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Flo-Therm™

Frying Oil Heating Systems with Pollution Control

Dedicated Food Processing Systems

The Oil Heating Standard for the Snack Industry

The forefront of food processing technology

Flo-Therm™

Introducing Flo-Therm™ Generation 4

High efficiency oil heating system with pollution control

The Flo-Therm™ range heater has evolved over the last decade and today we are proposing a heater which has a number of items which ensures that efficiency is maximised.

These efficiency improvements have been designed based on experience and scientific basis. The list below describes some of the key features of the Flo-Therm™ Generation 4.

Potato Chip (Crisp) Lines • French Fry Lines • Snack Lines

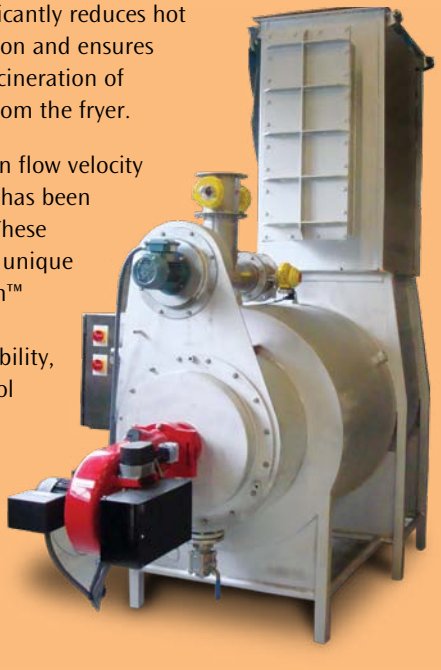
Equipment Description

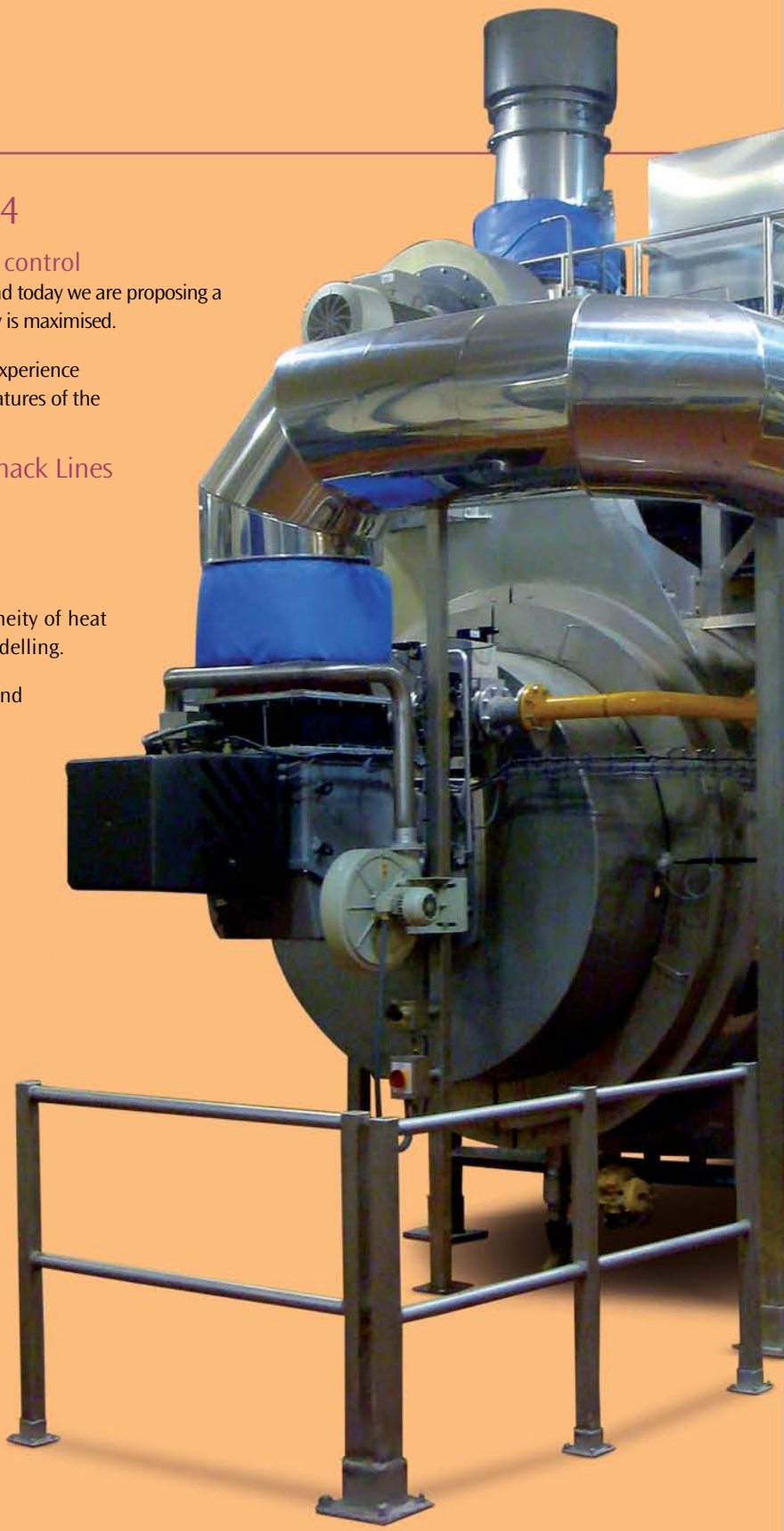
- Flo-Therm™ Heater

  Our heater has been designed to ensure perfect homogeneity of heat transfer across the heat exchanger via computer flow modelling.

  This ensures that energy from the gas is used optimally and vortex formation is minimised which significantly reduces hot spot formation and ensures complete incineration of pollutants from the fryer.

  The pollution flow velocity distribution has been optimised. These features are unique to Flo-Therm™ and ensure greater reliability, better control and greater efficiency.





- Burner Pre-Heat

  The Pre-Heat exchanger uses patented technology which allows maximum heat transfer with minimum pressure drop increase to the burner system. Pre-heating of combustion air up to 160°C from ambient is possible. An efficiency improvement of up to 5% has been achieved.

- Combustion Management

