innform

The Newsletter of Innoval Technology Ltd



... value through innovation

Issue: 6 2009

Weathering the Storm and

Looking Towards a Bright Future

As last year's edition of 'innform' was going to press, we were anticipating our most successful year in business, and I'm pleased to say that this was the case. Compared to 2007 our number of clients increased by almost 20%, our annual sales grew by 12% and new business more than doubled.

Of course, 2009 has been a very different and difficult year for our industry. However, we are fortunate that the recession has really only suppressed our strong rate of growth, and our sales have remained at a similar level this year to last. We are confident that this growth will soon return, and there are already signs that it is starting to happen. This is testament to the hard work, dedication and unique competencies of the Innoval team which has built a business capable of weathering such a deep global recession.



In this economic climate we all need to be looking at ways to control costs. In terms of aluminium manufacturing, the Innoval team excel in this area and we've been working with our clients to make their operations as efficient as possible. Projects have included asset utilisation, energy reduction, waste reduction and training. Because our skills are available on a project-by-project basis, we can be a cost-effective addition to existing improvement teams.

One area that can become neglected, and often put on hold, during challenging times is Research & Development. However, it's encouraging to see that several of our clients have continued to fund longer term work, using this time to strengthen their business ready for the upturn and to get ahead of their competition.

An exciting and growing market for Innoval Technology is the Gulf Aluminium Industry. With many new smelters either starting up or planned, together with a developing downstream industry, the region looks to be going from strength to strength. Over the last year we've been pleased to provide technical support to several strategic studies in the Gulf region. These have included plant feasibility studies, cost modelling projects and technical due diligence. You can read more about them on page 3 of this newsletter I'm happy to say this high-level work has allowed Innoval to broaden its expertise further.

Finally, I am confident that the focus on business improvement and efficiency that occurs during a downturn will lead to a stronger and brighter future for us all.

Dr Tom Farley Managing Director, Innoval Technology Ltd



Tom Farley (left) and colleagues on the Innoval Technology exhibition stand at Aluminium 2008

Inside this issue			
Cold Mill Audit at Hulamin	page 2	Refining without Grain Refiner - MCAST	page 4
Supporting Strategic Investments	page 3	More News	page 4

innform















Hulamin, situated in Pietermaritzburg, South Africa, is an independent producer of semi-finished and fabricated aluminium products. Their rolled products division manufactures a range of sheet, plate and foil alloys and is focused on high specification, tight tolerance products which it supplies to customers throughout the world.

Last year Hulamin contacted Innoval Technology to carry out an audit of their six-high cold mill. They asked us to assess the general capability of the mill, and to comment on its performance relative to other mills producing similar products. Dan Miller, who is part of our Process Improvement team, visited the plant in Pietermaritzburg.

During his visit Dan audited the rolling operations, assessed the recorded machine centre metrics and carried out detailed analyses of the process data. He measured the performance of the cold mill against its capability and the requirements of world class quality and performance. Dan then divided his recommendations from the audit into two parts: those that would help to improve mill performance immediately, and those which should be considered longer term improvements. Then he worked closely with the team at Hulamin to prioritise the recommendations.

The visit also proved a good opportunity for Dan to mentor



Hulamin's S6 cold mill control room

mills, as well as training in foil rolling and defect analysis for the lead operators.

Pierre Taljaard, Technology Manager at Hulamin, had this to say about working with Innoval:

"We value Innoval's comprehensive range of skills and extensive industry experience, and we can rely on their independence to give us sound advice. We've accepted the recommendations arising from the audit and are implementing these to realise the improvements in mill productivity and product quality."

For more information about our Process Improvement services, please contact Kyle Smith at kyle.smith@innovaltec.com

Presentations at Aluminium Industry Events

This has included a

study on the lubrication

requirements for

cold

the

Earlier in the year our Managing Director, Dr. Tom Farley, presented papers at two high-profile industry events. The first, MEED's Middle East Aluminium 2009 conference, was held in Dubai in March. Tom presented "Designing, Manning and Operating a World-Class Downstream Business" at this event, where we also had

an exhibition stand. The second event, again in Dubai, was The I4th World Aluminium Conference organised by CRU in May. Here Tom presented "Responding to R&D challenges in a changing industry". You can find both presentations in the Downloads section of our web site at www.innovaltec.com/downloads



Lecture hall at the 14th World Aluminium Conference



mill audit, we've been delighted to continue working with Hulamin by supporting their new foil mill installations.

Spray installation on the new foil mill at Hulamin

Supporting Strategic Investments

Earlier this year we launched several new services aimed at investors in the downstream aluminium sector. Here, you'll find brief descriptions of some of the strategic projects we've been involved in.

ما عليه MUBADALA

Pre-feasibility Study for a Greenfield Rolling Mill

Mubadala Development Company (Mubadala) is a business development and investment company wholly owned by the

Government of Abu Dhabi. Mubadala is a catalyst for the economic diversification of the Emirate of Abu Dhabi.

