HEAT EXCHANGER WORLD

Volume 3, Issue 5, September 2021

UNITING THE HEAT EXCHANGER SUPPLY CHAIN

Cover story:

Sandvik Materials Technology: Unparalleled innovative alloys for demanding applications

TSINGSHAN





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Read the letter from the editor ▶

ADVERTISERS' INDEX

CALENDAR of forthcoming events

Some important events occurring around the world for the heat exchanger community.

15 – 16 September 2021

CHEMUK 2021 EXPO

» This trade show is dedicated to bringing together the multi-layer Chemicals/ Chemical Product development, specification & processing/manufacturing communities, with crucial supply chain supplier groups. With some 2,500+ specialist businesses contributing to the UK's chemical industry embracing raw materials, chemicals, intermediates & consumables, equipment & apparatus, high tech innovation streams, sub-contracting & business services and much more, CHEMUK is the event where the UK's chemical industries meet.
Location: NEC, Birmingham, UK
Phone: +44 (0) 203 - 829 - 6060
Email: info@chemicalukexpo.com
URL: https://www.chemicalukexpo.com/

30 November – 01 December 2021

Heat Exchanger World Conference & Expo Europe 2021

» The Heat Exchanger World Conference and Expo will provide a dedicated meeting ground for professionals working in the heat exchanger supply chain to address key issues of the industry from design and manufacture, through purchasing to usage and maintenance.
Location: The MECC Maastricht, The Netherlands
Email: k.v.wijk@kci-world.com
Url: http://www.heat-exchanger-world.com/hew2021

30 November – 02 December 2021

The Stainless Steel World Conference & Exhibition 2021

» The Stainless Steel World Conference has established itself as the premier international forum for the exchange of knowledge and experience in the manufacture and application of stainless steels.
The event contributes to the development of new corrosion-resistant alloys as well as to a better understanding of the most recent trends in the fields of welding, fabrication, surface treatment and materials specification.
The conference offers an excellent opportunity for researchers, corrosion specialists, welding engineers, designers, manufacturers, stockists, architects and other industry professionals to share their experiences and challenges related to the use of stainless steel.
Location: MECC Maastricht, The Netherlands
Contact: Kiyo Ichikawa
Phone: +31 575 789 260
Email: k.ichikawa@kci-world.com
Url: www.stainless-steel-world.net/ssw2021

01 – 02 December 2021

Heat Exchanger World Conference and Expo Americas

» The Heat Exchanger World Conference and Expo Americas welcomes end users, manufacturers and other members of the heat transfer supply chain to share industry knowledge and expertise. The meeting point for the heat transfer industry, professionals will be given the opportunity to network and gain experience, and ultimately make heat transfer equipment a priority.
Location: San Jacinto College's LyondellBasell Center, Pasadena, TX, USA
Contact: Brittani Schroeder, Conference Coordinator
Email: b.schroeder@kci-world.com
URL: https://www.heatexchangerexpo.com/

31 January – 02 February 2022

AHR Expo

» The AHR Expo provides a unique forum where manufacturers of all sizes and specialties come together to share ideas and showcase the future of HVACR technology. Since 1930, the AHR Expo has provided a place for OEMs, engineers, contractors, technicians, facility operators, architects, educators and other industry professionals to explore the latest trends and applications and to cultivate mutually beneficial business relationships.
Location: Las Vegas Convention Center, Nevada, US
Phone: 203-221-9232
Email: info@ahrexpo.com
Url: https://www.ahrexpo.com/

16 – 18 March 2022

THERMAL POWER EXPO

» THERMAL POWER EXPO is Japan's largest show for thermal power generation technologies. Efficient and eco-friendly ways to generate thermal energy is grabbing the attention of the energy industry. Engineering technologies and components to build, maintain and operate such thermal power plants will be exhibited.
Location: Tokyo Big Sight, Japan
Phone: +81-3-3349-8576
Email: thermal@reedexpo.co.jp
Url: https://www.thermal-power.jp/en-gb/about.html

21 – 23 March 2022

OGWA (Oman's Oil & Gas Exhibition & Conference)

» OGWA is an international exhibition and conference which brings together local and international oil and gas companies to discuss the latest developments in the oil and gas sectors. The exhibition provides business opportunities for equipment suppliers, service providers in the oil and gas sectors.
Location: Oman Convention & Exhibition Centre, Muscat, Oman
Email: ogwa@omanexpo.com, info@ogwaexpo.com
URL:https://www.omanpetroleumandenergyshow.com/home/

Disclaimer

The rapid spread of the corona virus has affected trade fairs in many parts of the world. Events known to have been postponed or cancelled have been adjusted in or removed from Heat Exchanger World's Calendar; however, readers are strongly urged to seek local and timely advice before planning attendance at any of the shows listed above or on our on-line calendar.

CONTENT

In every issue:

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- Tube stabilization anchors

Tube Removal
- Failure analysis
- New tube installation

Tube Cleaning
- Projectiles
- Rotary Brush
- Hydrolyzing

Heat Exchanger Maintenance
- Open
- Engineering Support Pre-Inspection
- Develop & Implement FME Plan
- Tube Cleaning
- NDE
- Plug / Pull Tubes
- Engineering Support Post Inspection
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Project NEWS

Air Products LNG technology selected for Nigeria LNG project

Air Products has signed an agreement with SCD JV S.c.a.r.l, a joint venture of Saipem, Chiyoda, and Daewoo, for the Nigeria LNG (NLNG) Train 7 project.The project includes one complete LNG train and one combined liquefaction unit. Air Products will provide the main cryogenic heat exchangers (MCHEs) and the process technology for both liquefaction units. Air Products will supply this technology and proprietary processes to the JV for the production of eight million tons per annum of LNG in Nigeria for a major LNG production expansion at NLNG's existing NLNG Bonny Island facility.
Air Products previously provided the MCHEs and process technology for the first six trains for NLNG at Bonny Island with initial onstream LNG production from the units beginning in 1999 for the first, to 2007 for the sixth. All six LNG trains continue production.
Air Products will build the LNG heat exchangers at its Port Manatee, Florida manufacturing facility. Air Products opened its Port Manatee facility in January 2014 and completed a 60% expansion in October 2019 to meet the needs of the ever-growing LNG industry. In October 2018, Air Products dedicated a new LNG equipment test facility (ETF), which will enable Air Products to improve the reliability and yield produced from its LNG equipment and to design new equipment.

Shuangliang wins TUAS IWMF garbage PP project in Singapore

Shuangliang has received the letter of acceptance (LOA) from Singapore ST Marine regarding the award of bidding for an air-cooled condenser in the TUAS IWMF garbage power plant project. The project is located in Singapore with the winning amount of about CNY 48M (excluding tax). TUSA IWMF Project has been launched in July 2019, through continuous communication and cooperation with the owner and the EPC. The international division of Shuangliang Eco-energy and its exclusive agency in Singapore that is named Cyclect (in conjunction with Shuangliang Cooling System Co., Ltd) was finally accepted by the client for its excellent technical solutions and prompt response. The inspection and acceptance of this project are expected to be completed by the end of 2023.
The project of Singapore TUAS IWMF garbage incineration power plant is invested by the National Environment Agency of Singapore with a total investment of USD 1.5bn. It is planned for two phases, each phase to generate 2X65MW power with a waste treatment capacity to be 2,900 tons/day. When the project is completed, it will be the largest garbage incineration power plant in Singapore and even in whole Southeast Asia.

Liebherr-Transportation & Guangzhou ZhongcheJV

Zhejiang Liebherr Zhongche Transportation Systems Co., Ltd. in the south-east of China develops, produces, and services air conditioning technology and hydraulic actuation systems for all types of rail vehicles. The joint venture of Liebherr-Transportation Systems GmbH & Co KG, Korneuburg (Austria), and Guangzhou Zhongche Railway Vehicles Equipment Joint-Stock Co., Ltd. was established in 2006.
The two partners joined forces and contributed their expertise to lay the foundation for a success story: Liebherr possesses cutting-edge technology and is known as a reliable and innovative company in the international railway market. Zhongche Railway Vehicles Equipment Joint-Stock has a high reputation in China's railway industry.
The 15th anniversary of the joint venture is proof of Liebherr's longtime commitment to the Chinese market. It marks a milestone of an ongoing journey to meet the customers' demands and to develop innovative products for the railway industry.
As a business in the Chinese railway market has increased continuously during the last years, Liebherr founded an additional production facility in Pinghu in 2019: Liebherr-Transportation Systems (China) Co., Ltd.
The new company offers a complementary product portfolio and provides a sound base to develop, produce and maintain environmentally friendly air-conditioning systems, electro-hydraulic actuation systems as well as high-performance cooling technology for Chinese customers and abroad.

HTMS raises €5m in Series A funding led by SAEV & PTT

HT Materials Science Ltd. (HTMS), a developer of sub-micron-based heat transfer fluid technologies for use in new or existing commercial and industrial heating and cooling systems, announced the close of a Series A funding round of EUR 5M, led by Saudi Aramco Energy Ventures (SAEV), the corporate venture capital fund of Aramco Ventures and Progress Tech Transfer® Fund (PTT). HTMS produces heat transfer fluid additives which, when added to existing water and glycol heating and cooling systems, yield substantial improvements in energy use and system capacity. As the world warms up and energy demand for air-conditioning and industrial cooling grows, HTMS' products offer a significant step forward for businesses wishing to drive down energy costs, increase system capacity and meet climate change and emissions targets in a global heat transfer fluid market worth an estimated EUR 100bn.
The Series A financing will be used to fund HTMS' growing list of commercial validation projects, further develop HTMS' proprietary technology and range of products, scale its manufacturing capability and invest in sales and distribution networks in the US, Middle East, Europe, and Asia.

Qinshan plant to supply district heating

China National Nuclear Corporation (CNNC) has launched a district heating demonstration project at the Qinshan nuclear power plant in Zhejiang Province. The project, in cooperation with the Haiyan County Government, will "provide a nuclear energy solution to solve the heating problem in southern China," the company said.
The demonstration project is divided into three phases, CNNC said. The first phase is planned to be completed and put into operation by the end of this year, providing nuclear energy-generated central heating to 459,000 square metres of accommodation in three residential areas and 5000 square metres of apartments for the elderly in Haiyan County. The overall project goal is to have a nuclear heating area of 4 million square metres by 2025, covering the main urban area of Haiyan County and the entire area of Shupu Town.
The company noted the project will help Zhejiang province achieve its goal of carbon neutrality ahead of schedule and build a "zero-carbon energy, green development" national-level high-quality development demonstration zone.

Wittekind cement plant intends to reduce its CO2 emissions

Portlandzementwerk Wittekind Hugo Miebach Söhne KG from Erwitte in southern Westphalia has now signed a contract for six energy efficiency modules from Munich-based waste heat specialist Orcan Energy. With the plant modernization, the cement plant intends to generate additional electricity and significantly improve its eco-balance through sustainable energy generation.

The eP 150.200 efficiency Packs lead to savings on the existing cooler and convert the - previously unused - waste heat generated during energy-intensive cement production on-site into a total of up to 8,000 megawatt-hours of electricity per year.At the same time, they reduce the cement plant's CO2 emissions by around 4,000 tons.

The Wittekind cement plant has one rotary kiln and ten shaft kilns, with a total approved capacity of 3,500 tons of cement clinker production per day. As a result of the process, usable exhaust air from a clinker cooler is available, which is fed to an air-water heat exchanger. Water is heated and transported to the Orcan ORC modules via a closed hot water circuit. The efficiency Packs thus generate electricity from the hot exhaust air, which is consumed in the on-site power grid. By cooling the exhaust air, additional cooling capacity can be saved on the existing air-to-air cooler.

Alberta First Nation to build a net-zero power plant

Frog Lake First Nation, east of Edmonton, has partnered with Kanata Clean Power and Climate Technologies to use NET Power's patented technology to build the plant.

It will use natural gas and pure oxygen to generate electricity, with the resulting CO2 recycled through a combustor, turbine, heat exchanger, and compressor — finally generating power without emissions, according to the companies.

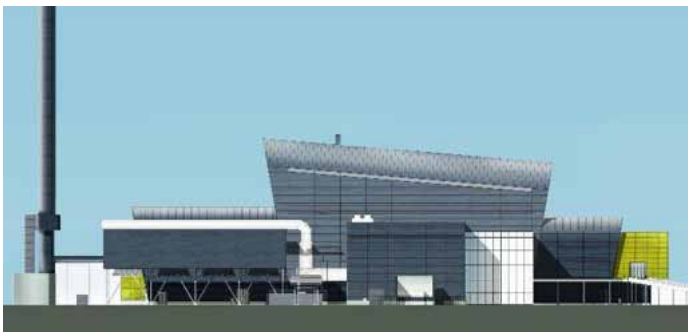
Chad Gvozdenovic with Kanata Clean Power said he believes the technology is a game-changer for both the province and the country. "This will allow our transition and will support renewables with firm dispatchable 24/7 power, so we will allow renewables to penetrate deeply in our electricity system," he said.

Frog Lake's NET Power plant will generate 300 megawatts of electricity and produce water for 15,000 households. Clean water is a waste product of the process.

Kanata says the project development is underway with construction expected to start in 2023 and power production to start by 2025.

"This announcement demonstrates Indigenous leadership in Canada's energy transition," said Frog Lake Chief Greg Desjarlais in a release. "We are now developing net-zero infrastructure that will demonstrate our leadership, addressing climate change using technology that will help decarbonize Canada's economy."

Hamon ACC selected for the Protos Project in the UK



The Hamon Group has been selected by Mytilineos to take part in the Protos Energy-from-waste (EfW) project with a 6 module Air Cooled Condenser in Cheshire, United Kingdom. The scope includes the design and the supply of the ACC.
The Protos Energy Recovery Facility will be processing 2 types of waste, Residual fraction of Municipal Solid Waste (MSW) and Commercial & Industrial Waste (C&I).
With 2 lines of waste-deriving energy recovery and an annual capacity of 200,000 tons each, the energy-from-waste plant will divert up to 400,000 tons of non-recyclable waste from landfills or export each year. It will generate up to 49 megawatts of low-carbon electricity and enable the UK to achieve national self-sufficiency in waste management.
Once operational, the Energy Recovery Facility will generate enough low-carbon energy to provide electricity to around 90,000 homes and help to reduce reliance on fossil fuels.
Developed by Covanta, Biffa, and Green Investment Group, the facility is planned to start commercial operation in 2024. Energy-from-waste plants provide a safe, technologically advanced means of waste treatment that reduces waste being sent to landfills while generating clean energy from the process.

Synhelion & Empa developing solar storage technology

Synhelion and Empa are conducting a joint research project, co-funded by the Swiss Innovation Agency Innosuisse, to further develop a high-temperature energy storage solution that is a key component in the production of climate-friendly solar fuels. The project will enable the cost-effective and scalable storage of high-temperature solar heat at over 1'000 °C for the first time. The storage technology is expected to be used in Synhelion's first industrial-scale solar fuel production facility, which will be built in 2022.
Synhelion produces sustainable fuels such as gasoline, diesel, and kerosene that are compatible with conventional internal combustion engines and jet engines. The ETH Zurich spin-off has developed a solar thermochemical process based on process heat generated from concentrated sunlight to produce these synthetic fuels. To enable the chemical reactors for solar fuel production to operate around the clock, a cost-effective, high-temperature thermal energy storage (TES) is needed. This solution stores part of the solar energy to be used during the night and cloudy periods, enabling continuous operation of the reactors, thereby significantly increasing plant capacity and drastically reducing capital expenditure.

Foundation stone laid for the hybrid SOFC system at GWI

The Gas- und Wärme-Institut Essen e.V. (GWI) and Mitsubishi Power Europe GmbH celebrate the laying of the foundation stone of the Hybrid-SOFC-System, which is unique in Europe. The demonstration plant is an important step towards a climate-neutral and low-CO2 future and is publicly funded as part of the "Demo Hybrid-SOFC" project of the joint project "KWK.NRW 4.0" under the umbrella of the Virtual Institute | KWK.NRW.

After the GWI commissioned Mitsubishi Power Europe GmbH with the construction of Europe's first hybrid SOFC system in September 2020, planning and initial preparatory work began. On June 1, 2021, construction began as scheduled, and the foundation stone was laid on July 2, 2021. The demonstration unit is expected to be put into operation at the beginning of 2022. Mitsubishi Power Europe GmbH is acting as general contractor

for the project, incorporating the group's own technology. In addition to planning, manufacturing, and delivery, Mitsubishi Power is also responsible for connecting the hybrid SOFC system to the GWI's power and heat supply.

Drilling at Eden Geothermal project in Cornwall underway

The drilling work for the Eden geothermal project in Cornwall, England continues with a target depth of 4,500 metres. As reported locally, on August 9, 2021, the drilling reached a depth of 2,2500 metres so half of the targeted depth, with a daily drilling depth of around 70 metres per day, so should have progress another 700 metres or so since.

The target depth is planned to be reached in about 2.5 months. Temperatures recorded so far in the "high heat-producing granite", the staff is confident a heat in the range of 170-190 degrees Celsius can be reached. With the first well drilled, it is planned to insert a coaxial heat exchanger, inject water into the well that is then superheated by the hot granite below. Initially, the extracted heat will be heating the Rainforest and Mediterranean Biomes, offices, kitchen, and greenhouses of Eden park. The used water will then be reinjected.

Geoscience Ltd is sampling mineralogy throughout the project building, it works also on the experience gained from the other geothermal project in Cornwall.

A second will is then planned to be drilled after the success of the first phase of the project. It is then planned to provide heating to the Eden Project, but also neighbouring industries.

The developer Eden Geothermal Limited (EGL), is a partnership between Eden Project Limited, EGS Energy Limited, and BESTEC (UK) Limited, affiliated with German company BESTEC GmbH.

nVent & PRI launch a strategic alliance

nVent Electric plc (nVent), an electrical connection and protection solutions company and Power Resources International, Inc. (PRI) has announced a strategic alliance to provide rail and switch heating solutions to the North American transit industry. The alliance will provide solutions based on nVent RAYCHEM technology.

