The Complete Range of Innovative Fluxes

NOCOLOK® Flux

Right to the point!

NOCOLOK® news

ISSUE 1/2008

SBU Fluor grows in Korea:

Third NOCOLOK® Production Site

Operational since July 2007, the Solvay Fluor Korea plant in Onsan is SBU Fluor's first industrial platform in Asia.

The new plant was designed and constructed in record speed, in line with Korea's dynamic tradition of "palli palli", which means quick quick! When decisions have been made and the right people are in place, things get done in double quick time.

Onsan is part of Ulsan City, the cradle of South Korean industry, located at the southeastern tip of the country not far from the port of Busan. This industrial area has grown enormously over the years, and is famous as the home of the first Hyundai car factories and shipyards. One million people live and work here, including the 82 employees at the Solvay Onsan factory. The strategy behind the plant is to demonstrate the Group's industrial expertise to its regional customers.

The Team Manager Dae-jun Han (3rd from left) and his business-team in front of the Onsan plant.

To further enhance its position in the country, SBU Fluor has set up a Regional Business Unit (RBU) in Seoul, which shares offices with Solvay Korea. 7 employees including 4 expatriates are based here, working hand in hand with their colleagues in Onsan to maximise customer satisfaction. They also cover the whole region to further develop the markets – mostly Japan, China and Taiwan, but also south-east Asia. This work is also implemented in close co-operation with Nippon Solvay – SBU Fluor's beachhead in Japan set up many years ago.

Keeping cool at the 2008 Olympics:

Air-cooled chillers to be installed at Beijing Olympics IBC

Carrier Building Systems and Services China will supply 22 air-cooled chillers, including eight AquaSnap Puron 30RB air-cooled high efficient scroll chillers and 14 AquaForce 30XA air-cooled high efficient screw chillers to the Beijing International Broadcasting Centre (IBC).

AquaForce is recognised for its high efficiency thanks to the use of micro-channel heat exchanger (MCHX) technologies. Widely used in the automotive and aeronautical industries, these heat exchangers, brazed using NOCOLOK® fluxes, are much more efficient than mechanically assembled heat exchangers (see Benefits of brazed heat exchangers, P.2) and are therefore steadily increasing their foothold in the HVAC&R market.

The IBC Beijing in the building phase in October 2007.

NOCOLOK® Open House:

Successful event in Onsan

The first NOCOLOK® Open House event took place in our Onsan/South Korea plant on 28 August 2007. The factory was opened to visitors. The production, customer service and logistics managers welcomed clients and guests, and gave them a tour of the state-of-the-art flux production facility.

The visitors were interested in demonstrations and presentations on NOCOLOK® brazing.

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Lower energy costs, higher performance

15 % of all the electricity produced in the developed world is used to run refrigeration or air conditioning systems. With ever increasing energy costs, as well as growing environmental concerns, boosting energy efficiency is currently the biggest challenge to the HVAC&R industry – and in many countries, energy efficiency regulations and labeling initiatives are being introduced or tightened to minimize energy consumption.

One of the largest potentials to increase efficiency lies within the heat-transfers: reducing condensing temperatures by 3 °K will improve overall system efficiency by approx. 10 % for a standard R 410 A air conditioning cycle. A minimization of the temperature difference between the air flows and the phase change temperatures of the refrigerants can be achieved by improving the heat transfer efficiency of the heat exchangers. Brazed microchannel heat exchangers have already proven that they are a cost effective solution for the utilization of this optimization potential – as well as boasting a number of other benefits (see below). Brazed microchannel heat exchangers have been the technology of choice in the automotive industry for the past 10 to 15 years, and are already making inroads into the stationary HVAC&R industry for the following convincing reasons.

Improved heat transfer performance

Poor contacts between fins and tubes account for approximately 5 – 10 % of heat transfer resistance in a standard heat exchanger manufactured by mechanical or hydraulic expansion of the round tubes because this always leaves imperfect connections between the parts. The microscopic image shows the small gaps between fins and tubes responsible for contact resistance that reduces heat transfer performance (see Fig. 1 below).

Fig. 1: Small gaps between fins and tubes reduce heat transfer performance in mechanically or hydraulically manufactured heat exchangers.

Brazed connections are much better because they metallurgically bond the fins and tubes in a single conductive material, eliminating all potential sources of contact resistance (see Fig. 2 below).

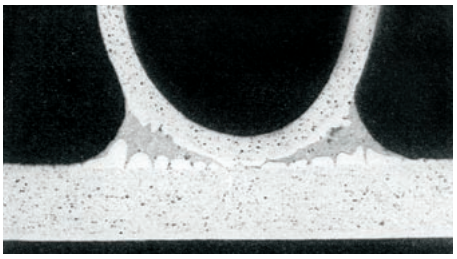

Fig. 2 Excellant heat transfer performance because no gaps in brazed connections.

Pressure drop reduction – the silent solution!

Brazing also offers the chance to change the design of heat exchangers by substituting round tubes with flat channels (microchannels) which offer improved heat transfer on both refrigerant and air sides for two reasons: better section/surface ratios, which affect the efficiency of heat exchange on the air and the refrigerant side; smaller surfaces in the air stream shadow where heat transfer is inefficient and lots of noise is generated. Brazed connections between fins and tubes are also rigid structures producing less mechanical noise in the presence of air turbulence.

More efficient heat exchange means lower air flows to exchange the desired heat, and microchannel technology already offers lower resistance to the air flow – flat is therefore better than round: reducing resistance by up to a factor of 3 under typical operating conditions (see Fig. 3 right)!

Refrigerant charge reduction

This increase in efficiency means the same refrigerant capacity can be produced with smaller exchange surfaces at the condenser and evaporator, with an associated reduction in piping volume, i.e. a higher heat exchange efficiency means smaller systems and lower refrigerant charge. Important given that third generation HFC refrigerant blends such as R 410 A are much more expensive than R 22 which they are now replacing.

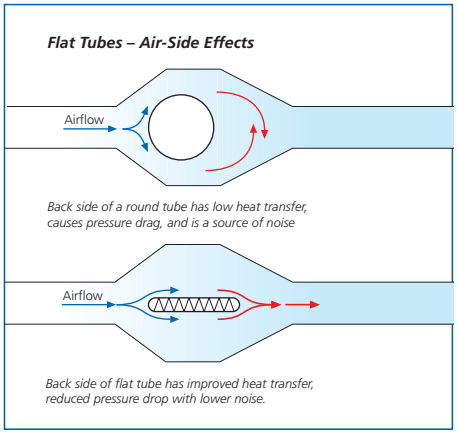

Fig. 3

Greater reliability, easy recycling and lower weight

Aluminum alloys offer high heat conductivity but also high resistance to corrosion. Brazed heat exchangers also boast higher mechanical resistance, especially in the fin connection, so that even incorrect handling or accidental collisions cause less deterioration with time. Moreover, microchannel heat exchangers are single-alloy system components which means easy and efficient recycling. And, although aluminum brazed heat exchangers have a similar performance to all copper units of similar size, they are about three times lighter.

All of these benefits explain the growth in the use of brazed heat exchangers in the HVAC&R market in recent years.

Brazing events 2008

- **Lötkonferenz**
  Düsseldorf, Germany
  May 6 – 8, 2008
  www.aluverlag.de
- **8th EABS Solvay Aluminium Brazing Seminar**
  Hannover, Germany
  September 2 – 3, 2008
- **Chillventa**
  Nuremberg, Germany
  October 15 – 17, 2008
- **13th Annual International Invitational Aluminium Brazing Seminar**
  Detroit, USA
  October 28 – 30, 2008

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