



HAITIAN
INTERNATIONAL



Advantage

Plastics News from Haitian International

A Magazine of Haitian International | Issue 18/2016



50 YEARS HAITIAN

10
10 YEARS MARS SERIES
150,000 SOLD MACHINES



Hall 15, Booth A57

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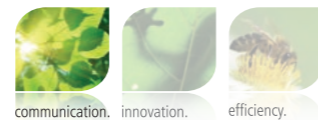
TECHNOLOGY TO THE POINT
"The perfect balance between flexibility and productivity at best costs", page 4



EDITORIAL

DEAR READER, DEAR CUSTOMERS, DEAR COLLEAGUES,

Advantage Magazine K-Show 2016
Chief Editor, Prof. h.c. mult. Helmar Franz



Welcome to Haitian International's booth at the K 2016 in Düsseldorf! The doors to the world's biggest trade show for innovation in the plastics industry are now open once again. Haitian International is represented at this K-Show with its Haitian and Zhafir brands using highly efficient, high-performance "Technology to the Point", which provides our customers not only with broader scope for action but also with strong competitive advantages, through a perfect balance between productivity and flexibility at best costs.

Flexibility in particular is one of the most important key factors for our customers in many sectors as evidenced by the user reports in this edition of the magazine. Our highly developed

standard machines primarily designed for flexible production in various categories provide a high measure of possibilities for integration, along with all internationally current available standard interfaces, and they can be integrated rapidly into any conceivable kind of production cell – or, as it is now termed, "Cyber Physical Systems (CPS)" – or into digitally interconnected communication and production monitoring systems. And of course they are flexibly and quickly interchangeable.

Moreover, at this year's K-Show we have two good reasons for celebrating: the 50th anniversary of Haitian, and the 10th anniversary of the world's best-selling injection molding machine technology to date, the Mars Technology.

In our view, this is a significant driver of Haitian International's success story and exemplifies our long-term innovation strategy of "Technology to the Point", permitting the Mars II Series' innovative and highly economic drive technology, but also enabling sustainable increases in productivity and efficiency, while at the same time providing energy savings and flexibility.

With this in mind, we look forward to productive conversations with our customers and with new interested parties, systems and business partners, and wish all visitors a successful K 2016!

Sincerely yours,
Prof. Helmar Franz



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THE PERFECT BALANCE BETWEEN FLEXIBILITY AND PRODUCTIVITY AT BEST COSTS

The key to success in modern manufacturing processes is a perfect balance between flexibility and productivity while taking costs into account. Our solution: machine technologies "to the point". This offers greater production efficiency while at the same time saving resources and providing a greater range of applications, which then in aggregate leads to a maximization of production capacities at a high level.



TECHNOLOGY TO THE POINT



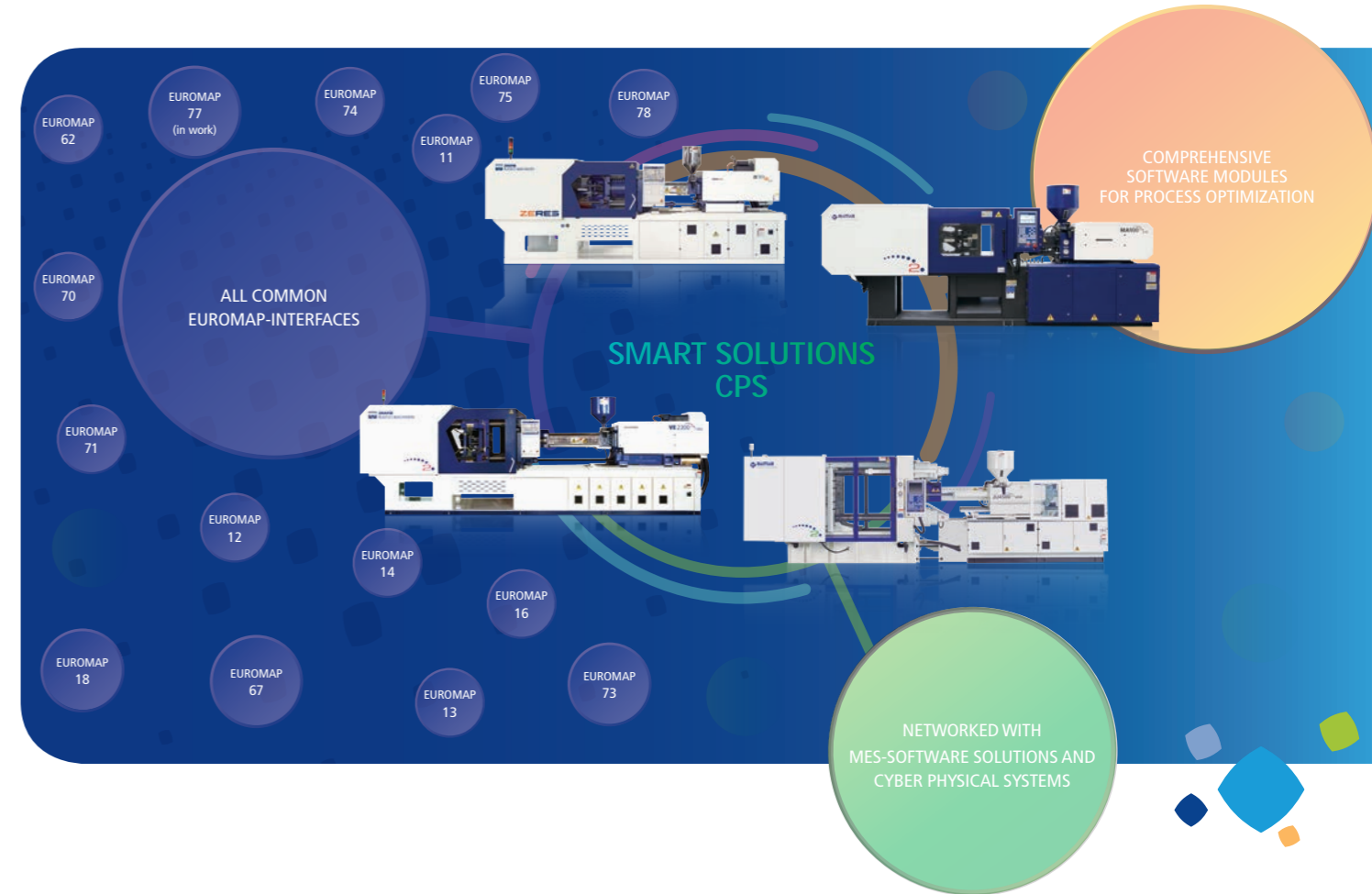
THE PERFECT BALANCE BETWEEN FLEXIBILITY AND PRODUCTIVITY AT BEST COSTS.

