HEAT TRANSFER TECHNOLOGY

ISSUE 9

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

100 YEARS OF HEAT TRANSFER TECHNOLOGY

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Keeping cool in Bangkok!

Bowman heat exchangers cool new hi-tech electric ferries.

A new fleet of aluminium electric ferries is set to revolutionise passenger transport in Bangkok, Thailand.

With an estimated 320 kilometres of waterways, Bangkok is often described as the "Venice of the East" and with 10 million residents, plus 23 million annual visitors, demand for water ferries is high.

Traditional wooden ferries, usually powered by excessively large, old engines emit high levels of pollution contributing to a grey smog that frequently fills the air, resulting in historic monuments, such as the Grand Place and the Temple of Dawn often being shrouded from view.

However, soon this could all change! Designed by South East Asia's leader in renewable energy technology, the company has developed a unique ferry, based on a catamaran design and plans to build 42 vessels for Thailand's capital city.

The result is expected to revolutionise water borne passenger transport in Bangkok. With a passenger capacity of 200, each 24 meter long ferry will be powered by two electric motors and have 26 lithium-ion battery packs providing an 800 kW/h capacity, with a range of up to 100 kilometres between re-charging. A maximum speed of 13 knots (15 mph) is planned, which is faster than most local ferry boats.

Rapid charging technology is being used and the company plans to install a network of dockside fast charging stations. Around just 15 minutes is required to re-charge the vessels, so usually by the time passenger transfer is complete, the ferry will be ready to disembark.

Cooling the propulsion system was a major consideration; the high ambient air temperatures dictating a proven, reliable cooling solution be adopted and after research, four Bowman GL400 marine heat exchangers were specified for initial trials.

With the trials successfully completed, full production has commenced and the ferries are scheduled to enter service during 2020. Early projections suggest they will double riverboat usage to over 60,000 passengers per day, with the new electric ferry accounting for around 50% of all users.

And, having been extensively proven during the ferry's sea trials, Bowman heat exchangers will be at the heart of the propulsion system, cooling the vessels batteries and motors.

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The path to Nirvana -Bowman heat exchangers!

Whilst relaxing on holiday, John Barley had an idea. Why not re-create this great holiday experience back home. And so the idea for Nirvana Spa was born.

The concept is simple; from the moment you arrive you feel like you're on holiday; the facilities and staff creating an experience rivalling premier Mediterranean resorts.

Water is understandably a significant part in the Nirvana experience, with 10 different pools throughout the complex, including a 'Roman themed' relaxation pool, a surf pool, a hydrotherapy pool, an outdoor 'garden spa pool', a fitness pool, a 'Celestial Floatation' pool, plus the Nirvana Pool itself, offering poolside refreshments.

Looking after them is the responsibility of Maintenance Director, Neil Phelps and one of the key issues is heating. No matter how good the pool looks, if the water's cold, no one's going in!

Nirvana is a long standing Bowman customer who's heat exchangers are used throughout the complex, the most recent purchase being a titanium JK190-5118-3T unit for larger pools.

"We're using the JK190 on the Celestial Floatation pool" said Neil, "it's perfect for the pool size and the minerals used in the water.

We bypass 50% of the water flow around the heat exchanger, reducing pressure drop.

It heats the water really quickly, whilst the salts in Dead Sea minerals would soon kill a stainless steel plate heat exchanger. We've also found that flow rates aren't as good with plate types compared to Bowman units."

The indoor pools at Nirvana Spa are heated to 35°C, with the outdoor pools at 29°C; the Bowman heat exchangers maintaining them all at the perfect temperature for relaxation. Which is important, because our best ideas come when we're relaxing!

...the swim spa was incredible!*

Ashlin Farm Barns is a unique country holiday experience. Located 5 miles from the city of Lincoln, it comprises five architect designed, luxury barns set in extensive grounds.

Each barn accommodates up to 10 guests and is equipped and finished to the highest standards.

A key feature of the south facing gardens is the huge private swim spa provided with each property, which creates a stunning focal point in the sun deck area. Capable of accommodating all 10 guests, these spas have proved to be a major guest attraction.

Maintaining the water temperature and ensuring the spas are re-heated quickly at guest changeover periods is extremely important for such a high end resort, as upon arrival, guests invariably want to relax straight away in the spa.

To ensure the water is always deliciously warm, the spas are heated from the barns own heating system via a Bowman heat exchanger. This solution provides extremely fast heat up times with energy efficient running costs and has proved to be a reliable heating solution. And judging by the feedback above*, the guests seem to approve!

Saving the day...

...and thousands of dollars!

Mark Tripi had a problem. He needed two intercoolers to replace failed units on his boat. But there was only one available - and it cost $5,000.00!

Mark is the owner of a Pursuit 3000 Express, a 'blue water' sport fishing boat powered by two Cummins 4BTA, 250 hp units, which was being refurbished for its 20th anniversary.

After removing both engines, he discovered seawater was leaking into the combustion chambers. Both intercoolers had failed.

