

# PROCESS HEAT TRANSFER WITH MOLTEN SALTS.



To date Bertrams Heatec has supplied more than 3000 thermal fluid systems all over the world. They are used for a wide variety of chemical processes and perform an essential task in the higher temperature ranges.

## QUALITY AND SERVICE FOR YEARS TO COME.

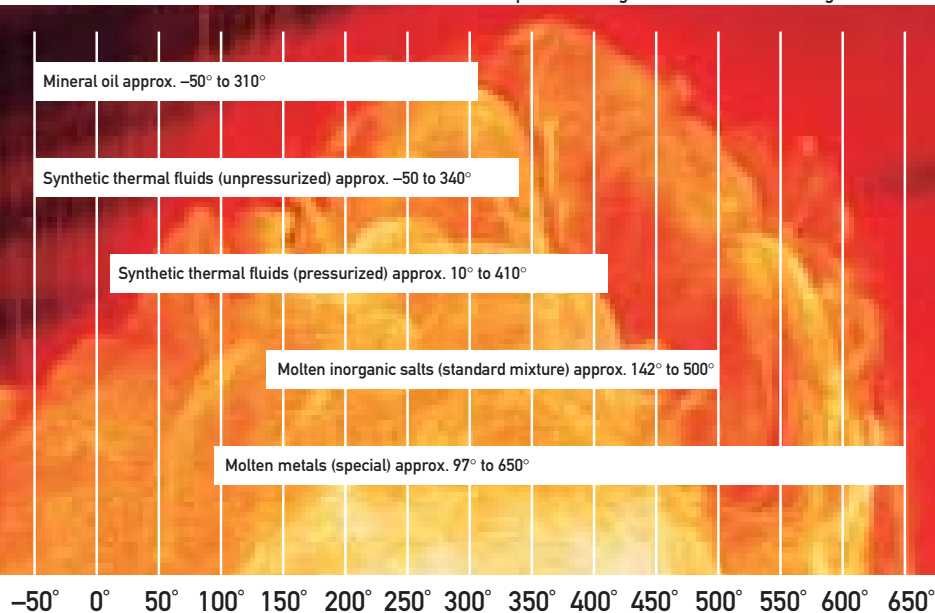
Bertrams Heatec systems are designed and built for trouble-free operation for many long years. We work in compliance with the international quality management standard ISO 9001:2000. This applies to all departments, from design work right through to after-sales service. Our equipment is certified by authorized inspection agencies recognized worldwide and bears their code symbol stamps for weld quality. We have developed our own fabrication and inspection methods for components subject to high temperatures and stresses. A constructive working relationship with our customers also contributes to the overall quality. Our customer-focused approach is exemplified by the long-term after-sales service given to our systems.



# PROCESS HEAT TRANSFER WITH BERTRAMS HEATEC.

Many chemical reactions and process technologies are dependent on external heating or cooling. This is why thermal fluid systems by Bertrams Heatec are of such vital importance – whether in the manufacture of artificial fibres, synthetic resins (melamine) and caustic soda, in the production of aluminium and dyestuffs, or for other applications in the chemical, textile and food industries.

Temperature range of various media in degrees Celsius



## THERMAL FLUIDS: MOLTEN SALTS, WATER-GLYCOL MIXTURES, MINERAL OILS, SYNTHETIC PRODUCTS, GASES, MOLTEN METALS.

Various media are available as thermal fluids to suit the specified duty. Their temperatures are raised to the required levels in the thermal fluid heater. The temperature range selected is an important criterion when designing a thermal fluid system.

## CUSTOMIZED INTEGRATED SYSTEMS – FOR THE RIGHT HEAT IN THE RIGHT PLACE.

Decades of experience have not only made us specialists in heat transfer by thermal fluids, but also the worldwide market leader in this field. We offer all plant components and engineering services from a single source – from project planning through fabrication to site installation. Every one of our systems is customized to meet your specifications; whenever possible we do not use standardized components. This approach creates ideal preconditions for maximum operational reliability and user-friendliness. It also ensures that each plant is designed for optimum cost-effectiveness and environmental soundness.

# HIGHLY DEVELOPED TECHNOLOGY FOR MOLTEN SALTS SYSTEMS.

## EUTECTIC SALT MIXTURES FOR TEMPERATURES FAR ABOVE 500°C.

At temperatures up to 600°C, molten inorganic salts are suitable thermal fluids for supplying heat to various chemical processes. Their prime applications, however, are those where a reaction takes place at high temperature levels, such as in the production of melamine or aluminium oxide. An eutectic mixture of salts with a melting point of 142°C (when new in service) is used. It is in the liquid phase under operating conditions and does not need to be pressurized.



▲ Molten salts system with a total output of 88 MW at 400°C. It supplies process heat to a bauxite digestion plant in Germany.

