This virtually eliminates oil overheating within the system.



High temperature insulation material

A special high-temperature ceramic fiber material is used in the combustion chamber. This material is resilient to stress and vibration.

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The burner, burner throat and tube coil are optimally designed and manufactured to work together to eliminate thermal stress.

We only use high-quality ceramic fiber materials as a seal between these components to ensure optimal reliability and durability. Due to this special design of the sealing, mainly in the area of the burner sleeve and tube coil, problems that occur with many other heater designs do not exist here.

The reversing chamber is sealed gas-tight and is comprised of multiple layers of insulation material. These layers are applied with a two-part adhesive that has been specifically developed for this purpose. The layers and adhesive solidify into one precisely made unit. The back wall and sleeve of the oil-fired heaters are lined with a robust and light weight refractory material that is resistant to heat and temperature changes.





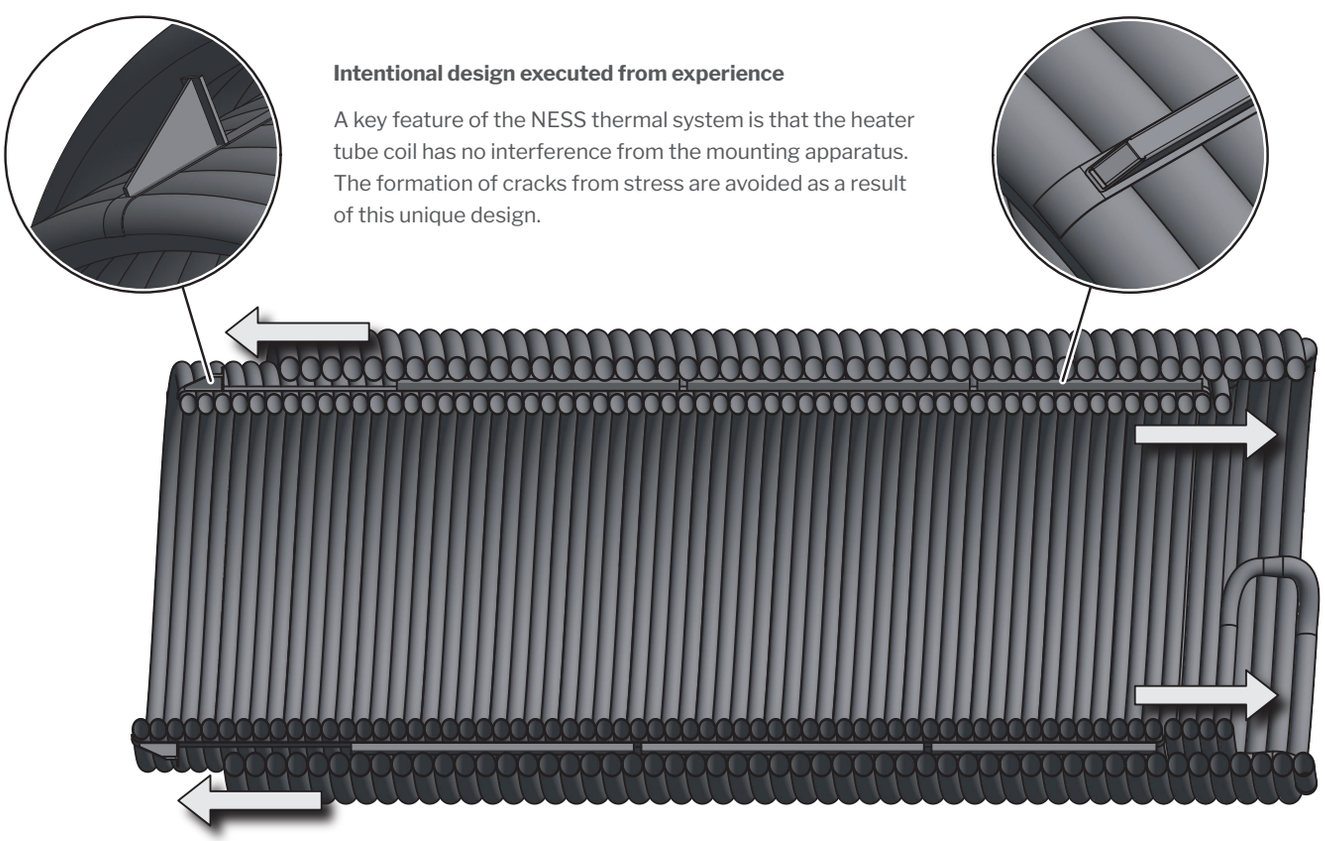
Heater back wall shown with lightweight refractory concrete

This additional refractory lining is resistant to swings in heat and temperature and is specifically applied according to the type of fuel used in the system

60 YEARS OF EXPERIENCE

in development, design, engineering and manufacturing are built into our heating systems. This is just one fact in why NESS ranks among the world's best thermal management companies.