Top performing athletes, in triathlons for example, can only be successful if they excel in all disciplines, for example by coordinating strong performance with versatility, through consistency at high performance levels, with mental strength and flexibility under highly competitive conditions. The key is that they are able to call upon their performance capabilities with utmost precision and score successfully in all the individual disciplines taken in their totality.

This is a profile of requirements with which we, in the plastics industry, are only too familiar. In highly competitive markets the requirements and challenges are mounting for the processing industry, be it customer demands, increasingly short product cycles and greater variation in product features, or of the increasing pressure for innovation because of manufacturing processes that are to an increasing extent interconnected, e.g. "just in sequence" production. The uncertainties in future energy costs add to the intensity.

A high grade of integration

The more efficiently the technology employed is geared to demand, the greater the competitive advantages for the user are. Injection molding machines by Haitian International score high in



every respect. Taking all criteria related to production, such as high-level integration using interfaces, solutions engineered for particular applications, or modular automation into account, low investment and maintenance costs, short delivery times and a transparent, cost-efficient policy on spare parts are also included. Overall, this results in maximum use of production capacities while conserving resources at the same time. Haitian and Zhafir machines are designed for flexible production, for diverse groups of plastic product parts. Optionally equipped with all available and future standard interfaces, by EUROMAP or SPI, for example, they can be integrated into any conceivable production cell. Also available are interfaces of all kinds for integrating the machines into interconnected manufacturing processes or into what are called "Cyber Physical Systems". This portfolio strategy, focusing consistently on demand, has proven its worth, especially in difficult times. It provides the plastics processor with rapid, energy-efficient solutions and creates clear competitive advantages by giving broad scope for action and the short-term ability to adapt to new customer requirements. Technological, machine-based flexibility, combined with "Technology to the Point", will gain increasingly in importance here. It will be the formative measure for and factor in the success of future generations of machine mod-

els. As of today processors can already produce an extraordinarily broad range of parts within one product group of similar parameters with efficiency and precision on our standardized machines. In the future, these machines will become even more flexible and efficient, even easier to operate, and interconnectable via standardized interfaces.

Vision "Industry 4.0": The customer benefit is crucial

"We monitor everything connected with the theme of Industry 4.0 very carefully and discuss it with our systems partners and with many customers", says Prof. Helmar Franz, Board Member of Haitian International. "How and when our machines are to be integrated into an "intelligent" environment is determined ultimately by what benefits and added value there are for the customer. Of course, it is important to overcome some other challenges first, the solutions to which do not all go hand in hand: key aspects such as data security, network accessibility, internet stability. On the other hand, there is the question of what makes sense. Not everything that is technologically feasible today would necessarily make economic sense for the individual

plastics processor. It's a matter of finding the happy medium, the perfect balance between flexibility and productivity while also taking cost into consideration."

