

# 3<sup>rd</sup> GENERATION TECHNOLOGY

NEW DEVELOPMENTS  
NEW MODULARITY  
OPEN INTEGRATION

## New efficiency, new flexibility and new opportunities for the future

Haitian International's 3rd Generation Technology is much more than just another machine update. It consistently fits into the success strategy of "Technology to the Point" and includes many beneficial innovations on several levels:

### New Developments

for instance

- New generation of servo drive systems – tailor-made, high-performance
- Electric injection units in a new dimension
- Economical machine concepts

### New Modularity

- Modular combination of mature core technologies
- Hybrid solutions for increased flexibility

### Open Integration

- New intelligence through Connectivity Plus
- Highest performance with Motion Plus

The move into the 3rd Generation Technology opens up numerous new possibilities and intelligent solutions for us in order to meet the increasing economic and ecological requirements even better. Our aim is to keep the ongoing development of hardware and software in a customer-oriented balance. Every development idea is put to the test in terms of efficiency and flexibility. Only what guarantees these two benefits will be realized.

continued on next page >



**“With the 3rd generation, the customer buys a platform with intelligent software that is extremely quick to learn.”**



One example of our Zhaifir Family:  
The new hybrid JENIUS Series with two-platen clamping unit and electrical injection unit from 3,600 kN - 33,000 kN

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One example of our Haitian Family:  
Our bestseller Haitian Mars Series in 3rd generation from 600 - 33,000 kN

## Technology Generation 3: Much more than a machine upgrade



Also visit  
[www.zhaifir.com](http://www.zhaifir.com)



Productivity and flexibility are the pillars of success in manufacturing. Modern injection molding machines from Haitian and Zhaifir serve both sides and keep them in perfect balance. Our machine technologies to the point increase production efficiency while conserving resources, increase application diversity and always pursue the same goal: the best possible utilisation of production capacities at a high level.

Just a few years ago, our research and development work was primarily focused on optimizing design, mechanics and control. The latter was largely in the hands of our system partners. With increasing digitalization and the nationwide expansion of stable Internet lines and infrastructures, the machines became more intelligent and communicative, opening up to the future requirements and scenarios of information technology at the “Industry 4.0” level.

While digital interfaces were initially still part of the optional machine equipment, today all internationally

demanding interfaces in our company are part of the basic equipment, the technological standard. Both the electric Zhaifir Series and the servo-hydraulic Haitian Series are fit for the future, ready for new challenges. “With the 3rd technology generation, the customer no longer buys pure hardware. Instead, the customer buys a system, a platform with intelligent and extremely fast adaptive software. This is one of our core developments,” says Mr. Fu, Chief Engineer of Haitian International in Ningbo, China.

Our in-house developed software solutions offer the processor a very high flexibility in the process optimization of all axes. Together with OPC-UA, they enable an extremely open integration or connectivity with all common Euromap interfaces, and the smooth connection of automation or any MES systems. Mr Fu: “We supply the customer with an intelligent machine system that is open to all possibilities, leaving him free to choose his integration partners.” In this way, the highly standardized Haitian and Zhaifir machines can

## “With all the exciting software developments, we can’t forget the machine itself.”

be integrated into automated processes, cells and production lines as required - maximum flexibility with the best possible productivity.

As digitalization becomes more intelligent and complex, the machine becomes more and more a functional body - powerful, flexible and as susceptible to failure as possible, explains Mr. Fu. He continues: “However, this in no way diminishes the importance of the machine. In general, although the technical optimization of the injection molding machine is already quite exhausted, we still see potential for groundbreaking improvements. Not so much in mechanics as in frugal innovation.” Reductions in material and energy consumption, minimized transport and delivery costs, less susceptibility to faults, simplified maintenance and shortened maintenance times would just be some of the monetary consequences of concentrating on the essentials. With this in mind, around 400 engineers and process experts are constantly working on the optimization and further development of our servo-hydraulic and electric injection molding machines.

We see the further standardization of machine components and assemblies as an equally important task. This is the only way for us as machine builders to think in terms of large quantities, create cost-efficient production processes and pass on the cost advantage to our customers.

As a pioneer of high-quality standard machine construction, it was our aim from day one to deliver technology to the point. The worldwide response to our 1st machine generation has impressively confirmed this decision. The innovative servo-hydraulic drive technology of the Haitian Mars Series has been inspiring for more than 10 years with its outstanding economy and reliability.