"OEM parts were no longer available and I couldn't find a company that could rebuild my leaking originals, which left me with a big problem" said Mark. "Fortunately, I found Bowman online. Their FG100 charge air coolers were the right spec, so I ordered two at a total cost of around $1800.00."

Mark designed and fabricated adaptor plates, so that the Cummins cold start air heater and temperature sensor feature could be retained enabling the new charge air coolers to easily fit the engines.

"It turned out fantastic" said Mark, "we ran sea trials in the Spring and the new coolers worked flawlessly. No issues and no loss of power. In fact if you were unfamiliar with the engine model, you would never even know these Bowman units were not the original equipment!"

Bowman charge air coolers are suitable for engine power from 50 kW to 800 kW and a computer aided programme is available to select the correct model for any application.

The Future Is Electric!

But how do we keep it charged?

Battery charging infrastructure is key to the future of electric cars.

If all UK cars were electric, 25,000,000 charging points would be required, according to a report in 2020. That's a lot of chargers to be installed as currently there are around 11,000!

The marine industry, though slower to adopt electric power, is catching up fast and over the next few years, the number of electric powered vessels is expected to increase significantly.

On land, virtually every street corner could have a charger installed, but for boats, it's very different! With limited marina space, demand for charging points could easily outstrip availability.

And it's an issue that needs addressing now!

For example, throughout Scandinavia, hundreds of vehicle ferries link communities across the Fjords. These ferries are vital links. Without them, vehicles would travel hundreds of extra miles, using fuel, creating emissions and adding hours to journey times. But ferries also generate CO^2 emissions and governments are seeking to reduce this by introducing 'zero emissions' vessels to replace them. Evaluation trials are already underway.

One 100% electric ferry being trialled requires the batteries to be charged after each crossing. Turnaround time is critical; once arrival vehicles are unloaded and waiting vehicles loaded, the vessel must be ready for departure.

To achieve this, a super-fast charging system is being used, but as this generates excessive heat, a system for cooling the batteries during charging was required, to protect them from damage.

A solution using Bowman heat exchangers has been developed and has proved extremely successful, keeping the batteries cool throughout the recharging cycle.

And during winter, the process is reversed; the heat exchangers being used to warm the batteries, as in extremely cold temperatures, charging takes much longer.

So, the future really is electric and Bowman heat exchangers are cooling both electric motors and batteries.

Clean Coolers Faster - and Safer!

Introducing the Bowman Double Seal Retaining Flange

Keeping hydraulic oil coolers clean and clear from debris is an increasingly important issue.

The problem of single use plastics that are now polluting our oceans is well known and requires a more rigorous cleaning regime to ensure oil coolers don't become blocked by it, as well as other debris such as algae and general detritus.

Whilst this is already a serious issue for the marine industry, inland watercourses can also suffer, so any process plant drawing fresh water to cool hydraulic equipment, could have similar problems.

Bowman hydraulic oil coolers are shell and tube units enabling the tube bundle to be easily removed for cleaning.

However, cleaning hydraulic oil coolers can create an additional hazard, as even after draining the oil, there may still be some residue inside. So removing the tube bundle could result in an oil spillage, creating potential slip or fall hazard for anyone around the unit.

Recognising this problem, Bowman have developed a solution that eliminates the hazard and reduces the amount of time required for cleaning and maintenance.

Known as the 'Double Seal Retaining Flange' or DSRF, it fits between the oil cooler body and a standard end cover, enabling the end cover to be removed for cleaning, without disturbing the oil circuit.

DSRF completely eliminates the need to drain the hydraulic oil during cleaning, saving time and reducing the risk of contamination getting in to the oil whilst it is stored during cleaning.

The DSRF unit is currently available for Bowman's GL, GK, JK and PK hydraulic oil cooler ranges, with versions for both seawater or fresh water cooling media.

On the 'net!

New Bowman web site is now live

Our new web site is now launched and is already making a big impact! Packed with technical and specification information on the entire product range, it features a 'knowledge centre', providing helpful information on important heat transfer issues, plus the latest news and events at Bowman.

The new 'dot com' web address reflects the international design of the site, which has been produced in 8 languages and visitor feedback has been extremely positive.

www.ej-bowman.com

It's new!

And it's packed with information on our marine heat exchanger and oil cooler range.

It covers everything from engine water cooling, engine and transmission oil cooling, turbocharged air cooling, fuel cooling, electric & hybrid propulsion cooling to hydraulic system cooling, including information on applications, performance and specifications.

Download a copy from our web site.

See us at:

Piscine Global Europe
17 FEB - 20 FEB 2021
See us on stand 5B34, at Europe's leading swimming pool show, in Lyon, France.
www.piscine-global-europe.com/fr

Electric and Hybrid Marine World Expo 2021
22 JUN - 24 JUN 2021
The world's leading show for electric & hybrid marine propulsion. See us on stand 2055
www.electricandhybridmarineworldexpo.com/en/

Splash Expo 2021
25 AUG - 26 AUG 2021
Our distributor, Hi Tech Pacific will be exhibiting the Bowman heat exchangers at Australia's premier swimming pool show.
https://splashexpo.com.au/

Visit our website for more information:
www.ej-bowman.com/news-and-events/

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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