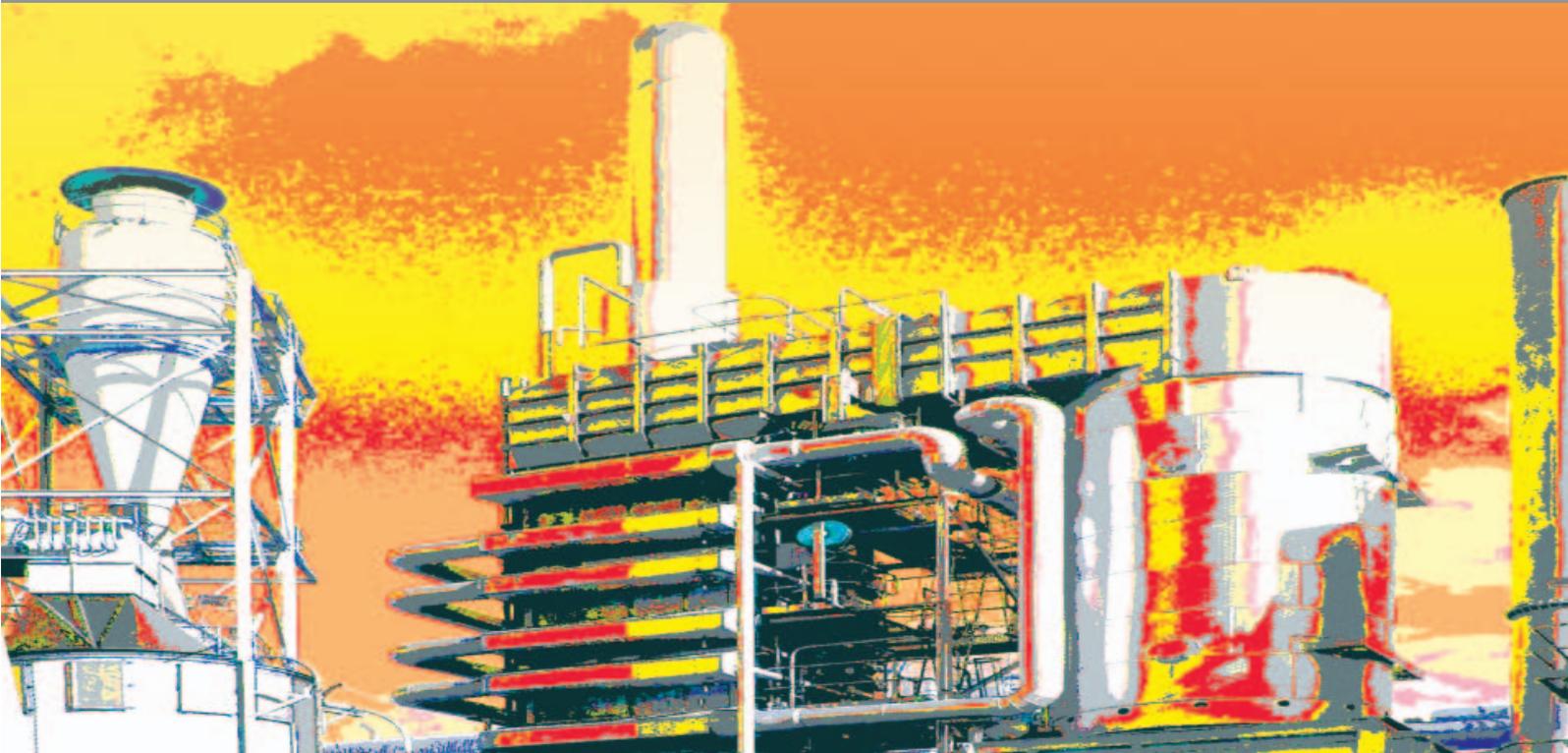


INTEC Engineering GmbH
Thermal oil heaters



Thermal Oil Heaters

Thermal oil heaters by INTEC® are successfully used for supplying process heat to industrial plants of various industries such as wood, textile, palm oil, chemical, ship building and food industries.

Compared to conventional plants using hot water or steam, thermal oil as a heat transfer medium offers the advantage that it can be heated nearly without any pressure until reaching a temperature of 320 °C. With synthetic oils, even temperatures up to 400 °C can be reached. For this reason, in most industrial processes heat transfer oil plants have finally achieved predominance in the supply of process energy.

