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Europe Die Casting Industry Research Report:

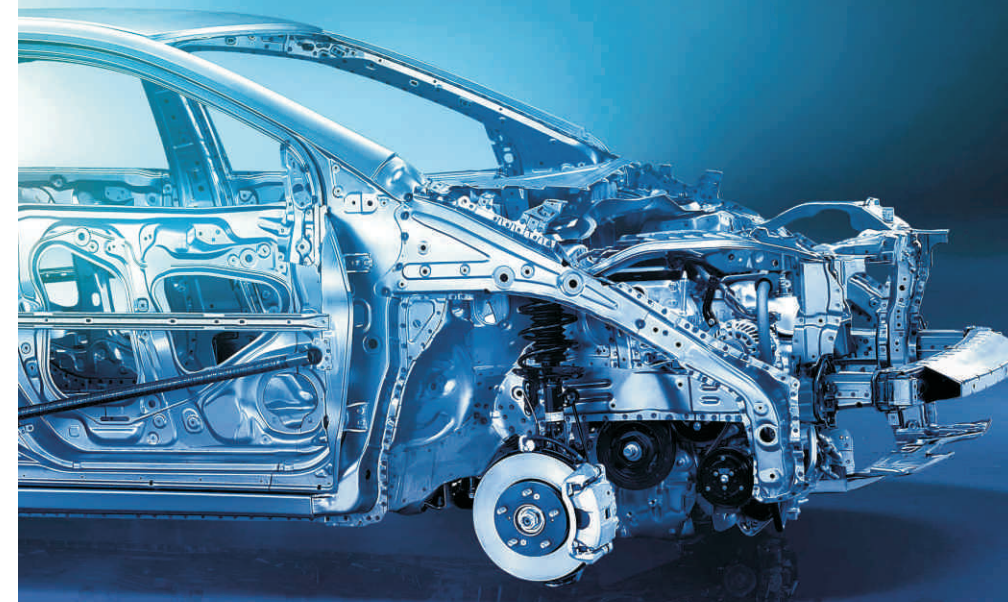
The Automobile Die Casting Structural Parts will Become the Main Growth Area in the Future

Manufacturing Upgrade

The capacity of Yizumi's die casting machines has surpassed 1 billion

Opening and sharing

YIZUMI has begun the seminar tour for the advanced metal forming technology (AMFT)



- ③ Preview P03
The Automobile Die Casting Structural Parts will Become the Main Growth Area in the Future
- ③ Enterprise P07
Yizumi's RA Robots: Boosting the High-End Transformation of Special Industrial Manufacturing
- ③ Observation P17
Under the trendsetting of new energy and lightweight construction, how would the die casting industry evolve?
- ③ Case P21
Millison: A Global Leader in Die Casting Field
- ③ Product P27
Hot Chamber Magnesium Alloy Die Casting Machine: Dominating Mobile Middle Plate Market
- ③ YFO P31
Yizumi Factory Outlet

VOL.26

Contents

- P03 Preview**
The Automobile Die Casting Structural Parts will
Become the Main Growth Area in the Future
- P07 Enterprise**
Yizumi's RA Robots: Boosting the High-End Transformation of
Special Industrial Manufacturing
- P17 Observation**
Under the trendsetting of new energy and lightweight
construction, how would the die casting industry evolve?
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- P27 Product**
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- P31 YFO**
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Perseverance in Excellence will Yield its Power

The year 2018 has passed the halfway mark. In comparison with last year's situation of overwhelming demands outstripping supply, the market sentiment this year has gradually slipped. The mobile phone market may be latent for some period. Many people have wondered, "Is it another trough?" In reality, this type of changes has been a repeating cycle as evidenced in the past 10 years. The die casting industry has exhibited a certain cyclical fluctuation and it is developing in a "W" shape manner. It reached a trough in 2008 and in the following 3 years, it exploded in full force. The year 2012 and 2015 were the turning points respectively, rising and falling in fluctuations.

From another perspective to view this period of changes, there is a feeling that the industry will be driving another growth path in the current period.

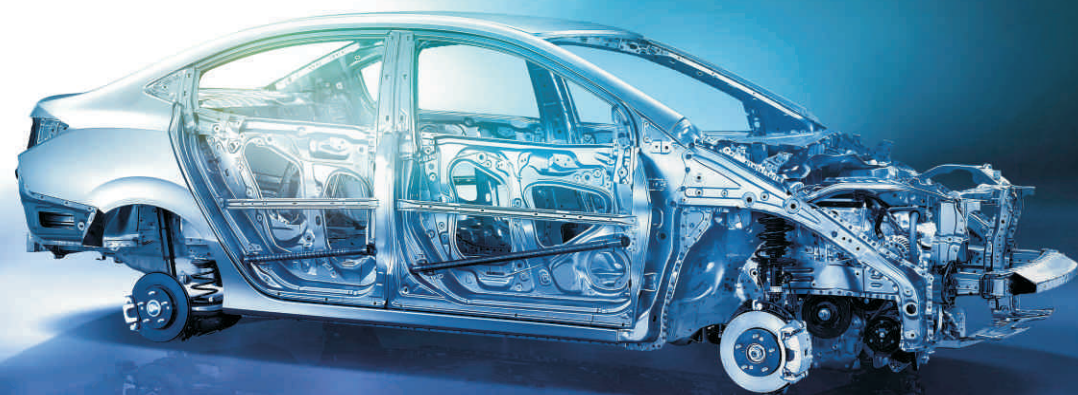
In the past decade, the market volume of China's die casting industry has experienced huge changes. From 2010 to 2017, the output had risen from 1.72 million tons to 3.55 million tons, topping the global chart (the output for die casting parts in the peak period of the U.S. was 1 million tons per year). With the advent of bike-sharing and the new energy vehicles, more new enterprises and technologies have come into the picture. At the same time, the old products, technologies and environment are going downhill. As such, the operation mode that the enterprises are relying on cannot be continued and it has been forced to move forward. Either the participants are being swallowed or they are taking up the challenge to press forward. In review of the sudden rise of the smart phone industry a few years back when the 4G license was issued in 2013, the metal phone body was the mainstream at that time. A lot of plastics mobile phone suppliers had closed down in Dongguan. Meanwhile, the die casting industry has welcome the unprecedented development opportunity. Looking at the mobile phone market again in the present time, it may be the calm weather before the arrival of another 5G "storm."

The huge changes in the 10-year period have inspired us to seriously look at the changes of today. The development of the market has always abiding by a certain objective law. In the past 10 years, Yizumi's die casting machines have been rising and falling in tandem with the market. However, Yizumi has still maintained a rapid growth from a private enterprise in Guangdong to an enterprise with the No.1 national export sales. The reason why it has not been phased out by the intense market fluctuations is because Yizumi has always been maintaining full confidence in the market and it has been continuously upgrading its products and technologies and grow along with the industry. Despite the trough period of the market today, the nascent new energy vehicles coupled with the 5G telecommunication have been ready to explode. It can be predicted that the next wave of explosion in the industry is approaching fast. Last year, Yizumi has strongly laid out its high-end heavy duty die casting machines, successfully developed its 1000H – 4500H series with reference to the North American technological standards. The products have been used in various companies such as Sinotruk International, Wuxi Langxian, Chengdu Aoxing, etc. This year, it has expanded its machining equipment and capacity of the heavy duty die casting machines. With the approaching new wave of market growth, it has been all systems go for Yizumi.

Regardless of the changes in the downstream products, the achievement of the basic structural parts in the product functions is almost like a forever market demand. However, the materials and molding technology must follow the development of the industrial technologies to grow with the times. In this protracted war, maybe you would have won the first-mover advantage by fighting with your courage and luck. Nevertheless, the next battlefield is perseverance and horizons. Yizumi believes that its perseverance in excellence will yield its power.

Europe Die Casting Industry Research Report:

The Automobile Die Casting Structural Parts will Become the Main Growth Area in the Future



By Yizumi's Technical Director, Mr. George Yu

Recently, our technical team has conducted an investigation in Germany for a week, understanding the German die casting molds manufacturing technologies, the technological research progress of research organizations in related universities as well as the development of lightweight solutions for the German car manufacturers. In this article, we would like to share the research result and hope that we can jointly communicate and improve together.

Mold Manufacturers: Comprehensive, advanced development capability of structural parts

The German mold manufacturers have not only accumulated an abundance of experiences in the traditional automobile engine cylinder body(including V4, V5 and V6) and automatic transmission, they also extend their reach to the automobile structural parts such as car door, shock absorber tower, A pillar, car rear connecting parts, etc. to be applied to the Model S and Model X of Tesla, Ferrari, BMW i3 and General Motors. Moreover, the German mold manufacturers have advanced designing software like Cartier and Siemens NX. Additionally, they also have flow analysis

software for the molds, boosting their machining capabilities. On top of that, they have large European machining centers, and for mold testing on a wide series of die casting machines ranging from 400T to 3000T clamping force.

Some of their mold companies have been developed for over 80 years. They have become technical experts with insightful experiences. At present, most of them can deliver a whole package of solutions beginning from the customer needs to the mold design and commissioning, covering the entire production process. They have gained the recognition and approval from the automobile manufacturers. Besides, there are also case studies of European automobile manufacturer's suppliers engaging in the collaboration with the Chinese die casting manufacturers.

