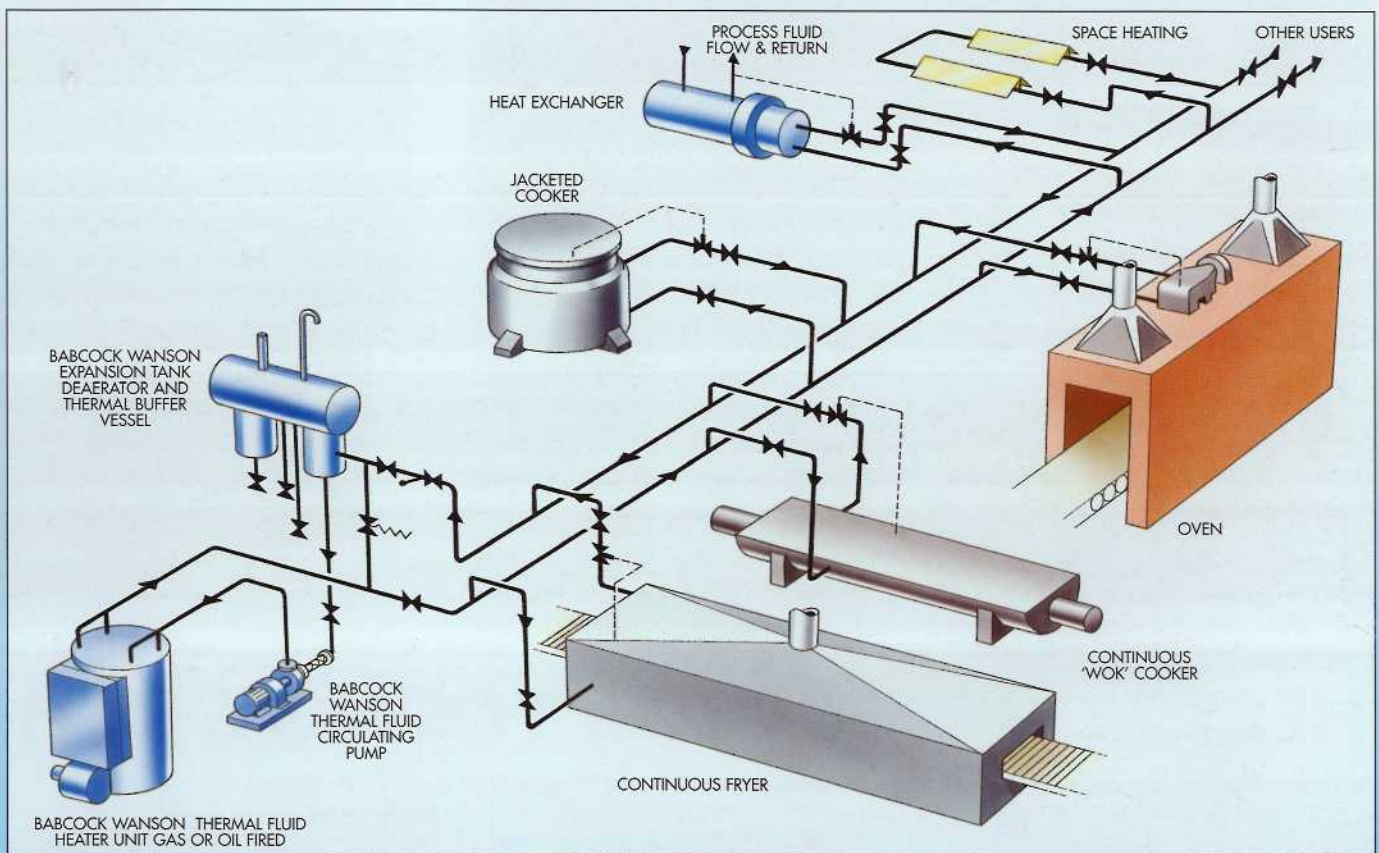


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# Babcock Wanson **SOLUTIONS** PROCESS AND SPACE HEATING

## THERMAL OXIDISING ODOUR DESTRUCTION AND THERMAL FLUID HEATING FOR THE FOOD INDUSTRY



Typical application by Babcock Wanson for a Food Industry Production Plant

### The Advantages of THERMAL FLUID HEATING SYSTEMS

**The principle advantages of Thermal Fluid for food processing include:**

Controllable supply of heat energy at lowest possible cost.

Very low maintenance requirements for highest possible plant availability and long plant life.

Easy to run closed circuit system requiring minimal supervision, may be fully automated and integrated completely into process plant for accurate temperature control and safety.

Thermal fluid operates at atmospheric pressure at up to 315°C without effluent being produced with no steam trapping, with no freezing hazard, no blowdown or condensate losses, all features contributing to low running costs, improved production rates and safe environmental compatibility.

