ISSUE 4

HEAT TRANSFER TECHNOLOGY

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

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Halley VI research station, which uses Bowman heat exchangers has won global awards for its design and construction.

AUTOMOTIVE TESTING SHOW SUCCESS

Having established a strong presence in the UK automotive testing industry, Bowman is actively developing opportunities in Europe and beyond – so we were delighted with the interest generated by our products at the Automotive Testing Expo show in Stuttgart in June.

Visitors from leading OEM's, test houses and consultancies across Europe, USA, Asia and South America came to discuss solutions for their development applications - particularly in the field of hybrid, electric/battery and turbocharger technologies.

The Bowman stand showcased a wide range of heat exchangers for engine test house requirements, with our exhaust gas heat exchangers attracting particular interest due to increasing awareness of the environmental and economic benefits of recovering and re-using waste heat energy. The new copper-free in-line plate heat exchangers, developed in response to the increasing use of Ethanol in fuels also proved extremely popular.

"The excellent level of enquiries we received proves just how vital a role heat exchangers and fuel coolers play in modern engine development and testing. High product quality and operational reliability are key issues when automotive companies are choosing equipment solutions for their test facilities which is why they increasingly specify Bowman." said Sales Manager, Steven Jackson.

NEW TITANIUM TUBE STACKS

Bowman heat exchangers can be found operating in some of the harshest conditions on earth. So it's no surprise that long life durability has been key to their success.

Now, to provide customers the ultimate 'fit and forget' solution, Bowman is offering the option of Titanium tubestacks across the full size range of its heat exchangers.

Titanium provides levels of durability and longevity unmatched by cupro-nickel or stainless steel. It can indefinitely withstand attack from aggressive chemicals and is impervious to galvanic reaction – a major cause of tubestack erosion. Additionally, as Titanium tubestacks allow higher velocity through the tubes than other materials, they are more efficient, providing better heat transfer.

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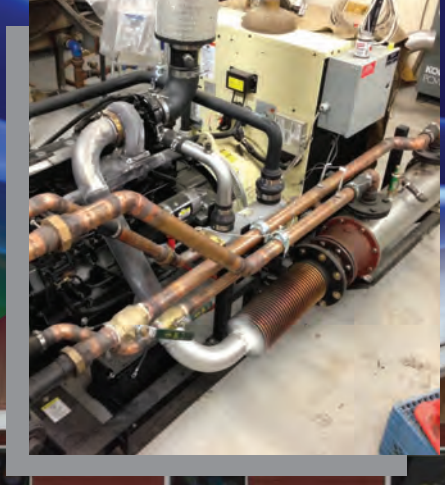
BOWMAN®
A World Leader in Heat Exchanger Technology

AFFORDABLE POWER FOR THE CANADIAN NORTH



Bowman heat exchangers are playing a key part in a co-generation system that has halved electricity costs in a remote Canadian community.

Charge Air and Exhaust Gas Heat Exchangers have been installed in an upgraded co-generation system that brings vital power and heat to Fort Providence in the Northwest Territories.

In this remote location, 2,000km north of the Canadian-USA border, some of the community's commercial and retail facilities are provided by the Snowshoe Inn (SSI) operation. In winter, temperatures can fall to -40°C and utility and diesel costs are extremely high.

For the past 40 years, a co-generation diesel power plant had provided all the required off-grid electricity and heat for the SSI operations. However, in 2013 the old 120kW/208v diesel Gen-sets were replaced with two new 150kW/600v state-of-the-art Gen-sets.

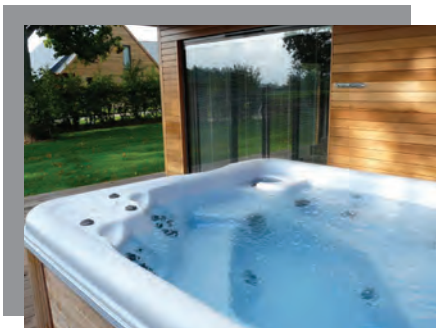
One generator has already been installed using a Bowman Exhaust Gas Heat Exchanger (model 8-32-3742-5) and Charge Air Cooler (model FG100-4705-2). A second generator will come on stream in Autumn 2014, with the third generator planned to serve as a backup unit.

The high efficiency Gen-sets and Bowman units have delivered huge savings in heat capture – results that have implications for scores of other remote communities in Northern Canada.

By adding a Bowman unit to a Gen-set, waste heat energy from the water jacket and exhaust gases can be used to provide a 'green' CHP solution that delivers heating and hot water - or even more power, with no additional fuel requirement. In addition, Gen-set efficiency is significantly increased - with up to 90% of waste heat being recovered and turned into valuable 'free' energy.