F U T U R E

**University Research Institute:
Focusing on the research of multi-
material molding**

To date, the German universities have not focused too much on the fundamental research relating to the die casting structural parts. They have instead placed their focus on hybrid molding technology involving many different kinds of materials such as steel and aluminum, steel and magnesium, aluminum and magnesium, aluminum and plastics, and so on. The main purpose is to

lower the costs, prevent corrosion, reduce the weight and also meet the requirements of use with the mechanical functions at the same time.

In addition, the research institutes have also conducted extensive research on the lightweight area. Using the finite element analysis (FEA), topology transformation as well as cracking and heat treatment simulations, it has successfully reduced the weight of the car seats from 3.24kg to 1.52kg and the mechanical stress has increased by 112%.

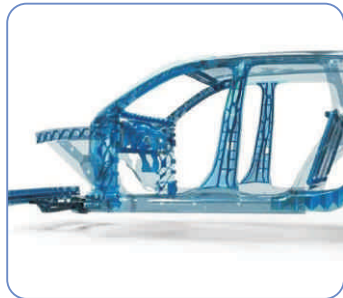


Figure 1: Case study relating to application of multi-materials molding



Figure 2: Structure in details

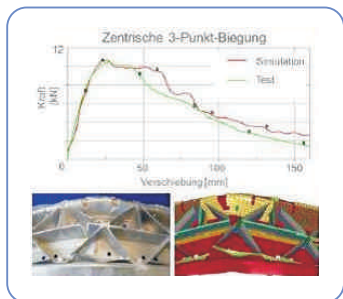


Figure 3: Mechanical function testing



Figure 4: Car seat skeleton construction diagram

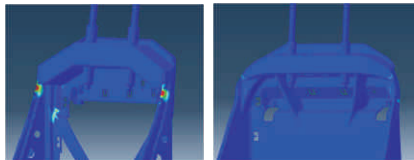


Figure 5: Traditional press forming



Figure 6: Die casting forming

In the semi-solid thixo casting area, it has also moved in the direction of large machines for future development. Presently, the largest tonnage is 1000T clamping force. In the future, it will also pursue in the direction of car parts for further development.



Currently, the local die casting suppliers have still not embarked on the mass production of the structural parts. However, they have been initiating related research and preparation work. It can be deduced that the automobile die casting structural parts will be the main growth area and development opportunity in the foreseeable future.

S T R U C T U R E

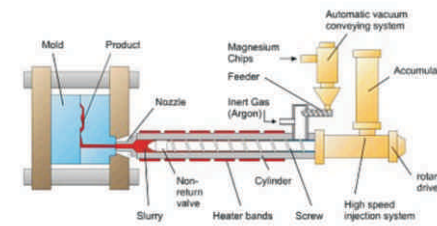


Figure 7: Semi-solid thixo casting schematic diagram

The followings are intergranular structural diagrams after shearing

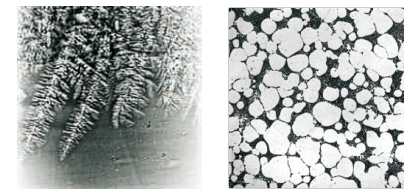


Figure 8: Tree-shape crystal structure prior to shearing

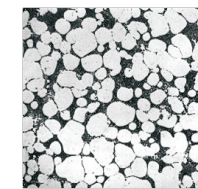


Figure 9: Ball-shape crystal structure after shearing

There are many advantages of using semi-solid thixo casting. The magnesium alloy can reduce the weight and its elastic modulus is far greater than plastics. Furthermore, its thermal conductivity is also better than plastics and it does not have mold gate. Besides, there are relatively fewer substances that will ooze out as well as runners. Nevertheless, its disadvantage is to resolve the corrosive issue of magnesium alloy.

Automobile Manufacturers: Leading the world in the research and development of lightweight products

The German automobiles are also moving in the forefront of lightweight construction. In the past, the die casting parts used in the Daimler-Benz AG's Benz SL series were over 100 parts per day; over 600 parts per day used in the S series; and over 2000 parts per day used in the C series. It has 6 suppliers and 7 production bases in the world. Its manufacturing products include C pillar, rear window frame, shock absorber tower, chassis

From the investigation, it can be known that the research institutes have been focusing on the research of multi-material molding for die casting structural parts in Germany. In the semi-solid thixomolding area, it has been developing the magnesium alloy die casting parts of 1kg and above. Besides, the molds have already covered the majority applications of the die casting parts in the automobile section. The automobile manufacturers have already started to use die casting structural parts in some of their new, high-end series car models.

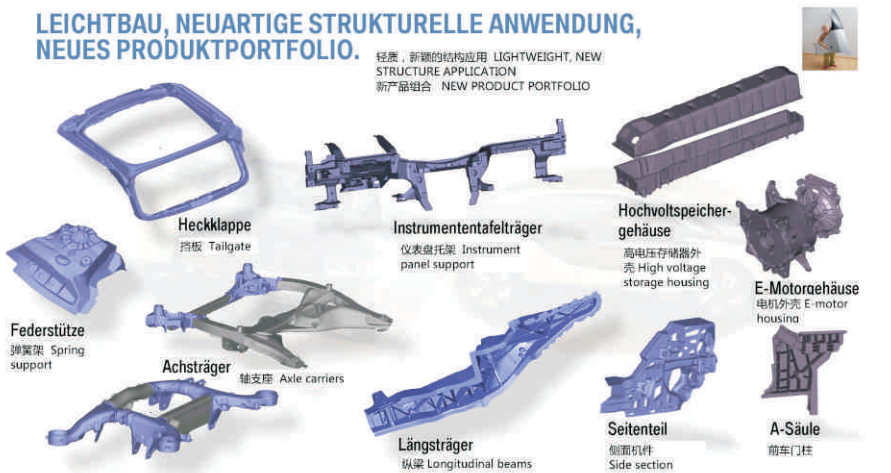


Figure 10: Applications of the die casting parts of new BMW 7 series

cross-beam, etc.

The new 7 series luxury cars launched by BMW have applied with many lightweight constructions. It is mainly consisting of the various parts such as rear integrated bracket, top frame, shock absorber bracket, front axle bracket, A pillar, dashboard, etc. Not only does it reduce the car weight, it also elevates the performance and the fuel economy of the vehicle.

Nevertheless, they are still not massively used in the common series.

Currently, the local die casting suppliers have still not embarked on the mass production of the structural parts. However, they have been initiating related research and preparation work. It can be deduced that the automobile die casting structural parts will be the main growth area and development opportunity in the foreseeable future.

Source of part of the article's pictures: Professor of The University of Kassel (Germany) – Martin Fehlbier

Yizumi's RA Robots: Boosting the High-End Transformation of Special Industrial Manufacturing

More and more robots are being introduced into China's manufacturing nowadays. According to statistics, the annual sales of industrial robots in China has been experiencing a compound annual growth rate of 32.1% from 2011 to 2016. The total sale in 2017 was 138,000 sets, increased 59% year-on-year.

The rapid rise of Yizumi's robotic automation system (hereinafter referred to as "RA") has grappled with this opportunity to put forward automation solutions for die casting and all kinds of special industries. RA has achieved a sales surpassing 70 million CNY / Year within 3 years after it was incepted. It had a growth rate of 115.93% year-on-year.

From 400T to 4000T automation die casting cell, RA has constantly strived to make breakthroughs, upgrading its products with constant technological advancement and march forward to the various special machining fields of forging, rubber injection, stamping, casting, etc. RA's Deputy General Manager, Mr. Han Gang said: "Although the era of unmanned operation has arrived, it will not achieve success overnight. We will work hand-in-hand with the customers in creativity and innovation, driving the transformation and upgrading of the various special industrial manufacturing toward intelligent automation."

Facing the coming wave of Intelligent automation

In the workshops of Chengdu Aoxing, 6 sets of die casting cells (above 1600T) are sequentially manufacturing the gear box casings. From extraction and testing to coding, printing, slag removal, cooling, biscuit cut, etc., the procedures within the cell are all automated. Ultimately, the products are transported by the conveyor belts and inspected in the final step for perfect external appearance by their skilled staff.

Even though there are still some distances from the notion of fully-automatic unmanned factory, the enterprise has obtained higher efficiency and quality.



In comparison with the previous three years, the metal molding industry has more pressing needs for automation as of now. The main reason is neither expensive labor nor difficulty in recruiting the right staff, but rather, it is the "distrust in manual operation." Mr. Han Gang cited: "The automobile manufacturers in the upper stream are hoping that the parts manufacturers are equipped with automated production. In this way, the efficiency and quality of each product will be stable and it can ensure high quality and timely delivery."

Facing the coming wave of automation and many years of experiences of the technical team from the robotic automation company overseas,

communication, they agreed to and appreciated our solutions. The final product was also compliant with the concept and ideas of the designers. The Robots for biscuit cut and clamping the finished products are all customized designed. Generally, the manufacturing process has attained a very high degree of automation.

Focusing on the automation solutions for special industries

Customization is the characteristics where RA is very proud of. Talking about automation, the first reaction from the customers is generally "Do you understand our applications?" The automation solutions are all non-identical because the factors such as the product dimensions, production environment, equipment, molds are all different. RA is good at working out customized solutions according to the varying applications of the customers. For example, the 4000T die casting cell of Wuxi Langxian Company. As the projection area of the product was relatively huge, RA specially developed a non-standard robot to take out the products. It was a direct contrast to the traditional method of biscuit cut. But it could meet the needs of the future products without sprue.