By joining the industry-leading heating solutions and customer support of nVent with PRI's excellence in engineering, controlling, and system integration capabilities, customers will be able to fully integrate their heating systems for winter operations.

"The new collaboration of nVent and PRI already is providing the switch heating and contact rail heating solution to the Long Island Railroad (LIRR) Floral Park to Hicksville Line Third Track Extension Project," said Mike Saini, nVent regional sales manager. "The two teams are successfully working together to address the customer's requirements and provide a solution that can help keep trains running in the harshest of winter environments."

BE WITH YOU

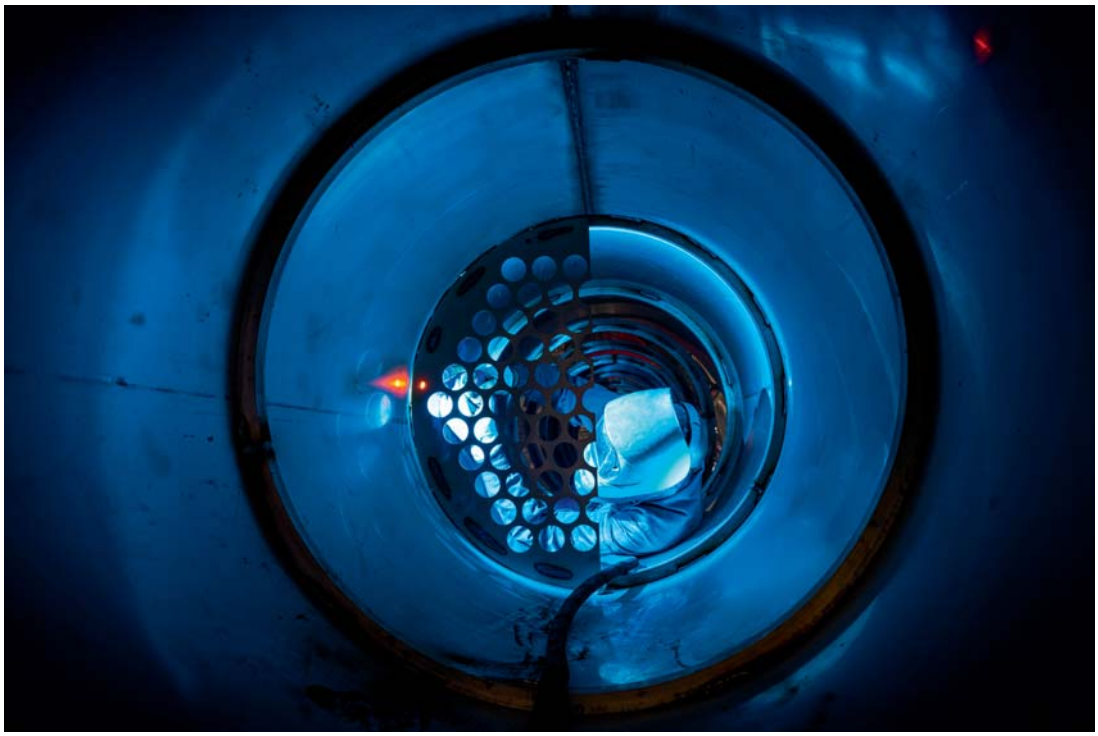
KOBELCO STEEL TUBE renamed
MARUICHI STAINLESS TUBE from June 1st, 2020.

Seamless Stainless Steel Tube and Pipe made in JAPAN

MARUICHI STAINLESS TUBE CO.,LTD. https://www.mstube.co.jp/english/

Sandvik Materials Technology: Unparalleled innovative alloys for demanding applications

Part of the Sandvik Group, Sandvik Materials Technology is a world leader when it comes to innovating, developing, and manufacturing advanced stainless steels and special alloys for very demanding environments, and systems for industrial applications. Its business history dates back 150 years, attributing to an unparalleled level of experience and expertise. Today, the company has a strong industry position across a multitude of end-user markets with leading players.



Sandvik has an extensive manufacturing program for seamless heat exchanger tubes.

By Ellie Pritchard and John Butterfield

To understand more about the company's continually expanding material solutions for heat exchanger applications, Heat Exchanger World spoke with Barinder Ghai, Regional Technical Marketing Manager, EMEA, and Jari Ponsiluoma, Product Manager for Heat Exchanger and Fertilizer Tube, EMEA.

Innovation is key, as with Safurex® and Sanicro® 35

Sandvik's materials are built for the most demanding environments, ranging from sea water to offshore to geothermal applications, the latter being a new area for the company. In these extreme conditions, customers require parts that are reliable, durable, and low maintenance to avoid the financial costs of downtime. For this reason, Sandvik continuously develops and adapts its materials, believing that there is always an opportunity to perfect further. "It is all about improving lifetime," says Mr. Ponsiluoma. "We are involved in some of the most challenging projects worldwide, and this is where our knowledge, experience, and expertise really come into play."

In the urea industry, for example, carbamate corrosion poses a particular challenge as the fertilizer process produces ammonium carbamate, which often causes extensive and relatively rapid corrosion even among many different grades of stainless steel. To combat this, Sandvik and its long-term partner Stamicarbon developed a highly corrosion-resistant material called Safurex®. It was created by combining Sandvik's specialist knowledge in high-alloyed stainless steel and Stamicarbon's expertise in the fundamentals of carbamate corrosion. Safurex® has not only proved to be highly corrosive resistant, solving 80% of all corrosion issues in instances of its application, it also allows a significant reduction of passivation air (80% proven), and can be operated without oxygen (although at an increased passivation corrosion rate). Safurex® does not corrode actively, also without oxygen, and has effectively led to 1.5 million years of heat exchanger tube usage without rupture, a gargantuan achievement. Other additional benefits to plant operators are that Safurex® has higher process safety, provides a higher yield for the plant since there is less inert gas in the process, leads to less maintenance and inspection costs, has higher flexibility in operations in blocking-in and start-ups, and is less sensitive to upset conditions. Barinder Ghai further expands on these benefits: "Once you install equipment made from Safurex®, you don't need to change it, and you don't normally need to factor in stoppages or maintenance. This type of result is something that Sandvik knows is desired by end-users in the heat exchanger industry."

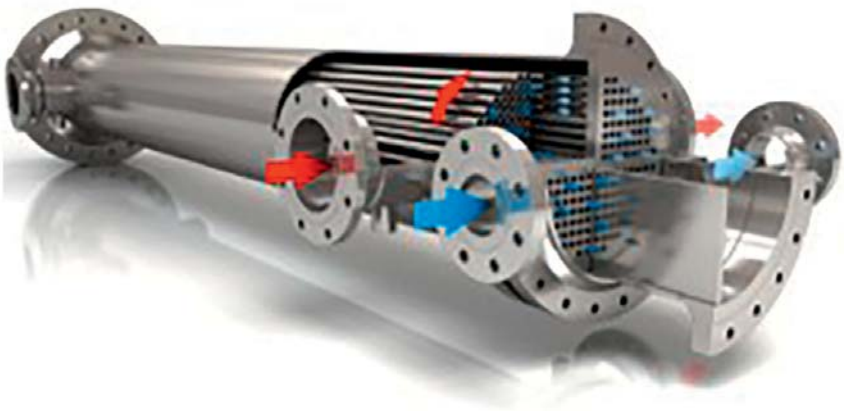
However, the Sandvik team didn't stop there with Safurex®. Barinder Ghai continues: "We have not stopped improving this grade and over the last three years we have gone on to develop the new grade, Safurex Star®." The company has now made the material into a brand as it is ideal for use under high-pressure industrial conditions and can considerably help to reduce plant investment costs. Moreover, thanks to a close relationship with the com-

pany's end-users, Sandvik can draw from its customer's experiences and use these insights to better understand market requirements. "Even with this degree of refined metallurgy we still continue to look for improvements so that the material can further enhance the lifecycle of equipment. This is Sandvik's strength, where taking an innovative approach is key. With every grade, we always work to enhance it," adds Jari Ponsiluoma. "We don't just believe in selling a material, we believe in adding value for our customers to extend their profitability."

Material highlights

In recent years, Sandvik's material highlights have been numerous. Its lean duplex SAF 2304®, for instance, developed for the ammonia industry has enabled the lifetime of ammonia condensers and interstage coolers to be extended by 10-12 years. Similarly, SAF 2507®, created for sea water coolers, has proven to be a cost-effective solution and an ideal replacement for cupronickel and admiralty brass alloys facing erosion–corrosion at relatively low rates. Sanicro® 28 has been/is used to successfully replace Alloy 825 in applications where the latter is used, and its possibilities are currently being explored for usage in Reactor Effluent Air Coolers (REACs). Further, SAF 2707HD™ is successfully used in applications requiring an enhanced resistance at critical pitting temperatures and crevice corrosion temperatures.

It is, nevertheless, Sanicro® 35 that has defined the past year for Sandvik. Launched in August 2020, its development dates back to 2012 and was Sandvik's response to the industrial market's need for a stainless steel alloy that combined corrosion properties with high mechanical strength (a super austenitic stainless steel, having a combination of high yield strength, resistance to severe acidic conditions, and excellent pitting and crevice corrosion resistance). The resulting grade has mechanical properties comparable to duplex grades and a corrosion resistance equivalent to high nickel grades. Prior to its development, Alloy 625 was regularly specified, for example, for severe heat exchanger applications such as REACs. However, it is a costly material and one that requires regular replacement. Sanicro® 35 thus bridges the gap between super austenitic steel grades and the more expensive nickel alloys grades such as 6Mo and Alloys 625, providing a high-performance alternative to conventional material grades. In this way, it has been possible to support more cost-effective and efficient operations. Certainly, a key differentiator in its development was its unique combination of chromium, molybdenum, and nickel that distinguished it from existing 6Mo super austenitics. "What is very pleasing is that the first positive responses have come in about its use in a refinery in North America," says Barinder Ghai. "In the future, I believe it will be a game-changing grade because you can mix and match it with equipment made from other grades in process equipment depending on the needs and specific situations."



For heat exchangers, Sanicro® 35 offers a smarter choice compared to other austenitic or super-austenitic steel grades and nickel alloys.

Full control, full independence

Mr. Ponsiluoma is keen to stress that, as well as Sandvik's constant search for innovation, the company's tube production process is undoubtedly something that sets them apart from their competitors. "It is unique in that

Designed for service in aggressive corrosive environments, Sanicro® 35 bridges the gaps between standard duplex or austenitic grades and nickel alloys.

Sandvik state of the art melting AOD process.

we have full control over the whole production process, from melting, where we use 82% recycled steel, through to alloying in the electric arc and high-frequency furnaces, the Argon Oxygen Decarburization (AOD) converter and the continuous casting plant, right on through to finishing operations such as cold rolling and cold drawing, or heat treatment. Additionally, we use quality management systems in our production processes that are approved by internationally recognized organizations. On the R&D side, we have one of the largest steel research centers in Europe."

As such, new materials are constantly being created and existing materials and production processes improved. On top of this, the company employs a comprehensive program of liaison and cooperation with universities, research institutions and specialized companies with exceptional expertise. Sandvik Materials Technology also continues to make investments to innovate and establish materials for demanding applications. It is these types of investments that will continue to form the backbone of company success into the future.

"Effectively," says Barinder Ghai, "we can be seen as being at the center of our own vast web; working together with all aspects of industries to ensure the best possible service for our customers and for end-users working with their products."

"The whole chain is important," confirms Jari Ponsiluoma, "and this means working together with process licensors, end-users, EPC contractors, to have a genuine understanding of current corrosion issues and gaps in the industry to meet new industry challenges and demands."

Sandvik and heat exchangers applications

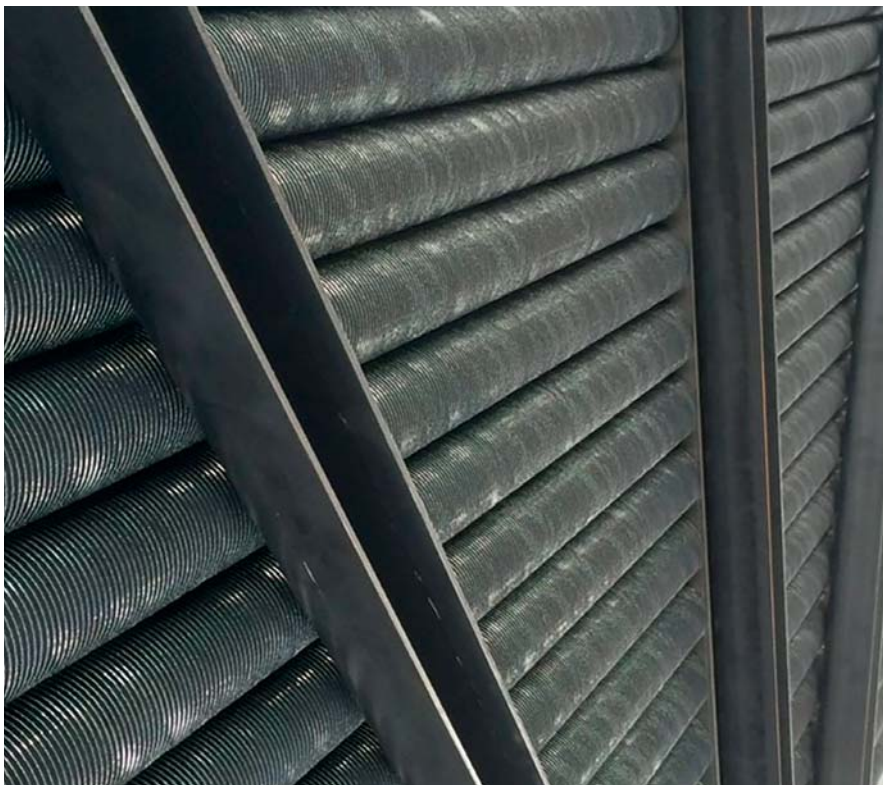
"Choosing the correct materials to enhance heat exchanger lifetimes is never an easy decision," says Barinder Ghai, "and wrong material selection can lead to shorter lifetimes of equipment, excessive costs, increased downtime, and even health and safety issues." It is therefore not surprising that the Sandvik Materials Technology technical marketing and sales teams pay great attention in helping their customers select optimum grades for their applications with knowledge based upon their extensive service experience, which has been gained from worldwide installations.

"The most expensive solutions on offer are also definitely not always the best solution for a company," adds Mr. Ponsiluoma. "What is particularly important is that the selected grade needs to have sufficient corrosion resistance combined with suitable mechanical and physical properties."

In seawater coolers, for example, choosing the correct grade is critical as seawater contains large amounts of sodium chlorides and solid particles such as silt and organic solids. In such severe environments, a grade is needed that has a high resistance against both localized corrosion and erosion–corrosion, such as SAF 2707 HD™.

"In today's oil refineries the process streams involve many corrosive elements that can shorten the life span of low-alloyed steels. This is because refining consists of many complex processes in which the heat exchangers operate under severe corrosion conditions.

"Most leakages occur because of corrosion in the tubing," says Jari Ponsiluoma. As such Sandvik has created several grades to provide solutions in such situations: SAF 2205™,



SAF 2707 HD™ Hyper duplex tubes, atmospheric crude oil distillation - overhead air cooler.

Sandvik's product offering for heat exchangers

Sandvik has an extensive manufacturing program for seamless heat exchanger tubes covering most types of standard austenitic, duplex (austenitic–ferritic) and high-alloy austenitic stainless steels, as well as titanium and zirconium. Produced in imperial and metric dimensions, the tubes range from 12 mm up to 40 mm outside diameters, and straight lengths up to 30 meters or as U-bends. Additionally, special sizes can be made to order.

SAF 2507®, and SAF 2707 HD™. These grades are used in a large variety of applications such as overhead condensers, effluent coolers, feed preheaters, water coolers, air coolers, reboilers, condensers, evaporators, strippers, as well as in salt evaporation, power generation, and gas processing.

The road forwards

Sandvik Materials Technology has set out a clear direction for the future in which it intends to use its position as a technology leader, a progressive customer partner, and a sustainability driver to become an even stronger and independent company. Jari Ponsiluoma: "Just as we did yesterday and today, we will continue to focus on what has made us successful – helping our customers get better, more efficient, and productive in their processes. This will involve fully integrating sustainability into our offerings and operations and systematically collecting data about new and growing challenges faced by our customers." In this respect adds Barinder Ghai, "We will continue to work closely with our customers to jointly discover ways of addressing their challenges with new and modified tubular products, and finally, developing advanced materials that can make industrial processes more efficient, profitable, and safer. Moreover, as we work towards providing sustainable solutions in all aspects of our work, we strive to provide a greener and better environment for all."

Sandvik's highly integrated and sustainable production.

Barinder Ghai, Regional Technical Marketing Manager, EMEA.

Jari Ponsiluoma, Product Manager for Heat Exchanger and Fertilizer, Tube, EMEA.

Duplex vs. carbon steel in heat exchangers

The use of more expensive duplex stainless steels when designing heat exchangers can effectively be cost saving in the long run because of the combination of high-mechanical strength, superior corrosion resistance, and the fact that the fabricating compatibility of duplex stainless steels makes it possible to reduce the wall thicknesses of tubes, resulting in the design of lighter equipment. In fact, the best way to compare lifecycle costs of equipment is to compare what the outcome would be using the next best alternative grade, for example carbon steel or a stainless steel/special grade as both long- and short-term options.

Short-term carbon steel option	*Long-term stainless steel/special grade option*
Low initial cost	Higher initial costs
Increased inspection costs	More reliable operations
More frequent maintenance required	Less frequent maintenance required
More frequent replacements required	Less frequent replacements required
Greater risk of production stoppages	Lower lifecycle costs

5 tips for easier air cooler maintenance

The design of an air cooler can be challenging for operators due to limited access to the tube sheet. Similar to a shell and tube heat exchanger, air coolers are made up of stacked finned tubes with header or water boxes on either end of the vessel. This design leaves the tube sheet bundle partially exposed to increase cooling, but limits access to the tube ends. While air cooler maintenance can be challenging, there are a few tips and tricks that can help make the process easier.