  Our current burner is a Weishaupt WK Series which offers great versatility. Added to our burner we also have an additional combustion management suite which allows tuning of the burner excess air. This allows saving energy not only at start-up but also across the range of throughput. This feature is proprietary to the Flo-Therm™ design and is not present on other suppliers machines. Additional gas savings of up to 2% have been achieved with this system.

- Burner Optimisation

  Burner optimisation allows fine tuning of the pollution flow, fryer damper and excess air through the range of production, to ensure that the heat energy to the heat exchanger is delivered with minimum gas use. Burner optimisation accommodates for variations in the process such as potato solids and production rate changes. Additional gas savings of up to 3% have been achieved.

- Heat Exchanger

  Our heat exchanger has been designed and optimised to:

  - Reduce pressure drop in both the oil and air side
  - Maximise exchange surface area which corresponds to the best heat transfer coefficient for sunflower oil
  - Optimise oil velocity throughout the different passes which allows reduced bulk to skin temperature.

  The resulting effects are:

  - Reduced power consumption of oil pump
  - Reduced exhaust stack temperature hence greater efficiency (+7%)
  - Reduced FFA formation.

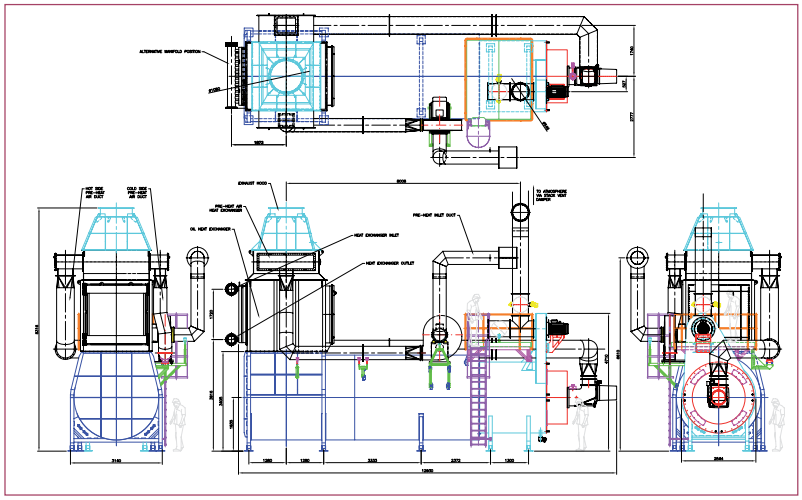
Our G4 combined with our pre-heater can achieve a stack temperature as low as 125°C which is ideal for water recovery units. The combination of our heat exchanger and burner optimisation allows a reduction in the fluctuation in Delta T hence improving the overall efficiency average.