Focus on integrated smart solutions

Haitian International will further continue its development on the path from being purely a machine manufacturer to offering holistic systems solutions. The course has been set and important steps have already been taken. Haitian Group engineers, systems developers, and IT specialists are collaborating in intercontinental project groups pursuing different approaches to solutions and goals. This includes optimizing or developing new interfaces to the systems environment (keyword: EUROMAP 77) so as to be able to integrate highly standardized machines even more flexibly into automated processes, cells, and production lines – without compromising productivity.

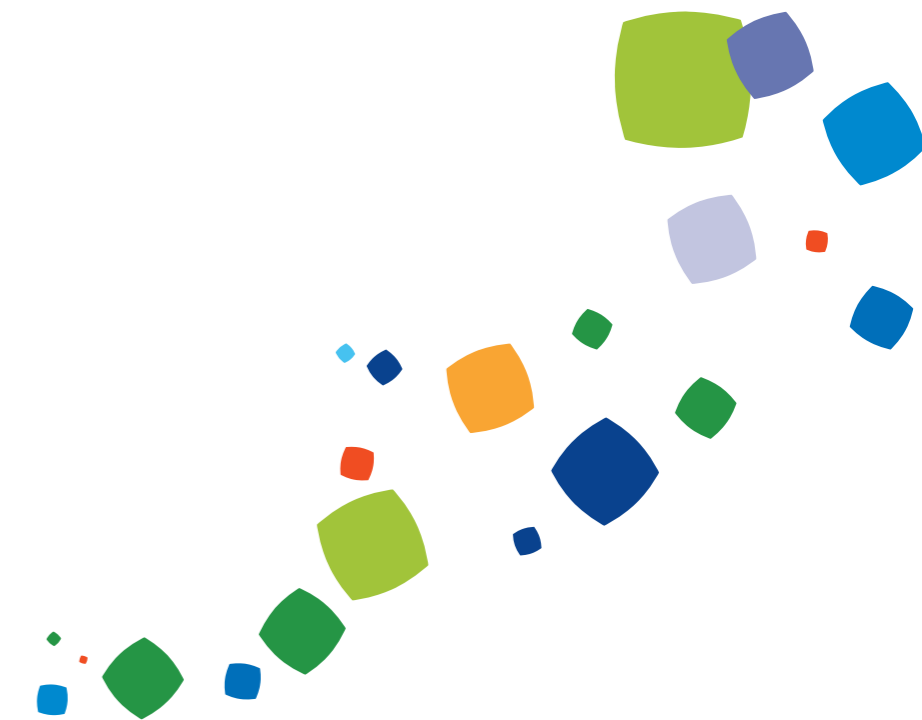


50 YEARS OF HAITIAN

Haitian International congratulates!



Haitian International is one of the leading companies worldwide in manufacturing plastics injection molding machines and possesses a global network of production and assembly plants, sales subsidiaries, and service partners. HTI is on the ground in all important international markets. Nonetheless, the philosophy remains deeply rooted in Chinese culture.



1966 MR. ZHANG JINZHANG FOUNDS HAITIAN IN NINGBO

1972 DELIVERY OF THE FIRST INJECTION MOLDING MACHINE, INJECTION VOLUME 30 G

1984 HAITIAN BRAND IS REGISTERED

1989 FIRST DELIVERY TO OVERSEAS

1994 HAITIAN BECOMES THE NO.1 IN TERMS OF VOLUME

2005 FOUNDATION OF ZHAFIR PLASTICS MACHINERY GMBH IN GERMANY

2006 HAITIAN INTERNATIONAL HOLDINGS LTD. HAS THEIR INITIAL PUBLIC OFFERING

2014 OPENING OF THE NEW HAITIAN GROUP HEADQUARTERS IN NINGBO

2015 OPENING OF THE NEW HEADQUARTER OF ZHAFIR NINGBO IN CHUNXIAO

2016 HAITIAN INTERNATIONAL GERMANY ENHANCES IT'S ASSEMBLING AREA UP TO 12,000 qm

Haitian was founded in 1966 by Mr. Zhang Jinzhang in Ningbo, China. Over a period of five decades and with passion, persistence, and expertise, the engineers developed solid and intelligent machine designs that provide customers in the plastics processing industry with crucial competitive advantages. From the very beginning, exemplary employee management was the foundation of the success. Because the employees identify with the corporate goals, they internalize basic values such as customer orientation, cost efficiency and quality awareness. This makes the continuous growth possible.