"The Bowman units are performing extremely well, with at least 60% gain in heat capture due to the massive improvement in efficiency," says Jeff Philipp, owner of the SSi Group of Companies which runs the Snowshoe operation.

"This is reflected in a reduced need for back up heat from a previously used waste oil burner. In fact, due to improved heat capture, the 900,000 BTU waste oil burner will soon be replaced by a modern 500,000 BTU unit. Today, Snowshoe's amortized cost per kWh is $0.24 compared to $0.51 for commercial grid power (and climbing annually), a 52% saving."



HOT NEWS FOR HOT TUBS

Bowman units have been used in a unique heating system for hot tubs that offers dramatic cost savings for domestic and commercial hot tub operators.

The units are installed at the KP Club, a resort in Yorkshire, UK which recently opened 24 new luxury woodland lodges, each with its own hot tub.

The system uses a biomass boiler and heat exchangers instead of conventional electric heating. It is believed to be the first time spa pools have been heated in this way and the energy savings have been nothing short of remarkable.

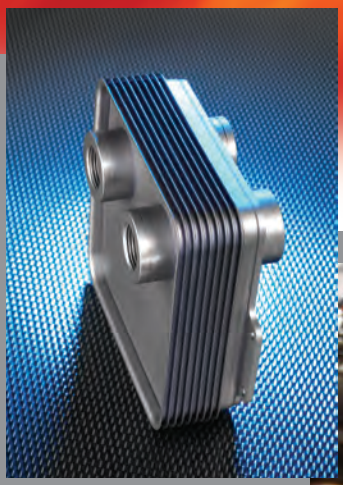
"On average, using conventional electric heaters, each hot tub would use around £500 annually in electricity. However, by using the existing heat source of the biomass boiler system, the hot tubs are now heated at no extra cost – saving the KP Club approximately £12,000 a year," says Antony Perry, Managing Director of Urban Cedar who supplied the hot tubs.

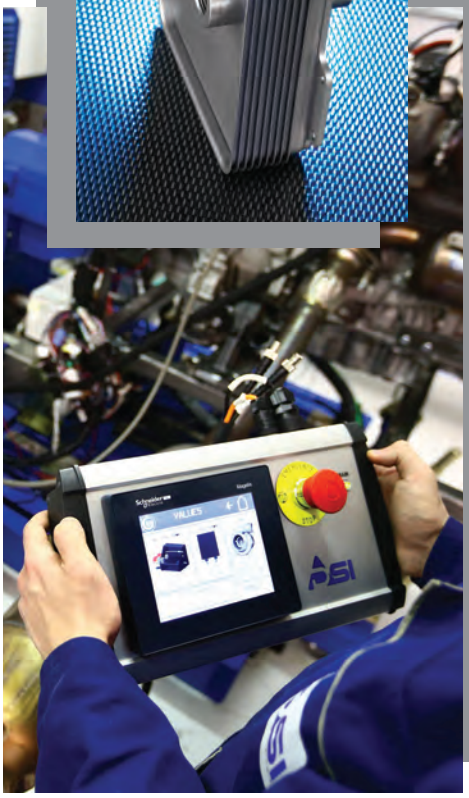
The electric heaters raise the water temperature in the tubs by just 1-2°C an hour, taking up to 24 hours to heat a tub from cold. The Bowman heat exchangers raise the water temperature by 12°C an hour. This means the tub reaches temperature within just 2-3 hours, giving the hotel greater flexibility between changeovers and ensuring the tubs are immediately ready when new guests arrive.

The 5113-2S units were recommended to Urban Cedar by one of Bowman's UK distributors, GVS. They are simple to fit using standard plumbing components and are hidden behind the skin of the hot tub so do not affect the design. They can also be used with gas or oil fired boilers as well as biomass systems.

"This is the first time we have come across this method. Bowman heat exchangers offer the opportunity to significantly reduce hot tub heating costs, and use a more energy efficient and sustainable method of heating while improving their 'green' credentials with customers," said Antony Perry.

TURBOCHARGED SUCCESS





The unique design, durability and performance of Bowman In-line Plate Heat Exchangers has made them ideal for a new lubrication system for the development and testing of turbochargers.

Developed by Belgian automotive testing specialist, DSi (Delta Services industriels), the TC-Lube test system allows for lubrication of turbochargers independently from the engine block. It also provides a very fast response, with programmable and accurate control of oil temperature, oil pressure and lubricant air content around the turbocharger.