Thermal oil heaters by INTEC® are characterized by the following features:

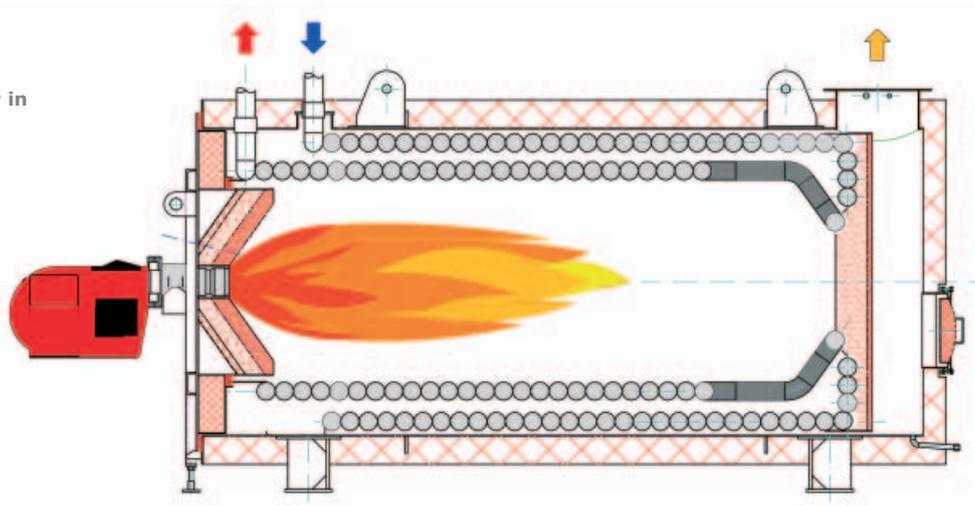
- **Optimised heat transfer and high efficiency due to generously dimensioned coil surface**
- **Tailor-made design to individual customer requirements**
- **Environmentally friendly operation due to low emission values**
- **High operational reliability**
- **Low operating costs**
- **Long service life**

Our highly qualified team together with our precise production methods ensure that your plant will meet the highest quality levels.

CAPACITY

Thermal oil heaters by INTEC® using fuels such as natural gas fuel oil are operated in the capacity range of 100 kW up to 20,000 kW. Heater systems with higher capacity values may be offered upon request.

INTEC® thermal oil heater in cross-section



FUELS

For heat generation with thermal oil heaters manufactured by INTEC® conventional fuels such as heavy oil, light oil and natural gas are usually burnt.

If one of the above-mentioned fuels is not available, it is possible to use electrical energy for the heating process.

Depending on the application certain production waste in gaseous or liquid form may be considered for additional incineration.

In order to be able to use biomass and other wood waste as fuel, INTEC offers own developed grate firing systems and dust burners.



Thermal oil heater fired with natural gas with a capacity of 1.6 MW, installed in Texas, USA, for the food industry



Electric heater with an output of 150 kW with six heating elements for individual and exact regulation of capacity

LAYOUT

Depending on the space requirements and the customer's wishes, the heater can be installed either in vertical or in horizontal direction.

At the end of the first pass the flue gas is turned around, still having high temperature. Usually this area is clad with refractory material to keep the bottom of the heater at low temperature. Alternatively it is possible to replace the refractory material by an oil-cooled plate.

In case of horizontal installation, we are able to insert an inspection hatch in the baseplate or to install a hinged heater cover in order to facilitate cleaning and maintenance. In case of vertical design, the burner can be mounted on the bottom of the heater.

On the customer's request, it is possible to pre-mount and to pre-wire heaters with capacity of up to 2,000 kW together with other components (burner, pump, valves and fittings) on a framework. Thus, the work required for installation at the customer's site is considerably reduced.

REMOVAL OF LOW-BOILING SUBSTANCE

With time the thermal oil filling experiences a degradation which leads also to a reduced flame temperature. In order to reduce this effects and to increase the life time of the oil, INTEC® has developed a method to continuously remove the low-boiling substance during operation.

EFFICIENCY

System efficiency may be further improved by usage of a combustion air preheater, which has been developed by INTEC® and exactly suits the INTEC®-heater, as well as by our high-quality economizers. Thus, it is possible to either reduce fuel consumption or to increase performance by applying the same amount of fuel. Although these installations require higher investment costs, the invested capital will pay off within a short period of time.



Horizontal heater with a net capacity of 10 MW with combustion air preheater, fired with light oil entry door at the reversing chamber for the inspection of the combustion area, Malaysia