"Not every customized need can be fulfilled by us," added Mr. Han Gang. Mr. Han Gang, a veteran in the automobile and special machining field with more than 20 years of automation experiences, is a perseverant tech guy that adores challenges. But he only accepts reasonable challenges. "If the existing capability of the customer has not yet reached the requirements of a more complex automation solution, we would expect him to be a little more conservative because automation is unlike buying a robot that can be used straight away. It requires the whole integration and coordination of the customer's equipment, molds, supporting facilities, etc. as well as its staff and workmanship management level."

Apart from the die casting industry, RA also challenged the special machining fields such as rubber injection, stamping and casting which are high temperature, high contamination and high loading. The forging industry is among one of the industries that is severely pressurized with the labor issue. Since the machining process in the forging manufacturing requires the spraying of graphite, it is severely harmful to the physical body. Fewer and fewer people are willing to join this industry. For the first time, RA has designed a two-in-one extraction and spraying robot that is in charge of material picking, heating, extraction and transportation. The entire process is fully automated resulting in an increase of 30% in its productivity and it has also resolved the customer's labor issue.

High level of flexible customization

With the growth in the market, RA has also been facing new obstacles — just a gripper can be designed in multiple ways based on various products. How do we meet the customization demands for the majority of the customers with speedy deliveries? In response to the above question, from the beginning of this year, RA has activated a standardized design and produced standardized series of products with the automation of each peripheral unit, including the robot, air cooling, water chute, release agent mixing, breaking device, conveyor, etc. Thereafter, the customer will individually select and combine the different modules.

Just like the modular operation of the automobile industry, this is a type of the high level of flexible manufacturing methods. "In this way, we can deliver more products in unit time, lowering the manufacturing costs," cited Mr. Han Gang. The automation market is undergoing a rapid growth. Customization and mass production are very appropriate for this trend of development. They can meet the needs of many customers and enjoy advantages in the competitive market.

Besides the upgrading of the manufacture, RA has still been preparing for smart manufacturing. How do you transform from an automation manufacturing to one that is unmanned with smart management is a question of paramount importance to every automation system company. Recently, RA has invited Mr. Chen Guodong, an associate professor of Soochow University and a robotic expert to join the company setting up the Suzhou Yizumi Robotic Research institute. The aim is to jointly develop the related projects. For a company that has just been founded 4 years ago, the pace of RA can be said to be swift and resolute. Mr. Han Gang expressed, "RA is a young company. Its growth pace also keeps up with the main trends of the industry. To date, unmanned and smart manufacturing has become the most pressing requirement in the manufacturing industry. But it will not succeed overnight. We will work hand-in-hand with the customers in creativity and innovation, providing a significant boost to the special industrial manufacturing to achieve smart manufacturing."

Yizumi's RA has been rapidly developing its niche market in the die casting industry. It has been named as the working partner for numerous renowned enterprises, including Guangdong Hongtu, FAW Group, HongTeo, Dajiang Meilixin, Vanward New Electric, Wojia Technology, Jiansheng Technology, etc.

"In the early period when RA had been set up, the Chengdu Lianzhu, a subsidiary company of FAW Group, already trusted us very much," recalled Mr. Han Gang. In many occasions of

T R A N S F O R M A T I O N

Chen Guodong: Technology is the soul; the machine is the carrier; the intelligent manufacturing is the direction



Mr. Chen Guodong, youth deputy professor of Soochow University, is a Doctor of Engineering from the Joint Training of Harbin Institute of Technology and Nanyang Technological University, and a postdoctoral scholar in computer technology from the School of Electronics Engineering and Computer Science Peking University.

Involved in the research and development of "Industry & Service Robots", the research and development objective includes industrial robotic design, simulation analysis, integrated applications and intelligent service robots. Core Member of the Key Fields Innovative Team of the Ministry of Science and Technology in 2014; hosting 1 project of the National High Technology Research and Development Program ("863" Program) of China, 1 project of the National Science and Technology Support Program, 1 project of The National Natural Science Foundation of China and 37 authorized patents (26 inventions), etc.

Previous appointment as technical person-in-charge of robotic industrial projects in Midea Group. Struck a collaboration agreement with Yizumi's robotic automation company in 2018, providing consultation for the newly established Suzhou Yizumi Robotic Research Institute.

This year, Mr. Chen Guodong has struck a collaboration agreement with Yizumi's robotic automation company. He will be responsible for the consultation of the machine series in Yizumi's robotic automation institute. As a highly celebrated expert in the local robotic field, why did he choose to collaborate with Yizumi? What kind of innovative projects would he unveil? This was an exclusive interview with Mr. Chen Guodong for our magazine.

Research Institute: Focusing on Technological Innovation

<Die Casting>: Professor Chen, you have had abundant research experiences in the robotic field and the founding period of Yizumi's Robotic Automation Company was not long. Why do you choose to collaborate with Yizumi?

Professor Chen: I have been in contact with Yizumi's Robotic Automation Company in the early period since its inception. Thereafter, we also had a few collaborations. Witnessing the exponential growth in the development of Yizumi's Robotic Automation Company over these few years, it has produced outstanding achievements in the backend automation field in the die casting industry.

Last year, I was honored to participate in the advanced technology connection seminar held in the headquarters of Yizumi in Guangdong. The takeaway from this seminar was a deeper understanding on its industrial impact and technological expertise in metal molding as well as polymer materials molding equipment industry. It can be said that Yizumi has a natural advantage in the backend automation field for special die casting and injection molding. Yizumi company has laid out a direction for its backend automation. As such, I am hoping that I could do a good job in automation field using the research institute platform. And as the core components of backend automation, the robots have become a very popular mainstream in the development of the industry. Moreover, I personally have done some work on the IUR (Industry-University-Research) collaboration for

the robotic and automation industry. Consequently, these several areas of factors have integrated and the collaboration has been struck in a natural manner.

<Die Casting>: The niche field that you are in is different from that of Yizumi. How do you integrate them together?

Professor Chen: Personally, I have a niche in the latest technology and workmanship research for the industry. And Yizumi has advantages in terms of the market, production and capital areas. After an in-depth understanding of both parties, I discovered that we could have deep cooperation in these areas such as the backend automation of metal material molding, new material molding and surface treatment. In addition, a more important point is Yizumi hopes to develop heavy load industrial robots in the die casting field. This is also one of my areas of industry-university research. Consequently, our collaboration is more of a supplementary of advantages.

<Die Casting>: The research institute seems to be a technology development department or organization. How would it be positioned by Yizumi?

Professor Chen: The early period of the research institute was mainly evolved around the automation and intelligent manufacturing of several industrial fields such as metal molding, polymer material molding, etc. to conduct relevant technological research. It was not involved in product upgrading or optimization. In other words, it was not profit-oriented but rather, it was exploring and laying out new technologies to prepare for the future technological applications in the development of the industry as well as the enterprises. If the projects that we have collaborated are matured, that would commercialize those projects and launch new products, providing disruptive and innovative solutions for the industry.

Moving in the direction of developing heavy load robots for metal molding

<Die Casting>: What is the research direction of the research institute. Please describe in detail.

Professor Chen: The research direction was mentioned earlier. Firstly, it is the research of robotic technologies and it is mainly focused on the development of heavy load robots in the metal molding field. Actually the working environment of the metal molding industry is deplorable. It is always associated with high temperature, powdery dust, noises and vibrations. However, there are very few applications for local heavy load robots. The robots were uniformly originating from imported brands. It has concisely indicated that the local robots have not yet to capture the key technologies in the metal molding industry and there was a lack of understanding in the key technologies of the industry. This may result in the local robots being unable to meet the demands and requirements of the industry. Take an example of the master and slave controls as well as the vibration-proof, impulsive load resistance, high temperature resistance, anti-pollution capabilities. They are still not achieved in a satisfactory way. As a result, we must initiate this project and hope that the local robots will replace the overseas ones, delivering products with high cost performance for the China manufacturing industry.

Moreover, the future development trends in technology are undoubtedly the industrial internet. The most important thing about industrial internet is open. With open systems, we can do a better job in the various areas such as the product lifecycle, manufacturing process management, workmanship management, quality management, etc. However, most of the overseas robots are proprietary. The enterprises have no way to obtain the data — such as the electricity consumption level of the robot, the operating time, takt time, etc. If the enterprises do not have these data for reference, it will not be beneficial for further improvements in the manufacturing process management. Therefore, our industrial robots will adopt an open control system, providing more data support for development analysis and decision-making for the customers in the future.

<Die Casting>: What if the overseas robots are also engaging in further opening up its systems?

Professor Chen: Nowadays, a popular concept in the China manufacturing is "buying instead of manufacture; renting instead of buying." In my view, this is a wrong perception. In this way, we would forever be controlled by others. If we are not doing it, we would never know the

existing issues and resolve the in-depth issues. It also does not render any help for the upgrading of our core technologies. Therefore, in the early period, we could refer to it. But in the later period, if the China manufacturing industry is pursuing in an intelligent manufacturing directive, it must do it in an in-depth manner. In this way, our foundation would be more stable.

<Die Casting>: In comparison with the foreign branding robots, what are the advantages of Yizumi?

