



## PERIODICO D'INFORMAZIONE IMPIANTI E MACCHINE PER FONDERIA

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### 25th YEAR OF IMF'S FOUNDATION

No Bake, was born day after day, particularly thanks to the closest of cooperation with users. "Quality" is increasingly decisive for foundry work and is the distinctive feature of IMF plants in Italy,

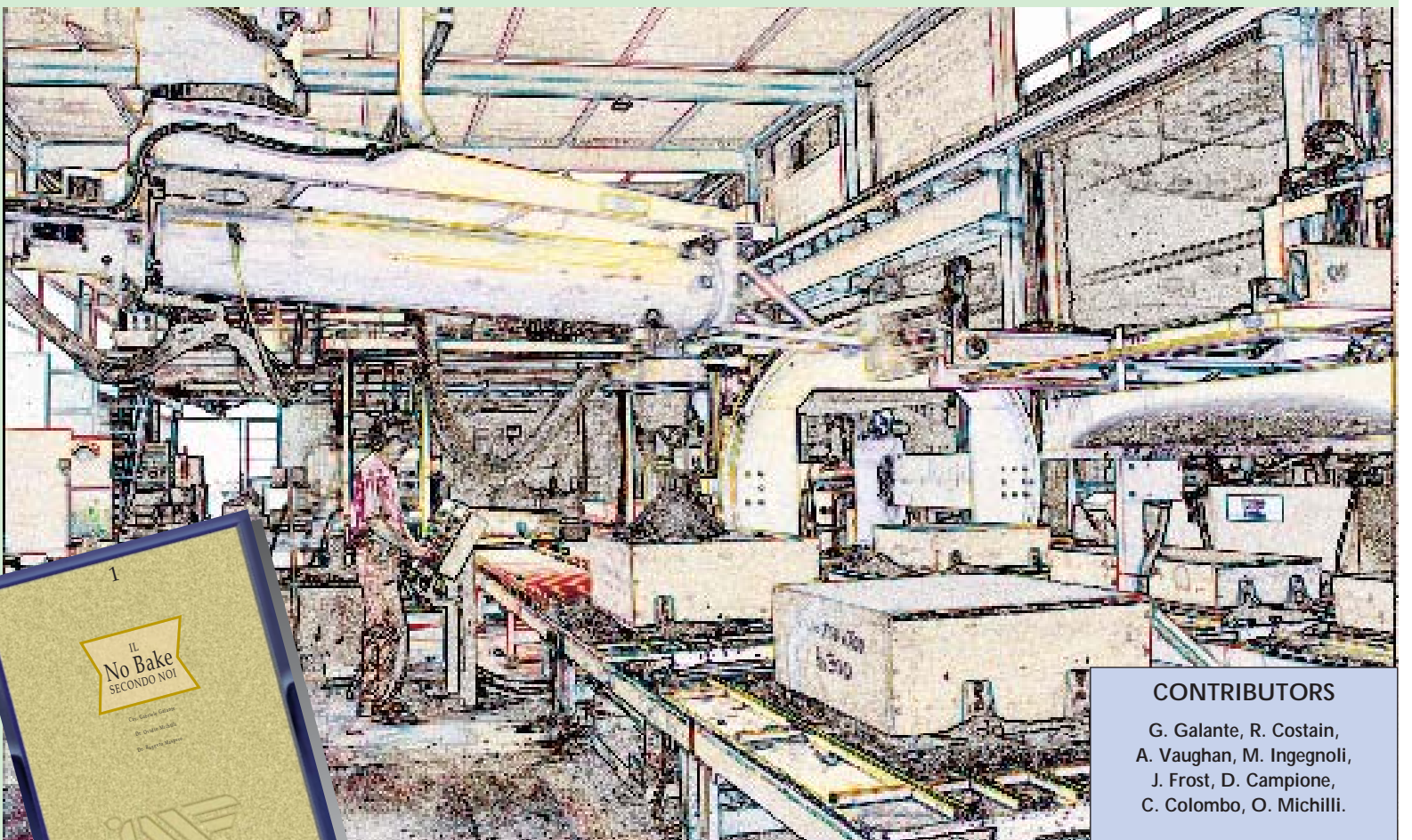
Japan and Australia. We are not content to stop at the results achieved so far, however. In the years to come, we intend pursuing the road to innovation with the greatest determination and contribute with our will, enthusiasm and all the energy and professionalism we can muster to develop No Bake technology. We are supported and sti-

mulated in reaching this ambitious objective by the recognition obtained in countries where technology and building quality are the prime concern. Countries where complete design of a whole department or foundry are contracted before actual machinery, where proper consideration is given to the experience accumulated by IMF over time in

designing, building, activating and servicing over a hundred complete plants in the various fields of No Bake technology. So, thanks to you all. Continue giving us as much trust as we have in our work and commitment.