Image credit shinobi/Shutterstock

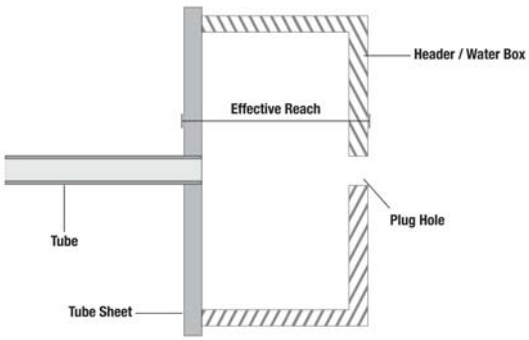
Text and images courtesy of Elliott Tool Technologies

Determine the proper reach

The header box design of an air cooler requires the use of long reach tooling for maintenance. In general, air coolers have an 8″ gap between the header box and the tube sheet, however, this distance can vary from vessel to vessel. It's important to determine the distance from the face of the water box to the back of the tube sheet before purchasing tooling. This distance will be the minimum reach required for tooling and extensions. For example, if the distance is 10″ then a 10″+ reach tool or extension should be used.

Size tooling to the tube ID

One common challenge operators face when maintaining air coolers is getting tooling that will accommodate both the tube ID and the header plug opening. Most header plug IDs are ~1/8″ larger than the tube OD, making it difficult to use tooling with a varying OD, such as a taper. As a result, it's recommended to select a product that can be sized to the ID of the tube, rather than an OD range. Mechanical plugs are a great option for plugging air cooler tubes since they are tube ID specific and can be set in place using an extended hex driver. In some cases, manufacturing a tapered plug to fit through the plug hole may better suit a customer's needs. In that situation, many customers will order special plugs with a threaded hole drilled in the center. This allows the operator to thread a rod into the plug, insert it in the tube, and hammer the plug into place.



When it comes to testing tubes for leaks, pressure leak test guns are preferred over vacuum test guns. This is because the seal sets are sized to the ID of the tube, as opposed to the tapered nozzle found on a vacuum gun. If sized to the correct tube ID, pressure test guns will allow the operator to reach through the plug hole to access the tube sheet with assistance from a properly sized extension.

Set tubes prior to expansion

Installing tubes in an air cooler is fairly similar to a shell and tube exchanger with regard to the expansion process

Pressure Leak Test Gun

Mechanical Tube Plug

itself. However, since the tube and tube sheet are not readily accessible, there is a higher chance of tubes rotating during expansion.
Tack rolling or nose rolling the tubes as a first operation can prevent tubes from spinning or moving during the expansion process. One method for doing this is to hold a piece of bar stock or pipe through the plug hole so it meets up against the tube being rolled. This will allow the operator to set the proper projection and help keep it in place while it is tack rolled. Once the tubes have been lightly rolled into the tube sheet on one end, both sides can be fully expanded.

Use an assisted rolling system

Assisted tube rolling systems are one of the most effective methods for tube installation as they reduce re-work, improve operator ergonomics, and increase tool life. Each system comes equipped with different features to suit your needs such as torque control, an articulated arm, and auto-lubrication.

Assisted Tube Rolling System

Torque control systems accurately measure torque in order to roll to the target wall reduction each time, eliminating the amount of rework needed on a vessel. An articulated arm will support the weight and absorb the torque of the rolling motor, allowing the operator to effortlessly roll and move the motor into position. Lastly, auto-lubrication provides automatic expander lubrication in order to increase tool life and reduce downtime spent re-lubricating tooling.

Pull stubs behind the header box

Traditionally, heat exchanger tubes can be pulled from the front of the tube sheet. However, since air coolers have header boxes at both ends, pulling tube stubs from the front would be a challenge and might require special tooling. One of the easiest ways to remove tubes in an air cooler is to first cut the tubes behind the header using a tube cutter or other traditional methods. After all the tubes have been cut at both ends, the bundle can be removed. This provides easy access to the back of the header and allows a collet style tube puller to pull tube stubs from the back of the header box.

Overall, design of an air cooler can make tube maintenance activities more challenging. However, there are several tips that can make the process easier. Determining the reach of the vessel and the ID of the tubes will make it easier to determine what tooling is needed to complete the job. Additionally, tack or nose rolling the tubes and using an assisted rolling system can allow for a better expansion and reduce the amount or rework needed. Lastly, removing the tube bundle and pulling stubs from behind the header will make the tube removal process much more efficient.

About Elliott Tool Technologies

As the original tube tool company since 1892, Elliott is committed to producing high quality products that customers can be confident in using time after time. Elliott's founder, Gustav Wiedeke, designed the first tube expander that others in the market have attempted to replicate over the years.

You can find out more on: https://www.linkedin.com/company/elliott-tool-technologies/

Damage caused to heat exchangers – a case study

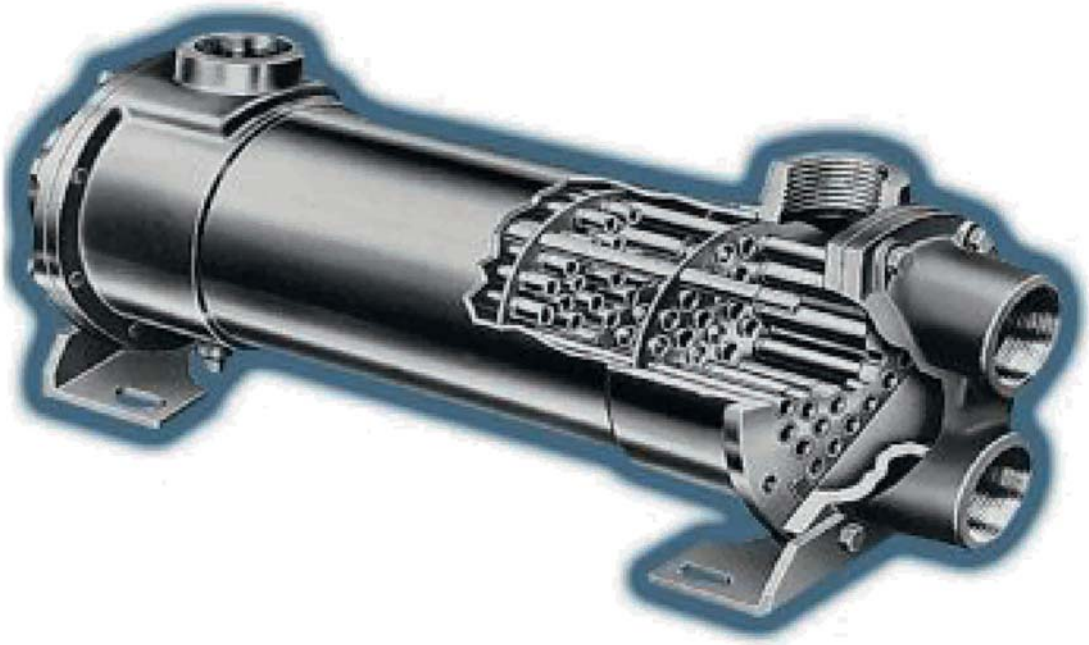


Image courtesy of Applied Measurement & Control.[4]

In a recent study, a cryogenic service heat exchanger that suffered seawater leakage was examined to determine what damage mechanisms were at play. Through maintenance tasks and several rounds of testing, a failure analysis was created.

By Syed Umair Niaz Bukhari, Senior Corrosion and Integrity Engineer

Stainless steel contains a minimum of 10.5% chromium, and varying levels of nickel, molybdenum, and niobium; these alloys are what provide the properties of corrosion resistance at high temperatures. Stainless steel can also withstand corrosive or chemical environments due to its smooth surface. Compared to regular steel, stainless steel does not easily disintegrate, stain, or oxidize/rust. Stainless steels are available in an extensive range of forms, grades, finishes, gauges, widths, and lengths.

The selection of an appropriate stainless steel grade for each application is the result of various considerations. The stainless steel grades are normally available in the following technical properties:

- Chemical composition of stainless steels;
- Mechanical properties of stainless steels; and,
- Physical properties of stainless steels.

Stainless steels & heat exchangers

A cryogenic service heat exchanger, which carried liquid oxygen on the tube side, suffered seawater leakage from the shell-side flange, as well as variations in heat transfer. Pitting damage was observed on the shell, it was assumed that some tubes might be leaking. The heat exchanger was taken out of service and was examined for further root cause analysis.

Material

As per the original fabrication/asbuilt drawings, the materials of the heat exchanger construction were:

- Dished head material type: 304L stainless steel
- Tubes material type: Duplex stainless steel
- Flange material type: 304L stainless steel

What is cooling water corrosion?

Morphology of Damage: Localized corrosion may result from under deposit corrosion, crevice corrosion or microbiological corrosion. Deposits or crevices can lead to under deposit or crevice corrosion. Metallurgical analysis of tube samples may be required to confirm the mode of failure.

Mitigation: The metallurgy of heat exchanger components may need to be upgraded for improved resistance, especially in waters with high chloride content, low velocity, high process temperatures, and/or poorly maintained water chemistry. Periodic mechanical cleaning of tube ID's (inner diameters) and OD's (outer diameters) should be performed in order to maintain clean heat transfer surfaces. With very few exceptions, cooling water should be on the tube side to minimize stagnant areas.

Damage mechanisms and failure modes caused by sea water on the shell side included cooling water corrosion, microbiologically influenced corrosion (MIC), and pitting on the flange faces.[1]

What is microbiologically influenced corrosion (MIC)?

Morphology of Damage: MIC corrosion is usually observed as localized pitting under deposits or tubercles that shield the organisms. Damage is often characterized by cup-shaped pits within pits in carbon steel or subsurface cavities in stainless steels.

Mitigation: Microbes require water to thrive. Systems that contain water should be treated with biocides such as chlorine, bromine, ozone, ultraviolet light or proprietary compounds. Proper application of biocides will control but not eliminate microbes so that continued treatment is necessary. Maintain flow velocities above minimum levels. Minimize low flow or stagnant zones.

Scope of activities

The following tasks were accomplished in order to proceed for the heat exchanger failure investigation:

- Removal of the tube bundle;
- Calculating the RLA as per API 570;[2]
- Repair the shell and outer surfaces of the bundle;
- Cutting the dished head;
- Leak testing of the tubes, followed by re-welding of the dished head which was considered for cutting earlier; and,
- Final pressure testing of the tube bundle (including hardness testing of dished head).

Findings

The failure analysis revealed that the tubes of the heat exchanger were weak and thin due to erosion and corrosion. Moreover, inaccessible portions (crevices) of the tube bundle were significantly affected by cooling water corrosion and somewhat by MIC. The tube damage rendered the complete tube bundle assembly beyond repair. This failure led to huge financial loss and prompted further risk of a possible plant outage due to the absence of a standby heat exchanger.

For many applications, moving forward a thorough review of potential damage mechanisms should be conducted in line with RBI (risk based inspection) guidelines.[3]

References

1. API RP 571, "Damage Mechanisms Affecting Fixed Equipment in the Refining Industry" (Washington, DC: API, 2020).
2. API 570, "Inspection, Repair, Alteration, and Rerating of In-service Piping Systems" (Washington, DC: API, 2016).
3. API RP 580, "Risk Based Inspection" (Washington, DC: API, 2016).
4. Applied Measurement & Control. "Standard Shell and Tube." Accessed at: http://www.appliedmc.com/sscf.asp.

About the author

Syed Umair Niaz Bukhari holds a bachelor's degree in Mechanical Engineering. He is an industrial expert handling corrosion, asset integrity, material damage mechanisms, repair, and welding-oriented tasks. Bukhari holds certifications from American Petroleum Institute, American Society for Nondestructive Testing, Institute of Corrosion, and National Association of Corrosion Engineers. He is a member of IMechE and ASME International.

Maus Italia s.p.a:
A 60-year-long adventure

Stefano and Anna Agostino, Maus Italia.

Maus Italia began in 1961. What was originally a backyard workshop with a lathe and one employee is now a production facility with 50 staff over an area of 35,000 sqm. Maus Italia has grown to be a global presence in the oil & gas sector, specializing in machines and tools for the production and maintenance of heat exchangers. The company also reports that its turnover for 2020 is in line with pre-Covid figures.

All text and images courtesy of Maus Italia Spa

Domenico Franco Agostino, born in 1917, began the company after leaving Sicily and moving to the North of Italy, hoping to create something innovative of his own. After meeting his wife-to-be, Luisa Capoferri, over a letter exchange, Mr. Agostino moved to Crema and started an industrial representation business. He first became a representative and then a manufacturer of tube expanders for the German company Albert Otto.

The turning point

In 1972, Mr. Agostino decided to buy a 10,000 sqm area along the Paullese road (Municipality of Bagnolo Cremasco) to set up Maus Italia Sas. His adventure continued with the patents signed by his son Stefano, a mechanical engineer with a degree from the Milan Polytechnic who had joined the company in 1976 and had begun to introduce new machinery onto the market, such as tube expansion controllers and the tube extractor, which he patented in 1979. In the same year, Stefano patented a machine which performs fully automatic tube rolling, welding, end-facing and grooving operations. In 1982 Mr. Agostino passed away and his son Stefano took over, taking Maus from being a small Italian company to becoming a world leader.

Third generation

Over the years, Mr. Agostino's son Stefano has developed a national and international sales network, allowing Maus Italia to expand to 60 countries across all continents. Now, Stefano's daughter, Anna Agostino, has joined the company and is working to prepare it for Industry 4.0.

Mr. Stefano Agostino states his pride for the culture of the company: "What makes us stand out in our sector is our ability to design our products and make them evolve. In addition to offering specialized products, we solve our customers' problems. That is how we earn their trust".

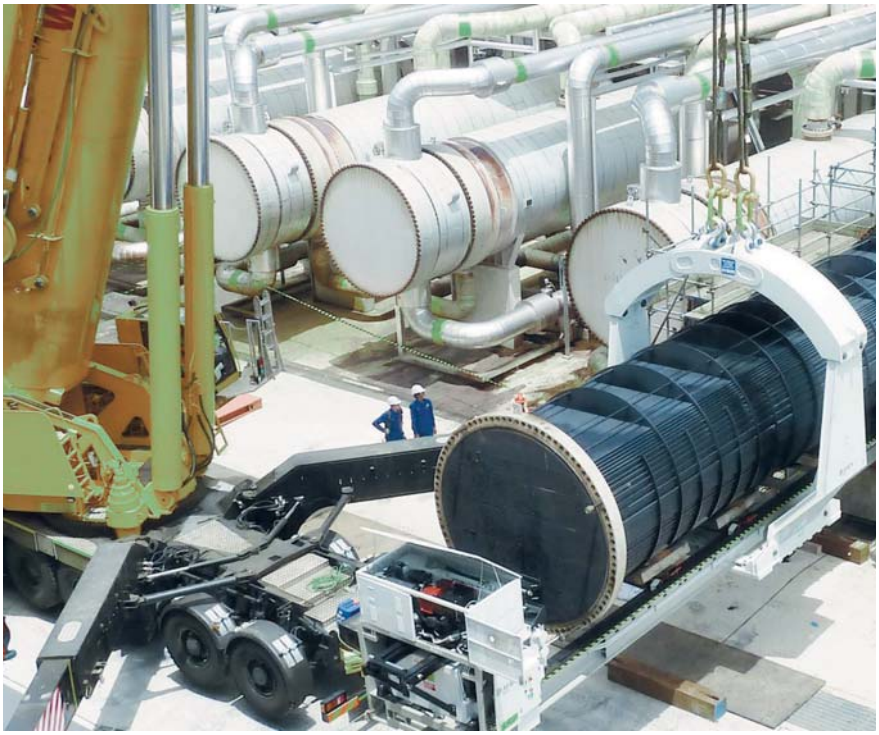
However, the company's strength lies above all in the quality of its workforce. As Mr. Agostino says: 'Our 50 employees are our main asset. We have reliable, well-trained collaborators who work in harmony, which is of paramount importance'.

The future

Ms. Anna Agostino shares the same sentiment for the future years of the company: 'We strive to be strong and unassailable on all fronts, to have qualified and motivated staff who think of the company's successes as their own and who feel enthusiastic about the victories achieved by the company at every level.'
Research, quality and safety are what drive Anna forward in her future plans for Maus Italia. Holding key certifications at an international level, the company has been able to increase both the efficiency and effectiveness of its internal processes, hence improving its market competitiveness.

Reflection

"Sixty years is not a short time. It covers the span of multiple generations: here at Maus Italia we are now living the third" - Stefano Agostino celebrates this milestone with satisfaction and reflects on the personal joy of running a company. "I am satisfied, but not only in terms of growth in employment or turnover, but rather of quality and level of our interlocutors. We are a reference point for many manufacturers all over the world. We have a highly diversified market, which constitutes our strength".



Maus Italia now employs around 50 employees and is a major presence in the oil and gas sector.

Domenico Franco Agostino began the company in 1961.

A reference point

As COO of the company, Anna Agostino is taking the necessary steps to take over the baton in the future. "I have been working alongside my father in running the company for five years now". Holding a double degree from the Milan Polytechnic in Mechanical Engineering and Industrial Engineering, Anna is happy with her choice: "Joining the company was a challenge for me. I have been lucky enough to find many people who have helped and supported me to prepare for the role I have to play. Side by side with my father, we face the daily challenges on the market with the aim of being an avant-garde company in our industry, a reference point for our competitors".
Maus Italia looks forward to the next 60 years of innovation.

Take part in the Heat Exchanger World Europe Conference & Expo

30 November & 1 December, 2021!

The Heat Exchanger World Europe Conference & Expo will take place in Maastricht, The Netherlands. Staged in the MECC, the event brings together end users, engineering companies, designers, fabricators, manufacturers, and heat exchanger builders from across the whole supply chain in a wide range of industries using heat exchangers. Although this is a first event organized by KCI Publishing about heat exchangers, KCI Publishing looks forward to adding Heat Exchanger World Europe 2021 to its repetoire of successful events. The goal of the event is to facilitiate the exchange of knowledge and experience about heat exchanger materials, applications, and innovations, with a clear aspiration to optimize the use of heat exchangers in terms of safety, performance, reliability, and costs with the global marketplace.