Professor Chen: In the technological field, we do not believe in the competition between whatever companies. It is a complementary process. Regardless of the companies, the reason for the success of their products in certain industry is they understand the technologies for that industry thoroughly. To date, there isn't any one overseas industrial robotic company that has in-depth penetration of the applications in the metal molding and polymer material molding fields. Leveraging on Yizumi's many years of accumulated expertise in this type of fields, we will start with the technology characteristics and demands. It would be more handy and smooth to further develop the robots that are appropriate for these special industries. Additionally, the products designed would also be easier to apply.

Building enterprise cloud and driving intelligent manufacturing

<Die Casting>: Apart from the heavy load robots in the metal molding industry, what other projects are the research institute focusing on?

Professor Chen: The second research direction is the industrial internet in the metal molding and polymer material molding fields. The said industrial internet refers to the seamless communication and connection of all equipment, technologies and clients. Firstly, we have to provide monitoring services for the customers by using the industrial internet. Thereafter, we would conduct the collection and analysis of data/information. In the following step, we would initiate decision-making based on the information and build a private cloud for our customers to help them do better in their self-diagnosis and constantly improvements.

On top of that, we would also develop IUR (Industry-University-Research) collaborations with key universities and research institutes from home and abroad. For example, we have collaborated with the Institute of Plastics Processing (IKV) at RWTH Aachen University to integrate the additive manufacturing technology and the robots together. At present,

we have had many communication and interactions with each other. In the future, the research institute and IKV will leverage on their own advantages in each field to build a new robotic flexible manufacturing center together.

<Die Casting>: Professor Chen, you have mentioned "Technology is the soul; the machine is the carrier; the intelligent manufacturing is the direction" on several occasions in the seminar. Is it consistent with the planning of the research institute?

Professor Chen: Yes, the contents I have been talking about are all revolving around this phrase. For Yizumi, regardless of metal molding equipment, polymer material molding equipment or robotic automation systems, they are all revolving around the application technologies in the industry. Therefore, technology is the soul. The carrier is the connection between the soul and the customer demands. Just like the backend automation for die casting, robots, die casting machines and injection molding machines. These are all visible and real. Intelligent manufacturing is the direction. This is also the pursuit of our research institute, achieving intelligent manufacturing. For this reason, we will develop open robotic control systems and industrial internet as well as the related technologies of artificial intelligence. Meanwhile, we still have a stretch of distance to travel before reaching a complete intelligent manufacturing. But we will extend our efforts in this direction.



Huge Success – Unveiling the Achievements of Yizumi’s Ultra Heavy Duty Die Casting Machines

4500T Ultra Heavy Duty Die Casting Machine – Truck’s Gear Box Casing

In 2016, Yizumi has released their HPM Chinese version — H Series heavy duty die casting machine. Thereafter in 2017, it consecutively launched high standard H Series ultra-heavy duty die casting machine (3450 – 4500T) and HPM4500T die casting machine. By stepping into the heavy machine era, Yizumi supply high performance die casting machine to the global market that close to the European quality standard. So, how does these Yizumi ultra-heavy die casting machines performed recently in the market? Let’s find out.

Commissioning completed for DM4500H, DM4000H – Ready to be sent on the market

Sinotruk International, a company that with 62 years of production experience in heavy duty vehicle, decided to purchase a set of Yizumi’s DM4500H die casting machine last year. The machine was delivered to the parts manufacturing department – precision die casting parts machining department of Sinotruk (HK) Limited in 2nd May 2018. Currently, the machine has completed its installation. Commissioning will be done by the end of June, and it will be moving into a

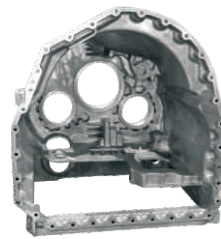
mass production in early July. It is mainly used for casting heavy duty truck gear box.

Sinotruk International firmly believed that Yizumi DM4500H die casting machine is guaranteed because it applied HPM technologies and strictly followed the use of materials as well as the manufacturing processes, which is stable and reliable. Besides, Yizumi has designed the integrated automation solution based on Sinotruk International product application requirements, which is able to reduce the labor cost.

In addition, DM4000H is also under commissioning process in Jiangsu Wuxi Langxian Lightweight Technology Co., Ltd. This is the first company in mainland China applying thermoforming, hydroforming and aluminum & magnesium die casting in car lightweight mold and car lightweight products manufacture. Its recent purchase of Yizumi’s DM4000H heavy duty die casting machine will be designated for the production of battery casing for the new energy vehicles.



A Successful Case Study – gear box casing of the Heavy Duty Truck



Truck’s Gear Box Casing



Sinotruk International – Yizumi’s DM4000H Heavy Duty Die Casting Machine

Power



Wuxi Langxian – Yizumi’s DM4000H Heavy Duty Die Casting Machine



Furthermore, many renowned enterprises such as Dongguan Jiansheng, Chengdu Aoxing, Zhejiang Wojia, Guangdong Hongtu, etc. have also procured a wide range of Yizumi’s H Series heavy duty die casting machines such as DM3500H, DM3000H, DM2500H, DM1650H, etc. in the last two years. As a result, Yizumi’s H Series ultra-heavy duty die casting machines (3500 – 4500T) have penetrated into the market completely. These machines are suitable for car parts production, new energy vehicles and large 5G telecommunications.

HPM4500T has successfully manufactured 57kg truck’s gear box casing

The resounding success of the H Series ultra-

heavy duty die casting machines in the market has to be attributed to the perfect integration between HPM mature technology and Yizumi’s technical team accumulated Chinese & oversea market experience.

A point worth mentioning is the HPM4500T die casting machine delivered in June last year, has successfully produced 125 pound (~56.7kg) weight truck gear box casing, as well as other types of gear box casing in a renowned North American automobile parts enterprise called Walker Die Casting.

HPM4500T die casting machine is the first joint efforts between Yizumi and HPM in the production and design for the biggest tonnage die casting machine. From the drawing design, parts procurement to

assembly, commissioning and acceptance, it consumed a span of 16 months. After the delivery of the machine, HPM service team has reassembled, commissioning and followed up with the manufacturing in the U.S. In view of the equipment’s performance, Walker Die Casting was full of compliments. Not only is the high molding quality of the die casting parts, but also the machine functions are stable, which is ensuring normal operation in long hours.



opening and sharing

YIZUMI has begun the seminar tour for the advanced metal forming technology (AMFT)

The advent of new energy vehicles, 5G telecommunications and other leading advanced technologies are leading the market development resulting in a new wave of consumerism. Therefore, the upgrading and innovation of the die casting machine industry is vitally imperative.

The 2018 YIZUMI AMFT seminar tour (hereinafter referred to as "YIZUMI AMFT seminar") with a theme of 'opening and sharing' was held in April this year. To date, it has already toured WuXi, Jiangsu and Chongqing. There were more than 10 YIZUMI die casting professionalism site to share their experience and discussed with the clients regarding to the trend of metal material advanced forming technology.

Keyword No.1: Lightweight

In the era of lightweight, it not only forces the auto die casting industries to upgrade their technology, but also raises new requirements to the 3C industries stepping in 5G. These would all need the die casting enterprises to provide high-quality, high performance and high precision solutions. In every YIZUMI's AMFT seminar tour, our senior technical experts have shared their forming experiences related to engine cylinder body, gear box casing and 5G base-station filters, etc. and explained the die casting technological upgrades and applications in the trendsetting of lightweight construction.

Keyword No.2: Robot for Special Industry

The "robots for special industry" is also one of the research topics in focus. YIZUMI senior technical experts not only explained how to maintain the industrial robots, but also analyzed the development prospect of the automatic robots applying in fields such as die casting, plastic injection, machining and metal polishing.



Keyword No.3: Fast responding service

To be able to satisfy the demand of service support, YIZUMI has built up the YFO (Yizumi Factory Outlet) system. In the seminar, YIZUMI senior technical experts have introduced the fast responding YFO service model and highlighted the overhaul of the die casting machine. From 2010 till now, YIZUMI overhauled department has renovated over 500 domestic and foreign brands die casting machines which were nearly scrapped. In Chongqing, the seminar also shared the applications and equipment maintenance of the die casting machines in enterprises which were representative of the Southwest region, providing comprehensive services for the local special industries.

Keyword No.4: Heavy-duty die casting machine

The forming of car structural components cannot be done without heavy-duty die casting machine. YIZUMI has grandly introduced H series heavy-duty die casting machine in the seminar, and fully displayed the R & D results and the advantages of the machine performance, safety, stability, gaining the market recognition for benchmarking against the European and American standards. From 2017 onward, YIZUMI has successfully created heavy-duty machines such as DM4500H, DH4000H, DM3500H and DM3000H in the market, and have completed all commissioning in customer's factories.



The seminar was a resounding success with many valuable takeaways. Every station was packed with more than 200 clients. They seriously listened and respectively complimented the seminar. Chongqing Die Casting Industry Association Secretary-General, Mr. Wang Gongping attended the Chongqing seminar and said, "The seminar is really servicing the die casting enterprises. It has a guiding significance in elevating the technological level of the die casting industry. In all respects, it is worth to promote such activity."



After successfully organizing the seminars in Wuxi and Chongqing, YIZUMI will also venture into Bohai Rim and the Pearl River Delta area, striving to build a communication and exchange platform for the advanced metal molding field.