The closed circuit no loss characteristics of a thermal fluid system not only offers considerably lower fuel consumption than alternative systems but result in equivalent reductions in emissions to atmosphere.



Effluent and odour produced by the cooking process from frier and cooker hoods, for example, may be simultaneously oxidised at the same time as providing process heat in the Babcock Wanson LNHI Combi combined thermal fluid heater and thermal oxidiser.

The advantages of using Babcock Wanson include being able to tap into the vast experience of our

international group to solve the practical problems associated with providing heat for cooking.

Babcock Wanson designers have experience in all types of food process heating from Snack Friers to Rendering plants utilising thermal fluid, steam, direct firing, thermal oxidising, heat recovery and combinations of these skills together with a turnkey option when required

bringing all the skills and all involved expertise to focus on the correct conclusion for the end user.

### Action

Call Babcock Wanson Process Engineering Division and talk through any aspects of your system problems or plans with us. Our specialists are keen to help and are pleased to visit you if you wish.



## HEATING FRYERS FOR YOUNG'S FISH

Fish from all over the world is quick-fried, chilled and packed at Ross Young's Pyewipe factory, Grimsby. Within hours it is in high street stores as Young's or supermarket own-brand products.

Frying is a vital element of the production process, and this means that consistent cooking oil temperature and safety are essential. Ross Young meets both these criteria at Pyewipe with two Babcock Wanson thermal fluid systems.

A gas-fired Thermal Fluid Heater 400 rated at 470kW pumps 81 litres of hot thermal fluid through coils in the factory's fryers to heat and keep their cooking oil at 200°C. The fluid is then piped back to the Heater and reheated in a continuous operation.

Using this system, the oil can be raised to the required temperature in only 45 minutes from start-up - which is

considerably faster than by direct gas heating.

### Accurate temperature control

But although speed-to-temperature is beneficial, it is worthless unless product quality is guaranteed. Here, Thermal Fluid wins again with its fully automatic operation, simplicity of temperature control and absolute reliability.

### Safe and reliable

Yet another benefit is plant safety, which is much greater with a closed circuit fluid system. On a Thermal Fluid system, a temperature controller pneumatically switches the bypass valve if the temperature oversteps the upper or lower limits, assuring complete safety if services fail.

### 30 per cent savings

The units are also 30 percent cheaper to run than comparable systems: all sizes of Thermal Fluid Heater are designed for a minimum combustion efficiency of 87 per cent.



# HOT POTATO ON THE EMERALD ISLE



Freshly fried Tayto potato crisps are conveyed to the packaging line.

'Quality starts here', says a large notice immediately inside the door of the factory of Ireland's leading manufacturer of snack foods and potato crisps.

As well as the tasty, well-presented products themselves, all aspects of this operation, including the interior and exterior environments of the plant project a similarly clean-cut image. The company is determined to keep this intact and has not been afraid to invest in the right equipment for the purpose.

Key aspect to production is the frying

process and Tayto uses only the best ingredients and methods. Their crisps, for example, are fried in sunflower oil using an energy efficient Babcock Wanson indirect fluid heating system, incorporating effluent incineration and heat recovery.

## Keeping the heat on

Two natural gas-fired Babcock Wanson Thermopac 1500s are installed at the plant, one being used at a time to heat the thermal fluid for frying and the other coming on line to satisfy peak seasonal demands. A Babcock Wanson Incinex incinerator, also gas-fired, takes care of any airborne effluent discharges from the two frying lines.

Heat is recovered from the hot gases produced by the incinerator via a condensing economiser, and is reintroduced to the thermal fluid circuit, thereby creating a very energy-efficient and environmentally-friendly cooking system. Moreover, the benefits of the incineration process do not stop here because the heat recovered is not only sufficient additionally to boil water for