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Also visit  
[www.haitianpm.com](http://www.haitianpm.com)





### CONNECTIVITY PLUS

Together with OPC-UA, they enable an extremely open connectivity with all common Euromap interfaces, and the smooth connection of automation or any MES systems. With free choice of integration partners.

### MOTION PLUS

With Motion Plus on board, mechanics and software form a strong symbiosis. High-performance drives and intelligent algorithms optimize the movements of all axes – quickly, accurately and very efficiently.

The all-electric Zhafir Venus Series is a prime example of efficient injection molding technology in terms of precision, dynamics and environment- competitive advantages with sustainability.

This demanding approach continues to drive us today. Mr. Fu says: “Our engineers are constantly working on optimizing our hardware components. The focus here is on dynamics, precise movements and process accuracy, but also on standardization with maximum flexibility. Our goal is to maintain a healthy balance between hardware and software. In our opinion, intelligent motion control can only develop into a real customer advantage and offer the injection molding machine new possibilities with well thought-out and above all cost-efficient hardware.”

Mr. Fu sees the further development of the drives as a typical example of this. “The new generation of electric and servo hydraulic drives in connection with the new inverter generation promise more power with less energy consumption and provide for more precise movements of all axes.” The specially developed servo motors are tailor-made for the most diverse application tasks, such as injection with long holding pressure, dynamic injection with medium holding pressure or extremely fast injection without holding pressure. The drives have been developed for each of these tasks. “Efficient and smart manufacturing processes and large-volume production make custom-

ized components a cost-efficient standard,” says Mr. Fu, smiling. “Paradoxically, one could also call it tailor-made standardization. This opens up completely new perspectives for the entire company.” Tailor-made drives, intelligent software and the unique manufacturing power in the Group allow us, for example, to

## “Mechanics and software become a high-performance symbiosis – one of the components of Motion Plus.”

think even larger in terms of electric drives and to further expand the still attractively priced range of future-oriented electric concepts – keywords being large clamping forces and above all large, affordable injection units.

Another example is our servo-hydraulic Haitian Series. Thanks to intelligent algorithms, the injection process has been optimized by replacing proportional valves with standard valves – closed-loop control, without sacrificing speed and pressure. Mr. Fu commented, “The sophisticated design of the injection unit in combination with a powerful servo drive system benefits from independent algorithm modules. Thanks to their fast, accurate calculations and highly efficient mathe-



**“Our goal is to maintain a healthy balance between hardware and software and to offer the injection molding machine new possibilities.”**

Mr. Fu Nanhong, Chief Engineer of Haitian International

matrical models, the stability of the injection process is now much higher, whether for extremely fast or slow injection. The improvement is significant.”

### Big Dimensions

A very innovative example is provided by the new, big electric injection units. “Here you can see the perfect interaction of software and hardware,” says Mr. Fu. “The challenge was the exact synchronization of all four spindles and with high dynamic in acceleration. This is only possible with extremely powerful, reliable, but also flexible components that are controlled by an intelligent control center.”

Motion Plus is the bundling of already established and new developments around intelligent motion control. Although many of these components are already standard in the Zhafir Series, for the Haitian Series it was a big step towards the digital future, digital intelligence. “This may not sound spectacular across all competitors, but given the enormous power of performance and service capacity, this technological leap is taking on a new meaning,” says Mr. Fu.

The consistent standardization of mature core technologies opens up new possibilities for Haitian International to combine within the various systems. “We call this the “new” modularity and in many respects we mean the abandonment of familiar structures. Apart

from that, the R&D teams had to think modularly from the start, but for entire assemblies. This way of thinking allows us today to think of any combinations. Each clamping unit and each injection unit can be combined with any component – whether electric or hydraulic drive system, toggle system or two-platen solution, single or multi-color injection. The new Zhafir Jenius Series is the first result: electric injection unit and a two-platen clamping unit. The JE Series combines mature and proven core technologies from the electric and hydraulic world. Further hybrids will follow.

### LIVE PREMIERE:

Electrical injection unit 12800 for JE Series

The new concept of electric injection units from Zhafir with the new generation of drives. Innovative and affordable.



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