During operation, oil used to lubricate the turbocharger constantly circulates between the main tank and the Bowman heat exchangers used for heating up and cooling down the oil.

Cooling is performed through a Bowman water/oil heat exchanger using cold water circulated through a motorized valve. The repeated temperature cycling of the fluids is a key aspect of the test application and is required to ensure the equipment performs reliably under tough operating conditions.

DSi opted for Bowman standard stainless steel units, where the heat transfer plates, outer covers and connections are copper vacuum-brazed together to form an integral unit. However, Bowman also produces a fully brazed copper-free 316 stainless steel unit, which DSi is considering using on future TC-Lube products.

This copper-free version provides even greater levels of durability for applications where extremes of operational temperature are encountered, while a further significant feature is its suitability for use in Ethanol fuel testing.

Thanks to their unique in-line structure, the Bowman units fit easily into the existing fluid stream – resulting in a very compact and neat arrangement within the TC-Lube system.

MAJOR BREAKTHROUGH IN WASTE HEAT RECOVERY

Bowman exhaust gas heat exchangers are at the heart of a breakthrough in converting waste heat into electricity.

Cool Energy has developed a patented 3kW ThermoHeart® Engine system which uses a Stirling engine, connected to a standard 30kW diesel generator to produce additional electricity from waste exhaust gas heat that would otherwise be lost.

This cutting edge technology developed by US company Cool Energy, has the potential to reduce fossil fuel use by 10% providing a significant reduction in energy consumption and fuel cost.

The generator is fitted with a Bowman 6-40 3741-6 Exhaust Gas Heat Exchanger to reclaim heat. The unit is designed for an engine rating of 140kW and capable of recovering around 90kW of waste heat through the engine's exhaust stream at an exhaust gas flow rate of 10.5kg/min.

Cool Energy chose this unit because as a world leader in heat exchanger technology, it knew Bowman's high quality products could deliver the levels of heat transfer efficiency demanded by the innovative engine design.

When used in conjunction with jacket water, charge air, fuel and oil coolers, Bowman units can recover up to 90% of all waste heat from the engine improving a Gen-sets overall efficiency from around 35% (power only) to over 90% (CHP).

DOMINATING IN THE POOL!

If you're in the pool or spa industry, put a date in your diary to visit the Bowman stand at SPATEX 2015 - the UK's number one international swimming pool and spa exhibition.

As the UK's leading manufacturer of swimming pool heat exchangers, we'll be there with a full range of high efficiency heat exchanger products for conventional boilers as well as renewable heat sources.

Our pool heat exchanger experts will be available to answer all your enquiries on our new custom-designed stand C37 in the Jaguar Exhibition Hall of the Ricoh Arena from 1st-3rd February 2015.

NEW FACES
Steven Jackson

We're delighted to welcome Steven to the team who joins as Sales Manager.

After graduating from University of Warwick, Steven developed a successful career in commercial sales and sales management working with OEM companies, travelling extensively throughout Europe, the USA, China and Asia, and covering industries as diverse as off highway, commercial vehicle, agricultural vehicle, power generation, pumps and compressors. We wish him every success in his new role for Bowman.

PART OF THE TEAM

Proudly showing off their new Bowman sponsored football kit are the players of Sutton Town Junior Under 13's. Bowman is pleased to be supporting young talent and wish the team every success this season.

GLOBAL AWARDS FOR ICE STATION

The British Antarctic Survey's Halley VI research station, which uses Bowman heat exchangers to power its heating system, has won a host of global awards for its design and construction.

The station officially opened in February 2013 and for the team living and working there, reliable heat and power is a matter of life or death. Bowman heat exchangers are a key part of the CHP (Combined Heat and Power) system that provides the base with a constant and reliable energy supply, including all its heating, lighting, ventilation and power. Designed by Westac Power Ltd, the CHP system uses waste heat to warm the buildings and melted snow to provide hot water. Bowman 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.

In winter temperatures plunge to around -50°C and 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, as was reducing energy consumption and emissions. At the Architizer A+ Awards ceremony in New York - the world's premier architectural awards - Halley VI was selected by a global audience and jury as the Best Education and Research Project in the World. The station was also voted the Best Education/Research category and Project of the Year in the ENR Global Best Projects Awards which honours the project teams behind outstanding design and construction efforts of the past year.

SEE US AT:

SPATEX 2015
Stand No.C37
Ricoh Arena, Coventry
1st-3rd February 2015
UK's number one international swimming pool and spa exhibition.

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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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