Mr. Zhang Jinzhang, founder of Haitian explains: "We made our vision clear from the very start simply with the name of our company. In the Chinese culture, Haitian means "sea" (hai) and "sky" (tian). Metaphorically, sea represents size and stands for the variety of technological possibilities. In contrast, sky knows no boundaries and allows all conceivable progress. Over the past four decades this ideal has constantly motivated us to invest a lot of energy and capital in product improvement and innovation. Today the Haitian brand has an excellent reputation worldwide. On the one hand, our high-quality machines meet customer demands in terms of precision and cost-effectiveness, while on the

other hand Haitian is highly regarded for its customer-oriented and comprehensive service. In the future, we will continue to follow this tradition as a reliable partner and a good employer for our personnel."

The foundation of Haitian International

2006 the company group was structured into several business units. The unit for injection molding machines turned into Haitian International and became stock listed at the same time. In 2010 Haitian International became the market

leader in the construction of injection molding machines in terms of sales and revenue for the first time. The trend continued as we were able to maintain this position of leadership, despite a changing economic climate and to some difficult general conditions in the core markets of Asia, Europe, and America.

Today Haitian International serves around 30,000 customers in more than 130 countries and develops innovative machine solutions using "Technology to the Point" and installs about 27,000 machines per year. Haitian International develops and produces machine designs to meet the challenges of the 21st century.

Our diversified portfolio of products and solutions covers the entire spectrum of the plastics processing industry and meets the most customer demands with high efficiency and an excellent price-performance ratio with clamping forces from 400 to 88,000 kN.

The electrical machine concepts of the premium brand "Zhafir" support application fields of the dynamically growing high-tech markets. The servo-hydraulic machines of the brand "Haitian" cover most of the middle and high standard segment of the plastics industry.



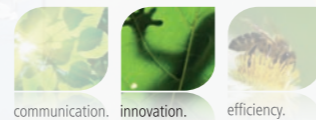
"HAI" means "SEA"
STANDS AS A SYMBOL OF VARIETY OF TECHNOLOGICAL POTENTIAL

"TIAN" means "SKY"
THERE ARE NO LIMITS TO CONTINUE FORWARD





MARS II SERIES 10 YEARS OF SUCCESS-TECHNOLOGY



The innovative Mars Series progressed to become an important driving force behind our success, setting new standards in repeat accuracy, precision, and energy savings with its servo-hydraulic drive system. Since its introduction of the Mars Technology in 2006, more than 150,000 units of the Mars Series have been sold and servo-hydraulic drives are now indispensable to the industry.



10
10 YEARS MARS SERIES
150,000 SOLD MACHINES

2006 THE ENERGY EFFICIENT MARS TECHNOLOGY DRIVE WAS DEVELOPED AND PATENTED

2007 THE MARS GENERATION 1 OF THE MARS WENT INTO SERIAL PRODUCTION

2012 THE MARS GENERATION 2 OF THE MARS WENT INTO SERIAL PRODUCTION

THE MARS TECHNOLOGY COMES AS STANDARD EQUIPMENT IN JUPITER II AND MULTICOMPONENT IAPETUS II SERIES

In 2006 with the development of the innovative Mars technology, Haitian has taken the leading role globally in the construction of servo-hydraulic injection molding machines. 2007 the first Mars Series was delivered. From there the patented drive system is an entirely newly developed, independent system, which comes as standard equipment on all Mars and Jupiter machines. The direct link between servomotor and gear pump ensures precisely regulated speeds and extremely fast reaction times throughout the cycle. An inverter matched to the drive guarantees optimal efficiency and repeat precision, while the high-efficiency gear pump ensures stable machine operation and low energy consumption. This is what makes the Mars technology so unique and it has great benefits for the customer with the most varied of applications and materials.

"Production efficiency" is more than just a buzzword to us. Rather, it is a concept that we have applied from the very start in a comprehensive manner. Thus, not only have our many years of experience in manufacturing injection molding machines given us a decisive advantage in technological expertise, but they have also given us structures that have been consistently optimized for cost-efficient production.

Extraordinary efficiency

Both today make it possible for us to manufacture high-quality standard and premium injection molding machines to meet the very highest customer expectations under conditions of extraordinary efficiency.

The extreme sturdiness and the durability of the built-in components are big sales points. All machines comply with every international quality standard and provide maximum reliability, flexibility, and cost-effectiveness the basis for efficient production operations for the customer. This closes the circle and this is what we mean by comprehensive production efficiency.

Design and performance of our diversified machine concepts are geared with precision towards the specific requirements of the processors. This is confirmed in numerous user reports and is also evidenced by the high and constantly increasing demand for the various models, from the best-selling Mars II Series to the space-saving Jupiter II Series with its two-platen technology, and from the all-electric Venus II Series to the electrical Zeres Series with its integrated hydraulics.

This is no reason for Haitian International to slack off. The international demands of plastic parts manufacturers continue to increase in tandem with the developments in the individual industry sectors.