Efficiency Calculation

Our method of calculating the efficiency utilises accurate data for both the oil and the calorific value of the gas and we also ensure that our temperature probes have been UKAS calibrated in the range of operation.

Specification

Counter-flow and U-tube heat exchanger, designed for a variety of oils with increased surface area maintaining system pressure drop. Combustion air pre-heat at 150°C with Weishaupt burner, combustion management and burner optimisation to ensure adequate gas to air mixture and optimum heat distribution with minimum gas use.



For more information please contact Flo-Mech Limited Telephone: +44(0)1733 233 166
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At the forefront of food processing technology…

Who are Flo-Mech?

Flo-Mech is a privately owned limited company, employing highly skilled personnel with a heavy emphasis on engineering. We design and manufacture specific pieces of machinery that cannot be procured within our group.

To achieve this, our designers create manufacturing drawings, which are then passed onto a number of specialist sub-contractor workshops. This equipment is manufactured under our total supervision before it is given the Flo-Mech name.

Turnkey project management

One of Flo-Mech's strongest assets today is its ability to provide our customers with the most complete project management service. Many of our customers prefer only to deal with one company who can manage full "turnkey"

projects. With many successful installations already completed, we have secured a number of long-term partnerships with major "blue-chip" clients. From pre-engineering studies through to factory installations we can provide a "total management" solution. Our team of experienced project managers pride themselves on providing the very best service to meet our customer's requirements. By using latest computer technology, CAD and 3D drawing facilities, projects are closely controlled to ensure "milestones" are met. Each project is enhanced by implementation of a modern Health & Safety policy incorporating on-going risk assessments and regular auditing. Production of P&ID and PFD drawings, detailed project schedules, operation and parts manuals and relevant C.E. documentation all go to help making each contract a complete success, to specification, on time and within budget.

Commitment to service

Commitment to our customers extends way beyond the sale. We understand that response times are critical in the food industry, and this is reinforced with our 24 hour a day, 7 day a week emergency service.

We ensure that members of our service team become involved with each contract at a very early stage, ensuring continued quality support long after the installation crews have left site. Our fully qualified service engineers are registered with the Gas Safe Register and A.C.S approved. A comprehensive range of spare parts is held at Flo-Mech House, further enhancing the commitment to our customers.

The Flo-Range

Flo-Cut™

The Flo-Cut™ sizer halver was originally designed and built to size-grade and halve large potatoes in a crisp production facility. Today it reaches a wider audience as companies look to use its features combined with other technology to produce end products such as quarters for roast.

Flo-Grade™

The Flo-Grade™ has been developed to be installed with our Flo-Cut™ sizer halver unit or on its own as a standalone potato or tuber grader. It has a tapered screw design for gentle grading and transfer of potatoes.

Flo-Flavour™

Flo-Flavour™ in recent times has expanded into two main areas. The systems are designed either to handle a pre-mixed slurry, keeping the components in suspension and delivering to the flavour drum, and in addition can be supplied with full mixing and holding/ distribution tank facilities.

Flo-Starch™

The Flo-Starch™ unit has been designed to recover starch from potato processing waste-water giving the benefit of reusing the cleaned water back in the process line and collecting the dry starch to be used in other processes. The Flo-Starch™ system is a self contained, skid mounted plug and play unit based on centrifuge technology with PLC control to ensure optimum performance.

Flo-Cool™

Oil quality is an important operational and financial factor in modern frying processes. Flo-Cool™ is designed to rapidly reduce the frying oil temperature at the end of production or during a production break. Production shut down times are reduced and coupled with our Nitrogen blanket system, the oil can be returned for storage and protected in an inert gas environment under greater operational control.

Flo-Mech Limited

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