Welcome address from John Butterfield

In just under three months' time we will open the doors on the first Heat Exchanger World Europe Conference & Expo. It will be the culmination of much work on the part of our team so we are naturally very excited at the prospect of shortly meeting you all there, and seeing the fruition of what we have been preparing for the event. We hope that it will be an unforgettable and positive experience at the MECC in Maastricht, The Netherlands, for all those who attend.

Things have moved fast since starting up our first publication in September 2019 and we are very pleased with the progress that we have made in establishing a vibrant and energetic heat exchanger community to date. From the many conversations, meetings, e-mails, and phone calls that we had had throughout the entire supply chain, we would like to express our gratitude for all the constructive and helpful suggestions we have received in getting our Heat Exchanger World platform up and moving. As expected, we see that there is a genuine need for a strong community, and we will endeavor to provide this for you through our forthcoming events, the 'adhesive community glue' of our magazine and newsletters, and the help which our staff can provide in helping you to get your message across to a wider audience.

As a company we have been working in the flow control industries for over thirty years and we are greatly committed to assisting our members to share knowledge and experience, to do business, and have fun together. So too at our forthcoming event. I am sure that it will provide the perfect setting for us to all finally meet up and get to know each other even better, which is the essence of doing great business.

The program that we have put together will showcase some of the latest developments within the industry as well as providing some interesting discussions on current challenges to the supply chain. As well as gleaning knowledge from the sessions we hope that you will enjoy getting up and voicing your opinions in our discussions. Make use of the opportunity to ask our experts about those niggling questions and challenges that you face in your daily working life. Undoubtedly, they will be able to provide advice and in many cases solutions. Moreover, this is your community so we want it to be of great value to you whether this be in gaining a better understanding of technicalities or challenges within the supply chain, meeting new business prospects, or just chilling out with like minds.

Of special interest to delegates at the Heat Exchanger World Europe event is that the Stainless Steel World Conference & Expo will also take place in the same venue, November 30 - 2 December 2021. As such it will be possible to visit both. So come along and share and have fun with us. Be part of our community and make it your home. Be with us, be there!

PROGRAM TUESDAY, 30 NOVEMBER 2021

9:30	Welcome by John Butterfield, Conference Manager, Heat Exchanger World
9:45	**9:45 – 11:15** **Workshop: Heat Exchangers connecting Industry Together** Workshop leaders: *Bharinder Ghai, Sandvik Materials Technology; Jos Kaandorp, Shell Pernis; Ernst-Jan Huijbers and Koppe van der Meer, Bronswerk Heat Transfer; and Leo Zoetemeijer, Independent Consultant* Heat exchangers are an integral and everyday part of a multitude of our process industries from chemical and petrochemical plants, refineries, natural gas processing, space heating, refrigeration, air conditioning, power stations, and sewage treatment. As with all industrial products they are continually under development as end-user needs evolve. This workshop will provide a discussion of some of the present day issues and offer some solutions and food for thought. A panel of experts from across the heat exchanger supply chain will address such topics as: - A brief overview and applications - What are some of the major challenges within the heat exchanger supply chain at present? - What are the challenges with using heat exchangers? Technical, commercial availability, skills, availability of product forms, fabrication/tube-to-tubesheet, lifecycle costs, materials selection, operating conditions, quality control - In the high-end industries is there a need to shift from low carbon steels to duplex/high-nickel alloys? - As industry already applies standardized equipment selected from a vendor's catalogue, like plate and frame heat exchangers, what would stop industry from going a similar route for shell and tube heat exchangers through eventual design standardization and replication? Can this new frontier be achieved in the foreseeable future?
11:15	Coffee and networking on the exhibition floor
11:45 11:50 12:10 12:30 12:50	**11:45 – 12:50** **Session on the Cleaning of Heat Exchangers** - Advantages of automation in heat exchanger cleaning. *Joost Bailleux, Peinemann Equipment* - Low pressure methods to clean heat exchangers – something unique. *David Bokov, Goodway Benelux* - Thermal cleaning of heat exchangers: no alternative but a better way to clean. *Robert Mol, Thermo-Clean Group* - Self-cleaning fluidized bed heat exchangers; proven solution for up to zero fouling operation. *Marco van Beek, Klaren International*
13:15	Lunch break and networking on the exhibition floor till 15:00
15:00	**15:00 – 15:20** **Repair/maintenance** - Heat Exchanger tube plugging in compliance with ASME PCC-2 article 312. *Ben Cock, EST Curtiss Wright*
15:30	**15:30 – 17:00** **Interactive workshop: The limits of duplex stainless steels** Moderator: *Mark van den Broek, Fluor* This session will discuss the the position of duplex stainless steels in the petrochemical industry. Serious incidents reported in the past decade relating to the incorrect use of the material have resulted in operators avoiding it. The session will look at restoring duplex's reputation. Duplexes can be a reliable and economical choice in many process applications when correctly used within their boundary limits. The session will end with new research results about lean duplex 1.4062. Presentations: - Specific material degradation mechanisms in petrochemical facilities relating to the use of duplexes. Examples of applications with issues (REACs, reboilers, vacuum condensers, etc.), and reliable and economically successful applications of duplexes in the petrochemical industry. *Mark van den Broek, Fluor* - For heat exchangers in hydrogen and wet sour service, the problem area is the tube-to-tube-sheet weld. A best practice approach in designing and welding of tube-to-tube-sheet connections will be provided. *Jan-Willem Rensman, Fluor, coauthor John Houben, ExxonMobil,* - Alternative solutions for REACS. *Jonas Howing, Sandvik* - Lean duplex stainless steel 1.4062 research to its erosion– corrosion and ballistic propertied behavior. *Jamila Adem, Ugitech* - Heat Exchangers connecting Industry Together

Three months out from the event, it is still possible there will be some slight changes to the conference program before it takes place.

PROGRAM WEDNESDAY, 1 DECEMBER 2021

9:30 9:35 9:55 10:15 10:35	**9:30 – 11:00** **Corrosion/fouling session** - Heat-cured phenol coating for corrosion protection. *Daniel Eras, CP Phenolics* - Using continuous helical flow to reduce fouling. *J. Lainer, Watlow* - Prevention of fouling using DLC with stainless steel pipes and apparatus. *Albert Angerbauer et al., University of Applied Sciences of Upper Austria* - Corrosion, scaling, and leaching - best practices for happy ownership, *Parisa Sayad, SWEPS*
11:00	Coffee and networking on the exhibition floor
11:30 11:35 11:55 12:15	**11:30 – 12:35** **Design session** - A new cold-end heat exchanger for fired heaters for an exhaust temperature reduction below acid dew point. *Euro-Apex* - Solid heat exchanger for flowable bulk goods. *Dr. Winfried Dallmann, Heinz Gothe GmbH & Co. Ltd.* - Polymer-based heat transfer solutions for flue gas treatment and utilization in corrosive environments. *Marcus Swetlik, Technoform*
12:35	Lunch break and networking
14:00 14:05 14:25	**14:00 – 14:45** **Materials session** - Why choose plastics in preference to stainless steels. Plastic heat exchangers - solution for chemical corrosion and stick. *Erwin Volkers, Polyfluor Plastics* - Plate heat exchangers and the growing demand for high nickel alloys and titanium. *Jorgen Smith, Harald Pihl*
14:45	Coffee and networking on the exhibition floor
15:30	**15:30 – 17:00** **Interactive workshop: Welding** A word from the moderator: This session will start with a short series of welding-related presentations. The presenters will be *Loïc Amadu (Groupe Ortec), Harry Schrijen (Schrijen Consultancy), Kees Meurs (Polysoude),* and *Raymond Cordewener (RCMC)*. The subjects will include the welding of duplex stainless steels and new welding developments. A heat-exchanger always has challenges regarding welding issues. These can be related to the materials selection, the welding position, or the fact that the pieces to be welded are located in hard-to-reach places. Sometimes weld overlay is needed, with the piping welded into the overlay. Whenever I visit a heat-exchanger fabrication factory I am always astonished by the speed and skills of the expert welders. They really make a pipe-to-pipe-plate weld in one quick and smooth operation. They are so fast that you would even be challenged to position an automated weld-torch in this time. These sort of welders are worth their weight in gold for their companies. However, the reality is that the availability of these experts continually decreases. In this workshop, we will discuss the choice of the grade of pipes in relation to the exchanger plates used across industry. Duplex is not new to the heat exchanger business. A discussion that continually crops up is the safe working (application) temperature of duplex and super duplex. We are curious to hear audience experiences. Similarly, we would like to discuss the temperature control during the welding process. How do you control the interpass temperature? Do you manage the temperature with the pattern in which you are welding? Do you preheat? Do you test/measure the austenite/ferrite percentage HAZ in the deposited weld? Is it constant over the 360 degrees weld? Therefore, please bring your questions to the workshop. They could be the main course of our discussion, or a dessert to this workshop session.

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From all of the team at KCI Publishing BV, we are delighted to welcome you to Heat Exchanger World Conference & Expo 2021! This advance conference program aims to showcase some of the plans we have in store for this, our first European Heat Exchanger World event. You can find information about the conference program, the exhibition participants, the sponsor, and the exhibition. Join us for two days of knowledge sharing and networking. If you have any questions relating to the event, please see the details for the appropriate contact person and we will do our best to help you.

Very best regards,
John Butterfield/Kamiel van Wijk and the KCI Team

For more details go to: https://heat-exchanger-world-europe.com/contact/

Welcome Reception

Monday November 29th, 17:30; Where:MECC Café

Held at the end of the Monday afternoon, the welcome reception is open to all. The reception is an opportunity to meet the valued and influential group of community members who are instrumental to the structure and direction of both the Heat Exchanger World and the Stainless Steel World Conferences & Expos. So come along and have a drink, a snack, and a chat. This informal gathering is a great way to kick-off your networking participation at these prestigious events.

Heat Exchanger World Networking Dinner

Tuesday November 30th, 18:00 – 20:30; Location: The Brightlands Suite, MECC Maastricht

After a long and busy day, you are welcome to join the Heat Exchanger World Networking Dinner. The formal dinner is an opportunity to meet and discuss business and further develop your industry connections over delicious food and drink. Live music will accompany the evening, creating a relaxed atmosphere. Don't miss the chance to mingle and initiate your new business plans and ideas. Tickets to join the Heat Exchanger World Networking Dinner are €85 per person.

Register Online: bit.ly/3iVI4Go

Conference Registration

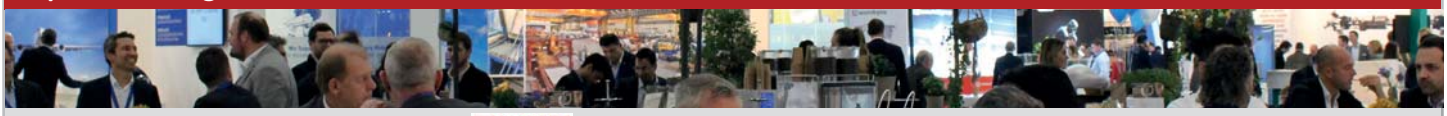
Held for the first time in Europe, the Heat Exchanger World Conference will focus on discussion, interaction, and knowledge transfer. Via interactive workshops and dedicated sessions the program has been designed to address a range of key issues relevant to heat exchangers, including cleaning, repair/maintenance, welding, corrosion/fouling, materials, the supply chain and market trends. Our experts will also be at hand to solve your technical issues in both the conference and on the expo floor. We look forward to welcoming you to Maastricht!

Full 2 Day Conference Ticket €495	Full 1 Day Conference Ticket €295
- 2 days participation to all the conference's sessions and workshops - All conference proceedings online (password protected) - 2 days unlimited access to the Heat Exchanger World exhibition and 3 days unlimited access to the Stainless Steel World exhibition	(choose 30 November or 1 December) - 1 day participation to all the conference's sessions and workshops - The chosen day's conference proceedings online (password protected) - 1 day unlimited access to the Heat Exchanger World exhibition and Stainless Steel World exhibition

If you are an end-user, EPC contractor, or student, please contact Mrs. Clotilde Straatman by email (c.straatman@kci-world.com) directly to discuss our special rates.

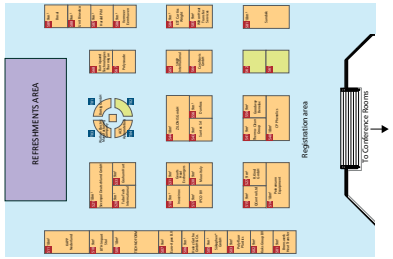
Register Online: bit.ly/3k37aTk

Expo Visitor Registration



Register Online: bit.ly/3CRJB8B

Latest Floorplan



Latest Floorplan: bit.ly/3D0NUya

Unique antifouling technology for refinery key process units, fired heater and heat exchanger tubes

In most refining conversion units, such as delayed coker and others, unscheduled shutdowns, high maintenance, higher fuel consumption and throughput reduction are common problems. This is mostly due to furnace tube coking, fouling and corrosion. Ceramic coating technology minimizes formation, deposition and plugging due to coke/carbon in addition to reduction in fouling, corrosion and fuel usage. Use of ceramic coating in these applications leads to longer runs, incremental life cycle for equipment, reliable operations, reduced fuel consumptions and hence significant savings in OPEX and CAPEX.

By Sanjay Lodha, Global Business Director - Tubacoat

Tubacoat tubes (advanced ceramic coated tubes) are a disruptive innovation technology from Tubacex Group. This new technology of silica ceramic coating has an excellent resistance to coking, erosion and corrosion at extreme conditions and high temperatures up to 800°C (1472°F) in critical refinery and petrochemical process equipment. Tubacoat tubes also minimize coke formation, deposition and plugging due to their chemical inertness in delayed coker, visbraker, vacuum distillation unit, resid hydrocracker and other refinery unit furnaces. These benefits improve unit run lengths, unit reliability, heat transfer efficiency, and tubes life cycle without the same level of need for decoking, and they increase throughput and reduce carbon footprint for both new and aging plant equipment.

Key properties

The coating is a continuous, homogeneous layer. Tubacex is able to control the thickness of the layer across the pipe in a very unique way, based on suspension parameters and rheological properties.

There is a 97% drop in roughness from the uncoated to the coated tube, minimizing particle adhesion. As we know, the smoother the surface, the less resistance there is to the flow.

After 10,000 cycles there is a 94% decrease in mass loss between the uncoated and coated tubes. The hardness and elasticity properties of the tubes can be improved by modifying the structure and composition of the ceramic compounds and process conditions. The hardness of Tubacex's coated tubes is four times higher, while allowing for more elongation (up to 1.5%).