Keywords here are: Energy-saving drives, speed of mold change, precision, repeat accuracy, integration into smart manufacturing

The research and development work addresses this dynamic by recognizing important market trends at an early stage and implementing them into future-oriented machine and systems technology using standard-version international

interfaces, interfaces for MES-software solutions, opportunities for smooth integration into Cyber Physical Systems, etc. Regular transfer of knowledge between our R&D teams in Germany and China is fertile ground for this process. This is how new generations of machines emerge, taking into account both global and regional industry needs through interdisciplinary exchange between experienced specialists.

We have many more additional plans, and we are on the right track. While consistently expanding Haitian International's locations worldwide by adding more production plants and modern application centers, the company will intensify its research and development work in order to further develop each top-performing and resource-saving machine technology into an application-driven, standard precision solution.

With new innovations, new peripheral interfaces, and new possibilities for integration into automated production cells or complex production lines.

In the future, Haitian International will continue to systematically improve its machines, processes and services, preparing technologies that provide precisely what our customers really require: practical solutions that meet actual needs; solutions that are specific to the industry and with performance capabilities that are perfectly balanced between flexibility and productivity. These are lasting solutions for achieving cost-effectiveness and sustainability in conservation of resources.

CUSTOMER STORY

THE JUPITER II HAS PROVEN ITS VALUE



Haitian | Interview with Reydel Automotive Slovakia s.r.o.

As a T1 supplier, Reydel Automotive Slovakia s.r.o. specializes in high-quality interior components, mainly for cockpits. Their production range extends from instrument panels to ventilation systems and even door trim. We spoke with Milan Večera, Manufacturing Manager at Reydel in Nitra, about the importance of flexibility for just-in-time manufacturing.



Behind Milan Večera stays a JU 24000 II, producing door trims for VW Caddy.



The Nitra site has 380 employees and production is in 4 shifts, 24/7. The production plant currently comprises 21 injection molding machines of 3,200 to 28,000 kN, including five Haitian Jupiter II Series (from 4,500 to 28,000 kN). Mostly standard materials such as PP, HCPP, PAGF, ABS, and PC/ABS are processed, with a total volume of approx. 4,000 – 4,500 tons per year.

Reydel Automotive Slovakia has been a Haitian customer since April 2014. The headquarters of the Reydel Group is located in France and maintains regional engineering centers in Europe, Asia, and South America, as well as "JIT" (Just In Time) production facilities near OEMs in

Western and Eastern Europe, Asia, South America, and Morocco.

Mr. Večera, we notice that with processors in the automobile industry in particular, more and more flexibility is required in production so as to be able to react to facelifts and thus to rapid mold exchange, increasingly shorter product life cycles or short-term special projects of OEMs. What is your opinion on this, and what do you expect of your machine suppliers?

"Yes, the pressure from the OEMs on T1 suppliers is enormous. As time goes by, there are more and

more product variants and in the case of many OEMs, these have even doubled. This influences personnel requirements and the availability of machines, two factors that require solutions that offer rapid mold change, for example."

How complex is the structure of your production lines?

"Our lines include high-quality standard injection molding, work in progress, and ASSY, i.e. module assembly with final inspection and shipment. Some parts are furnished with "Soft Touch", others with black, high-gloss piano lacquer. Here, the ASSY is the most complex part of the



production line. Usually it includes the pre-assembly, e.g. ultrasound welding machines, vibration welding, infra-red welding, laser perforation for the instrument panel with airbag, and also pressing, cutting, and gluing machines in order to trim with textiles or leather."

Your Managing Director, Ing. Jana Bogyóová, said in an interview that the production for Trnava is done "Just in Sequence". What does that mean for you as the Manufacturing Manager?

"Just in Sequence really makes life simple for our customers, but it's a hard job for us. A recent production for the Peugeot 207 explains this very well: On the line at PSA in Trnava, the automobile goes through a station that is connected to us. So we receive a description of the expected door panels – in this case it was black doors with "pointil" textile, electric ... – our Commissioning Department enters the inquiry, retrieves the finished injection moldings from the warehouse, enters them into the ASSY manufacturing process, labels them, and places them in their correct location on the rack. From the time of ordering to delivery to the line at PSA took 183 minutes. No matter if it's snowing, if your truck has an accident, or no matter what happens: If you don't deliver on time, if the parts are wrongly located on the rack or are mislabeled, the automobile leaves the line and you pay. That's our business and our risk."

With "Technology to the Point", Haitian International focuses precisely on this balance between flexibility and productivity, offering injection molding machines of high standard, equipped with extensive software, all standard interfaces, and the possibility of adding all kinds of options as hardware. This makes possible maximum flexibility and a wide production range for parts. What experience have you had at Reydel with this "Technology to the Point"?