OPEN SHARE



Manufacturing Upgrade – The capacity of Yizumi’s die casting machines has surpassed 1 billion

New energy vehicles and the 5G era will become a reality in a near future. The mass production of large die casting structural parts will be faced with abundant development opportunities accordingly. Whoever is the first to complete the entire industry chain, it will enjoy the first-mover advantage in the next phase of economic development. The demand for heavyweight die casting machines in the die casting industry is expected to grow rapidly as a result.

In 2017, the sales of Yizumi’s heavy duty die casting machines (1000T and above) had significantly shot up, representing nearly 50% of its die casting business revenue. In the heavy duty die casting workshops, Yizumi have succeeded to manufacture die casting machines of 1000T to 4500T. To ride on the approaching wave of development, Yizumi has further enhanced its product quality. This year, it has added several equipment such as an imported five face machining center and three sets of PAMA table type boring and milling machining centers, which have been successively launched into service. The position and dimension of each hole on the plates, brackets and guide rails are all completed by one-time machining ensuring the machining precision and quality of the key parts.

With the increasing of output, there is an urgent need for Yizumi to have a more comprehensive operational management to ensure productivity. In the earlier few years, Yizumi has realized the need to refer to modular production in the automobile

industry. In addition to the optimization of the whole product design, the modular production also enables the reorganization of the entire work flow. Capitalizing on a modular, universal and standardized product design and manufacturing, on top of maintaining a broader universality of the product, it also delivers a wide variety of product configuration at the same time, satisfying the customized needs of the customers.

Deputy General Manager of Yizumi’s Die Casting Business Division, Mr. Li Qianhu said, “This type of flexible manufacturing based on purchase orders allows each and every independently assembled part to undergo inspection and troubleshooting in advance, ensuring the product quality and shortening the production cycle of the products.” To date, Yizumi has tasted some preliminary achievements in its small and medium die casting machines. The final assembly cycle has been shortened; a small machine has only required less than 12 days to complete the assembly, troubleshooting and warehousing; a medium machine has only required less than 15 days to complete the assembly, troubleshooting and warehousing. In the next step, Yizumi will be going to complete the optimization of the manufacturing of heavy duty machines.



UPGRADE



Deputy General Manager of Yizumi’s Die Casting Business Division, Mr. Li Qianhu said, “This type of flexible manufacturing based on purchase orders allows each and every independently assembled part to undergo inspection and troubleshooting in advance, ensuring the product quality and shortening the production cycle of the products.”

At the same time, to satisfy the capacity requirement, Yizumi has begun adjusting its production layout in 2018. In the beginning of the year, its high-speed packaging machine division has relocated to the production base in Wusha; its die casting machine workshop area has expanded another 5,000 square meters. At the end of the year, the rubber machine division will be relocating to make way for the production of die casting machines. As a result, the workshop areas for die casting machines is going to be increased to 100,000 square meters and its capacity will surpass CNY 1 billion. Mr. Li Qianhu expressed that the over-saturation of orders last year had brought about greater pressure to the production of the company. When the capacity has expanded this year, the output of the heavy duty die casting machines will also double. Furthermore, Suzhou Robotic Automation Co., Ltd will be relocated to a new factory with an expanded capacity. It will fully satisfy the future needs for robotic automation solutions for the heavy duty die casting machines. “From manufacturing, quality, operation, capacity layout to the automated solutions, Yizumi is all ready to usher in the next wave of development in new energy vehicles and 5G telecommunications.”

Under the trendsetting of new energy and lightweight construction, how would the die casting industry evolve?

The development of new energy vehicles has been overwhelmingly hot, while the die casting industry in China has also been forced to move along with the growing trend. The development plans of the die casting parts that have been brought about by the new products like battery packs, drive motors, transmission boxes, etc. have gradually surfaced on the agenda of the die casting manufacturers.

The new energy vehicles are transforming the development of the die casting industry in China. However, prior to the arrival of its explosive impacts, the die casting equipment has already been facing a new wave of reform and challenges.

The challenges faced by the die casting industry toward new energy vehicles is still lightweight construction

In the last two years, the hottest topic in the die casting industry has been none other than the new energy vehicles. From the birth of Tesla to widespread introduction of all kinds of electric cars around the world, new energy is undoubtedly a new turning point in the history of development of the automobile industry. The new energy vehicles have spread much of their tentacles in the global stage. But from the perspective of the die casting industry, the boom arising from the manufacturing of new energy vehicles has not yet arrived. Most of the automobile die-casting parts manufacturers are still mainly relying on the traditional petrol vehicles. This had indicated that the market share of the new energy vehicles is still relatively small and a large majority of the vehicle models have not yet been mass produced.

In light of the observation of die casting, for the die casting industry, the impact from the new energy vehicles has not exploded yet. More importantly, regardless of new energy vehicles or traditional petrol vehicles, the real challenge that they face is actually ---- lightweight construction. In every reduction of 100kg in the vehicle, the gas consumption will fall by 0.4 liters per 100km; the carbon dioxide will also emit 1kg less. Similarly, for the electric vehicles, lightweight construction can lower the battery consumption and prolong the durability of the battery, meeting the requirements of energy-saving and emission reduction to the maximum extent.

In the past, the main focus of the traditional petrol vehicle die casting parts was the power assembly as well as the transmission assembly. As of now, to meet the needs of lightweight construction, it has been gradually extending to the structural parts of the vehicle body such as door frame, shock absorber tower, internal/external side of A pillar, B pillar, suspension arm, etc. From the trends of the market development, the structural parts of an automobile can be said to be the future growth in the die casting parts sector.

It is the time to change your way of thinking in the selection of die casting machines

In view of the common die casting parts of power assembly, the die casting manufacturers have all been very familiar and experienced. And their workmanship and technologies have already been perfect, while they have also been using die casting equipment of uniform standards.

However, it is quite different to have the vehicle structural parts integrally molded. In comparison with the typical vehicle die casting parts, the structural parts are larger and their structures are complex while the walls are thin. Besides, the quality requirement is also very high with assurances for robustness and tenacity. This not only requires the die casting machine with a wider adjustable range in the technological parameters and more stable injection specifications, a major breakthrough also should be achieved in several technologies like the high tenacity alloy for casting, high vacuum die casting, mold sealings, temperature field control, etc.

N E W E N E R G Y



So how do you choose from the die casting equipment? In the future, the automobile parts manufacturers must combine the dimensions, shape features and robustness requirements of die casting parts to select the die casting machines. The clamping force of the die casting machines is closely related to the projection area of the products. Under the conditions with the same dimensions and shape features, if the product is consecutively distributed, it may require comparatively larger clamping force. If the product is frame-structured, it may require relatively smaller clamping force. This would require the clamping unit of the die casting machine has a clamping force with wider adjustable range in order to meet the technological requirements of different die casting parts.

In addition, there is an apparent feature in the new structural parts. Either the projection area is large yet thin; either they are frame-structured and large. But in reality, the needed weight of alloy for die casting is not too heavy. In this case, while choosing from the die casting machines, the corresponding relationship between the clamping force and the injection force must be fully considered. You should choose the injection system based on the requirements of the die casting parts. Take an example of the vehicle door. Despite its large projection area, it is very thin and the die casting volume is not large. However, it requires a high injection speed. Selecting the die casting machines require the focus on rapid injection molding. On top of that, similar to the valves, this type of die casting parts has thick walls and small projection area. But its requirements on gas-tightness are comparatively higher. Therefore, the selection of the die casting machines must emphasize on those that have high pressure injection molding capabilities.

It can be deduced that the three platen die casting machines with toggle structure can no longer meet the molding needs of the vehicle structural parts. In the future, the two platen die casting machines may have greater opportunities. In the recent three years, Yizumi's die casting division has invested heavily in the research and development of two platen die casting machines. At present, it has achieved many technological breakthroughs. This year, it will manufacture its first set of two-platen die casting machine (above 1000T). At the same time, Yizumi has also been constantly fostering the value chain collaboration between the German Research Institute, mold companies and auxiliary equipment manufacturers, working hard to open new boundaries of the market and delivering solutions for the lightweight construction of vehicle structural parts.



Loncin's Die Casting: Benchmarking with BMW's Quality System

Authorized by BMW in the production of large displacement motorcycles

In relations to Loncin's motorcycles, the recent hot topic was Loncin Motor Co., Ltd (hereinafter referred to as "Loncin Motor"), which had gotten the "entrance ticket" from BMW to manufacture its C400X motorcycle in mass production. It is said that Loncin Motor has already begun its production. This is not the first time these two companies have collaborated. From the beginning of 2013, Loncin Motor has been constantly supplying large displacement engines and motorcycles to BMW. In their collaboration over a long period of 5 years, Loncin Motor has been constantly striving to upgrade its proprietary products and brands under the foundation of the "BMW bloodline". Undoubtedly, Loncin Motor, a national motorcycle industry that has been ranked in the forefront, is a national benchmark for the locally produced motorcycles.

Benchmarking against the quality system of BMW, this is exactly the right prescription that Loncin Motor has always been seeking. It includes the design, materials, manufacturing and casting of each and every part. Loncin Die Casting Co., Ltd (hereinafter referred to as "Loncin Die Casting"), a wholly-owned subsidiary of Loncin Motor that specializes in the die casting of aluminum alloys, is principally responsible for the manufacturing of engines, supporting structures, cooling pumps of BMW and Loncin Motor as well as the die casting parts of unmanned aerial vehicles (UAV), general engine and small electric vehicles.