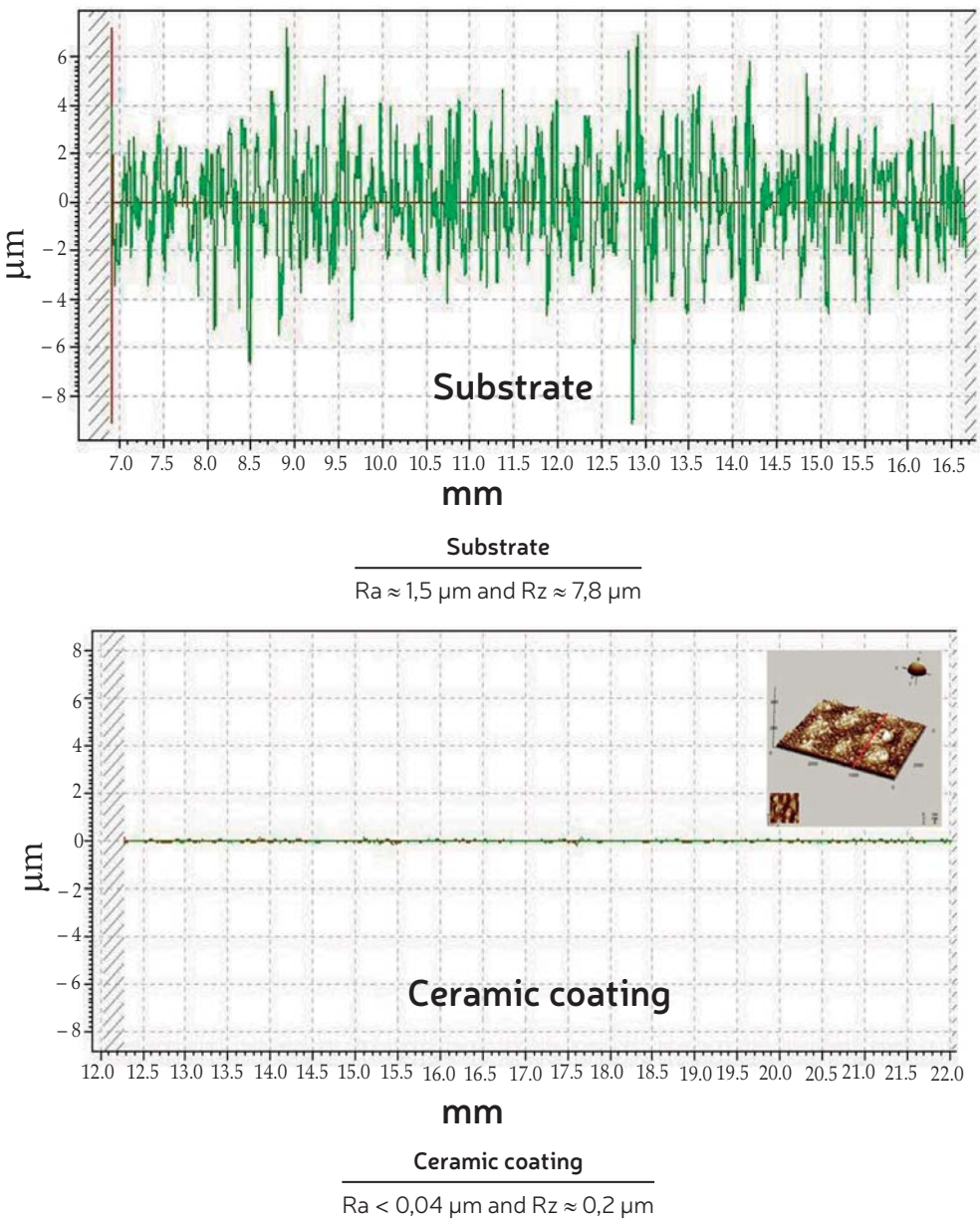


Figure 1: Roughness. Ra and Rz decrease > 97% minimizing particle adhesion

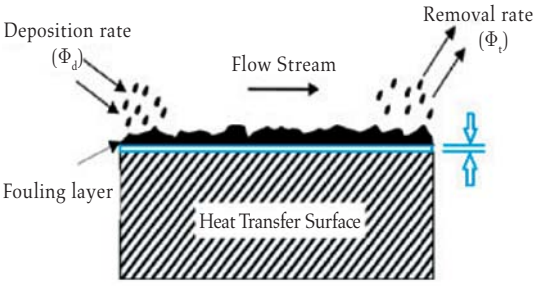


Figure 2

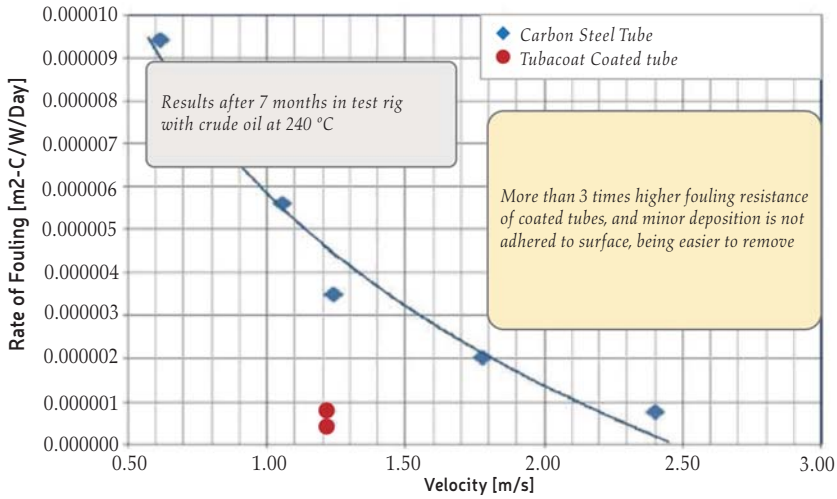


Figure 3: Fouling tests performed by major Oil&Gas companies

Subheading

In any refinery or petrochemical process, there are startups and shutdowns – rapid heating and rapid cooling. The coated tubes perform well under thermal cycling, with no delamination and no cracking. The Tubacoat glass-finished layer will protect the inner and outer surface of the tubes, minimizing any fouling. The deposition rate will decrease because the tubes are chemically inert and as smooth as glass. The removal rate will increase because it will not stick to the surface of the tube, and because of that, heat transfer loss will reduce significantly. And since there won't be any fouling or heat transfer loss, the fluid flow will maintain at a steady state. There is significantly higher fouling avoidance with the coated tubes, as proven in a study conducted at one major U.S. refinery over a period of seven months (see figure 4). The eventual deposition is not adhered to the surface and is more easily removed with pressurized water.

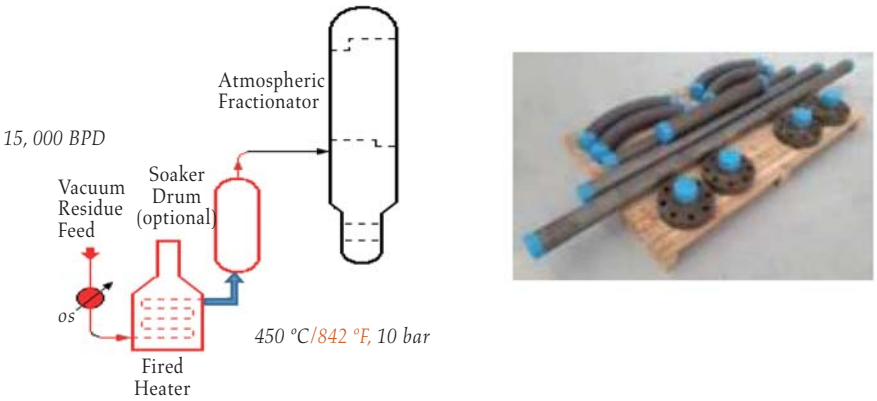


Figure 4: ID coated tubes, bends and flanges installed at the furnace outlet line to prove anti-fouling properties.

Conclusion

In conclusion, applying an inner coating in DCU/VU/VDU and RHC tubes results in longer run lengths, improving overall throughput, and requires less frequent cleaning. It increases safety by reducing the number of shutdowns and startup operations and avoidance of hot spots. It is much cleaner, with a reduced fuel consumption due to increased heat transfer efficiency and CO2 reduction. And it is extremely reliable, with an ad-hoc formula designed for specific applications. The ceramic coating can be applied to carbon steel, stainless steel, and steel and nickel alloy materials.

Case study

Visbreaker Unit, European Refinery

Problem: Coke deposition inside the tubes was causing frequent shutdown in the fired heaters for pigging. This resulted in a huge loss of production. The preheat exchangers were constantly being taken out of service because of coke accumulation. There was tube deformation related to hot spots. The unit had poor heat transfer efficiency and resulted in high fuel consumption in the furnace.

Solution: Tubacex installed ID coated tubes, bends, and flanges at the furnace outlet lines.

Results: After nine months, there was a 75% reduction in coke deposition. What little coke was there was much easier to remove and required three times less the amount of pressurized water for removal. Future cleaning will be less frequent and softer pigs may be used.

The run lengths without decoking/online spalling was increased between three and four times. It saved this refinery $1.5 million per year.

About the author

Sanjay Lodha is a Global Business Director for TUBACOAT, a subsidiary of Tubacex Group, Spain.

Sanjay has over 26 years of experience across various roles in the international refining and chemical industry.

He has a MS in chemical engineering from University of Idaho, and Executive Management from MIT. He is currently based in Dubai, United Arab Emirates.

HPHE and greener furnaces: a combo that can make emissions plunge in the aluminium industry

Furnaces can account for more than 70% of energy consumption in secondary aluminium production, releasing 25-35% of the heat they generate. Industrial furnace manufacturer Insertec, based in Biscay - Spain, has been a crucial partner in one of the three case studies where the European Union-funded project ETEKINA is testing a new range of heat pipe heat exchangers (HPHE).

By Stefania Gozzer, European Science Communication Institute (ESCI)

Rotary hearth furnaces, Insertec. Heat treatment close cells for T5, T6.

Insertec's adjustments to increase a furnace's energy efficiency, combined with HPHE, will help the aluminium industry improve its carbon footprint. The company's Corporate Key Accounts Manager, Ignacio Yebra, explains Insertec's role in ETEKINA in this interview carried out by ESCI.

We know it better than anyone

Yebra: Our role in the project consists of adapting the system at Fagor Ederlan, one of our partners in the ETEKINA project, to integrate HPHE in an existing furnace that was built about 10 years ago by Insertec. We are the designers and manufacturers, so we know it better than anyone. Right now, we are in the phase where the system, all the tubes and control loops, have been installed in the plant's furnace and we are making sure that everything is in place before we begin the actual trials.

The ETEKINA project aims to recover up to 70% of the waste heat stream in energy intensive industries such as steel, aluminium and ceramics. Is heat reutilisation something you had worked with before?

Yebra: We try to be as ecological as possible in our designs, making progress with every product by improving the burner itself and its integration into our furnaces to reduce energy consumption, that is a must for us. We

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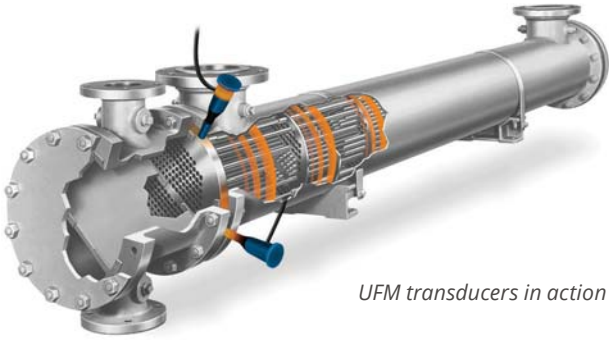
Our Ultrasonic Fouling Mitigation technology allows your heat transfer equipment to be continually cleaned while in its normal operation.

The Ultrasonic Fouling Mitigation (UFM) system employs specialized ultrasonic transducers that are physically mounted to the heat exchanger. Custom calibration of our equipment provides acoustic waves that disrupts fouling from remaining on all heat transfer surfaces. The system operates 24/7, converting electrical energy into mechanical cleaning. The system is totally hands-off from needing any operator intervention.

Running the distance

Social distancing has escalated the need for condition monitoring solutions to get smarter. While this can mean fewer hands required upon operating units, it does not solve or reduce the reality that heat exchangers still suffer from excessive fouling and need to be cleaned at regular intervals. UFM spreads out regular cleaning intervals to allow you to run significantly longer, improving overall profitability and asset life.



UFM transducers in action

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To learn more about the UFM technology including case studies and FAQs, visit our website. Better yet, get in touch to book a virtual tour with one of our technical representatives for you and your team. Send your request to info@orangecleantech.com or call us at the number below.

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also try to redirect some of the exhaust fumes onto other processes. However, what we are doing here now with HPHE is completely new.

What changes are HPHE bringing to your industry?

Yebra: At the moment, fumes go to one baghouse system and the atmosphere, which means all this heat is lost. With HPHE we recover all these hot fumes and use them in the next process, which happens in the same furnace. It has two main chambers, and the temperature can reach 500 °C in the first one, where solution heat treatment happens. Then the metal is quenched before going into the second chamber, where ageing occurs at about 200 °C. Both chambers need heat and, with HPHE, we will be using the heat from the first unit to heat the second one instead of generating it with burners. Therefore, we will avoid, or at least decrease substantially, natural gas consumption in that second area of the furnace. What are the challenges? The first is that the pieces we treat in this type of furnace are security pieces, so the temperature must be very controlled. We are talking about plus-minus 5 °C throughout the whole process. We cannot get out of this range because we would have low quality pieces that cannot be used for security purposes. Hence by integrating HPHE we are adding another external factor to control, so we need to recover all this energy while controlling the process and the requirements of the plant.

Reducing carbon footprint has become a priority for many firms. As a supplier of industrial heating equipment, which traditionally releases a large amount of emissions into the atmosphere, how has your technology in furnaces for the steel and aluminium industry evolved to meet these needs?

Yebra: The demand to reduce the carbon footprint in these processes is not the same in every single continent. Right now, we feel that Europe and Japan are the main areas where companies feel this has become compulsory. Of course, everybody wants to decrease waste heat, but not everybody is willing to pay for these new technologies. But the demand is growing. For example, some of our customers have already started to promote their products by informing their clients of the footprint left by their processes and products. So, for them, it has also become a marketing issue and a sales argument: if they have cleaner processes, customers will consider them. And, of course, there are increasing requirements from the European Union to make the industry greener. I cannot provide names (confidentiality is a must for us), but we have at least five large EU customers with worldwide operations asking for improvements in equipment to make it cleaner.

Insertec Corporate Key Accounts Manager, Ignacio Yebra.

T6 roller type continuous furnaces (T4, T5, T6 & T7 treatments), Insertec. Used in the automotive, railway, power generation and aerospace industries.

And how can furnaces help reduce the total carbon footprint in a factory?

Yebra: For instance, in the aluminium factory where we are testing ETEKINA's HPHE, furnaces are one of the most natural gas consuming pieces of equipment. So if you are able to reduce this consumption by making greener furnaces, you will be reducing a great percentage of emissions released by the whole plant.

What are the challenges of producing energy efficient furnaces?

Yebra: When a burner is on, you will always release emissions. The volume can be lower or higher, but they will always be there. Burner manufacturers are trying to improve that, and we are also doing it by integrating the latest developments, and by having technical control of the whole furnace. Burners tend to be on all the time when heat is demanded by the system, so in the ETEKINA project, we are making the most to switch them off and therefore, reduce the consumption. If HPHE let us reach the temperatures needed by furnaces with heat from fumes stemming from the first chamber, we wouldn't need to use burners in the second one, so these furnaces will release less emissions, reducing their carbon footprint significantly.

About ESCI

The European Science Communication Institute (ESCI) supports national and international research initiatives in communicating effectively and leveraging their dissemination potential. You can find out more at: https://www.esci.eu/

The importance of quality control of cast and forged nickel aluminum bronze alloys

Aluminum bronze alloys have been developed to face sea water corrosion issues and are used in heat exchangers with either castings or forgings. The quality of each component is controlled by international standards, most of the time along with customer 3rd party inspectors. An example on forged split rings will highlight those different tests and how they helped Inoxyda identify a forging process problem.

By Sebastien Delamare and Ayoub Malouadjmi of INOXYDA

Chemical analysis

Quality begins when the alloy is melted and undergoes the first control: a chemical analysis on a sample to check that the concentration of each alloy (copper, nickel, aluminum) are those expected. This is done by Optic Emission Spectrometry. At the same time the part is casted, sample ingots are also casted; the part will undergo non-destructive testing while ingots will be used for destructive testing.

Mechanical test

The mechanical test covers three different properties: tensile strain, hardness, and resilience.

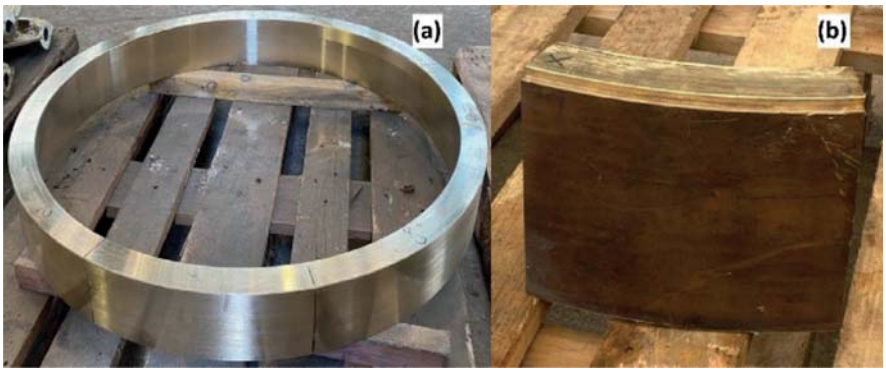

Figure 1: (a) Forged aluminum bronze split ring, (b) section of a test forged ring.

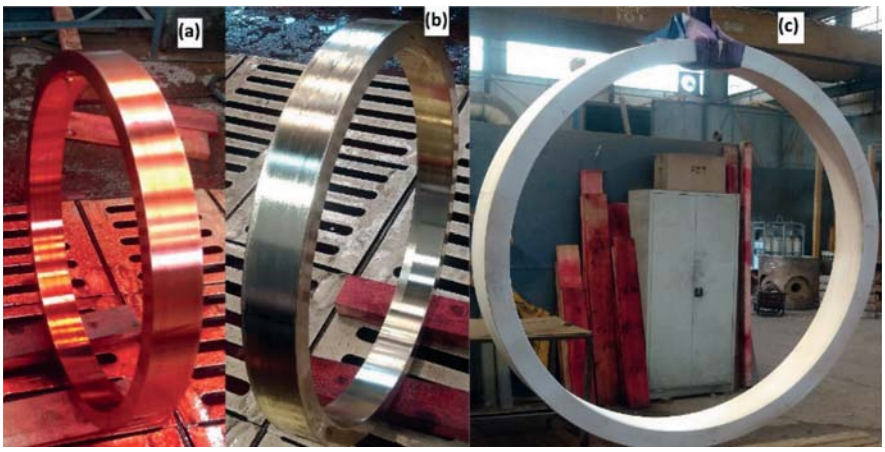

Figure 2: Different step of dye penetrant test. (a) Application of the penetrant, (b) washing (c) application of developer.

A sample is cut from the ingot for Brinell test to be done according to ISO standards (Brinell test is easier to perform than the Vickers or Rockwell tests). The test consists
of a ball penetrating the material with a predefined speed and force, it is applied for 10 seconds before reading the print left in the material with the help of a scale.
Inoxyda has carried out various studies on the limits of the Brinell test by varying the range of force applied, the rate of penetration of the ball, and the temperature at which the test is carried out. It has revealed that it gives reliable results.
The sample ingots are machined into standard test bars. One is used for making a tensile test, and the second is used for a Charpy test. The tensile test specimen reveals mechanical characteristics such as tensile strength, elongation, elasticity and plastic properties
Resilience is characterized by the Charpy test where a weight is dropped from a given height to break the sample. Depending on the height it will reach, after breaking the sample, the resilience will be determined.

Micrography

Micrographies are used to control the distribution of the grain size, the homogeneity of the material, as well as the porosity. Deeper analysis can also lead to checking the different phases in the material. At Inoxyda those tests are regularly carried out using an optical microscope. The specimens are polished down to ¼ mm, then undergo a chemical attack before they can be observed under the optical microscope.

Dye penetrant test

This non-destructive test will be used to get an idea on the integrity of the part. First, a colored penetrant is applied and washed away. The dye will penetrate the shrinkage crack and stay there until a developer is applied, releasing the dye by capillary action. Spots will indicate possible defects which will be interpreted according to international standards and, depending on sizes, locations and shapes of indications, parts are accepted or rejected.

Ultrasonic and X-ray control

Dye penetrant test reveals only the emerging defects. To find deeper flaws in the material, either ultrasonic or x-ray test are used. The concept of ultrasonic test is to send an ultrasound signal through the material, a receiver on the opposite surface will calculate the intensity of the received signal. When an ultrasound wave encounters a defect the intensity drops, indicating a defect. It's possible to determine the size and the location of a defect with this test. Ultrasonic test has to be performed by skilled people to prepare the tools according the kind of material to control.

