

ISSUE 1

HEAT TRANSFER TECHNOLOGY

The latest news and views on heat exchanger technology from **BOWMAN®**

IN THIS ISSUE



GREEN HEAT

Providing low carbon heating for Turnberry Golf Course. See page 2.



LEADING THE CHARGE

The new JK190 charger cooler. See page 4.



SUCCESS IN MILAN

PowerGen Europe exhibition proves a major success for Bowman. See page 3.

How Bowman brought heat to the Antarctic

Heat exchangers supplied by EJ Bowman are a key part of the success of the British Antarctic Survey's new Halley unit facility. Read more on page 2.



Solar Heating... why is it such a brilliant idea for swimming pools?

Jamie Pratt explains the pros and cons of this natural resource as a primary heating source for swimming pools. Read more on page 4.



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HOW BOWMAN BROUGHT HEAT TO THE ANTARCTIC

In the Antarctic, reliable heat and power isn't a luxury, it's a matter of life and death. Bowman heat exchangers have been used in the combined heat and power (CHP) system at the British Antarctic Survey's new Halley VI station, which is currently under construction on the Brunt Ice Shelf, Antarctica, and due to be fully operational at the beginning of 2012.

As the UK's most isolated research facility, the station houses laboratories and living accommodation for BAS scientists. The CHP system provides the occupants with a constant and reliable energy supply, including heating, lighting, ventilation and power.

It was designed by Westac Power Ltd and uses waste heat to warm the buildings, melt snow and provide hot water. The heat exchangers capture the waste heat from the exhaust and cooling systems, which would otherwise escape into the atmosphere. This process allows the CHP unit to provide heating and hot water at no additional cost in terms of fuel usage or emissions to the environment.

With the station operating in extreme temperatures - in the middle of the Antarctic summer the average temperature is only -5°C, plunging to around -50°C in winter - an estimated fuel demand of 240,000L per year is required to keep the station operational. Meeting this demand was critical in the design of the power system alongside reducing energy consumption and emissions.

The Bowman heat exchangers can reclaim almost all of the lost heat from the engine and achieve total performance efficiencies in excess of 90%. They also help lower the cost of operation by reducing energy consumption and saving on fuel and shipment costs.

Kevin Howell comments: "If you take a typical 35 kW gen-set, the power generated can be increased substantially by simply recovering waste heat from the exhaust and cooling systems. Typically another 60 kW of thermal energy which would otherwise be lost to the atmosphere can be recovered. Even with the most efficient gen-sets, generating electricity alone is inefficient in terms of fuel input to power output.

INCREASING GENSET EFFICIENCY UP TO 90%

"For example, for a 100 kW (gross power) engine, only around 35% of the fuel energy gets converted to electrical energy. The balance is thermal loss and waste heat, which gets released to atmosphere through the exhaust, cooling and lubricating systems.

"Heat exchangers turn the gen-set into a CHP system, enabling waste heat to be captured. This significantly improves system efficiency which can be as high as 90% plus, if all the heat recovery opportunities are realised.



GREEN HEAT

Turnberry golf course gets the benefit of CHP

EJ Bowman has helped reduce the carbon footprint of one of the 'greenest' locations in Scotland; Turnberry Golf Course.

Turnberry is one of the world's premier golf courses and has hosted the British Open Golf Championship four times. Over the past decade, it has developed into a year round 'Luxury Collection Resort' including a hotel, a spa, sporting and outdoor leisure activities, restaurants and bars.

While the resort's demand for energy has

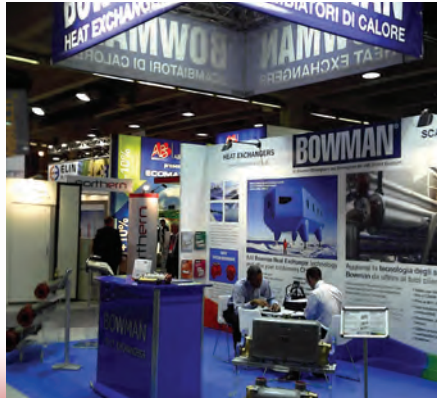
SUCCESS IN MILAN!



Bowman heat exchanger technology wows visitors to PowerGen Europe

EJ Bowman has made a major impact on its debut appearance at the Power Gen Europe exhibition which was held in Milan in June.

The company showcased its latest products designed to provide engine based Gen-set manufacturers with a simple way to offer a Combined Heat and Power (CHP) solution to their customers and, says Sales Manager, Jamie Pratt, the response from visitors "exceeded all expectations."



