# The Newsletter of Innoval Technology Ltd

Part of Danieli Group



. . . value through innovation

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DIAMOND

## A Change of Ownership but it's Business as Usual

2012 has been a year of change at Innoval Technology. In March we became part of Danieli, joining forces with Danieli Fröhling and Danieli Wean United to create the Danieli Aluminium Strip Division.

The Danieli group of companies rank among the three largest suppliers of plant and equipment to the worldwide metals industry. Being a part of a global organisation, but maintaining the ability to govern ourselves, represents a huge and exciting opportunity for us. The integration of Innoval Technology into Danieli follows five years of successful cooperation between our two companies in designing and marketing the Danieli Fröhling Diamond Mill as we first reported in issue 5. In the last two years alone



Jörg Schröder of Danieli Fröhling and Tom Farley on the day Innoval joined Danieli Group

the team has achieved many significant orders, including a universal Diamond Foil Mill for Nikkei Siam Aluminium in Thailand, a 6-high Diamond Cold Mill for Aleris Europe in Belgium, the world's widest aluminium 6-high Diamond Cold Mill and a hot aluminium rolling mill for KUMZ in Russia, and a hot aluminium rolling mill for AMAG in Austria. We're now involved in the commissioning of the Diamond Mill at Nikkei Siam Aluminium and you can read more about it on page 2.

As far as our day-to-day consulting business goes, it is very much 'business as usual'. Innoval Technology will continue to operate from its offices in Banbury, UK. We will still provide the same confidential, independent service and impartial expert advice as we have always done. The philosophy of all companies within the Danieli Group is to invest in product development, so our service offering is set to increase as well as, with the support of the Group's global network, our expansion into new markets. In fact, we're currently looking to increase our team by recruiting a Process Modeller and Materials Scientist.

2012 has seen the BLOODHOUND World Land Speed Record project gather pace with the vehicle moving on from the design phase and into production. Regular visitors to our website will know that we are one of BLOODHOUND'S Product Sponsors. We've been involved in the design of the wheels by providing advice on which aluminium alloy to use. After a hugely successful rocket firing test in October, we're eagerly awaiting the runway tests in the UK in 2013. The actual IOOOmph record attempt is scheduled to take place in South Africa in 2014.



Innoval's Adam Nadin with BLOODHOUND's Project Director Richard Noble and Chief of Aerodynamics Ron Ayers at a recent Sponsor Conference

This year we've sadly said goodbye to Catherine Sparks who's been with Innoval Technology since we started. Catherine left us in August to spend more time developing her own business. In her place we've welcomed Julie Hodgkins who is working alongside Sally Barlow on our Administration team.

I hope 2013 is a successful year for you all.

#### Dr Tom Farley Managing Director, Innoval Technology Ltd

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## Commissioning of the first Danieli Diamond Mill NGA

We're pleased to report that our collaboration with, and eventual ownership, by Danieli has resulted in several high-profile sales of Danieli's Diamond Mill. The first Diamond Mill sale went to Nikkei Siam Aluminium Ltd in Thailand and it is now in the final stages of acceptance testing.

Nikkei Siam Aluminium Limited (NSA) is the leading manufacturer of aluminium sheet and foil products in Thailand. The company, which is owned by Nippon Light Metal in Japan, employs around 300 people and had a sheet and foil rolling capacity of 20,000 metric tons and 7,000 metric tons per annum, respectively. NSA's products include brazing sheet and finstock, foil in a range of gauges, capstock and sheet.

The Diamond Mill purchased by NSA is a 4-high Universal Cold Mill with a maximum entry thickness of 2.0 mm and minimum exit thickness of 0.05 mm. Innoval Technology's rolling expert, Dan Miller, and foil expert, Vicente Martin, have been involved with this mill from its design through to commissioning. They have been tuning the control software together with Danieli Automation, creating pass schedules and training the operating team, all to ensure NSA get the best performance out of their new mill.

The official opening ceremony, which saw production of the first coil, took place on IOth August 2012. As we write this, the mill is undergoing Final Acceptance Testing and is already being used for significant product volumes.

Somsak Uthaiwattanatorn, Project Management Manager at NSA, comments:

"It's been a huge advantage for us to work with Dan and Vicente from Innoval. We've really benefited from their knowledge and experience of both the rolling process and rolled products. They have the knowledge of both the automation of the mill and the relationship between the hot and cold rolling processes and the final product requirements."



Dan Miller and Mr Ruengrit Ruengthum, Assistant Manager – Preventive Maintenance



Ishikawa-san, President of Nippon Light Metal, cuts the ribbon at the Diamond Mill opening ceremony in August 2012

### Using Innoval's Process Models

In the 2011 issue of 'innform' we introduced our suite of Aluminium Rolling Process Models; a set of fast-running analytical models designed to help reduce processing costs quickly and easily. In this edition, we report back on how Sapa Heat Transfer is using two of our models.



Innoval Coil Heating and Cooling Model

Sapa Heat Transfer manufactures rolled aluminium products for the global heat transfer industry. The company has about I,500 employees worldwide, with the majority based in China and Sweden where its two largest factories are located. Sapa Heat Transfer's products are used in a range of applications including radiators, heaters, oil coolers, chargeair coolers and air-conditioning systems.

The process development team at Sapa Heat Transfer has been using both the Innoval Ingot Preheating Model and the Innoval Coil Heating Model to give them insight and a thorough understanding of their processes. They wanted to ensure uniform heating throughout the ingot/coil in as fast a time as possible, whilst keeping the maximumminimum temperature range as small as possible. Following work with the models, new heating practices have been developed.