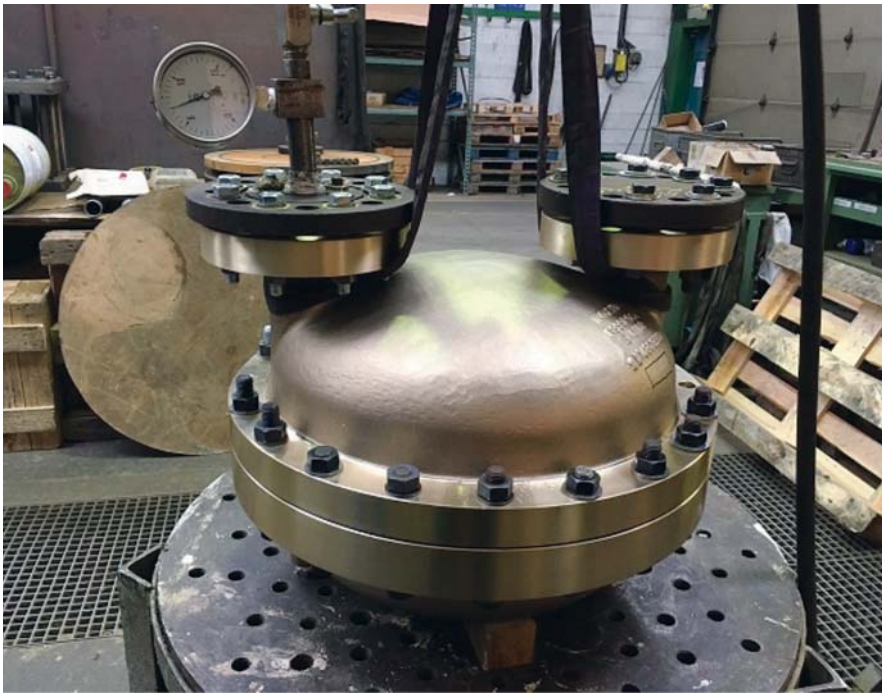

Figure 3: Example of Hydraulic pressure test.

X-rays or radiography, similar as in hospital, show the defect as a contrast on the picture. With this method, it is possible to determine the size and position of the defects if the angles for taking x-rays are chosen wisely. But of course, the cost of these tests is not the same and it depends mainly of the product thicknesses.

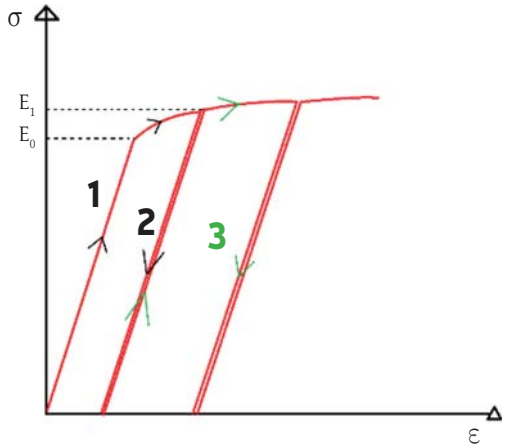

Figure 4: Tensile curve forging step.

For single surface and constant thickness, it's in general suitable to use ultrasonic test. In short, the choice between these two methods will depend on the geometry of the part and it shapes.

Hydraulic pressure test

For pressure containing parts, a hydraulic pressure test is often requested to confirm that the casting or forging is pressure tight at a given pressure level and duration. when a hydraulic pressure test is performed.
In this case, depending the using of the parts, hydraulic pressure test could be enough to know if the parts is ok for use.
To sum up, all these tests can be done on castings or forging and can be used to qualify the material depending the using purposes.

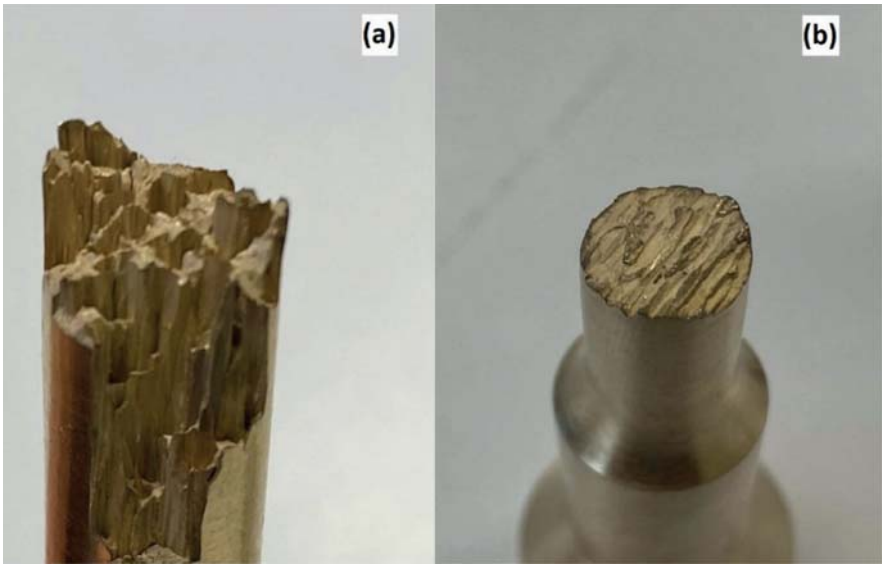

Figure 5: Fracture face of test bar sample in orthogonal planes.

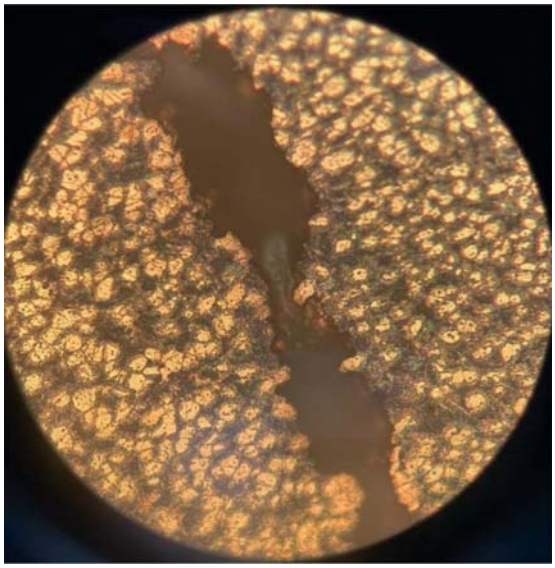

Figure 6: Micrography showing inter-granular crack due to forging.

By our experience and knowledge, we are here to help the customers to choose the right control or test to perform to characterize it parts.

Example of applications of some of these tests above during a manufacturing of forging parts.

Forging

Forging consists of mechanically compressing a casted billet part after heating it. For NAB alloys, the temperature is around 800-850°C. From a structural point of view, forging consists of a plastic deformation of the material (step 1) and letting it resume a shape slightly different from the previous shape (step 2). The process is repeated until reaching the expected dimension and shapes (step 3). This increases its elastic resistance and decreases its elongation at break. Structurally, given the heating, the microstructure is modified. Atomically, forging will displace the dislocations in the material. In general forging is used for special application where high quality, and high level of mechanical results are necessary.

Figure 7: Dye penetrant test showing directional crack.

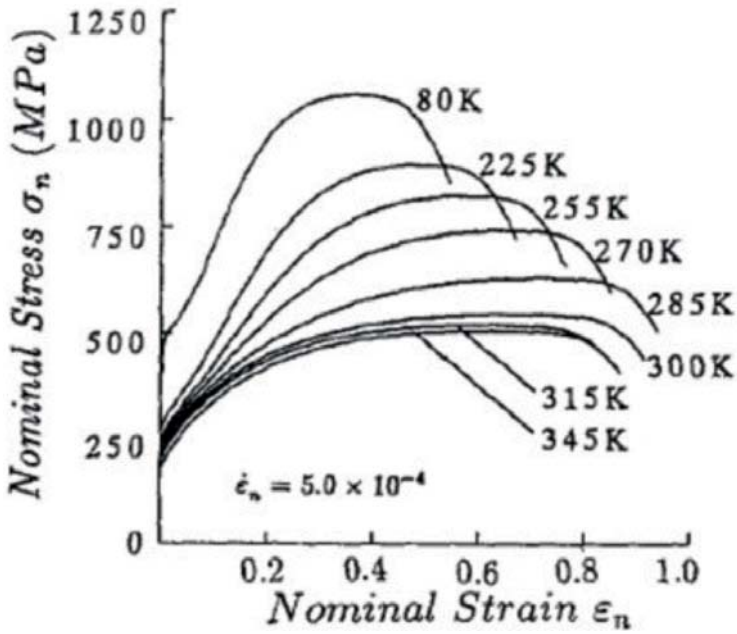

Figure 8: Tensile curve showing the effect of the temperature variation on the mechanical proprieties of a given.

During an experiment carried out by inoxyda aiming to characterize the effects of a bad forging on the forged rings, the tensile test presented unusual results which were investigated more deeply.
Figure 5 shows the tensile test bar after forging having a strange face crack which did not enable to determine the tensile curve. It seemed similar to those found in fibrous composite, so we decided to carry out more detailed test.
Chemical test, tensile test, and micrography of the original casted billet showed normal results indicating that the problem could have originated at the forging process. The micrography of the forged component showed a new and abnormal phase with a lot of directional shrinkage crack which are also identified on the tensile test bar by doing a dye penetrant test (figure 7).

Correlation between mechanical behavior and microstructure

In this particular case the forging was carried out probably at a wrong temperature. This range to forge is significant as shows the curve below: at a given temperatures, materials react differently (Figure 8) which in our case led to the creation of:

- An undesirable new phase (known as β′) which embrittle the aluminum bronze mechanically and against the sea corrosion.
- Unidirectional inter-granular cracks.

Research for the improvement of quality control

Quality tests have proved their efficiency in identification of a complex forging process problem deliberately caused by Inoxyda during its study on the precipitation of the phase β′. This phase is only created when the usual forging conditions are not respected. Although forging is a process widely used, alternatives could exist. Inoxyda has developed a wide range of specific aluminum bronze alloys to cover different customer property requirements.
Inoxyda, as a technical leader in aluminum bronze is engaged in developing further the knowledge and the controls that lead to quality. New tests will shortly be conducted with Scanning Electron Microscopy and Atom Prob Tomography to understand how a heat treatment can have an influence on the corrosion resistance of aluminum bronze alloy in sea water (mainly study β′ phase which is very unknown today), but this will be the subject of a future article.

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About the authors

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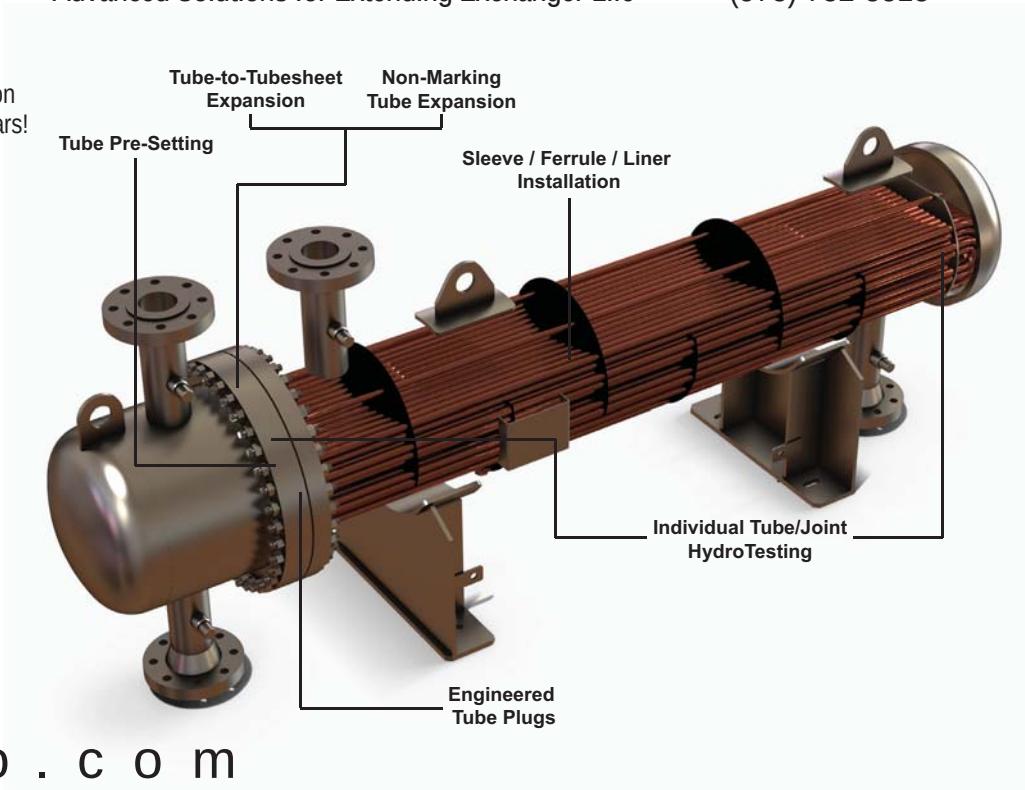

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Product NEWS

Tenova launches TRKSX SmartBurner

Tenova announced the accomplishment of a key milestone towards a more sustainable combustion process: the development of the first burners for heat treatment furnaces using up to 100% hydrogen while keeping NOx emissions largely below the strictest limits.
Tenova continues its efforts towards carbon neutrality with an important achievement resulting in a unique portfolio of hydrogen-ready technologies. After the recent launch of the multi-megawatt TSX SmartBurner family for reheating furnaces fueled with a mixture of natural gas and hydrogen (up to 100%), the company is now ready to bring onto the market a self-recuperative burner for heat treatment furnaces.
The new 200-kilowatt TRKSX (Tenova Self-ReKuperative Flameless) SmartBurner was successfully tested with a variable fuel mixture of natural gas and hydrogen to potentially eliminate CO2 emissions during the combustion process. The system works in flame and flameless mode with the aim to keep nitrogen dioxide emissions well below the strictest future limits.
The TRKSX SmartBurner was designed in consideration of the decarbonization goals of the steel industry, and will be first installed in a heat treatment furnace for pipes at the productive site of Tenaris (in Dalmine, Italy).

SWEP introduces high-capacity B85s heat exchanger

SWEP, part of Dover (DOV), a supplier of compact brazed plate heat exchangers (BPHEs), has announced the addition of the B85S medium-size, high-capacity model to its existing All-Stainless product range.
The new model is highly efficient, with a higher thermal performance than any comparable heat exchangers. It also has a smaller pressing depth as compared to previous generations for a more compact design, while still featuring large ports to cope with high capacities. The B85S is ideal for most types of low-capacity chiller applications and high-performance heat pumps. It covers a wide capacity range in district heating substations and is a proven oil cooler for compressors and hydraulics.
In addition to its new design, as part of the All-Stainless product range, it is durable, compact, and designed for the most demanding heat transfer applications that often use aggressive media such as ammonia, deionized water systems, or fluids with high sulphur content, all of which can be corrosive to copper.
As with all BPHEs, the absence of gaskets or loose parts in the All-Stainless heat exchangers, including the B85S, makes them robust, low maintenance units.
All-Stainless lessens the need for unit replacement due to copper corrosion and, due to its copper-free materials, requires infrequent oil changes.

Protix procures Kelstream scraped surface heat exchanger

Protix is a leading insect breeder and producer of quality products such as ProteinX, LipidX, and PureeX. These products are created using the very latest technology and provide animal feed with a unique protein as its key ingredient. The company's by-products can also be put back into the food chain by processing dietary fibre and insect skin and faeces into a sustainable fertiliser named Flytilizer. Chief Operating Officer at Protix Bas Jürgens was closely involved in the purchase of a Kelstream Scraped Surface Heat Exchanger. This hi-tech machine is now a vital part of the production process of Pureex, a fresh and hypoallergenic ingredient used as a basis for wet pet food.

"The communication, feedback, and customer service with GPI De Gouwe was extremely high quality and the Kelstream meets every single expectation," says Bas. The Scraped Surface Heat Exchanger is part of the Pureex production line and is used for the product's second cooling stage. The Kelstream also ensures the uniformity of the product and prevents blockages during the cooling stage. "Upon delivery, it was very simple to put the heat exchanger into operation using the documentation provided. In addition, GPI is always on stand-by in case any problems occur," says Bas.

New product line for hydrogen refueling stations

Mirai Intex is known as a pioneer of future-proof technologies in the Ultra-Low Temperature (ULT) refrigeration sector. The sector which is burdened with the use of refrigerants having an immense impact on ecology. Typically used refrigerant in this sector (R23) has a Global Warming Potential of 14 800. Other frequently used coolant – Liquid Nitrogen – brings other challenges. Mirai's vision of changing this industry required the opposite approach – the use of one of the most ecological refrigerants – Air. The Air cycle refrigeration machine allows air through repetition of compression and expansion to reach temperatures up to -130 °C. Developed portfolio of MIRAI Cold refrigeration machines grew past few years to satisfy customer needs requiring Ultra-Low Temperatures. MIRAI Cold Open Cycle is ideal for storage applications and Whole-Body Cryotherapy. MIRAI Cold Closed Cycle is ideal for process cooling freeze-drying and solvent recovery.

The company has launched an entirely new machine line – MIRAI H2. Line developed and designed to help grow the number of Hydrogen Fueling Stations using refrigeration technology with zero ecological impact. MIRAI H2 units were developed with attention to safety related to hydrogen use. Additional safety systems, features, and special software is part of the MIRAI H2 package. One particular change for MIRAI H2 is the use of Nitrogen instead of Air due to safety reasons.

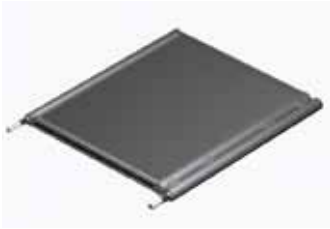
SACOME's heat exchangers for treatment & conditioning of biogas

SACOME continues to successfully design and manufacturing tubular heat exchangers for the treatment and conditioning of biogas, in different sectors and applications. In a recent project, SACOME has been contacted by a national company, dedicated to the integral service of liquefied natural gas (LNG) and compressed natural gas (CNG). The project aims to design a pilot plant for upgrading from biogas to biomethane in a modular format to carry out tests and demonstrations at the client's facilities.

The pilot plant includes a first gas/gas heat exchanger that pre-cools a flow of up to 200 Nm^3/h of biogas that is supplied at 85 °C, by means of the biogas from the second heat exchanger — in which it has already been cooled to the final temperature of 5 °C by means of glycol water.
The solution proposed by SACOME consists of two units of the I-TFM-I heat exchangers, adjusted to the available space and with a dimensioning that guarantees their correct operation.