✓ G. Galante

The fortunate coincidence of the publication of this newsletter with the 25th year of IMF's foundation allows me firstly to thank our customers who have shown full trust in our work ever since the very beginning. I wish to extend these thanks to all my assistants, technicians, employees and agents, in a word to all those who have actively contributed to building up and strengthening the extraordinary relationship that ties our company with our customers today. I use the word extraordinary on purpose. These past twenty-five years have been a period of ongoing development in line with research efforts directly tied to solving the various and diverse needs of our customers. Our technology and know-how that now ranges over all the different aspects of



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### "NO-BAKE" AS WE SEE IT

Great innovations have been introduced in recent years by Italian foundries still labouring under the effects of their strong "empirical" origins. Plants and installations have been improved enormously, new advanced chemicals have contributed a lot to improved processes and personnel have become technically far more expert, but still some uncertainty persists in the

moulding process. The No Bake process certainly contributed a lot in overcoming some uncontrolled issues but the need to improve and simultaneously "motivate" foundry operations, remove rooted diffidence and combine innovation with professional skills and industrial policies, is still quite strong. This is why IMF decided to publish a real and proper "guide" to moulding with the No Bake system, aimed

primarily at technicians. The technicians are the natural partner for a leading foundry leader such as IMF. The authors of the guide, whose first two volumes are due to appear soon, include Ovidio Michilli, who summarises his work as follows: "Our primary purpose was to clarify the actual "state of the art" today and minimise the "empirical" component that still exists in our business. By analysing moulding processes, the guide gives precise data on known problems, to make everything

as "technical" as possible for standardising production quality. Solutions found by individual foundry operators after years of field work and experience, in fact often lead to marked differences in the end product". This IMF-sponsored guide gives an indispensable tool for investigating a "complete" type of process. Products are created from start to finish in foundries, which is why errors must be eliminated first of all, to avoid jeopardising the entire cycle of processing operations.

The guide's first explanatory volume contains the basic theoretical concepts and the most important technical topics of foundry work. The second volume is a handbook, whose technical and practical structure offers the most significant technical data on the No Bake process. The third volume will deal with plant and quite naturally centre on IMF's vast experience in this field.

✓ O. Michilli



# FUKUYAMA FOUNDRY Co. LTD

The Japanese cast iron foundry Fukuyama, producing parts for machine tools and electric motors, is another example of great interest.

It is probably the most sophisticated No Bake Foundry now in operation. With typical Japanese care and precision they have everything under complete computer control from order acceptance to shipping and it is all driven by one man in a central office in the foundry.

The very efficient mould production takes place in a very compact space because after closing, moulds are stored in a computer controlled vertical storage warehouse.

The system supplied by IMF is a Fast Loop with a 25 t/h mixer producing moulds of size 1200x 1400 mm at the rate of 20 complete moulds