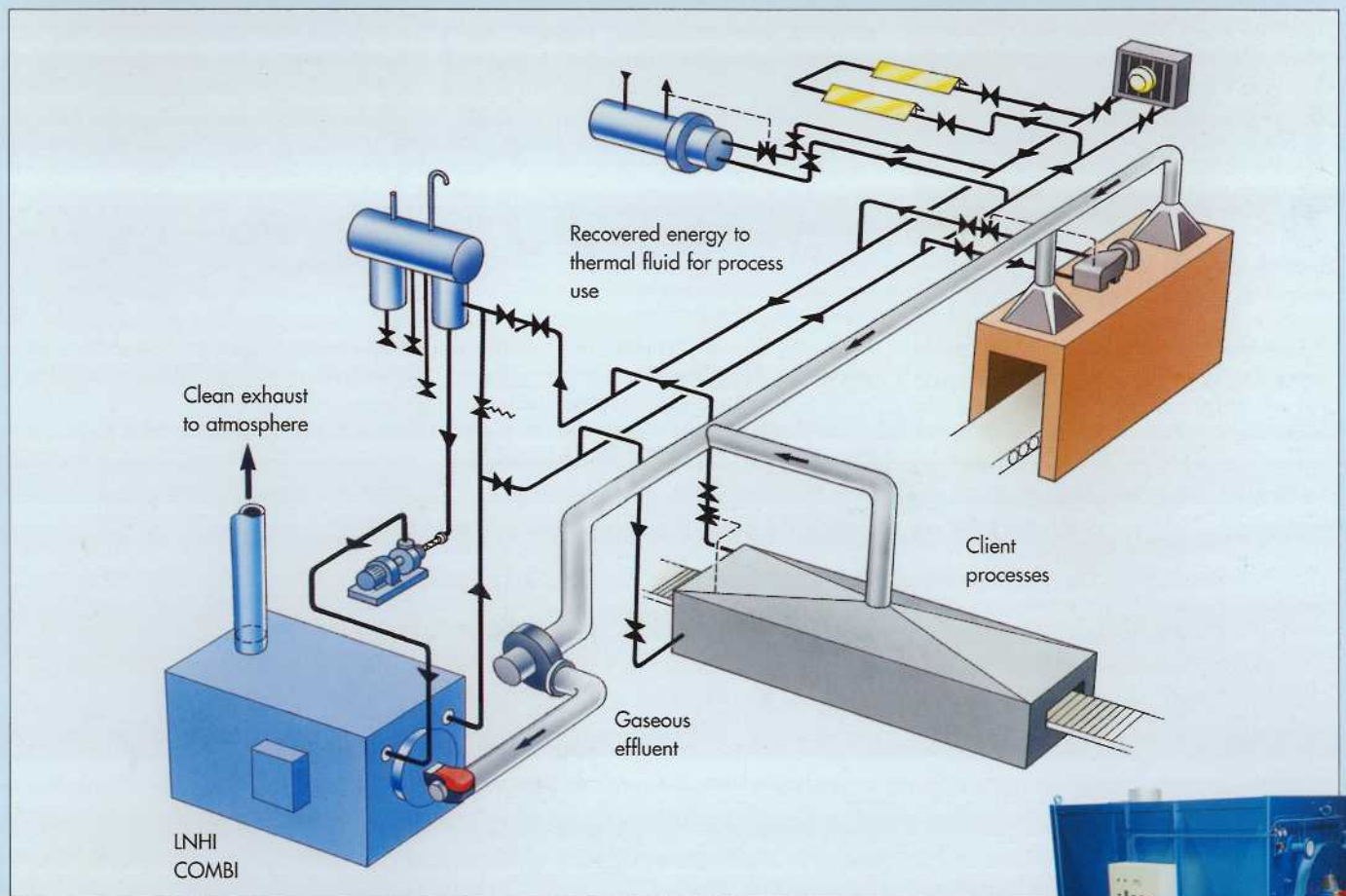
blanching potato crisps prior to frying, but also to drive the factory's radiant space heaters during the winter months.

A frying temperature of 180°C is achieved in the sunflower oil by means of the heat energy indirectly transferred by the thermal fluid as it is pumped through specially configured coils in the firers at 265°C. Each Thermopac unit provides a heat flow rate of 1740kW to drive the thermal fluid circuit, whilst a temperature of 800°C is reached in the combustion chamber of the Incinex to burn off the odour and oil vapour from the frying process.

Tayto has capitalised on the advantages of thermal fluid since 1984, having switched to Thermopac from a Salvo direct fired heat exchanger at that time.

Thermal fluids are available in a wide range of types, from water-based though oil-based to inert silicon fluids and accommodating temperature differentials of -40°C to +400°C in both heating and cooling modes.

## THERMAL OXIDISING AND COMBINED THERMAL FLUID HEATER



Thermal oxidation and odour destruction with the Babcock Wanson COMBI combined Oxidiser and Thermal Fluid Heater.



# Perfectly-fried chicken with Babcock Wanson heating at Sun Valley Foods



Sun Valley Foods Ltd's new purpose-built Balliol Business Park plant near Wolverhampton has recently commissioned two Babcock Wanson Thermal Fluid Heaters 250LN units 290kW each for a jacketed Autowok and a Stein fryer. The equipment is part of a £1.6M investment in plant for the £30.0M factory development project. The highly automated processing facility produces a wide range of packaged and frozen foods for a leading fast food chain and a major UK food retailer. The contract was won by Babcock Wanson after proving its comprehensive engineering and service capabilities and its ability to provide a compact, reliable solution to overcome the space restrictions.

The Balliol plant was designed to meet the stringent quality control programmes of Sun Valley's customers

and provides very rapid response to customer demands. As the factory was already in round-the-clock operation when the equipment was installed, great care was required in planning the engineering works. Minimum disruption was ensured as the installation of the two heaters, expansion tanks and all pipework was completed by Babcock Wanson engineers in a single weekend.