BUILT FOR LONG-LASTING RELIABILITY AND EFFICIENCY



Intentional design executed from experience

A key feature of the NESS thermal system is that the heater tube coil has no interference from the mounting apparatus. The formation of cracks from stress are avoided as a result of this unique design.

We have a product for your application by covering a **wide range of performance** and **structural parameters**

OVERVIEW OF OUR HEATERS

PERFORMANCE RANGE AND CONFIGURATION FOR YOUR PROCESS

We design and build oil transfer heaters ranging from 160kW (0.5459 MMBtu/h) to 16,000kW (54,59 MMBtu/h)

Horizontal heaters (WEH) and **vertical heaters (WEV)** are available in our product range

Floor space is often a deciding factor on which style of heater a company might require. Even so, vertical and horizontal heaters are configured basically the same way and have typically the same thermodynamic properties.

The **WEH heater type** is very accessible for maintenance requirements due to its horizontal design. A combustible air preheater is recommended in conjunction with the horizontal heater.

The **WEV heater type** works best in smaller floor space applications. It is also possible to fit a preheater directly to this type of heater.

Higher outputs are often required in complex systems with multiple consumers. In this case, it is reasonable to look closely at the whole system in its entirety and to operate multiple heaters, if this is necessary.
Considering the number of individual consumers and the level of performance required for the application, a multiple heater system is easier to maintain and a failure in one heater would not affect the entire system, allowing limited operation instead of downtime.



WEH/WEV - Two different heater configurations

There are two choices of heater designs depending on your space parameters and constraints. The WEH (left image) is the horizontal option and the WEV (right image) is the vertical option.

NESS offers alternative methods of heating to higher outputs compared to traditional methods, i.e. biomass heating. Our engineers would be pleased to work out the optimum solution for you.

OVERVIEW ON HEATERS

WEH/WEV heaters available (ex works)

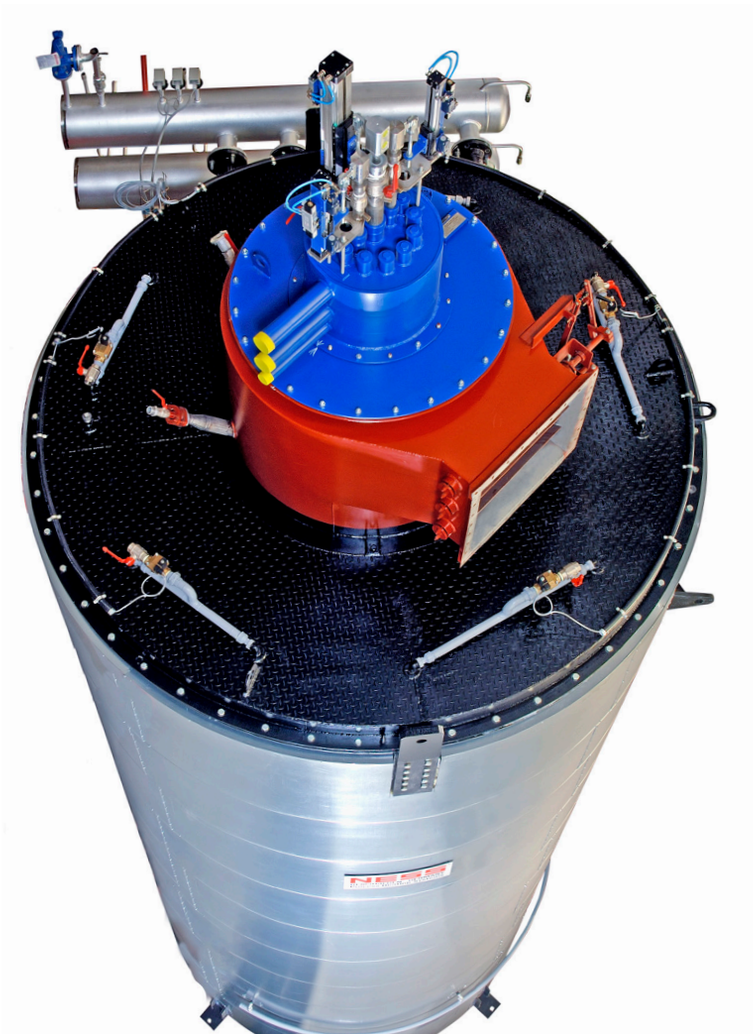
Please see below for an overview of NESS standard heaters listed by output, dimensions and weight.

