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# POWDER INJECTION MOULDING

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# LÖMI, a leading manufacturer of solvent debinding furnaces, celebrates its 20<sup>th</sup> anniversary and doubles production capacity

Located in Aschaffenburg, close to Frankfurt in the centre of Germany, LÖMI is an innovative manufacturer of solvent debinding furnaces. In 2011 the company celebrates twenty years of experience in explosion-proof systems for handling flammable solvents. As *PIM International* discovers, the company has become, over a period of just over a decade, a market leader in solvent debinding furnaces for the PIM industry.

LÖMI GmbH was founded in 1991 by José M. Dias Fonseca, an engineer whose vision was to produce reasonably priced, high-quality and reliable solvent recovery systems. The explosion-proof systems that the company developed employ vacuum distillation and meet European directives with regard to occupational health and safety and environmental protection.

The technology proved itself right from the start and only six months after the formation of the company, LÖMI won Ciba-Geigy as a customer.

During a two-year period of cooperation, LÖMI developed a completely new solvent recovery system which then was sold worldwide to customers such as Motorola Singapore and Ericsson Australia.

## A focus on R&D

Another innovation followed just a few years later. This time for Volkswagen, LÖMI developed a new process to recover lubricating oils, precious metals and high-alloyed steel from

abrasive slurry in a research project with Technische Universität Braunschweig, Germany.

In addition to the development and production of process plants, various research projects with renowned project partners became a regular aspect of the company's activities. With Fraunhofer-Gesellschaft, LÖMI developed systems for de-waxing by means of solvent extraction and small peripheral systems for biodiesel production from rapeseed oil and other organic oils.

In addition to innovation, LÖMI's philosophy is that of quality and service. LÖMI's Dias Fonseca told *PIM International*, "Our company sets value on manufacturing the highest quality systems in the market and sees itself as the industry's partner. As a result, we have earned an excellent reputation and our customers come from numerous end-user sectors."

The sectors that LÖMI currently supplies include automotive, aerospace, chemical, optical, electronics, printing, medical and pharmaceutical.

## LÖMI and the PIM industry

The company's involvement with the PIM industry dates back to 2001. Dias Fonseca explained, "We were approached by a feedstock producer



Fig. 1 LÖMI's management team, Christian Ferreira Marques (left) and José M. Dias Fonseca (right)



Fig. 2 LÖMI debinding plants EBA-2500 for the high volume debinding of powder injection moulded parts



Fig. 3 Rack with green parts loaded on trays, ready to be inserted into LÖMI debinding plant EBA-2500

who was looking for a debinding furnace for solvent soluble binder systems, where moulded parts were to be immersed in a solvent bath. LÖMI adapted a solvent recovery system to meet the customer's requirements and thus developed its first solvent debinding furnace."

This was a crucial step in the development of the company's relationship with the PIM industry. Over the following years, LÖMI has closely cooperated with its partners, both feedstock producers as well as metal and ceramic injection moulded part producers. "Through these experiences we gained a comprehensive understanding of the PIM debinding process, which has led to continuous enhancements of our debinding furnaces, helping to make them ever more reliable and efficient," stated Dias Fonseca.

Five years ago, Christian Ferreira Marques joined LÖMI as an additional Managing Partner, coming from a large German company. Subsequently, LÖMI restructured its business divisions to meet the increasing demand from the international PIM industry.

### Advantages of solvent debinding furnaces

Ferreira Marques told *PIM International*, "Solvent debinding furnaces are very versatile. Injection moulded part producers are free in their choice of feedstock manufacturers, as numerous kinds of feedstock can be processed."

"At the same time, various organic solvents can be employed, including acetone, ethanol, hexane, heptane, trichloroethylene (TCE), just to name a

few. Our process allows for very small debinding furnaces, if needed, through to very large plants. Another plus is the very long lifetime of the furnaces as the solvent debinding process causes very little wear and tear," added Ferreira Marques.

### Characteristics of LÖMI debinding furnaces

The company's debinding furnaces offer users the ability to process either water or solvent soluble binder systems. LÖMI's compact furnaces with solvent extraction capabilities start with a volume of 50 litres. For small numbers of injection moulded parts, the EDA series of furnaces combine debinding, vacuum drying and solvent recovery in one single unit.

For medium and large numbers of injection moulded parts, the company's

systems consist of two units, a debinding furnace of up to 2,500 litres and a parallelly operated solvent recovery system. All systems can be extended on a modular basis.

LÖMI's Marketing Director Ralf Wegemann explained, "Our solvent debinding furnaces are cost-saving through their compact design, low investment and short lead time. Generally, they pay for themselves within a very short period of time after commissioning."

The company states that their furnaces employ well proven technology and are fully customisable by means of programmable logic controllers. In addition, state LÖMI, their systems are environment-friendly as the solvent is operated in a closed system where it is completely recycled.

Complex processes can be handled with the company's debinding furnaces



Fig. 4 Three debinding furnaces EBA-900 with a parallelly operated solvent recovery system VDA-3000, shortly before commissioning at a major Indian customer



Fig. 5 A LÖMI debinding furnace type EBA-150 with a parallelly operated solvent recovery system LRA-150

and tailor-made units can be specifically developed to meet customer requirements. To facilitate the operation of a system, remote diagnostics and maintenance are also available.

## LÖMI today

In its 20<sup>th</sup> anniversary year LÖMI sees itself as an engineer-operated company with comprehensive knowledge of the entire process chain: research and development, design engineering, production, commissioning and after-sales-service.

The company believes that it has

*‘there is a lot of activity in the debinding market and many PIM part producers are changing to different debinding technologies’*

set many new standards in the PIM industry and it regards its technology as “state-of-the-art”. Its systems meet European safety regulations and are free to be installed and operated in hazardous areas.

The company states that it is an accredited company according to the EU Water Framework Directive and offers an in-house accredited safety engineer. The company is also a member of various bodies and professional associations, including the European Powder Metallurgy Association (EPMA) and German MIM-Expert-Group, under the direction of



Fig. 6 The LÖMI production area in Aschaffenburg for EDA-/EBA-50 models, for solvent soluble and water soluble binder systems

Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM).

## New opportunities

LÖMI sees a huge potential in the PIM industry. “Currently, there is a lot of activity in the debinding market and many injection moulded part producers are changing to different debinding technologies,” stated Dias Fonseca. “Ten years ago, the market for solvent debinding furnaces was a secondary business for LÖMI next to the traditional solvent recovery sector. But over

processes. In addition, occupational health and safety considerations are becoming increasingly important in many countries. With regards to process development, the company believes that the use of water soluble binder systems is also becoming more and more attractive for part producers.

## Looking to the future

LÖMI states that it is committed to further expanding its PIM debinding operations. “Together with our partners, we will continue to refine our debinding furnaces. Over the next months, we are doubling production capacity and expanding the area for our own pilot plant stations, where prospective customers are welcome to test their debinding processes. The number of rental systems will also be increased so that customers can perform in-house testing at their own companies,” stated Dias Fonseca.

## Contacts

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the last four years alone, the orders for solvent debinding furnaces have increased to such an extent that this field of business by now has reached the same volume.”

“We believe that we are the market leaders in explosion-proof solvent debinding furnaces and are privileged to be able to count some of the leading MIM manufacturers world-wide as our customers. We are very confident that we will be able to expand the market even further,” continued Dias Fonseca.

Tightened environmental regulations, he suggests, are also increasing the demand for clean solvent debinding

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