Stringent Safety Requirements

In the production workshops of Loncin Die Casting, many sets of Yizumi's 500T, 800T automated die casting cells have been used in the production of BMW motorcycle's cooling pump caps. These products will then pass through crack detection and resistance to corrosion treatment spanning across 6 weeks. Loncin Die Casting Deputy General Manager Mr. Zhang Cai said, "BMW has very high requirements on the workmanship of the products. Regardless of its inherent quality or external appearance, all must reach a certain predefined standard. For instance, all external parts of BMW are powder coated. As such, there must not be a dot of defect on the surface of these parts."

What impressed Mr. Zhang Cai most is BMW's emphasis on safety. "In view of anything that will affect the safety of the vehicle, BMW is very serious about it. It has laid down a series of key performance indicators. For example, the compression strength and elongation of the products must be thoroughly checked by a tensile machine. All parts must fulfill the material as well as endothermic requirements. The safety aspect is achieved on each and every part."

All Workshops Equipped with Automated Production

To date, the stringent requirement of each production cycle inherent with BMW has been integrated into the entire production process of Loncin Die Casting. Nowadays, Loncin Die Casting has had the same standards with BMW in every product. It has been strictly controlling each production phase. To maintain the stability in the production process, Loncin Die Casting has invested in a new equipment costing 40 million to restructure its production workshops. At present, it has pre-ordered 3 sets of Yizumi's fully automated die casting cells. Among them, a 1250T die casting cell will be used to manufacture the BMW's

motorcycle casing in another subsidiary of Loncin Motor.

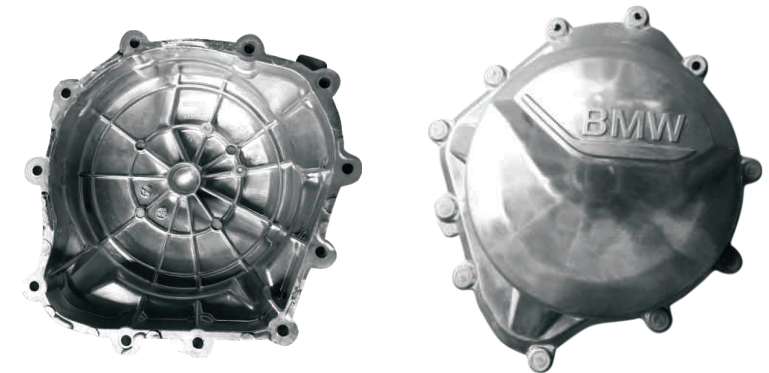
According to reliable sources, Loncin Die Casting will be employing automation in all of its manufacturing equipment so as to resolve the issues of shortage of manpower and fluctuation of quality. "Comparing a skilled worker with a robot, maybe the product quality standard is also equally good. But if the worker is unskilled or is still undergoing training, there will be an efficiency difference with the robots. Moreover, there is an acute shortage of skilled workers nowadays." Mr. Zhang Cai expressed that Loncin Die Casting will fully automate all its workshops. Nevertheless, it still requires manual labor such as professionals specializing in technical workmanship and advanced technologies.



Loncin Die Casting is very impressed with the stability of the die casting equipment. It has divided the quality into three respective indicators: 1. The stability of quality; 2. The stability of daily production; 3. The stability of services, including the timeliness of its service staff, swift response in the resolution of issues.

Since collaborating with Yizumi in the beginning of 2017, the performance of Yizumi's die casting equipment has always been outstanding. It has passed the assurance of a high passing rate and productivity for its products.

— Loncin Die Casting Deputy General Manager, Mr. Zhang Cai



Millison: A Global Leader in Die Casting Field

It has established strategic partnership with the World Top 500 Enterprises like Ericsson, PSA Peugeot Citroen, Tesla, etc.



When we talk about Millison Die Casting, it is undoubtedly belong to top “seed” enterprise in China die casting parts industry.

Since its inception in 2001, Chongqing Dajiang Millison Die Casting Co., Ltd (herein after referred to as “Millison Die Casting”) has been leveraging on technologies and innovation to drive its development. From the design of small bracket to the R&D of high precision automobile engine cylinder casing, Millison Die Casting has been constantly moving in the forefront of the industry with excellent products. Besides, its businesses have leapt to other fields like telecommunication, generators and electromechanical machines from automobile, pushing its development with diversity. As of now, it has established strategic working partnerships with many World and China Top 500 Enterprises such as Ericsson, PSA Peugeot Citroen, Changan Ford, Changan Suzuki, Deutz AG, etc.

Millison Die Casting always focus on connecting seamlessly with the international community with the latest technology in die casting, creating a world-class standard for the China die casting industry.

Automobile Field: Manufacturing Tesla car parts

In the achievements of Millison Die Casting, the area that stands out is definitely in the automobile field. In a long term, Millison Die Casting has been specializing in the manufacturing of automobile engine cylinder body, automatic transmission, automobile structural parts, etc. In 2012, it set up a production base in Xiangyang, Hubei. The production base is primarily responsible for the mass production of engine cylinder body to supply to a lot of renowned automobile enterprises, including Dongfeng Peugeot-Citroen, Volvo Cars, SAIC-GM, etc. Yizumi’ s DM3500T has been put into service in the production base in Xiangyang.

Due to the excellent performance of several areas such as on-site management, improvements in workmanship, and so on, Millison Die Casting has consecutively been awarded the Changan Ford Q1 Certifications in 2016 and 2017. To that end, Millison Die Casting Deputy CEO, Mr. He Mao said, “The automobile die casting parts are very concerned with quality control. From the workmanship layout, selection of equipment models, molds manufacturing to manufacturing technique, machining, etc., Millison Die Casting has invested a large amount of manpower and material resources to constantly improve and optimize its manufacturing processes.

Apart from the continuous efforts in petrol cars, Millison Die Casting has been proactively investing in new energy vehicles.

According to reliable sources, it has already been supplying various new energy vehicle parts like the gear box casing, battery tray, radiator, etc. to Tesla, Schaeffler, GM, and so on. “As the new energy vehicles are in the infant ascending phase, mass production has not yet to be achieved. However, it is the necessary mainstream trend in the automobile industry. Millison Die Casting has fully considered the requirements of such products, in particular the die casting technologies and the selection of equipment models,” Mr. He Mao cited.

LEADER

Telecommunication Field: Strategic layout of 5G products with Ericsson and Hua Wei

In 2005, Millison Die Casting has tiptoed into the telecommunication field. It has been recognized by an international heavyweight, Swedish Ericsson.

To achieve the radiation and lightweight effects of the products, Millison Die Casting has independently invented a new die casting technology involving thin radiators. It is able to die-cast radiators with 1.2mm thickness directly (the thickness of blades using traditional die casting technology is generally 2mm). The weight of the radiators has plunged nearly 40% as a result. Currently, the telecommunication products have steadily employed such technology. Among them, a portion of the 4G base station filter casings are completed by Yizumi’ s DM1650ARC real-time control die casting machine. In addition, it has also used Yizumi’ s robotic automation systems facilitating many operating procedures like feeding, extraction, spraying, testing, etc.

without using any manpower, thereby ensuring rapid delivery.

On top of that, Mr. He Mao cited that in the 5G projects, Millison Die Casting has successfully developed many related products and implemented batch production.



Yizumi has been rapidly developing in the last few years, especially in the die casting related automation field, it has had apparent improvements. Dajiang Millison has been laying out its intelligent factories. In time to come, I believe that we would have many more collaborative opportunities with Yizumi in the areas of automation as well as intelligent manufacturing.

— Chongqing Dajiang Millison Die Casting Co., Ltd. Deputy CEO, Mr. He Mao



Explanatory Notes: What is Q1?

Q1 is the implementation standard for Ford. Its main purpose is to distinguish the different classes of on-site manufacturing that employs sustainable, understandable matrix tools to ensure quality.

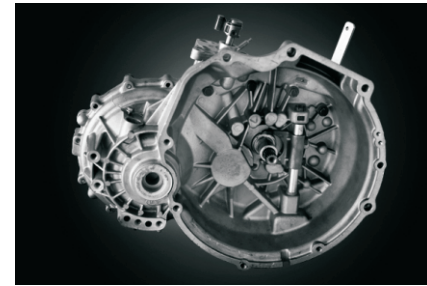
CHENGDU AOXING: Specializing in Automobile Drive Systems

The largest automotive parts enterprise in Sichuan, a leader in the drive system field

At the edge of a public road along a small town in Chengdu, therein lies the largest automobile parts enterprise, specializing in die casting production in Sichuan, China — CHENGDU AOXING AUTOMOBILE MANUFACTURING CO., LTD (hereinafter referred to as “CHENGDU AOXING”). Since its inception in 2001, it has grasped the golden opportunity of a booming economy in China’s automobile industry. Specializing in research and development, manufacturing of automotive drive system parts and with a wide penetration into the market, it has rapidly evolved into an outsider winner in the industry. Its annual production of

aluminum alloy die casting parts is above 4 million sets. Additionally, its main customers include SAIC-GM-Wuling, Continental AG, Ai’erling Keling’er Car Parts (China), etc.