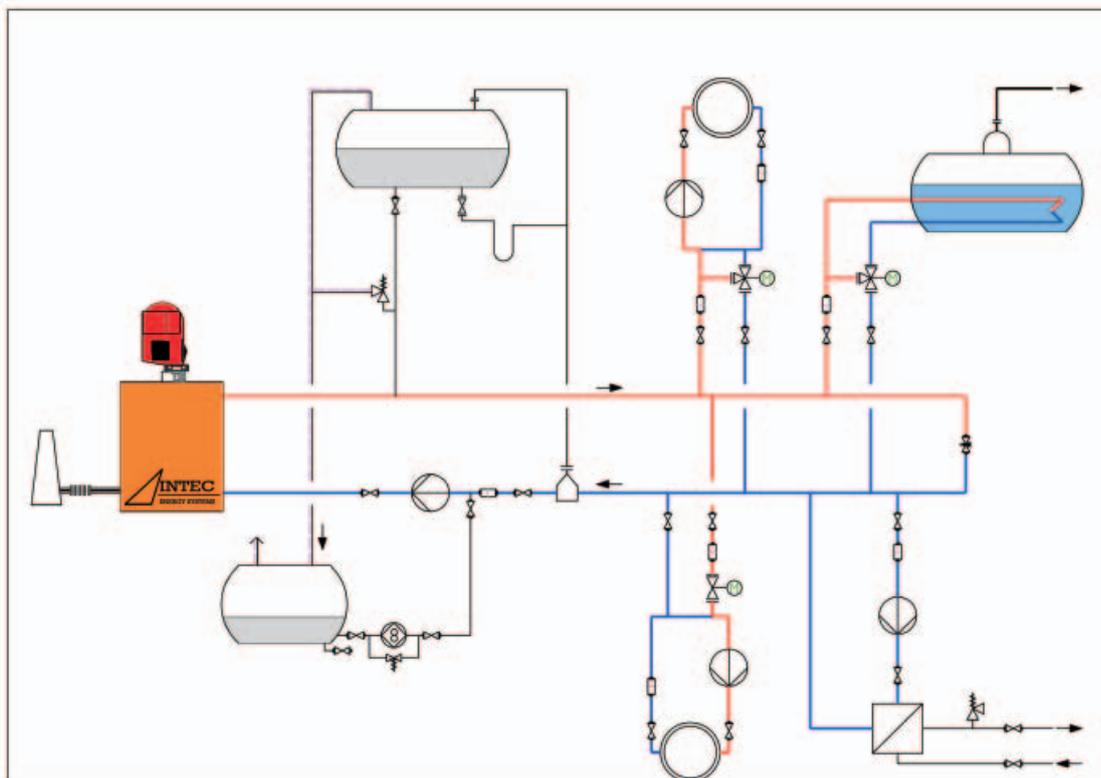
Heater in vertical layout, capacity: 9.6 MW with built-in combustion air preheater and subsequent stack, total height: 25 m, fired with natural gas; for heating of a particleboard press, Romania

SAFETY DEVICES

Emphasis is not only put on efficiency, but also on operational reliability:

- **The burner will automatically switch off, should the maximum admissible thermal oil outlet temperature or the flue-gas temperature after the heater be exceeded**
- **In order to protect the thermal oil, the burner capacity is reduced during cold start until the minimum temperature is exceeded. Following that, capacity output of the burner is increased until reaching the setpoint value**
- **The burner shuts down immediately if the pump stops running**
- **To avoid over heating and thus damaging of the thermal oil, a minimum volume of the oil must always flow through the heater. A flow control device approved for this type of installation controls the minimum oil flow through every single pipe coil**
- **The filling level of the thermal oil in the expansion tank is monitored by a float switch. If the filling level is too low, the plant will switch off**
- **If the plant is shut down, the circulation pump is operated for a certain period of time to carry away heat that may have accumulated**

In order to achieve high safety standards, INTEC thermal oil systems comply with the regulations of the German Industrial Norm DIN 4754.



INTEC® plants allow the connection of different consumers

The main components of the INTEC® heater are manufactured in Germany by INTEC Rohrtechnik GmbH providing the highest possible quality level



MANUFACTURING

In order to be able to meet the quality levels required by our clients and us, the core components of the INTEC® plants are manufactured by our subsidiary INTEC Rohrtechnik GmbH.

For the manufacturing of large components, we dispose of production facilities with a surface of 2,500 m² and cranes with an ultimate load of 12.5 t per unit.

Our machine park is specialised on the cold forming of tubes up to a nominal diameter of DN 250 as well as on the machining of thin and thick sheets up to a thickness of 25 mm.



Thermal oil heater fired with sanderdust and/or natural gas with a capacity of 16 MW



Thermal oil heater used to heat a plant for producing particleboard near Moscow, Russia, with a capacity of 12 MW



Extractable tube bundle of a waste heat boiler with automatic cleaning using a soot blower



Radiation boiler with built-in opening for dust burner, with oil-cooled combustion chamber cover

APPROVALS

Our subsidiary INTEC Rohrtechnik GmbH is a certified company according to:

- **AD 2000 - HPO**
- **Germanischer Lloyd (German Lloyd)**
- **Lloyd's Register**
- **Bureau Veritas**
- **ASME B & PV-Code, Section VIII, Division 1**

Thus, INTEC® is able to meet all specifications commonly required for execution and production of thermal oil.

Chemical tanker: INTEC® plants are also used in the marine industry:
Thermal oil heaters with capacities of 2 x 3.8 MW and a waste heat boiler with a capacity of 900 kW used for heating the cargo tank and the engine room consumers



Horizontally installed heater for the food industry pre-mounted and wired as compact unit



Thermal oil heater fired with natural gas and/or heavy oil, used for a polyester production plant in Thailand, with a capacity of 3 MW



Waste heat boiler in three-pass design with a net capacity of 8 MW, for heating of a production line for rubber products

In order to offer our customers best local support INTEC® is expanding the worldwide network of representations and partner companies

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DELIVERY PROGRAM

- **Thermal oil heaters**
- **Solid fuel firing systems**
- **Waste heat boilers**
- **Secondary control circuits**
- **Electrical heaters**
- **Plant ancillaries**
- **Project management**
- **After sales service**
- **Calculation of stresses in piping systems**
- **Plant maintenance**
- **Upgrading of existing installations**

www.intec-energy.com