"We have now been working with the Jupiter II machines for one-and-a-half years without any significant incidents. There have been some minor issues, but these we have solved. From the technical perspective, Jupiter II is on exactly the same level as equivalent machines of the

competition. Since that time they have proven their worth and so we have not called into question their functionality in any way. Quite the contrary. All components of Jupiter II enjoy international recognition: Rexroth, Mitutoyo, ABB, etc. Many of the replacement parts are even freely available on the market. We very much welcome Haitian's transparent and open strategy. It gives us great flexibility. And of course we are very familiar with the KEBA control system. All in all, I can say that the machines deliver what we expect them to. If we need more, we just ask."

What are the main applications that run on the Jupiter II machines?

"Mostly door trim on tandem molds, instrument panels, and airbags."

How do you assess the collaboration with Haitian International, and what was the decisive factor for this cooperation?

It began because we wanted to avoid transporting old machines. The costs for repairs and transport were just as high as the price for new Jupiters with a slightly lower clamping force. I'd had no experience of any kind with Haitian, but anything with a 2-year warranty is better than old machines with oil leaks. So I decided on the Jupiters, and I don't regret it so far. Then, after the first machine, we struck up a good partnership. The Haitian Team reacts immediately, e.g. when there are changes in systems, machine adaptations, etc. This is not customary in Europe. The operating system is open at all levels, so we are the absolute owners and can program whatever we want. Of course, this kind of freedom brings with it a certain degree of risk. You have comprehensive access but you are also responsible for the result. In my opinion, it's a good strategy if you know what you're doing."

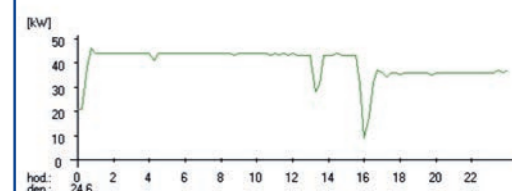
What drive concepts do you prefer?

"We are locked into servo-hydraulic drives. They permit a cost savings of approximately 60% in terms of electricity in comparison with the conventional drives. And the two-platen design saves us space in production. That's what we call "Technology to the Point"."



Application	Door trim of VW Caddy
Produced on	JU 24000 II
Shot weight	3,400 g
Cavities	2+2 – stack mold
Material	PP
Cycle time	72 s
Energy analysis KW/h	80 kW/h
Energy analysis kg/h	170 kg/h
Energy analysis KW/h/kg	0,470 kW/h/kg

Energy diagram of a JU 18500 II



CUSTOMER STORY

FLEXIBILITY IS A MUST

Interview with Magna Slovteca s.r.o.



The Magna Mirror Systems, founded in 1994, produces around 53 million exterior and interior mirror systems for the automotive industry and is one of the largest global suppliers. The Group employs around 146,000 people and has 370 plants along with 27 engineering and sales offices around the world. We visited the factory Magna Slovteca in the heart of the growth regions of Eastern Europe and spoke with General Manager Ladislav Lutz Hrotko and Martin Maderic, Focus Factory Manager of Magna Mirrors.



Left picture: Magna Slovteca delivers 18 OEMs. This means maximum flexibility with peak logistic performance.
Right picture: Proving part particle: (from left) Sales Engineer Filip Mizia from Mapro with Martin Maderic, Focus Factory Manager of Magna Mirrors.

Mr. Hrotko and Mr. Maderic, Slovakia is the largest market of automotive suppliers worldwide and it seems that the lack of skilled workers in the future could be a significant problem. How do you assess this?

Mr. Hrotko: "Not only for us as a supplier but also for the car manufacturers it is problematic. Everyone is vying for skilled workers, especially in the technical field. To an employer, to be attractive and to remain attractive, you have to develop their own solutions. The Magna Slovteca is an independent, autonomous company. Thus, our employees have the opportunity to grow. Project Managers, for example, have decision-making power and are not dependent on anyone else unlike other companies in the Slovakia area.

The buyers work directly with the supplier. There is no one in between, which leaves room to grow. And so does the location. It is growing steadily and healthy every year by 10 to 15%. This is realized by the employees which in turn creates trust and loyalty."

Why is the site of Slovakia so popular among automotive suppliers?

Mr. Hrotko: "It is relatively centrally located. Magna, for example, delivers to Britain as well as Russia, just to give you an idea. From here, the transport routes are relatively short. As a result, this affects prices per part in addition to a stable high level quality with maximum flexibility."



Then flexibility plays an essential role for you?

Mr. Maderic: "You have to have flexibility, otherwise the OEMs would no longer be interested in you. Yet it also depends on the nature of the products. We have a very clear market position with our mirror systems. Here the production cycles are getting even shorter, but the tool geometries move within a product group. This allows us to configure flexibly designed facilities, which can be modified after the project without much effort for the next project. Leaving further processing aside, one can say our mirror systems are more or less standard injection molding."