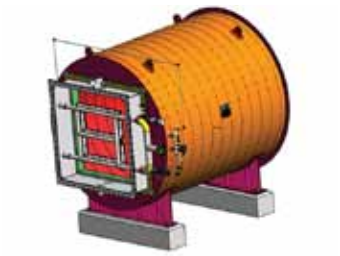
Kaltra's optimized microchannel evaporator

Kaltra's research center completes work on the streamlined microchannel evaporator design that displays amplified performance under partial load conditions. Evaporator's outlet manifold was subjected to optimization to achieve optimum refrigerant distribution between multiport tubes.
The resulting design includes intermediate manifold and outlet manifold – this ensures pressure drop balance within the coil and contributes to uniform distribution of incoming gas/fluid mixture among tubes regardless of load demand (starting from about 15% load). Distributor located inside inlet manifold prevents the gaseous refrigerant from entering microchannel tubes, creating almost single-phase heat exchange. Thus, maldistribution is only due to the asymmetric pressure losses in inlet and outlet manifolds. Large-volume outlet header levels local pressure drops, eliminating uneven, pressure-induced liquid distribution. This novel design



is still suitable for large coils having long manifolds and can operate at any installation angle except horizontal or close to it.
Inlet manifold remained unchanged with inbuilt distributor tube with orifices, as well as common coil configuration with vertically-oriented microchannel tubes (ensuring free condensate removal).
The performance of evaporator coils of the present design has been tested in the field, confirming the results of numerical simulations and theoretical expectations. As almost the entire finned surface is used for evaporation, new evaporators demonstrate efficiency not found elsewhere in other designs.

Fives' hot gas generators set the tone for the cement industry



The largest cement producer in India ordered a Pillard LD-HeatGen System™ with a Pillard REBURNFLAM® burner to efficiently dry fly ash and reduce its NOx emissions. Power plants generate wet fly ash whose use, once dry, can be hazardous for the environment. Indeed, fly ash needs to be mixed with cement @30-35% first to create Pozzolana Portland cement (PPC), a component that has a reduced impact on the environment. The HeatGen system designed by Fives makes for the perfect Hot Gas Generator (HGG) to dry fly ash so that it can be used in cement production. The customer also chose Fives' solution as it will enable him to reduce NOx emissions thus complying with the requirements of the National Capital Region. Additionally, since the HeatGen system is running with a single combustion air fan and without a dilution air fan, it requires less power consumption. Its single shell configuration also reduces the refractory weight compared to conventional double-shell HGG. As a result of the limited number of equipment, the installation and maintenance costs of Fives' natural gas burner system is much cheaper than of conventional coal-fired HGGs. As for the Pillard REBURNFLAM® burner incorporated in the HeatGen system, it has a 23 MW rated capacity and will fire natural gas with an outlet temperature from 300-350 °C.

Danfoss: winner in ACHR news 2021 dealer design awards

Danfoss was recognized for excellence in product design in the 18th annual Dealer Design Awards Program sponsored by The Air Conditioning, Heating & Refrigeration News magazine. An independent panel of contractors acted as judges in the contest that had 117 entries. The company's Optyma™ Control was the silver in the Commercial Controls category. The ACHR News is the leading trade magazine in the heating, ventilating, air conditioning, and refrigeration industries. NEWS Publisher Mike Murphy stated, "These awards give us a unique opportunity to recognize the outstanding research and development efforts that go into many of the products serving the HVACR industry and the awards issue gives our readers an opportunity to read about innovative installation and service solution."

"The Danfoss team is honored by the Silver Award recognition," says Chris Nitz, Regional Segment Marketing Manager REF Solutions—North America. "We're very excited about working closely with our customers as the trend continues toward the use of electronic temperature controls in walk-in coolers and freezers. Saving installation and set-up time for contractors, while improving energy efficiency for end customers, is paramount and the Optyma Control delivers on both."

ACI Mechanical adds Johnson Controls brand

ACI Mechanical & HVAC Sales has added another Johnson Controls Family of Brands product, Skymark Water Source Heat Pumps, to their applied HVAC line card. Water source heat pumps address a growing need for providing smart HVAC solutions for state and local energy codes. This new relationship will cover all of ACI's territories in Seattle, Spokane, Portland, and Northern Idaho. Rick Schnarr, Vice President of Sales at ACI, referenced the large number of installed heat pumps, and the diverse offering of 0.5 to 25 ton horizontal and vertical units from Skymark. "This WSHP offering, along with self-contained water-cooled systems, and Reymsa cooling towers, allows us to combine our air distribution expertise and applied equipment knowledge to solve retrofit problems and help new designs work for buildings in our market." "Working with Johnson Controls, and their advanced software selection tools, allows us to provide engineers and design-build contractors with comprehensive solutions and modern documentation," says Keith Glasch, President of ACI. "Visualizing the solution in REVIT and other tools provides our customers with more resources to help building owners make educated decisions."

Rheem launches new heat pump water heater

Rheem Australia has launched its new generation Ambiheat heat pump water heater, designed to offer a reliable, flexible, renewable option for households.
According to Rheem, thanks to the COP of 4.5, households with an Ambiheat installed could save up to 64-71% of their usual water heating energy bill.
Rheem Marketing Director, John Collignon, says the Ambiheat has been developed by Rheem Australia after extensive R&D to offer another environmentally-conscious option for customers.
"Renewables and greener alternatives are a category that more and more people are eager to include in their home, both for environmental reasons and for their hip pocket," he says.
"Sometimes it's not possible to include a full solar hot water solution in a home, which is where Ambiheat comes in. Using the heat energy that is in the air at all times, regardless of weather and at most temperatures, Ambiheat ensures steady, hot, and strong hot water to the household at a fraction of the energy use of traditional electric water heaters."
The features of the Ambiheat include: Touch-screen LED panel designed to make maintenance and control easier; Operation across a wide range of temperatures, from -5˚C to 43˚C; Backup electric element to ensure hot water even in very cold temperatures below -5˚C; Advanced wrap-around micro-channel heat exchanger technology making the Ambiheat suitable for harsh water; Eligible for government incentives on renewables; and Seven-year cylinder warranty.

Allied Air Enterprises expands its products

Allied Air Enterprises, a Lennox International Inc. Company, has expanded its line of easy-to-install home heating and cooling solutions with the new LYNX™ 18 SEER Inverter Heat Pump under the Ducane™, Concord® and Allied™ brands. Quickly adaptable with AHRI-rated systems and offering compatibility with a wide range of existing indoor equipment, the LYNX 18 is a smart replacement upgrade that provides application versatility and high performance. While heating and cooling replacements are often unplanned, the LYNX 18 Inverter Heat Pump provides a balance of performance and value that fits the budget.
It is powered by intelligent algorithms instead of expensive, proprietary thermostats, the LYNX 18 works with most conventional 24v thermostats.
The unit's proprietary QuickLink™ Inverter Technology delivers enhanced homeowner comfort, with consistent dehumidification and temperature levels. The LYNX 18's unique five operating modes can dial in the perfect balance of comfort and increase energy savings by up to 22% annually compared

to conventional 14 SEER single-stage heat pumps. Other benefits include: Quiet Shift™ Technology and sound-isolating compressor mounts that produce noise levels as low as 60 dBA. Omniguard® Total Corrosion Protection Technology and a factory-installed Suction Line Filter Drier that helps extend the unit's life. Clean Sweep Defrost technology help reduce the number of defrost cycles needed. The simplified piping system virtually eliminates installation and operational complexities as well as the causes of potential leaks.

New Magnetic series by Frascold, the answer to Tier 2

Frascold has launched Magnetic, a series of compact screw compressors with innovative IPM (Interior Permanent Magnet) motors, capable of ensuring the best energy performance, particularly with partial load. The range, designed to meet the stringent SEER, SEPR, and SCOP standards required, is ideal in the comfort and process cooling segment and for heat pump applications. Magnetic offers a wide range of cooling capacities, thanks to the 5 models ranging from 170 to 310 HP, for volumetric displacements from 137 m^3/h to 1,054 m^3/h.

At the heart of the Magnetic line is the synchronous motor with magnets in the electric rotor, which eliminates slippage and ensures more accurate speed control, to achieve high cooling capacities, even with small compressors.

Another advantage of choosing IPM motors is the significant reduction in power consumption, compared to traditional solutions, in favour of greater energy savings.

In addition to reduced consumption, their strengths are reliability, simplicity, and flexibility, as well as integration into any type of system. In this sense, it is possible to achieve Tier 2 standards, without the need for sophisticated system solutions, leaving manufacturers complete freedom in designing and configuring the system, even when it comes to choosing the inverter.

Heat transfer experiment arrives at International Space Station

A new experiment designed by Purdue University engineers addresses both problems. The Flow Boiling and Condensation Experiment (FBCE), which arrived at the International Space Station recently, will soon advance the science of heat transfer in microgravity.

Two-phase flow refers to two phases of matter – liquid and vapor – that happen during boiling and condensation. In a process known as "flow boiling," a specialized liquid flows by a heat source, which causes the liquid to boil and create bubbles. Those bubbles of vapor flow past the heat source, reject the heat and then condense back into liquid, which recirculates constantly in a closed system.

It's a highly efficient and well-studied process, but one aspect remains unknown: is flow boiling in space as efficient as flow boiling on Earth? To find the answer, Mudawar formed a research partnership with NASA's Glenn Research Center. His team designed and built an experiment to test flow boiling and condensation in microgravity, and in 2012 the team sent it on the "vomit comet," an airplane that simulates periods of 15-17-seconds of microgravity by flying up-and-down parabolas.

In collaboration with colleagues at Glenn Research Center, Mudawar's team continued to tweak multiple factors in the process, and in the next few years, sent the experiment up several times on parabolic flights with Zero Gravity Corporation (ZERO-G). Purdue students were aboard to operate the equipment.

Laird Thermal Systems launches OptoTEC OTX/HTX series

Laird Thermal Systems has launched the enhanced OptoTEC™ OTX/HTX Series of miniature thermoelectric coolers designed for high-temperature environments found in telecom, industrial, autonomous, and photonics applications. Featuring next-generation thermoelectric materials, the Series offers a 10% boost in cooling capacity, greater temperature differential, and higher efficiency than standard thermoelectric coolers.
The high-performance, solid-state cooling devices are specifically designed to control the temperature of heat-sensitive optoelectronic components used in laser diodes, optical transceivers, LiDAR, CMOS, and Infrared Range (IR) sensor applications.
Optoelectronic devices, such as laser diode packages, can reach operating temperatures as high as +85°C in an outdoor or air-restricted environment. Whether used for fiber optics in telecommunications, industrial processing, or autonomous systems, temperature stabilization is key to maintaining the laser diodes' peak performance and ensuring long-life operation. Thermoelectric coolers utilize the Peltier effect to keep sensitive optical components below their maximum operating temperature. By reversing the polarity, thermoelectric coolers can heat or cool, which allows for a temperature control accuracy of up to ±0.01°C under steady-state conditions.
In footprints as small as 3 X 4 mm, the Series offers high heat pumping capacity and improved temperature stability for optoelectronic applications with tight geometric space constraints.

Mira's HeatCapture - latest innovation in sustainability

Mira Showers announces its latest launch - the Mira HeatCapture™. This new offering provides developers the opportunity to offer a sustainable and efficient wastewater heat recovery system (WWHRS) to their developments. This new product utilises heat from bathroom wastewater to increase the efficiency of a domestic heating system. This results in the boiler applying less energy to heat water, as the required heat rise has been reduced.
With hot water demand being added to the Standard Assessment Procedure (SAP) regulations for 2025, Mira's HeatCapture™ will help specifiers and new property developers ensure new building projects are in line with these regulations from the onset. Mira's new product will increase the overall hot water efficiency of a new home by up to 10%.
The Mira product is designed with a double-wall stainless steel heat exchanger, the only one of its kind currently available on the market in the UK. The ridged stainless-steel core ensures water exiting the shower waste or bath transfers its heat to the cool incoming mains. Conforming to EN1717, the steel heat exchanger is perfect for new build applications. This step forward in sustainable solutions will also support UK housebuilders in achieving their goal of net-zero greenhouse gas emissions by 2050.

OMRON launches G9KA high power PCB relay

OMRON Corporation based in Kyoto, Japan has announced the global release of the G9KA High-Power PCB Relay. This product improves the power generation efficiency of PV generation systems by minimizing energy loss caused by heat generated by power conditioners, power supply equipment, and related equipment used in solar power generation systems. The ultra-low contact resistance of 0.2milliohm suppresses heat generated by the relay and improves the power generation efficiency of solar power generation systems, thereby accelerating renewable energy deployment and contributing to realizing a decarbonized society. One of the factors that can cause equipment to generate heat is the relays mounted on the PC board inside the equipment. Relays are components used for executing ON/OFF control of the electric current flowing through equipment when linked with the power system, and for safety shutoff in an emergency. Conventional high-power relays have a high contact resistance value. So, energy loss due to heat generation has been an issue.
The G9KA can reduce the temperature rise of the relay by about 30% – compared with conventional high-power relays – by lowering the contact resistance to the industry-leading 0.2milliohm. This product helps to reduce the size and weight of equipment by simplifying the heatsink and cooling fan installed as a countermeasure against heat generation.

Carrier introduces infinity return air purifier

Carrier recently launched the Infinity® return air purifier, its latest indoor air quality solution designed to help create a healthier home. Installed and mounted in the return air duct, the air purifier offers proven, third-party tested effectiveness in inactivating 99% of select airborne viruses and germs, including coronavirus1 trapped by the MERV 15 filter.
Carrier is a part of Carrier Global Corporation (NYSE: CARR), a leading global provider of healthy, safe, sustainable, and intelligent building and cold chain solutions.
The Infinity return air purifier, a part of the Healthy Homes suite of Carrier's Healthy Buildings Program's indoor air quality solutions, offers a quiet-operating, MERV 15 measure of efficiency for residential air filters. In addition, it's ideal for applications where the furnace air handler is not easily accessed by the homeowner. Minimal maintenance is required, including filter cartridge replacement and occasional inspection/brush cleaning of the ionization panel. Plus, the Infinity return air purifier is installed inside the living space, allowing for convenient and easy filter cartridge replacement.

Panasonic introduces advanced AHU Kit for PACi NX Series

Panasonic Heating & Cooling Solutions has added a new Air Handling Unit (AHU) Kit to its successful PACi NX Series designed for commercial applications. The powerful PACi NX range achieves outstanding SEER / SCOP efficiency values and energy labels up to A+++.
The new AHU Kit (PAW-280PAH3M) provides a robust and reliable fresh air solution for the PACi NX Series with optimal control for users to ensure their ideal environment.
The kit combines air conditioning and fresh air in just one solution. It is available in a medium version and comes in a sleek and sturdy steel casing.
The system has Panasonic's efficient CONEX Controller with Bluetooth built-in for quick set-up. The innovative IoT remote controller can be used through a smartphone or tablet and is compatible with the Panasonic H&C Diagnosis App for analysis and troubleshooting.
It is designed for ease of installation, maintenance, and use, Panasonic has ensured the new AHU Kit is straightforward with clear guidance to avoid errors. The new PAH3 models have all access points displayed on one layer, in full view, and for easy access. Furthermore, all parts and wiring are clearly labelled and there is sufficient space in the terminal block to allow easy installation.

SECESPOL streamlines the selection of heat exchangers

Choosing an optimal heat exchanger can be a challenge, which is why SECESPOL engineers decided to simplify the process as far as possible. The new version of the CAIRO selection software enables you to select the right exchanger in just one minute. In addition to many new features, users can also count on real-time technical support.
Heat exchangers have very wide applications in various industries and everyday life. The efficiency and reliability of the exchanger are key features that determine the choice of a particular manufacturer. However, several other parameters must be met for the device to fit into the selected system.
CAIRO is proprietary exchanger selection software, which is constantly developed in response to user needs. Thanks to locating the software in the cloud (Microsoft Azure solution) you can use it without installation, on any device with a web browser.
CAIRO uses high-security standards that are standard in electronic banking, and the management system of personal data is compliant with the requirements of the GDPR. Working media are certified by the National Institute of Standards and Technology (NIST).

San Jacinto Opportunities

Further field automation, closer alignment with STEM fields, and the push for a more diverse workforce have moved more female students to look at industrial fields as viable career choices.

The LyondellBasell Center for Petrochemical, Energy, & Technology offers a wide variety of programs that lead to exciting, rewarding careers:

- Electrical Technology
- Process Technology
- Instrumentation/ Analyzer Technology
- Inspection Technologies
- Environmental Health and Safety Technology
- Welding, Pipefitting, and Millwrighting*

*NCCER Pipefitting and Millwrighting are offered as non-credit programs at Central Campus. NCCER Pipefitting is offered as a credit program at North Campus.

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Industry NEWS

Emerson acquisition of 7AC propels NREL HVAC technology to market

In November 2020, multinational powerhouse Emerson acquired a startup company, 7AC. It was a big deal in the world of cleantech startups—a fairy-tale ending for a startup company whose technology had made it to the HVAC commercial market.

And it was an acquisition celebrated across NREL—by a group of Buildings Program engineers whose R&D advanced the technology and by members of the Innovation, Partnering, and Outreach directorate that managed the agreements, including a grant from the Wells Fargo Innovation Incubator (IN2), that helped launch the HVAC company to commercial success.

7AC began working with NREL in 2010 when 7Solar founder Peter Vandermeulen came to NREL with a conundrum: They were making solar panels and wanted to know what to do with the solar heat. As Luttik tells the story, 7Solar was looking for a heat sink and thought NREL's Desiccant Enhanced Evaporative (DEVap) air-conditioning system (a 2012 R&D 100 award winner) might provide that opportunity. The DEVap technology turned out not to be an exact fit for 7Solar, but it was intriguing, and the company licensed the technology and changed its focus and its name to 7AC. It was a starting point. Then 7AC and NREL launched into several iterations of liquid desiccant heat exchanger technology (LDHX) using a technology services agreement and later a cooperative research and development agreement (CRADA). Eventually, the research took the team from NREL to Anderson Air Force Base on the island of Guam. And the research team expanded to include the U.S. Navy.

HRS Heat Exchangers acquired by EIL

Exchanger Industries Limited (EIL) has acquired HRS Heat Exchangers Ltd. (HRS). The financial terms were not disclosed.