The Stein fryer and Autowok each have a dedicated gas-fired Thermal Fluid heater. The systems are not cross-linked in order to comply with stringent fire and safety standards. A food-safe thermal fluid from Panatherm meets the performance requirements at the original operating specification of 300°C. The Thermopac unit for the Stein fryer is currently operating at 260°C and the Autowok at 230°C.

Colin McGibbon, engineering manager at Sun Valley Foods, commented on the quiet operation of the Thermal Fluid units but considers that the main benefit of using Babcock Wanson equipment is the accessible local service which Babcock Wanson provides for installation and after-care. "Getting the installation completed in less than two days requires qualified, technical staff," he noted. Babcock Wanson also had the edge over other suppliers with the compactness of the vertical configuration heaters, and the extra feature of a deaerator unit which is important when

you are using food-safe oils."

The vertical configuration of the heaters minimises the occurrence of vapour trapped in the system and the deaerator unit in the expansion tank removes any remaining vapour suspended in the thermal fluid before it is circulated. Unvented air will cause fluid degradation through oxidation. The expansion tank also has a thermal buffer unit which keeps the temperature in the tank below 50°C to reduce the rate of oxidation of fluid held in the tank. Food grade thermal fluids are more susceptible to oxidation than synthetic or mineral oils so the careful temperature control and deaeration techniques of the Babcock Wanson system ensure longest possible fluid life.

The new LN range of low-emission thermal fluid heaters has been developed by Babcock Wanson to meet increasingly rigorous environmental regulations. There are fourteen models with outputs from 290kW to 2385kW which can be oil, gas, LPG or dual-fired. Built to international standards and approvals, TPC equipment provides low pressure, high temperature fluid heat transfer in a closed circuit system for fryer, tank, jacketed vessel and oven heating in the food processing industry as well as process heating for a wide range of industrial applications.

## Frying bhajis to just the right colour



Thermal fluid heating provides precise control of cooking temperatures at Katsouris.

Thermal fluid heating used by Katsouris Fresh Foods Ltd at Park Royal in West London maintains the temperature of the deep fat fryers so precisely that even the onion bhajis, notoriously sensitive to changes of temperature, are always cooked to just the right colour. John Gray, Chief Engineer at Katsouris, explains that the company's Babcock Wanson thermal fluid heating system has done everything required of it, even throughout the last year or so during which the company's size and food output have doubled. "I think it is superb" he said. "We have four

tunnel fryers, each with a separate thermal fluid circuit, to which thermal fluid is supplied at up to 280°C. We have brat pans running at 205°C, rotary rack ovens, a jacketed cooker and other equipment - all entirely heated by thermal fluid. A deviation of even 3°C in the bhaji frying temperature of 147°C would change the colour of the product dramatically and unacceptably. However, the controllability of the Babcock Wanson system ensures that it simply does not happen".

### Foods for supermarkets

Katsouris is a family-owned business employing 1,200 people in three factories either side of the busy A40 road west of London, with a further factory at Wembley. The company is a leading manufacturer of food products such as samosas, snack foods and ready meals for the leading supermarkets, so quality control and efficiency are paramount.

John Gray first introduced the reliability of Babcock Wanson thermal fluid heating into the company in 1981, and the scale of the

Babcock Wanson installations has been growing with the company ever since. At 306 Elvedon Place, Park Royal, the factory has two natural gas fired Babcock Wanson TPC 600B thermal fluid heaters, each rated at 705 kW and delivering 2,400,000 Btu/hr. During 1997, Katsouris, already bursting at the seams at 306 Elvedon Place, bought No. 305 next door and doubled the available space. Within a year, the new factory was fully utilised, and No 304 was added to the premises to provide warehouse space.

John Gray and his team discussed the requirement for additional heat for cooking operations at the new factory with Babcock Wanson, who worked closely with the Katsouris plant engineering team to draw up a specification. As a result, Babcock Wanson was asked to supply and commission a larger TPC 1000 B thermal fluid heater rated at 1175 kW with an output of 4,000,000 Btu/hr. Alongside this has been installed a Babcock Wanson VPX RR 2500 steam generator, used to provide steam on demand to meat cooking processes where product weight has to be maintained during cooking.

**"115 years of Babcock - 70 years of Wanson - 44 years of Wanson UK.  
There is no substitute for experience."**



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Sales and Manufacturing facilities in UK, Belgium, France, Italy, Morocco, Poland, Portugal, Spain and Switzerland.

The Babcock Wanson Organisation operates in more than 50 countries. This network makes it possible to offer services to Babcock Wanson customers anywhere in the world. Babcock Wanson Company's policy is one of continuous improvement and the right is reserved to change specifications and dimensions at any time without notice.

