



## Maximising foundry business opportunities in the current economic climate

*Guy Henderson, sales manager of continuous casting technology specialists, Rautomead Limited, considers how the global foundry industry might best respond to the current economic downturn in order to maximise business opportunities and be better prepared for growth when the green shoots of recovery appear.*

Such initiatives include the establishment of more controlled continuous casting manufacturing techniques; the virtues of smaller-scale casting where metal making would not have been previously possible; maximising the capabilities of older casting machinery and assistance with research and development.

The technology provided by Rautomead is designed to provide non-ferrous metals processing companies with the expertise, equipment and know-how to produce their own semi-finished 'near net shape' bars and hollow sections in-house.



An RMT 200 machine in operation.

### Developing a survival strategy

As the impact of the global financial crisis spreads further down into the retail, service and manufacturing industries, organisations of all sizes need to assess their own business activities in order to make plans for survival and to position themselves ready to take advantage of renewed growth whenever that occurs.

For manufacturing industries, and those across the metals processing sectors in particular, a survival strategy may be achieved via:

- Ensuring a measured reduction in processing cost
- Upgrading or modernising of existing manufacturing equipment
- Continued investment in new technologies
- Greater reliance on in-house production
- Diversification away from low-margin, higher-volume products
- Development of new product alloys and section shapes.

### Creating a more controlled manufacturing sequence

In the foundry sector, the continuous casting operation can often replace existing processes to provide a much more efficient, economic and controlled manufacturing sequence. Examples include:

- Continuous casting of lengths of hollow bronze bearing alloys as opposed to static casting of individual hollow pieces
- Continuous casting of small diameter alloy wires in place of billet casting and extrusion or bar casting and rolling
- Continuous casting of copper wire rod for continuous rotary extrusion to strip in place of billet casting and conventional extrusion.

Rautomead has been supplying continuous casting equipment to the non-ferrous metals industry for

more than 30 years. The technology has continuously evolved and been modified, adapted and improved to meet the ever more demanding requirements of the industry.

Continuous casting technology currently exists for horizontal continuous casting of solid or hollow billets; upward vertical continuous casting of small diameter hollow bars and shapes; upward vertical continuous casting of alloy wires; horizontal casting with QDC (quick die change) technology for batch production and horizontal and vertical (downwards) casting for small batches of high purity materials used in the electronics and jewellery industries.

### Economies on a small scale

The fact that continuous casting can be economic on a relatively small scale (50 to 500 tonnes per month) has led to opportunities for producers to install this technology at locations where metal making activity was previously not possible and where process scrap arisings and off cuts required to be sold to others for recycling.

As a result, new users have been able to become independent from large metals producers and take complete control of their product quality and cost. Ownership of their own metal manufacturing equipment has enabled these organisations to develop techniques for the production of new alloys and sections shapes, equipping themselves with the flexibility to react and respond to changes in market demand. It also enables them to expand their product range and to diversify into offering products to a wider range of industry sectors.

A number of organisations have recently invested in the smaller-scale continuous casting technology provided by Rautomead. These include Saudi Mechanical Industries which installed continuous casting technology for in-house production of hollow bronze bearing material for use in the manufacture of water pumps. Copper Alloys (UK) expanded its manufacturing capability and ability to produce specialist alloys and sections whilst Rapsri Industries (India) commissioned RT 650 and RMT 200 models to modernise the manufacturing process and increase the efficiency of production of selected items at its foundry in Bangalore.

### Enhancing capability via upgrades and retro-fits

As an organisation, Rautomead invests significantly in new product development and provides extensive retrofit and upgrade opportunities. Recent innovations in casting die tooling, withdrawal pulling systems, operation and data recording software are developed primarily for use in conjunction with new Rautomead furnace technology.

However, opportunities exist to retrofit the latest designs on to existing Rautomead machines and also adapt the technology to enhance the operation of furnaces originally manufactured by different suppliers.

In circumstances where there may not be sufficient funds available for investment in a completely new manufacturing line, the potential to modernise an existing piece of equipment may prove an attractive alternative.

In today's economic climate, organisations may be advised to consider all opportunities, even where this

may involve researching the ability to produce new materials and products. Where there is a requirement to develop new die/cooler designs or to adapt the continuous casting technology to attempt to process new alloys or section shape combinations, the Rautomead R&D facility and engineering team may be commissioned to undertake such evaluation.

The Rautomead facility includes horizontal and upward vertical continuous casting equipment configured with the most sophisticated control systems and data-recording capability. Customer-specific R&D work can be used to establish production techniques and casting parameters for new alloy and sections for those that cannot afford to interrupt existing production for R&D purposes.

Alternatively, it can be used to produce representative samples to satisfy potential investors of the quality of the cast product and the capability of the technology to produce it.

### Ongoing research and development

Recent projects undertaken by Rautomead include:

- ECO Brass casting - to develop the tooling design and identify the horizontal continuous casting parameters capable of producing high quality, near net shape bars and hollows in ECO brass alloy whilst achieving an economic casting die life.
- Superior Quality (SQ) copper rod production - to develop techniques and tooling designs for the upwards vertical continuous casting of SQ oxygen-free copper wire rod. The objective of the exercise was to minimise or eliminate the 'micro-cracks' that occur at the pulse mark of conventional continuous cast wire rods. The existence of micro cracks only becomes an issue for the manufacture of certain specialist applications such as superfine enamelled wires and other special enamelled copper products.
- Development of specialist casting die tooling designed to overcome the problems associated with zinc bar processing.
- Development of Quick Die Change (QDC) technology - to enable casting dies to be changed without requiring the casting furnace to be cooled down. This technology is specifically designed for use with continuous casting systems that use graphite crucibles for containment of the liquid metal.

Granted a European patent in 2008 and available on various new Rautomead horizontal casting models as well as being a retrofit opportunity on several Rautomead continuous casting machines already in service, new innovation enables casting dies to be changed without first cooling the furnace in order to bring significant benefits to users. QDC reduces typical die change time from around 30 hours to about one hour, with 20 - 40% improvement in operating efficiency according to the length of each casting campaign.

Quick die change is a significant advancement in continuous casting technology, one that offers considerable time-saving benefits to users and further underlines Rautomead's position as a leading provider of continuous casting equipment.

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An RT 850 machine in full production