## SELF-DRAINING FOR MAXIMUM RELIABILITY.

Bertrams Heatec molten salts systems are self-draining. This means that when plant operation stops, the salts drain back down into the salt tank, leaving the piping empty and preventing solidification occurring there. Heaters can often attain impressive dimensions, up to 16 m in height and 5.5 m in diameter. The core of the heater is a proven design of tube coil which allows for thermal expansion.

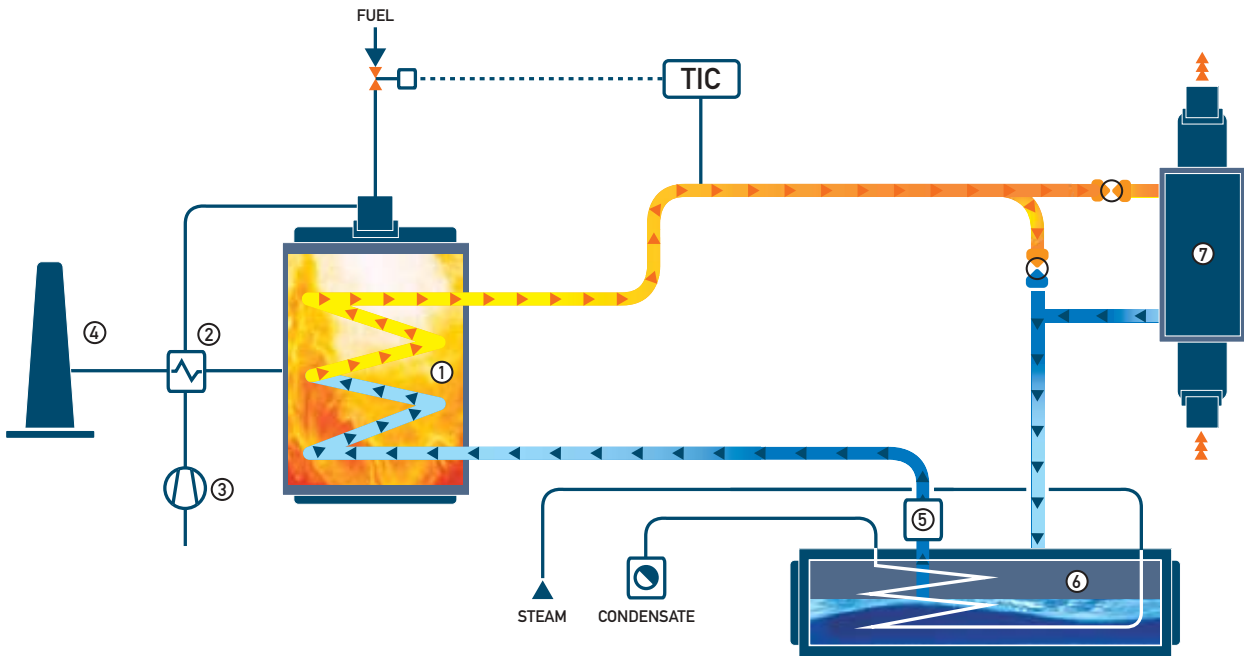
▲ A molten salts system with an output of 7.7 MW at 470°C for heating a melamine plant in Poland.

▼ Manufacture of a heater, the core component of any thermal fluid system.



## STATE-OF-THE-ART THREE-PASS DESIGN FOR HEAT TRANSFER.

The tube coils of our heaters are fabricated in a three-pass design for maximum energy efficiency. This allows for optimum transfer of heat from the flue gases generated by the burner to the heater tubes. The total length of tube coiled in the heater can amount to several kilometres for the larger units.



## DIAGRAM OF MOLTEN SALTS SYSTEM.

1. heater with burner
2. air preheater
3. combustion air fan
4. stack
5. salt pump
6. steam-heated salt tank
7. heat user

### THE TECHNICAL CORNER:

- Output temperatures up to 630°C
- Wide selection of capacities up to 45 MW per heater
- Self-draining for safety and reliability
- No radiant heat reflection as little refractory lining
- Optimum heat distribution through three-pass design
- Various firing orientations possible (downshot, vertically upwards and inline)
- Heaters supplied completely assembled
- Turnkey supplier responsibility
- Over 60 years experience in building thermal fluid systems

# CUSTOMIZED SYSTEMS FOR EFFICIENT HEAT TRANSFER.

Bertrams Heatec designs, develops, manufactures and erects thermal fluid systems for heating a wide variety of processes. Every single project is executed to meet customer specifications exactly.

- Heat transfer with molten inorganic salts
- Heat transfer with organic media in liquid phase
- Heat transfer with organic media in vapour phase
- Heat transfer with water-glycol mixtures
- Fired process heaters for direct heat transfer
- Thermal fluid heaters and waste heat recovery systems for solid fuels
- Compact electric heaters