“Technology is like a layer of paper. Once you have pierced through it, you will understand.” From the perspective of Mr. Wang Anli, Technological Director, CHENGDU AOXING, the insights in technologies can resolve all difficulties. As such, CHENGDU AOXING can stand out in the sea of automobile drive systems.



Preparing for new-energy drive systems

In the drive system parts, the quality and precision of the gear box defines the good or bad of the drive performance. CHENGDU AOXING has always been reinventing the technologies behind the gear box, building a strong production team that consists of medium to high level of technological professionals and utilizing technologies such as APQP, FMEA, as well as 3D design software so as to accelerate the development of new products with assurances of reliability. In 2005, it had successfully developed new products including the 524 left casing and the 514 right casing of sedan gear boxes and was awarded the “New Product Development Contribution Award” presented by Chongqing Tsingshan Industrial Co., Ltd.. In addition, the 465 and 474 gear box casing for small cars had represented a 60% market share in the parts of Changan Automobile.

Mr. Wang Anli said, “CHENGDU AOXING is both professional and focused in its production of gear boxes. The company will also be focusing on the investment in this field under its future strategic initiatives.”

With the popularity of the new energy concept, the automotive drive and transmission systems have embarked on the electrification path. In face of these development opportunities, CHENGDU AOXING has collaborated with several industrial heavyweights like Dongfeng Honda, Germany’s Ai’erling Keling’er, Continental AG and so on.

The main component of a new energy automotive drive system is its decelerator. Despite the product structure is not very different from a gear box, the requirements of robustness and strength and the air hole standards are much higher than that of a petrol car. “We have used all the technologies in the die casting industry, including vacuum die casting, high pressure jet cooling, squeeze pin, etc. We have conducted a mold test and production trial using Yizumi’s heavy duty die casting machine. The result was good.” Mr. Wang Anli believed that the company can smoothly develop new energy automobile projects because of the fact that it has strong technological backup and experiences in the drive systems.

Unwavering Support for Local Equipment

Leveraging on the many years of experiences in die casting of automotive parts, CHENGDU AOXING has a stronger emphasis on its technological expertise in the current period. “In the past, the customers would request to use imported equipment when they felt that the products were difficult to produce. However, the key is in the technological expertise of the enterprise. In this industry, “the mold represents 70% while the machine takes up 30%”. We have also participated in the design and development of molds, notwithstanding that the local equipment have had major improvements.” Mr. Wang Anli cited that CHENGDU AOXING will consider the local equipment in priority for new projects, even if it is the whole packaged solution. Take for example, the

Yizumi’s H Series 3000T die casting machine procured in the year is a preparation for the new project of SAIC-GM’s gear box.

To date, the die casting workshops of CHENGDU AOXING are principally equipped with local equipment, including several Yizumi’s 3000T, 2000T, 1650T, 1250T heavy duty die casting machines. Besides, the automated systems have also been leaning toward the local products. All our die casting machines have been installed with Yizumi’s automated robotic systems. From feeding of raw materials, parts extraction, spraying, removal of slag, edge shearing to coding, logistics, etc., all processes are fully automated with precise robotic movements. The whole production process is both stable and orderly.

“The automation equipment in mainland China is able to completely fulfill the unmanned requirements. The biggest challenge now is, on the contrary, production based on artificial intelligence.” Mr. Wang Anli reiterated that CHENGDU AOXING will adopt the MES system and its strategic plan to achieve artificial intelligence within 2 years.



I have known Yizumi earlier on and I was also the first generation of witness to observe the real-time control system of Yizumi’s die casting equipment. The development of Yizumi in recent years has surpassed my expectation. It has progressed in leaps and bounds because it has wholeheartedly excelled in its research and development as well as upgraded its products. I had seen the real-time control system in its third generation with a sense of soaring quality. I firmly believe its fifth generation will be equally mind-blowing.

--- CHENGDU AOXING CAR PARTS MANUFACTURING CO., LTD, TECHNICAL DIRECTOR, MR. WANG ANLI



D R I V E S Y S T E M S

SINOTRUK CHINA: 4500T Die Casting island automatic production system is officially launched

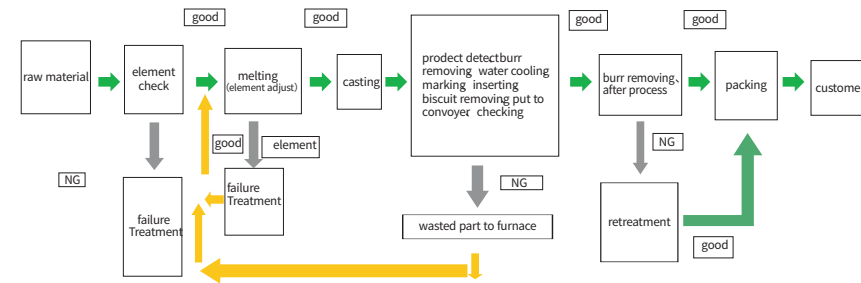
YIZUMI H series 4500T Die Casting Machine has entered CHINA NATIONAL HEAVY DUTY TRUCK GROUP CO.,LTD (SINOTRUK) factory in May 2018. The machine as well as the peripheral robot automatic system has started their installation and debugging process. This is the heaviest YIZUMI die casting machine in domestic. Moreover, it is the first time for YIZUMI to equip entire robotic automation system to 4500T die casting machine. To be able to provide a whole set of automatic production system, YIZUMI R & D team has done a lot of researches and created different solutions in 5 months even though they have met a lot of difficulties.

Heaviest Automation Die Casting Island in Domestic

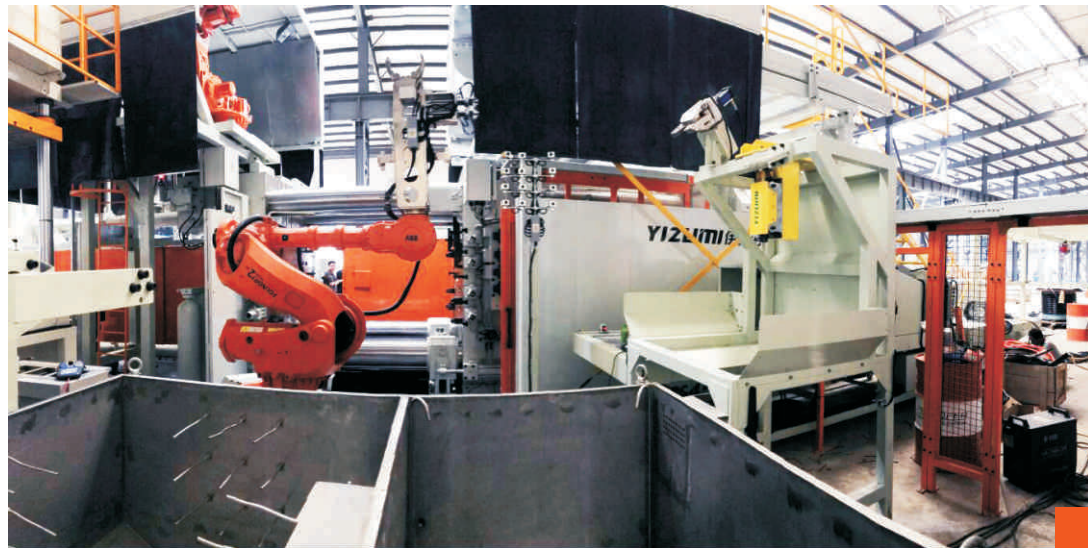
This 4500T automatic die casting island can achieve functions such as product extraction, integrity detection, mold spraying, part preheating and insert, product cooling, product runner trimming, marking and transferring.

Spraying system

It uses ABB robot that is special for casting. The system adopts advanced Japanese release agent and spraying technology. The sprayer nozzle is designed by YIZUMI, which is external mixing type and stable cone angle spraying. The volume is adjustable for each nozzle, which is 0-600ml/min, along with 3 circuit control system, which has strong effective atomization and well balance mold coating.

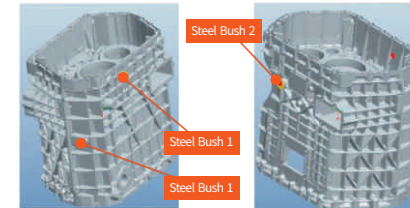


4500T



Product Extract and Insert System

Due to the large land occupation, many peripheral equipment and huge casting, product extract and insert ABB robot has been used to save more room. The operation radius of this robot is 4m with the installation of the gripper and the insert arm. The effective load can reach 325Kg.



Difficulties for Product extraction and steel bush inserting system

Difficulty 1: What the 4500H produce is the transmission housing for heavy truck, which is big and heavy. If it uses the normal way of product biscuit gripping, the connection area between runner and product may be deformed or even cracked. It will be impossible to move on to the other processes such as marking, runner trimming and so on.

Difficulty 2: It is required to insert two different bushes, one is for the moving mold, and the other one is for the fixed mold. As each of the cylinder liner insert point is different, it will bring a huge challenge to the design of insert gripper as well as insert movement commissioning.