"Not only did we get an excellent response to the stand, we also secured a substantial number of new business enquiries during the show. Visitors appreciated the quality of the product, and our knowledge and experience in this market," adds Jamie.

New products on show included the 2-25 and 2-30 ultra compact exhaust gas heat exchangers which enable even the smallest Gen-sets to be converted to offer the benefits of Combined Heat and Power, as well as Bowman's new charge air cooler, the JK190.

MARINE COOLING AT THE DOUBLE

Bowman technology provides an efficient solution to marine cooling application.



The new double cooler is based on Bowman's popular EC heat exchanger range, which was designed for use with smaller engines up to 300kw. It connects individual sealed circuits for cooling specific fluids such as engine oil, gear box oil or water jacket coolant within a single heat exchanger - using just a single flow of sea water to cool and keep these fluids at optimum temperatures.

Multi-function cooling offers a wide range of benefits to vessels and Bowman has responded with a new compact 'double cooler' marine heat exchanger.

STAYING COOL



Bowman has extended its range of hydraulic oil coolers with the introduction of the new PK 800 unit. The PK Series is a well established range of heat exchangers, designed to provide a highly efficient cooling solution for a very broad range of hydraulic oils and fluids.

The PK 800 has been developed in response to customer demand for a larger heat exchanger to cool the most demanding hydraulic applications generating heat loads of up to 850 kW. It features a fully floating tube stack which minimises thermal stresses on the unit and enables it to be easily removed for routine cleaning and maintenance.

expanded, it was also keen to reduce its CO₂ emissions and energy costs by generating power independently on site through an independent CHP system.

Working in conjunction with *I Power Energy Systems*, a specialist USA CHP manufacturer, Bowman supplied a series of exhaust gas heat exchangers to capture waste heat from the generators and convert it into heat and hot water energy. This process increases generator efficiency significantly, from

around 35%, when generating electricity alone, up to a possible 90% when used with heat exchangers to recover waste heat from exhaust and cooling systems.

As the heat captured is a by-product of the generator's engine, no additional fuel is consumed and with no extra CO₂ emissions, the heat and hot water is effectively produced for free and no detriment to the environment.

Terry Pahls of *I Power Energy Systems* said,

"The significant improvement in "carbon footprint" for the hotel is the result of the high thermal efficiency of our CHP Gensets and a major contributor to this efficiency is the use of Bowman exhaust gas heat exchangers. We value our business relationship with Bowman and the high quality of design and manufacturing we experience with their components."

SOLAR HEATING - A BRILLIANT IDEA FOR SWIMMING POOLS

SALES MANAGER, JAMIE PRATT OUTLINES THE POTENTIAL FOR HEATING POOLS USING SOLAR ENERGY.

Solar collection has long been a 'green' option for the pool industry. While it has been successful for installations in Southern Europe, do the vagaries of the Northern Europe climate limit its potential.

Jamie Pratt, Sales Manager explains; to use solar collection to its full potential, it is vital to look at other components in the pool's heating system. The performance of a high efficiency heat exchanger, for example, can have a profound effect on pool heat-up times and energy efficiency.

Bowman quality heat exchangers, achieve the desired water temperature in around a third of the time of many competitor products. This

maximises the effectiveness of solar collectors, enabling them to be used as the primary pool heat source for much longer throughout the year, saving significant amounts of energy, reducing fuel costs and carbon emissions.

Bowman offers one of the most comprehensive ranges of swimming pool heat exchangers in Europe, from 40kW-1000kW, in cupronickel and up to 320kW in titanium and stainless steel to suit all applications.

With pool heat-up times up to 60% faster, energy demand is significantly reduced, making solar heating a much more viable heat source for Northern Europe.

Bowman's solar panel heat exchanger range has been specially designed to work with the lower temperature water from solar heating (compared to the hotter temperatures of traditional boilers) and is supplied with a thermostat pocket end cover and mounting brackets as standard.



LEADING THE CHARGE



Bowman has launched a new charge air cooler that is ideal for larger capacity turbo charged applications, including Gen-sets, co-generation equipment, as well as engine test and development programmes. The JK190 is designed for engines rated up to 650kW and provides reliable cooling of turbo charged air, enhancing engine performance and fuel efficiency, whilst reducing emissions.

The JK190 is part of Bowman's comprehensive charge air cooler range which is capable of handling heat loads of up to 85kW. The units are available in a variety of materials to suit even the most demanding applications and a further benefit is the fact the tube stack is easily removed for routine cleaning and maintenance.

FOR MORE INFORMATION

If you would like more information on any of the articles contained in this newsletter, or for technical data on any of our heat exchanger ranges, please contact us directly;

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