Details of the mixer during moulds filling on the Fast Loop



Details of the vertical moulds storage system

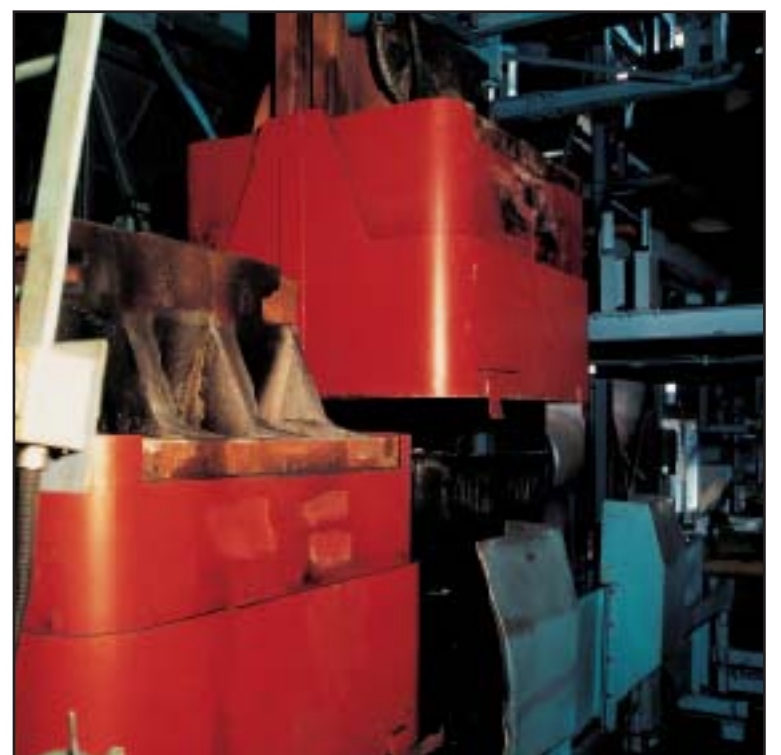


View of automatic closure

per hour (Fig.2). A general program, run by one operator from his office, controls the whole foundry production, continuously selecting the castings to be produced. This program is interfaced with the moulding program controlling the entrance of patterns into the Fast Loop and as far as stripping from the rollover. Moulds are cored and closed on two parallel lines, one equipped with an automatic closer and the other with a manual handler and are then stacked in vertical storage racks managed by

proper software. The moulds that are to be poured, are automatically called-up according to the production program, are prepared with counter-weights and special size "jackets", containing loose sand, and are then poured. The poured moulds go back to the vertical storage for cooling. The management program sends them to the shake-out at the right moment, following the logic sequence dictated by the production requirements.

✓ M. Ingegnoli



Mould weights and jackets

## Warman International Ltd.

The Australian Company Warman International is the worlds leading manufacturer of high quality slurry pumps.

With 3 foundries at different locations around the globe Warman's Sydney Australia Foundry is the largest.

In 1989 the WARMAN Sydney foundry embarked on a 5 to 10 year plan to double the manufacturing capacity of the foundry by the year 2000 without increasing the floor space.

The strategy evolved around international "best practice" with targets set for quality registration to ISO 9001 and environmental approval now to the recently established standard ISO 14000. Health and safety issues also weighed heavily on Capital Equipment and process improvement decision. Using Furane no Bake across all mould lines, the foundry is capable of making 0,5 kg's to 12 tonne castings in many differing ferrous and nickel base alloys.

The existing medium mould line was removed in 1994 and replaced with a complete IMF Fast Loop System

capable of producing 8 to 10 closed moulds / hour in sizes ranging from 1000 x 1000 x 300/300 to 1200 x 1200 x 600/600.

The sturdy design, ease of maintenance , experience with other IMF equipment already on site (large 40 T/hour superstretch mixer, 2 \_ T /hour mixers, pouring lines etc.) plus the experience of other users around the world whom Warman Foundry personnel visited prior to making a decision, made the IMF system the obvious choice from the large number of moulding systems available.

To further improve productivity from this line, an additional level over each existing pouring line is planned to be added.

The 2nd level will comprise the pouring lines with the existing lines becoming exclusively cooling lines.

The transfer cars will be exchanged for cars with lifting capabilities to move moulds up or down between levels.

✓ R. Costain



● Infrared drying tunnel for mould wash

## Vaughan Castings

Vaughan Castings of Fremantle Western Australia commenced trading as a ferrous and non ferrous foundry in 1966. Following a change of management in 1990 the company has developed into a major supplier of crushing and grinding consumable steel castings for both the domestic and international market.

With the need to increase production and remain competitive it was essential to invest in moulding equipment which would mechanise the process, reduce the dependency on labour, reduce work place injuries, reduce manufacturing costs and shorten delivery lead times. A number of possible suppliers were asked to submit a proposed layout. Key issues in the evaluation of the proposals were experience in successful projects comparable to our own, equipment design and reliability and technical support. Following an extensive evaluation it was decided that an IMF Fast Loop moulding plant offered the best solution. Mould size, flexibility, production rate and minimal changes to existing patterns and manufacturing practices were the major advantages. The order was largely placed as a "Turn key" project with local supply limited to civil work and large fabrications.