Last year we contributed technical know-how to a prefeasibility study commissioned by Mubadala. As part of this study, which was for a Greenfield hot and cold rolling plant, our Process Improvement team specified the equipment required to make a pre-determined range of aluminium flat rolled products and designed a factory floor layout. To determine the project's feasibility, the team used their extensive experience of working in rolling plants to create a preliminary financial model. In addition to equipment utilisation and ramp-up schedules, this model took into account equipment costs, buildings and infrastructure costs, as well as operational costs such as utility loadings and staffing.



Jeremy Nottingham, Senior Adviser, Mubadala comments:

"The team at Innoval have years of experience working in world-class rolling operations throughout the world. Their input was vital to this study to ensure we had a realistic financial model to base our decisions on."















CRU | STRATEGIES

CRU Strategies is a specialist management consultancy providing advice to the world's leading metals and mining companies, financial institutions and governments.

Recently CRU Strategies were asked to undertake a pre-feasibility study to establish the market for, and the technical and commercial viability of, a continuous casting and cold rolling operation in the Middle East. Part of the project included a technical study for which they approached Innoval. We provided information on the optimal scale of the plant and the choice of technology. This was followed by an overview of the plant layout with construction and

Technical Due Diligence of a Rolling Facility

Innoval was approached by a group of potential investors to undertake a technical due diligence project. The group were evaluating an investment in a company with aluminium rolling plant assets.

Following a visit to the plant, we compiled an account of the current state and the future potential of the rolling facility. This included whether the equipment was capable of reaching the planned production output at the quality levels necessary for the target markets. What's more, we commented on the skill levels of the

Pre-feasibility Study for a Greenfield Continuous Casting and Rolling Plant

capital costs. We also advised on the raw material requirements, labour requirements and operating costs, and we gave an overview of the environmental issues.

Colin Pratt, Managing Consultant, CRU Strategies, had this to say about the project:

"Because of their independence and well-known technical expertise in the field of aluminium rolling, it was the logical choice to bring Innoval on-board when we compiled this study. We hope to collaborate again on future aluminium projects."

Drs workforce and the safety and environmental aspects of the plant.

One of the potential investors comments:

"We approached Innoval for this project because, not only are they independent, they know and work in the target industry. We wanted an unbiased, honest and technically accurate assessment of the potential investment."

For more information about our Strategic Investment Support services, please contact Dr Tom Farley at tom.farley@innovaltec.com

innform



Grain Refining without Grain Refiner, courtesy of MCAST

In the 2005 edition of 'innform' we introduced you to a novel melt processing technology from Brunel University that can be used to produce castings with superior mechanical properties and performance characteristics. The process, called MCAST (Melt Conditioning by Advanced Shear Technology), uses an innovative twin screw device to subject liquid metal to intensive shearing and high turbulence. This results in liquid metal with extremely uniform temperature and composition and well dispersed oxide particles.









Recently, the team at Brunel University have shown that MCAST can bring about the much sought-after grain refining of aluminium-containing magnesium alloys. This is achieved by the intense shearing action which disperses magnesium oxide (MgO) throughout the melt. The dispersed MgO particles then nucleate the manganese-containing intermetallic particles (Al_8Mn_5) and trigger the solidification of magnesium. The high number of active nucleating particles and their narrow size distribution (brought about by the melt shearing), results in a much finer grain size after solidification.

The use of oxides as a grain refiner, rather than a potentially damaging defect to be removed by filtration, is an exciting development and suggests that the technique will be applicable to a wide variety of metal alloys in the future. Furthermore, melt shearing increases the tolerance

500µm



significant grain size reduction after melt conditioning at 650°C (a) conventional, (b) MCAST and at 605°C (c) conventional, (d) MCAST



(a) 650°C







Schematic diagram of the twin-screw melt conditioner which forms the MCAST process

to impurities which could result in an increase in the use of process scrap for magnesium alloys and post consumer scrap for aluminium alloys.

Our Chief Scientific Officer, Dr Geoff Scamans, is leading three Technology Strategy Board Innovation Projects based on Brunel University's high shear melt conditioning technology for aluminium and magnesium alloys. All three projects have significant involvement from the casting and automotive industries, including well-known end-users keen to embrace the new technology for lightweight automotive castings.

For more information about MCAST, please contact Geoff Scamans at geoff.scamans@innovaltec.com

More News ... More News ... More News

Introducing our newest recruit!



Adam Nadin

and football teams. He's also a bass guitarist in the covers band 'Molly Makes Mistakes'.

Adam Nadin is the most recent addition to the Innoval team, having joined our Materials Testing group in November 2008. Adam's analytical skills include 20+ HPLC, GCMS, IC and various wet chemistry methods.

Outside of work, Adam enjoys playing sport and is a member of his local cricket

Promoting the aluminium industry to school children

For the last two years Innoval has welcomed students from The Cooper School, in Bicester, Oxfordshire, to our facilities in Banbury to learn about what it's like to have a career in technology. The visits are themed around aluminium beverage can manufacture and, over the course of a morning, the students learn about how cans are made and how the team



at Innoval are involved in the canning industry. Included in the visits are laboratory demonstrations of tensile testing, crush testing and SEM analysis.

innform is published by Innoval Technology Ltd, Beaumont Close, Banbury, Oxon UK OXI6 ITQ.

Tel: + 44 (0) I295 702800, Fax: + 44 (0) I295 702898, Email: enquiries@innovaltec.com, Website: http://www.innovaltec.com