In a direct comparison test between a VE 4500 II and a corresponding hydraulic machine, Venus II reached a value of energy below that of 75 % of the competitive machines.

Mr. Hrotko: "Apart from that, Magna Slovteca delivers 18 OEMs and their 80 plants in Europe. We deliver in almost every European country. This requires a lot of logistics and a well-organized production process. Flexibility is therefore our daily issue."

What does your machinery look like?

Mr. Hrotko: "We run 23 injection molding machines between 200-750 tons. The main parts are the hydraulic machines. Our six Venus II machines are the first electric producing machines for Magna Mirrors. We manufacture its visible parts and engineering components."

Are there any special requirements for the machines needed to produce the mirror components?

Mr. Maderic: "No, nothing in particular. It's about precise injection, parallel function, solid extraction robots, hot runners... so nothing extraordinary. As I said, we do standard injection molding, but certainly on a high quality level."

Mr. Hrotko: "Production is running 24/7, with an average of six to ten tool changes per shift. But even that does not have special requirements because the magnetic plates for convenient tool changes also come as a standard option."

What were your reasons for choosing machines from Haitian International?

Mr. Hrotko: "The facts spoke for itself, the service and the entire package. At the time there were six to seven machines for discussion. All European manufacturers had been requested, and since there were no insights about Zhafir machines - but much talk on the market - we were curious. There are strict rules when it comes to supplier lists at Magna. Zhafir was not on this list. Mapro finally told us to test a machine, so we could check the Venus through its paces. We left nothing to chance and made numerous tool tests and measurements concerning energy consumption and precision. We did testing on both, the Venus parallel to the hydraulic machine competition. Apart from the energy value - the Venus spent about 70 % less energy - the results were consistently at the same level, the price of Venus was but significantly less. I presented the results before management and we discussed persistently."

Mr. Maderic "Mr. Hrotko remained adamant and broke several lances for Venus II. With tangible facts such as energy values, noise level, no oil, availability of spare parts... it was complicated persuasion that was worth it in the end!"

Mr. Hrotko: "That's right, we have had no significant defaults since then. I had inquired with our sister plant in China, which has already been very pleased with Zhafir and Haitian machines. And thus we decided on Venus II. Last but not least it was also a reliable service. Therefore Mapro is certainly an established partner in Slovakia.

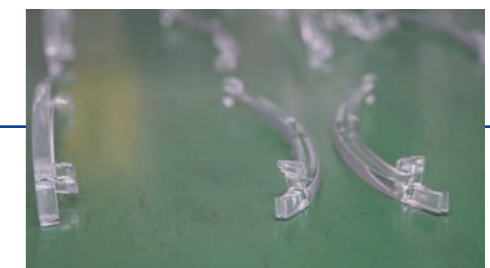


Venus fan from the beginning: Ladislav Lutz Hrotko, General Manager of Magna Mirrors.

Service is really one of the most important purchase decision factors and as for the team of Mapro, the cuts are above average."

Haitian International is consistently following their product philosophy of "Technology to the point", while other manufacturers often praise their machines for special features or the many special options. What are your experiences and how do you evaluate Zhafir machines?

Mr. Maderic: "Zhafir machines correspond absolutely to our standard. The option list contains everything that we need. The controls are easy to use and comply with the latest standard of technology, in regards to the fact that the training period for four technicians is conceivably short. We are satisfied that Venus II machines are completely integrated and constantly fully booked."



LightGuide STI with 60 g. shot weight of PMMA, manufactured on a Zhafir Venus II machine with 2 + 2 cavities and 65 second cycle time.

CUSTOMER STORY:

BEST IN ITS CLASS WITH A SMART STANDARD



communication. innovation. efficiency.

Interview with Mirror Controls International

Mirror Controls International's stock-in-trade is defined by high quantities with extremely high precision and efficiency. The world market leader in mirror glass and powerfold systems delivers more than 60 million drives annually to the top 10 OEMs in the automobile industry. For manufacturing at the very highest level, they rely with absolute conviction on the all-electric Zhafir Venus II Series. And not just in Ireland.



17 electrical injection molding machines bear the logo of the Venus II Series, working with clamping forces of between 600 and 1,200 kN.

Mirror Controls International (MCI), a company founded in 1964, currently has around 850 employees worldwide. This makes MCI the largest independent manufacturer in its industry sector – and at the same time the only system supplier with its own patents. They manage everything themselves, from design to production. By their own account, the secret to their success lies in extremely high precision and efficiency, based on 100% quality control and the high availability of their machines and assembly lines. We visited the MCI plant in Ireland and met with Plant Manager Director Vince Keehan and Technical Manager John O'Donoghue.