Type	Power	Length	Width	Height	Weight
WEH/WEV **160**	160 kW / 0.545 MMBtu	1.9 m	1.0 m	1.4 m	0.6 t
WEH/WEV **320**	320 kW / 1.091 MMBtu	2.3 m	1.2 m	1.5 m	1.0 t
WEH/WEV **400**	400 kW / 1.363 MMBtu	2.4 m	1.4 m	1.6 m	1.7 t
WEH/WEV **500**	500 kW / 1.704 MMBtu	2.6 m	1.6 m	1.7 m	2.3 t
WEH/WEV **630**	630 kW / 2.045 MMBtu	2.7 m	1.7 m	1.7 m	2.6 t
WEH/WEV **800**	800 kW / 2.727 MMBtu	3.0 m	1.9 m	1.9 m	3.4 t
WEH/WEV **1000**	1000 kW / 3.409 MMBtu	3.3 m	2.0 m	2.0 m	4.4 t
WEH/WEV **1250**	1250 kW / 4.261 MMBtu	3.6 m	2.0 m	2.0 m	4.7 t
WEH/WEV **1600**	1600 kW / 5.455 MMBtu	4.1 m	2.2 m	2.2 m	6.1 t
WEH/WEV **2000**	2000 kW / 6.819 MMBtu	4.4 m	2.3 m	2.3 m	6.9 t
WEH/WEV **2500**	2500 kW / 8.523 MMBtu	4.5 m	2.3 m	2.3 m	7.5 t
WEH/WEV **3200**	3200 kW / 10.910 MMBtu	5.1 m	2.4 m	2.4 m	8.8 t
WEH/WEV **4000**	4000 kW / 13.638 MMBtu	5.5 m	2.6 m	2.6 m	11.2 t
WEH/WEV **5000**	5000 kW / 17.047 MMBtu	6.5 m	2.8 m	2.8 m	14.1 t
WEH/WEV **6300**	6300 kW / 21.479 MMBtu	7.1 m	3.0 m	3.0 m	16.7 t
WEH/WEV **8000**	8000 kW / 27.276 MMBtu	7.4 m	3.5 m	3.5 m	23.5 t
WEH/WEV **10000**	10000 kW / 34.095 MMBt	8.3 m	3.8 m	3.8 m	30.5 t
WEH/WEV **12500**	12500 kW / 42. 618 MMBtu	9.5 m	3.9 m	3.9 m	34.9 t
WEH/WEV **16000**	16000 kW / 54.552 MMBtu	10.6 m	4.1 m	4.1 m	44.9 t

The figures listed in the table refer to a standard heater. In the case of a specific order the dimensions and weight can be different. The dimensions are stated without burner.

TAILOR-MADE HEATER SIZE

Based on different standard sizes we adapt the heaters to your needs and individual performance requirement.



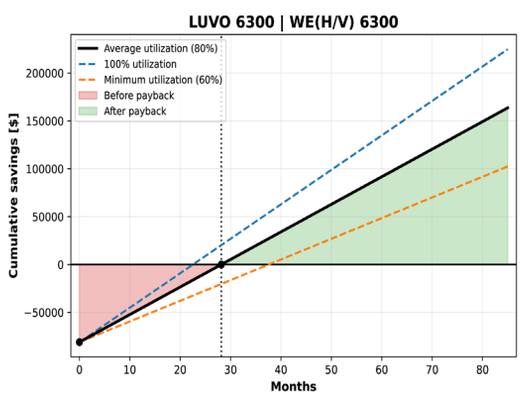
FUELS AND TYPES OF FIRING

NESS heaters can work with burners made by various manufacturers. Common fuel types consist of:

- **Natural gas and liquid gas, process gases**
- **Heating oil EL (diesel), heavy heating oil**
- **Combination of different fuels**
- **Special firing systems for special fuels**

A sustainable extension for NESS heaters is the
combustion air preheater for increasing efficiency

HEAT RECOVERY FOR INCREASING EFFICIENCY





INCREASES EFFICIENCY

Type	For heaters	Savings with combustion air preheater depending on heater utilisation[2]			Expected amortization time
		60 %	80 %	100 %	
Luvo **3200**	*WEH/WEV* **3200**	$11,481	$15,308	$19,135	6.3-10.4 Years
Luvo **4000**	*WEH/WEV* **4000**	$13,805	$18,406	$23,008	5.9-9.9 Years
Luvo **5000**	*WEH/WEV* **5000**	$17,404	$23,205	$29,007	5.4-8.9 Years
Luvo **6300**	*WEH/WEV* **6300**	$21,231	$28308	$35,385	5.0-8.4 Years
Luvo **8000**	*WEH/WEV* **8000**	$26,562	$35,415	$44,269	4.7-7.8 Years
Luvo **10000**	*WEH/WEV* **10000**	$33,487	$44,649	$55,811	4.2-7.1 Years
Luvo **12500**	*WEH/WEV* **12500**	$42,872	$57,163	$71,454	3.8-6.4 Years
Luvo **16000**	*WEH/WEV* **16000**	$53,989	$71,985	$319,551	3.6-5.9 Years

[2] *The table refers to guide values only. Electricity price 0.1315 USD / MMBtu, Gas price 4.90 USD/ MMBtu*

MORE INFORMATION AND EXAMPLES AT WWW.NESS.DE

SAVES FUEL AND ENERGY COSTS

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Adding a combustion air preheater to a NESS thermal oil heater is an excellent way to gain sustainability in your operation. The preheater captures the energy from hot flue gases at the output of the heater to save on fuel and energy costs and dramatically reduces CO2 emissions from the heating system.

To achieve the proper temperature of the heat transfer medium, flue gas temperature must be higher than the medium gas temperature. This means the flue gas temperature at the heater output must be higher than the flow temperature of the medium, often above 300°C / 572°F. The standard heater emits this hot flue gas without the use of further thermal energy.

The combustion air preheater uses a high percentage of the energy remaining in the flue gas for preheating the combustion air and thus, saves fuel.



Do you want to save on electricity costs? We can help!
Control your heater flow rate automatically as you need it

NESS SMART HEATERPUMP

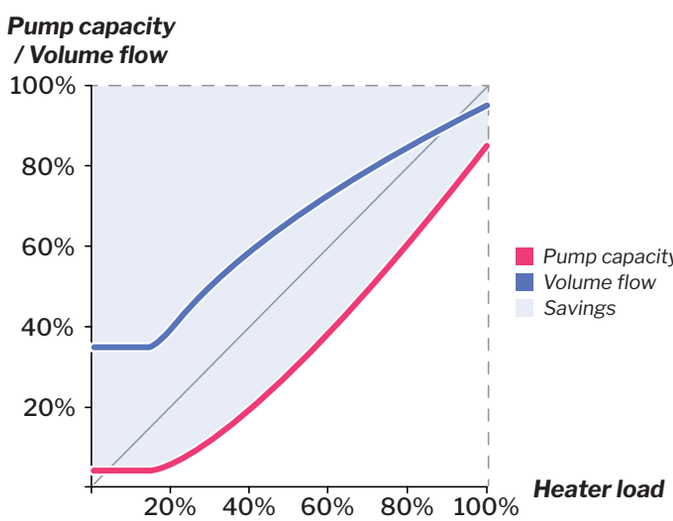


OUR EXCLUSIVE INNOVATION WILL SAVE YOU A LOT OF MONEY!

Due to the present state-of-the-art, heat transfer oil heaters must be operated with the full fl ow rate, also when the full heat output is not required, and the heater works with partial load. This is now a problem of the past!

Electrical power consumption of a pump depends on the third exponent of the flow rate and typically, much more oil is pumped through the heater than what is required for safe operation of the system.

Adding the optional NESS Smart HeaterPump, the load on the heater is monitored and the flow rate will be automatically set preventing the unnecessary waste of electricity.