HRS is a specialist global supplier of heat exchangers and custom process systems across the environmental, food, beverage, chemical and pharmaceutical sectors. The acquisition by EIL creates new opportunities by combining HRS's capabilities and market sectors with EIL's accelerating expansion into power generation, Liquified Natural Gas (LNG), renewable energy, power storage, and biofuels applications.

The combined business is positioned to create market growth by providing its customers with environmentally sustainable heat exchange solutions. The seasoned HRS management team will be retained by EIL and will play a critical role in executing plans for robust international expansion afforded by the strategic combination of two distinct, yet complementary industry leaders.

To deliver these projects competitively, the acquisition provides EIL immediate access to a cost-effective global footprint with scalable hubs in both India and Spain, and a combined portfolio of anti-fouling technologies that enhances differentiation and acts as a unique platform to create value for customers.

The acquisition of HRS Heat Exchangers provides EIL with an extraordinary opportunity to expand their exposure to an impressive international customer base across rapidly growing geographic market positions in the U.S., U.K., Spain, Mexico, India, the Middle East, Malaysia, Australia, and New Zealand. As evidence of this opportunity, HRS was ranked number 161 in the U.K.'s prestigious Sunday Times HSBC international top league table that tracks the international growth of U.K.-based companies.

Energy Minister visits UK's largest heat networks

The Minister for Business, Energy, and Corporate Responsibility, Lord Callanan, recently visited Cory's Riverside Energy from Waste Facility (EfW) in Belvedere.
Vattenfall, in conjunction with Cory, will harness heat to serve 21,000 homes in the Thames Estuary area. The project was made possible when Cory was awarded GBP 12.1M through the Government's GBP 320M Heat Networks Investment Project (HNIP) in April 2021.
Vattenfall will develop one of the UK's largest heat networks to supply low carbon heating locally. This is possible thanks to the GBP 1.6M commercialisation grant and GBP 10.5M construction loan, delivered by Triple Point Heat Networks Investment Management.
Over recent weeks, Lord Callanan has been touring projects awarded HNIP funding to meet the teams behind the future of low-carbon heating in the UK.
Cory's existing Riverside EfW facility will provide heat for up to 10,500 homes in Bexley in the first phase of the proposed heat network. A second EfW facility – adjacent to the existing one and part of Cory's Riverside Energy Park which received planning permission from the Government in April 2020 – will supply an additional 10,500 homes.

HERING supplies 160 heat exchangers for PTA plant in China

HERING is manufacturing 160 pieces of stainless steel shell & tube heat exchanger for an installation in the biggest PTA plant worldwide located in the northeast of China. The complex heat exchangers have been designed for special vacuum processes in cooperation with the customer and are now in the manufacturing stage.
Besides these customized vacuum heat exchangers, HERING also manufactures heat exchangers for food, beverage, and chemical industries in its stainless steel workshop. This area of the production is strictly separated from the rest and only for pure stainless steel products.
Also, a big rate of the ASME exhaust heat recovery units (hot water and steam boilers) for the international CHP market are complete manufactured out of stainless steel. With this stainless steel design, HERING sets new standards in quality and reliability.

Southern Heat Exchanger opens a new facility in Tuscaloosa, Alabama

Southern Heat Exchanger has opened a new state-of-the-art manufacturing facility in Tuscaloosa, Alabama. The new 42,000 sqft facility, which boasts a 120,000 lb. lift capacity, is situated next to their existing 30,000 sqft Plant 2 facility and will allow for seamless production flow, all on one site. The new facility also includes a new office that will integrate the various staff functions allowing them to work and interact more effectively and productively. Bob Giammaruti, Southern Heat Exchanger and Worldwide Air Coolers CEO said, "The new Tuscaloosa facility will enhance our operating efficiency and allow us to provide our customers with an enhanced experience. With shell and tube facilities in Tuscaloosa, AL and Houston, TX, along with our Worldwide Air Cooled Heat Exchanger facility in Tulsa, OK, we have the people, equipment and facilities to serve our large and diverse client base and be their First Choice when it comes to selecting the products and services we offer."

Enertopia Corp develops a new technology

A new technology developed by Enertopia Corp. (Kelowna, B.C., Canada; www.enertopia.com) aims to improve the efficiency of solar panels by collecting excess waste heat and using it to heat water. Besides improving energy output, the technology also significantly lengthens the useful lifespan of solar panels by reducing overheating. Enertopia's technology involves outfitting the backside of a solar panel with a sponge-like heat-dissipative device made of ethylene propylene diene monomer (EPDM).
"Basically, there's water flowing underneath the solar panels, which removes the excess heat, but to couple the panel to the EPDM rubber device and not shock the panel or break the glass, we have developed a breakthrough technology that actually acts like a one-way heat sink on the back of the panel," explains Mark Snyder, lead process technologies consultant for Enertopia. In some conditions, says Snyder, the EPDM device can take advantage of dewpoint differences and draw water out of the atmosphere, meaning that it can actually create water in addition to collecting waste heat. "If you have a large array, you could actually be making several thousands of gallons of water per day," he adds.

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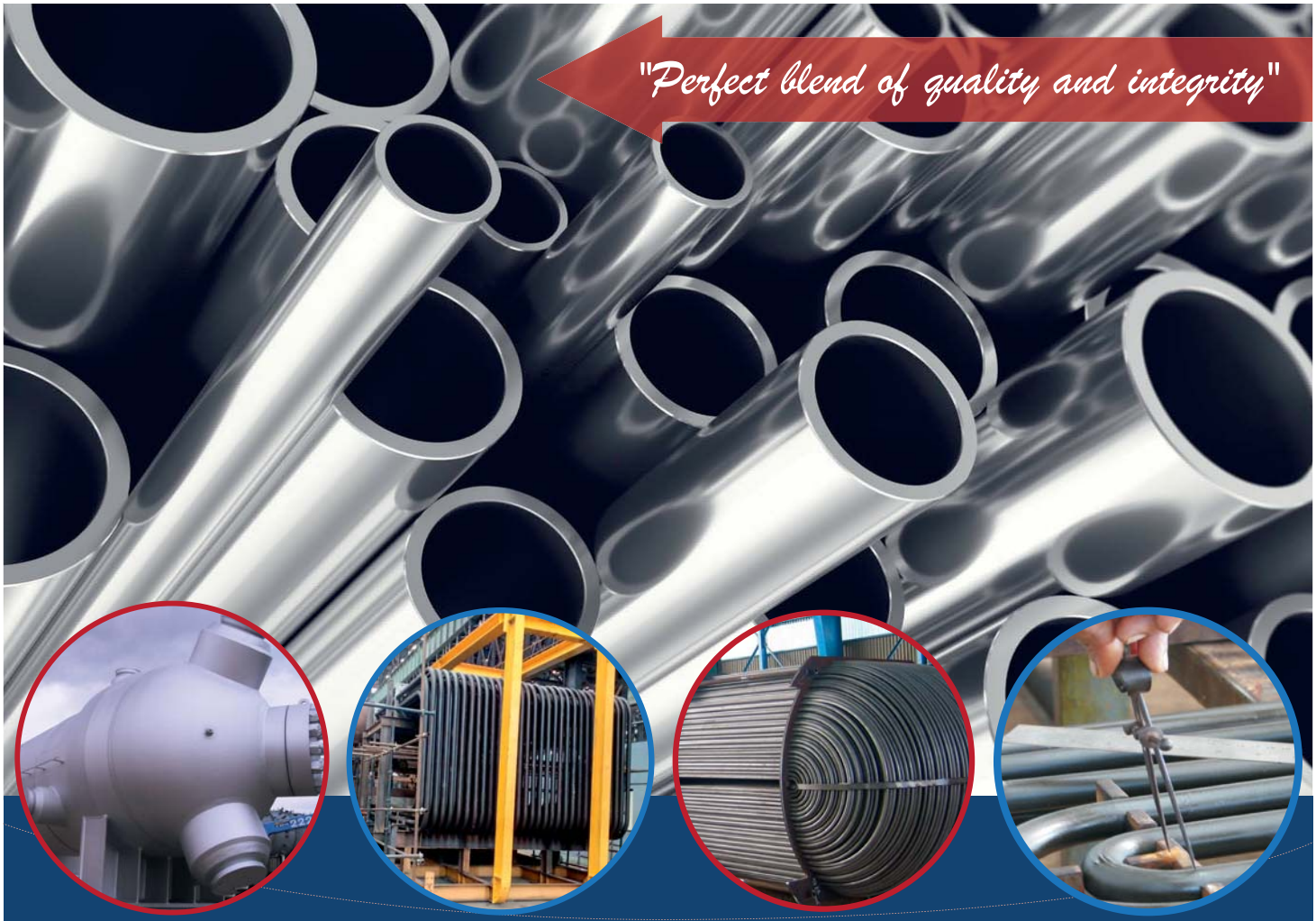

Applications

Heat Exchanger | Condensers | Super Heaters | HPFWH | Boilers | Instrumentation & Process Piping
Automotive | Locomotive | Hydraulics & Fuel Injection | Conduits | Ornamental

What Differentiate HMT from Others

Carbon Steel, Alloy Steel & Stainless Steel from same mfr.
Capability to mfr. st. length tubes upto 34 Mtrs. | U-Tubes with max. hydro test pressure @700 Kg/CM^2
Special grades with quick delivery | SA334 Gr. 3, SA213 T5/T9/T91
Duplex & Super Duplex, TP310/TP321H/TP347H/TP405/TP410

Grade & Specifications

Stainless Steel

ASTM A213, 249, 269, 270, 312, 688, 376, 789 and their equivalents in ASME, EN, DIN, BS etc.

TP304, 304H, 304L, 304LN, 310S, 316, 316L, 316H, 316Ti, 316LN, 317, 317L, 321,321H 347, 347H, 405, 409, 410, UNS 31803/32205, 32750 & their equivalents in ASME/DIN/EN etc.

Carbon Steel

ASTM A179, 192, 210,556,519 106 Gr. A / B / C, A-333 & 334 Gr.1/3/6 & their equivalents in ASME, DIN, EN, BS etc.

"BS-1775, 3059, 3601, DIN-1629, 2391, 2448, EN10216-2St-35.8, 45.8, 52, P195, P235,P265, P235GH, P265GH, AISI 1026, 4130, 4140, 8620, etc."

Alloy Steel

"ASTM A213 Gr. T2, T5, T9,T11, T12, ASTM T22, T91, ASTM A335 Gr. P2, P5, ASTM P9, P11, P12, P22,P91, ASTM A209 Gr. T1, T1A, T1B,16Mo3, 13CrMo44, 10CrMo910 and their equivalents in DIN,EN, BS etc."

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CACW for the renewable energy sector

"The global energy mix is changing, with more clean renewable energy sources being added to the grid. The intermittency of renewable energy sources has raised clear challenges to grid integration and its stability," said GE Power Conversion. So, they developed a rotating stabiliser as a solution. GE Power Conversion asked Sterling Thermal Technology to equip their latest rotating stabiliser with the closed air circuit water coolers (CACW). Why did they choose the machine coolers? Because of long-term partners and it also has the experience, technical expertise, and manufacturing capabilities.

The high inertia rotating equipment requires reliable and precise thermal management. This is where they can assist. How? It has designed and manufactured air to water coolers to their client's exact specifications. They are optimised, efficient, and reliable, tailored to this application. In this case, even if the coolers are compact, they are still relatively large, with a footprint of more than 40 sqm and a weight that exceeds 13 tons. Besides, they selected the appropriate materials to minimise erosion, corrosion, and fouling to ensure the longevity of operations with minimal downtime.

Ground-breaking JV to accelerate UK's journey to net-zero

SGM is combining with UK renewable energy solutions provider Vital Energi to form a unique and pioneering private sector initiative to develop, own and operate low and zero-carbon heat networks.

The 50:50 joint venture will create an Energy Services Company (ESCO), representing the UK's leaders in utility infrastructure and heat networks to provide affordable and low-carbon infrastructure to the existing land portfolio. This includes delivery of heat to developments planned by the property arm, SGN Place, and the local vicinities where there is a demand for low-carbon heat.

It is estimated that the heat network market requires approximately GBP 30bn of investment by 2050 to meet the UK Government's net-zero targets, and the decarbonisation of heat has been highlighted as a particular challenge where heat networks can offer a solution. The Climate Change Committee's Sixth Carbon Budget suggests the UK should target 20% of UK heat demand through low-carbon heat networks by 2050.

Together, it has ambitious plans to establish solutions to this challenge across strategically located sites. These locations are a combination of the redundant sites owned and others that will be developed over time through Vital's existing market presence.

The objective is to supply new and existing residential, industrial, and commercial facilities and development activity is already underway for two projects in Scotland and the South East, with another 20 in the pipeline.

Heat exchanger market expected to register a CAGR of growing rate

Over the past few years, the global heat exchanger market has witnessed significant developments. Heat exchangers are the widely accepted equipment for various end-user applications, due to their eco-friendly and energy-efficient properties. The increasing focus of various regulatory bodies to reduce greenhouse gases (GHG), to meet future sustainability, is expected to further drive the market studied. Moreover, the increasing industrial operations in developing countries are one of the major factors propelling the demand for heat exchangers.

The innovations in heat exchanger technology are likely to drive the market during the forecast period. The efficiency improvement of heat exchangers is a big boost for enhancing the economics associated with the usage of heat exchangers. The enhanced performance of heat exchangers, fostered by technological advancements, leads to higher efficiency in energy usage. Due to the multiple associated benefits, shell and tube heat exchangers are the most commonly used heat exchangers for industrial applications. These types of heat exchangers can transfer large quantities of heat from one end to the other. Their application is highly sought after, in temperature and pressure applications. The high-pressure and temperature and long-distance heat transfer cause significant wear and tear, which result in regular maintenance and periodic replacement of the shell and tube heat exchanger. The replacement of shell and tube heat exchanger is expected to play a significant role in the market studied.

Busch Vacuum Solutions acquires VFE

Busch (UK) Ltd, part of the global Busch Vacuum Solutions group, has acquired Vacuum Furnace Engineering (VFE). Now a wholly-owned subsidiary of Busch (UK), the move enables both VFE and Busch (UK) to strengthen their leading vacuum solutions and services for UK metallurgy and composites manufacturers.

Since 1985, VFE has provided vacuum services, specialist equipment, control, and calibration solutions to heat treatment and advanced material manufacturers in the UK. Their long-term commitment to these market segments, their applications knowledge, and service mindset have enabled VFE to become the market leaders in their field.

Busch (UK) has 50 years of experience in providing individual and tailor-made vacuum solutions and services to Customers in a wide range of market segments, including food, chemical, pharmaceutical, oil and gas, semicon, medical, and metallurgy. The full portfolio of vacuum technology is continuously developed by the Busch group to ensure to offer customers the lowest total cost of ownership. Operationally, the VFE subsidiary will remain focused on the markets that benefit from their expertise in vacuum metallurgy and composites. The existing Busch business will continue to serve the existing customers under the Busch brand.

The low-carbon, energy-saving, & innovative development seminar

The "Low-carbon, energy-saving, and Innovative Development" seminar was held in Hohhot Inner Mongolia during the last week of July 2021. Accessen was invited to attend the conference and deliver a speech. With the continuous development and application of low-carbon energy conservation and the new energy industry, Accessen has discussed the future development trend of heat exchange stations with the experts. As a result, Acceesen's concept of green energy-saving heat transfer and R&d direction of improving efficiency and reducing consumption has been unanimously praised. Accessen is a genuine original plate heat exchanger and plate heat exchanger skids manufacturer with all components are produced in its factory and complete end products. Maximum capacity: producing 30000 sets of the heat exchanger and 5000 sets of heat exchanger packages per year.

Heat and Control new facility under construction

Heat and Control, Inc., an equipment manufacturer and food/non-food processing industry supplier is constructing a new facility in Lancaster, Pennsylvania.
The new site will expand support for the North American manufacturing industry and will meet the increased needs of pre-sale and after-market needs, including product/equipment testing, demonstrations, service support, and training. The facility will primarily support engineering, sales, service, spare parts, and training of packaging and inspection products lines. The building will feature a technology showcase of Heat and Control's industrial equipment alongside leading partners Ishida and CEIA.
The new facility measures 120,000 square feet (11,148 sq. m) on a 13 acres lot. It will include an equipment demonstration center, a state-of-the-art training center, an expanded spare parts automated fulfillment center, along with an expanded office and warehouse space to accommodate an increased stock of inventory equipment. Operations at the Lancaster site are scheduled to commence in late 2021.

Well prepared for future textile market with sustainable production

The Austrian textile producer FEINJERSEY and the German textile machinery manufacturer BRÜCKNER are connected by a long-standing partnership. Both develop and produce in Austria and Germany respectively, have high competence in their field and offer their customers quality and first-class service.
The latest BRÜCKNER line has a working width of 4.20 m and is mainly used for the finishing of highly elastic and extremely sensitive knitted fabric. To avoid yellowing on the fabric, the stenter is equipped with an indirect gas heating system. The knitting oil vapours coming from the fabric during the heat-setting process are extracted from the dryer and cleaned in a BRÜCK-NER ECO-AIR exhaust air cleaning system before being extracted to the atmosphere. The complete exhaust air treatment on the newest stenter is carried out by a multistage BRÜCKNER ECO-HEAT and ECO-AIR system.
The first stage is an ECO-HEAT heat-recovery system air/air. Here, by means of 12 plate heat exchangers, the exhaust air heat is transferred to fresh incoming air which is pre-heated and then fed into the stenter for the drying process. This increases the drying capacity and reduces energy consumption.

Exhaust air pollutants generated during the heat-setting process cause thin, hard deposits to form on the heat exchangers over time. The integrated, automatic steam cleaning system keeps the heat exchangers in good working order.
The second stage is an ECO-AIR exhaust air scrubber that fulfills two important tasks at the same time: it cools the exhaust air and binds oily pollutants in water. Thanks to a sophisticated design of the exhaust air scrubber, only about 1 cbm of wastewater is produced per week. The oil-containing substances extracted from the exhaust air are separated from the water by an oil skimmer and disposed of separately.