It is a tightly organized operation at the Manorhamilton site in the northwest of Ireland. At present some 56 injection molding machines

form the nucleus of the production in an environment of strictly controlled processes and fully automated assembly. Here, 198 employees work 24/7 to process a yearly total of 2,500 tons of raw material. Week after week 12.5 million plastic components and individual parts are made and later assembled into completed systems. 17 of 18 electric injection molding machines bear the logo of the Venus II Series, working with clamping forces of between 600 and 1,200 kN. Others will follow in order to switch to strictly electric technology and to thus rely fully on the Venus. The favorable arguments are: no oil, low background noise, and – not least of all – precision. "Our plastic parts are processed in fully-automated assembly and thus minimal variation is allowed. In order to guarantee such precision, we are

increasingly converting to electric machines," Vince Keehan tells us in the production shop. Immediately before us stand the Zhafir machines in neat rows. "We want to show our customers that we value the latest technology and precision and that's why we have placed the Venus machines at the entrance." Just a few weeks before our visit, PMM, Haitian International's sales partner for UK and Ireland, installed five Zhafir machines here. "The PMM team has done a great job", John O'Donoghue enthuses. "Delivery, installation, and setup within 14 days – that was impressive. What is more, the service is excellent, and my colleagues very much appreciate PMM's flexibility."

When asked about the decisive factors in favor of Haitian as machine manufac-



John O'Donoghue, from MCI Ireland (left) and Richard Hird from PMM (right).

turer, Keehan and O'Donoghue name some key facts that are both forward-looking and pragmatic: service on-site, high availability, short delivery times, energy-saving technologies, good value for money. "The machines have to be easy to operate in order to convince the employees of a new supplier as well. We have had good success in this regard with the Zhafir machines. Haitian International scores well in this aspect together with PMM", Keehan says emphatically. "Moreover, as far as energy costs are concerned the injection molding department causes the lion's share. Every bit of saving here counts. The Venus machines consume on average 50% less energy compared with the other machines in manufacturing."

The first Venus II Series machines within the globally operating MCI group were installed by the Chinese subsidiary plant in Suzhou. That's where Keehan and his team's machine was tested and approved. "No question about it, the visit to Suzhou and our satisfaction there with the Zhafir machines was what convinced us initially," says Keehan in summary. In the meantime, the plant at Suzhou now runs only Zhafir machines, he adds, and in Manorhamilton too "the Venus II Series is highly popular because it offers an excellent price-performance ratio." In Mexico also, the conversion to Venus II Series

began long ago. "Our plastic parts must meet the same standards worldwide," O'Donoghue explains, "because we distribute them globally to all the plants based on demand. Today we can receive plastic parts from Mexico or China and assemble them - there is no difference to in-house production. By doing this, we have created a truly global network. If we have free capacity here, we can produce for our subsidiary plants. And vice versa."

Precision and 100% quality control are the rule at MCI. The components are subjected to a series of quality tests that are both appropriately extensive and intensive, whether it's material tests, as for example with MFI Index, or control of material drying, the sensor technology in the injection molding machines, visual monitoring centers in assembly, or any number of measurement analyses or downstream tests such as vibration tests, noise tests, temperature tests. Keehan: "All of the 12 million molded components that we produce weekly are tested, certified, and documented. All of this is done to guarantee 100% functionality of the final systems in the most varied of applications, irrespective of customers, location or application. And, as we've already mentioned, this is all done worldwide."

MCI Facts

- Approx. 1,000 employees
- Including 40 R&D engineers
- More than 250 years of experience
- 59 patents applied since 1997
- Global supplier to the top 10 OEMs
- Global bidder to 40 of the top 50 platforms
- Manufacturing more than 60 million actuators per year

MCI has been a subsidiary of Flextronics since July 2015.



Plastics components for the actuators.

In terms of productivity too, they leave nothing to chance. The automation has been built specifically for the individual products, and the internal product design also affects their role. If there are updates within a module, this has little influence on the injection molding machinery; you just change the mold and if necessary the material. Keehan: "We have reliable customer forecasts. This is very unusual in the moulding industry. We know the platforms of the individual automobile brands and their developments, and since we design and develop our products ourselves we influence standardization to a high degree."

As for the question as to why manufacture in Ireland of all places - after all there's no automobile manufacturing on the island and MCI has to export 100% - Keehan explains that the site was founded by a German at the time. "Then out of that a manufacturing plant developed that grew bigger and bigger. In addition, we have particularly good toolmakers in this region and good training centers for technicians. Moreover, for many US companies Ireland has in the past been what you might call the doorway to Europe. And in terms of taxes Ireland is certainly not unattractive either."



Haitian Plastics Machinery manufacturing hall in Ningbo, China



Zhafir Plastics Machinery in ChunXiao, China



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