THE NEW KIND OF HEATER OPERATION

For heaters	Typical amotization time by fuel[3]	
	Natural gas	HEL
WEH/WEV **16000**	3 - 8 Months	6 - 15 Months
WEH/WEV **12500**	5 - 11 Months	6 - 16 Months
WEH/WEV **10000**	8 - 11 Months	10 - 16 Months
WEH/WEV **8000**	10 - 15 Months	14 - 20 Months

[3] Calculation using average heater load, flow temperature and electricity price

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DISCOVER NEW SHORES BY TEAMING UP WITH NESS

Why should you pay for something you don't use? The NESS Smart Heater Pump can save on electricity costs in a huge way.

UP TO 95% ENERGY SAVING

Considering an average utilization of 80%, the operating costs for electricity can be reduced by approximately half. Also, the Smart HeaterPump is designed for maximum functional safety thanks to a redundant design. The Smart HeaterPump achieves the Safety Integrity Level 2 (SIL 2) and has been certified as a minimum flow limiter according to DIN 4754-2.

SAVINGS VIA OPTIMIZIATION AT THE POINT OF OPERATION

The flow rate through a heat transfer oil heater is selected in a way that at full load, a desired temperature spread between flow and return flow is achieved. The specified film temperature of the heat transfer medium can never be exceeded in any operation. For this reason, the required minimum volume flow at full heater load is usually determined and then monitored. The NESS Smart Heater Pump continuously determines the required volume flow depending on performance required. However, if the heater is operated at partial load or the current flow temperature of the oil is lower, the film temperature in the heater is also lower. The oil flow through the heater can be lowered without exceeding the maximum specified film temperature.

Product overview

OUR PRODUCTS

NESS offers high quality, sustainable-minded systems and concepts to improve a variety of processes in many different industries

NESS OPERATES WORLDWIDE

ALL NECESSARY CERTIFICATIONS

RELIABLE IN USE

INTELLIGENT SOLUTIONS



THERMAL OIL SYSTEMS

For heating at a high temperature level

The decision for a thermal oil plant is almost obvious for some processes, as thermal oil has many compelling properties. For example, the operation of the plant is possible up to a temperature of about 350 °C / 662°F almost without any pressure and is extremely efficient.



ELECTRIC HEATERS

Electrical heaters as an alternative to fired heaters

The electric thermal oil heater (EWE) is a true alternative to fired heaters and, in addition to continuous operation, it is also suitable for bridging peak loads and during retrofits to the system.



HEAT RECOVERY

More efficient use of existing resources

A sustainable option for your plant is heat recovery through a combustion air preheater. Thanks to the Luvo, the energy of the hot flue gases at the outlet of the heater can be used to save energy costs and resources.

MORE PRODUCT INFORMATION ON WWW.NESS.DE

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HEATING AND COOLING SYSTEMS

Heating-cooling circuits for machines and devices

In particular, these processes are dependent on the precise control of temperature gradients, such as in printed circuit board production or composites production for the aerospace industry.



BIOMASS PLANTS

Using biogenic solid fuels for process heat

NESS realises biomass plants together with strong partners in their respective special fields. Our focus at NESS is on the radiation and convection parts of the plants. Thus, grate-fired, dust-fired or underfeed-fired variants can be realised.



STEAM SYSTEMS / HOT WATER SYSTEMS

With fired or indirectly heated heat generators

This type of heating system is characterized mainly by the economical heat transfer medium. Hot water works well if lower temperatures up to 180 °C/ 356°F are required. Steam is often used as a heating medium with direct product contact.



SECONDARY CIRCUITS

Independent control of your process temperature

With secondary circuits, the heating parameters (temperature and volume flow) can be optimally adapted to the requirements of the process. The temperature can be regulated very precisely and is therefore ideal for demanding processes.



SPECIAL INSTALLATIONS

Special installations from experts for experts

Customer requirements and wishes are often the reason to develop new concepts that are customized to specific applications. Some solutions are therefore completely reviewed by us and “refreshed” as needed.



NESSESSITIES

More safety, availability, durability and efficiency for your thermal oil system

NESSessities products increase permanent increase of safety, availability, durability and efficiency in thermal oil systems. Each of the NESSessities has been developed in close cooperation with our customers and is therefore practice-oriented.

WE LOOKING FORWARD TO HEARING FROM YOU



NESS
The Process Heat Company

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