Enormous attention was paid to integrating the machine design and layout with the constraints of the existing building and considering operator access, work station layout, the delivery of raw materials and patterns to the plant, and maintenance. It was viewed as essential to create the best possible interface between all factors of the plants operation to ensure that maximum production levels were achieved at a minimum operating cost.

Finally it was imperative that the installation was completed in the shortest possible time as this equipment was installed in a fully operational foundry with a heavy and inflexible production schedule.

The new equipment was to be located on floor space occupied by existing equipment and constituted 50% of the total foundry floor space. To accommodate existing production during installation a temporary moulding floor was set up in the adjacent building with moulds transported to the castings floor. There was actually an increase in production during this difficult period to accommodate customer demands. The highlight of the commissioning process was that the first mould produced was useable. Vaughan Castings planned and costed into the project an intensive operator training program which included the maintenance staff. IMF commissioning staff, their technical support liaison and a specialist consultant were used to develop and deliver the training. The equipment is rated at a capacity of 9 closed moulds

per 8 hour shift and by the close of the first week of operation this was 50% achieved. Within one month the machine was operating at full capacity on a single shift. Now 7 months after commissioning the equipment is successfully operating at capacity where casting configuration and scheduling factors will permit. A third shift is now planned for start up within 3 months. Equipment problems and limitation have been encountered but the performance and operation of the equipment has proved an overall success. From an operational perspective the equipment has contributed to the total foundry becoming a safer, cleaner and a more systematic operation. This has allowed the company to attract and maintain quality employees and has attracted the attention of existing and new customers.

The ability to shorten lead times or become more of a batch producer has improved deliveries, provided operating cost efficiencies and reduced work in progress. The increased capacity will allow the company to further develop its market. Further investment in equipment is now under review to fully exploit the potential and meet the market demands of the future.

✓ A. Vaughan

Manual mould closing station



Details of the mixer and of the Fast Loop



Mr. Allan Vaughan, Manager of the Foundry in front of his Fast Loop system

# IMF'S THIRD ALUMINIUM FOUNDRY REUNION

IMF's third aluminium foundry reunion brought together foundries from Canada, France, Italy, Switzerland and the UK. Each shared common ground in the manufacture of light alloy aerospace castings and similar components, characterised by their complexity of moulding and coremaking. A team of Italian and foreign experts were able to visit the foundry in Benevento of AGUSTA SpA, specialist in "Premium castings" of high technological content. The reunion created a gathering of likeminded foundry management which is not possible in conventional conferences. Delegates travelled to Telesse, en route to Benevento, after a welcoming reception in Naples. The Grand Hotel in Talesi's town provided the venue for a morning seminar



Details of factory tour



IMF's third Aluminium "Premium Castings" reunion delegates gather with staff outside the Agusta foundry

Speakers presenting papers at the conference



Factory tour during the conference



at which AGUSTA SpA, Alu Menziken and Fonderies d'Ussel managements each presented a perspective of their foundries. Introduced by Mr. Galante, Gilberto Bergantini, General Manager of AGUSTA SpA Benevento described the transfer some 20 years ago of AGUSTA's foundry activities from Northern Italy to the South and the improvement in the new foundry. The new plant meets all Agusta Group needs but it is also a major supplier of components to third party customers in motorsport, both cars and motorcycles as well as aerospace components for many of the leading international names.

The AGUSTA plant was supplied by IMF, following the supplier's experience with foundries all over the world. The Benevento moulding line meets the typical requirements of light alloy foundries: small series production and a vast range of components to be processed in a short period of time, involving complex moulds and cores. IMF's Fast loop design for mould production and pattern preparation was chosen and at Agusta divides into three lines, one for small and medium size moulds up to 1000 x 1000 x 600 mm, one for larger moulds up to 1200 x 1500 x 600 mm and one for exceptional moulds of

1600 x 2000 x 1000. To face the higher request of cores due to the production increase, AGUSTA SpA will install in the near future a new system for the production of cores.

✓ G. Galante

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