"The correlation between the models and our physical measurements has been very good. They've certainly saved us time and disruption during furnace optimisation projects. I've found the models easy to use too."

Karin Lingborg, Process Development Engineer, Sapa Heat Transfer, Sweden

For more information about our process models and process support, please contact Dr Tom Farley at tom.farley@innovaltec.com

#### In April 2012 Innoval's joining specialist, Doug Boomer,

® Part of the Luxfer Group,

two manufacturing facilities

Research and services to the insurance and motor repair industries. Primarily, the centre conducts research and produces data which assists in the efficient, safe together with automotive sheet expert, Geoff Scamans, organised a one-day training course for Thatcham at our offices in Banbury. The course, which was aimed at engineers and technicians, provided an introduction to aluminium in automotive structures, including the specific uses of various alloys, as well as the joining technologies used during vehicle repair.

Garry Clark, Project Engineer - Repair Information, comments:

"Doug and Geoff arranged a great course for us! The feedback I've received from the other delegates is all very positive. We especially valued learning why certain procedures need to be different when dealing with aluminium compared to steel, and we will use this knowledge when writing procedures for repair."

#### Superplastic Alloys

of twelve, which included the company's Operations Manager, Quality Engineers and Production Manager, learnt about the fundamentals of metallurgy and mechanisms of superplasticity, as well as how aluminium sheet is manufactured.

Dave Edwards, Technical Director at Superform in Worcester, has this to say about the training:

"Everyone who took part in the one-day course from Innoval found it invaluable for increasing their metallurgical knowledge of the aluminium alloys we use here at Superform. We are hoping to repeat the course for more delegates in the near future."

#### Foil Metallurgy

AMCOR Flexibles Singen aluminium coils

supplier to major OEM's.

Amcor Flexibles Singen (Germany) operates one of Europe's major aluminium foil rolling plants

In October 2011, foil rolling expert Vicente Martin and metallurgist Dr Gary Mahon visited the plant to deliver a two-day training course to a group of around twenty people from the rolling and finishing operations. The course covered the metallurgy of foil alloys, thin foil requirements for converted products, and how product performance can be affected by both foil rolling and foil stock quality.

Frank-Michael Apel, Head of Rolling at Amcor Flexibles Singen, comments:

"As a group of non-metallurgists we found this training very useful. It has given us a greater understanding of our products and, specifically, about the effect various processing parameters can have on the final product."

## Focus on Training

Many of you will be familiar with our Aluminium Rolling Technology Course (ARTC). We held the 30th ARTC in November, meaning we've trained an impressive 350 people, from 56 different companies based in 33 countries over the last 7 years. What you may be unaware of, however, are the other training courses we're able to offer. Due to the diverse range of expertise within the company, we give bespoke training courses on all manner of topics. Here are just three examples of what we've delivered recently:

#### Automotive Structures

Thatcham Thatcham Research provides a unique range of products and cost effective repair of motor vehicles.

SUPERFORM Superform operates from

in Worcester (UK) and Riverside, California (USA).

The company specialises in superforming aluminium, magnesium and titanium components and is a first tier

In July 2012 Dr Gary Mahon, Innoval's Director and Senior

Metallurgist, visited Superform's Worcester site to deliver a

training course on the metallurgy of superplastic alloys. The team

at Superform wanted to increase their knowledge of aluminium

in order to improve quality and operational efficiency. The group













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## Material Characterisation Update: formability

We're always expanding our material characterisation capabilities and so we'd like to introduce you to some relatively new additions to the facilities at our Banbury laboratories; earing and Erichsen testing.

The degree of earing is affected by many process parameters in the manufacture of can body sheet, including composition, hot rolling and the amount of cold rolling reduction. The degree of earing is a key product attribute for can body stock and, to a lesser extent, can end stock. For O-temper products, where high and consistent formability behaviour is required, the Erichsen dome height (similar to the Olsen Cup test) allows the impact of alloy and process changes on the alloy microstructure, in particular grain size, to be quantified.



It is also a very useful benchmarking tool when comparing materials from different manufacturers and has proved invaluable in our alloy development programs. Both methods are covered by our ISO I7025 accreditation schedule and form part of our inter-lab cross-check activities.

Influence of grain size and processing route on dome height

For more information about materials testing, please contact Alan Gray at alan.gray@innovaltec.com



Drawn Earing Cup



Aluminium cans

## More News ... More News ... More News ...

#### New booth for Aluminium 2012



Our booth at Aluminium 2012

In October 2012 the aluminium industry's biggest event was held for the first time in Düsseldorf, Germany. Tom Farley, Gary Mahon, Kyle Smith, Dan Miller and Helen Forrest promoted Innoval's Aluminium Rolling Process Models and consulting support from the newly designed Innoval booth.



Gary, Tom, Helen, Kyle & Dan

#### Innoval supports Aluminium Surface Science and Technology

At the triennial Symposium for Aluminium Surface Science and Technology held in Sorrento, Italy, during May 2012, Innoval Technology (represented by Dr Eoghan McAlpine and Dr Geoff Scamans) continued to make its presence felt in the world of aluminium surfaces through participation in the Organising, Scientific and Young Researcher Awards committees, chairing a session on Multi-materials, and presenting several talks (including a Keynote by Geoff).

Overall the symposium was deemed to be successful, providing an opportunity to keep abreast of the latest developments and emerging techniques in the world of aluminium surfaces; none more significant perhaps than the advances in 3D microstructural characterisation capabilities.

Full programme details for the symposium can be found on the ASST website: www.asst2012.org.

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