In order to overcome these difficulties, YIZUMI technical team has gone through a lot of arguments. They have designed a compatible gripper which is able to insert and extract the product. When the die opened, it will take the part out of the mold by gripping the product body directly. The contact surface of the gripper uses special material, which can protect the product body away from damages. After the product is removed and detected, the robot sprayer will come down to the mold area and start spraying. Meanwhile, the extractor robot will continuously finishing the processes such as burr removing, cooling, marking, grab the pre-heated insert part and so on. After spraying, the robot gripper will pick up the

cylinder liner and insert to both movable mold and fixed mold. As the gripper is specially designed and the movement is interference avoidance, the workers only need to change the programs while changing the casting products, which is more convenience. By using YIZUMI designed and produced insert conveyer and pre-heated devices, the workers only need to do the feedings regularly.

Product cooling

It adopted two station cooling water tanks, one for cooling, and the other one for drying. Meanwhile, the extractor robot can continue other duties.

Burr removing

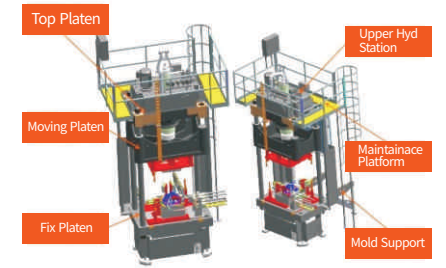
It uses combined device for burr removing. First of all, it uses trimming press to remove the connected burr. Secondly, the collision device and air hammer will be activated to remove the remained burr. This function has strong applicability, which can skip the manual removal process.

Marking device

It has adopted air marking device, which is able to store over 200 sample icons and can be back up via USB connection. TCP/IP is connecting with Enethnet ports, which is convenience for PLC and computer connections. Moreover, the fixed layer platform has been designed based on the products, which means that the robot can perform other duties while the product is being marking.

Trimming press

Customized trimminmg press is designed for the big tonnage machine. The mold moving stroke is big, which can meet the requierment of large product runner cutting. Advanced Japanese imported controller system is used, which is safety and low failure rate, it is equipped with air blowing function, which is able to blow wastes from the platform. The air blowing time can be adjusted, and the runner cutting precision is high.



This is the first 4500T Die Casting Island with Automation System designed by YIZUMI. By facing the huge challenge of this project, YIZUMI R & D team has focused on the workmanship. By repeatedly communicate with customer in all details, R & D team has also provided high efficiency and stable automation solutions to their customers.



This is the heaviest YIZUMI die casting machine in domestic. Moreover, it is the first time for YIZUMI to equip entire robotic automation system to 4500T die casting machine. To be able to provide a whole set of automatic production system, YIZUMI R & D team has done a lot of researches and created different solutions in 5 months even though they have met a lot of difficulties.



Hot Chamber Magnesium Alloy Die Casting Machine: Dominating Mobile Middle Plate Market

Molding 0.35mm Ultra-Thin Phone Accessories

Since the successful trial production of the first HM hot chamber magnesium alloy die casting machine in 2011, the HM-M Series has quickly kept up with the booming smartphone market. By providing ultra-thin (wall thickness <0.5 mm) metal molding solutions to mobile phone accessory suppliers, it has filled the domestic market gap in the production of mobile phone die casting parts using hot chamber magnesium alloy die casting machines and broke the situation of reliance entirely on imported equipment. Today, the Yizumi HM-M Series has represented a 95% domestic market share in the hot chamber magnesium alloy die casting machine.

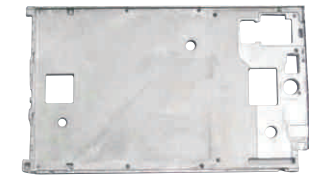
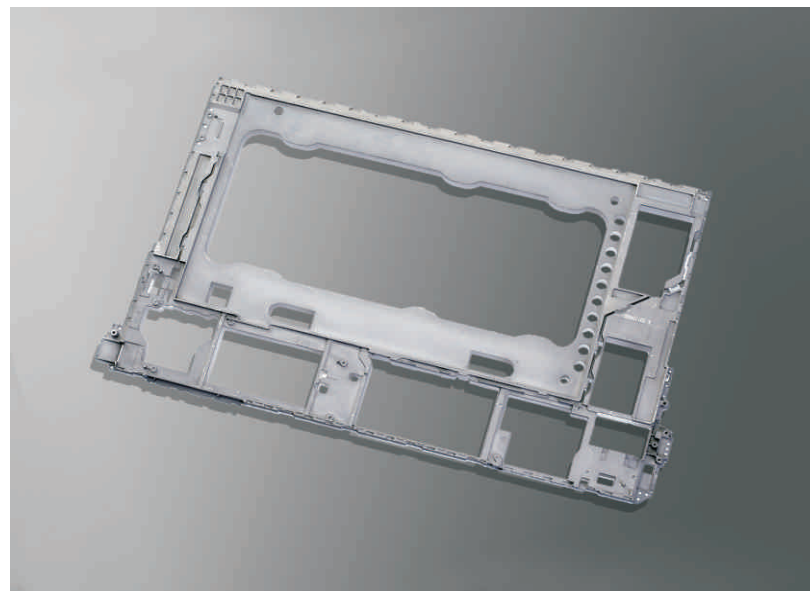
How did Yizumi manage to occupy the share in the mobile phone market when imported equipment dominated the market share? As the HM-M series is really starting off from the value requirements of the smart phone accessory suppliers – in light of the intense competition in the industry, the better the cost control in mobile phone accessory large-scale production, the higher the production efficiency, the greater the competitive advantage in the industry. Not only does the R&D and manufacturing of the HM-M Series maintain the cost advantages of domestic equipment, but also its focus on increasing the rate of qualified products and production efficiency ensures its performance is as good as imported equipment.

Mg

High qualification rate: Molding 0.35mm Ultra-Thin Phone Accessories

To ensure continuous and steady production, the HM-M Series has adopted an innovative hydraulic control design concept, reasonable electrical and program control system, precise control, and an air injection speed greater than 6m/s. These designs can greatly improve the production yield of metal molded parts. It is widely applicable to the production of precise and complex 3C structural magnesium alloy parts.

Since its initial market launch, the HM-M Series is now widely used in magnesium alloy ultra-thin parts (wall thickness<0.5mm), mobile phone casing, tablet PCs, and other 3C products, covering well-known mobile phone brands such as Huawei, Xiaomi, OPPO, and VIVO. Besides, it can mold the thinnest of 0.35mm for the mobile phone accessory.



High productivity : Increase by 10%

Following the issuance of 4G licenses, the Chinese smartphone market has entered an era of white-hot competition. As the fact that the shipments exceeded 450 million units per year in the past two years, this force the major mobile phone accessory suppliers seek for higher production capacity for the value-added products.

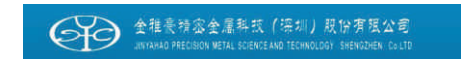
The HM-M series has a user-friendly interface to enable quick and skilled operation. Its optimized structural design is equipped with an ultra-fast mold clamping system and a large-capacity energy storage device. Compared to the conventional models, its production efficiency has increased by more than 10%, guaranteeing quality and timely delivery to customers. According to production statistics from one of Yizumi customers in Dongguan, the actual production cycle time of HM200M is 9-10s and HM280M is 11-12s.

Manufacturing upgrade : Delivery in 7-days

With continuous improvement in Yizumi product quality in the last few years, it has been apparent that the HM-M Series is deeply integrated with the customers in the hot chamber magnesium alloy field, with the development of machine models covering 200T-400T. To meet the customers' need for rapid delivery, Yizumi has driven an operational upgrading project in 2015, implemented modular production, and shortened the production cycle to ensure deliveries within 7 days.



Due to its superiority in efficiency and precision, the HM-M Series Hot Chamber Magnesium Alloy Machine has won recognition from many domestic mobile phone accessory suppliers. Yizumi's customers come from all over the Pearl River and Yangtze River Delta. The following five companies each own more than 25 sets of such equipment from Yizumi: Dongguan Tengmei Metal Technology Co., Ltd., Jinyahao Precision Metal Technology (Shenzhen) Co. Ltd., Fast Precision Technology Co., Ltd., Dongguan San Cheng Feng Precision Technology Co., Ltd., and Dongguan Runmeng Precision Hardware Co., Ltd. Besides, over 10 companies own 10-20 sets of such equipment.



With the advent of the 5G era, the HM-M Series will closely follow the development in technology, based on the application needs of our customers and at the same time, Yizumi will work toward the upgrading of equipment performance and functionality, providing the mobile phone accessory suppliers with the molding solutions of precise metal parts of magnesium alloys.

Reliable Robotic Safety Control System

Die casting industry has strict requirement on safety production due to its unique features such as high temperature, inflammability and strong production continuity. In particular, it needs safety control system to ensure safe, stable and continuous production. Even if failures occurred, robot control system is still able to protect working personnel and equipment at maximized level. Therefore, safe and reliable robot control system is playing an increasingly important role in die casting production.

1. Design Principles

During the design of Yizumi's robotic control system, the corresponding telecommunication interfaces must be considered so that the users can monitor the operational status of the installations within the entire die casting cell during the production and troubleshooting processes in the whole system. The design principles are shown in Figure 1.

In principle, the components that require independent settings include detection elements, electronic control elements, actuating elements, logic computing devices, safety control systems as well as other telecommunication parts of the peripheral equipment within the die casting cell.

For safety control system that is relatively more complex, it will be broken down to several sub-systems. Each system is correspondingly independent and it is respectively configured with independent safety control functions.

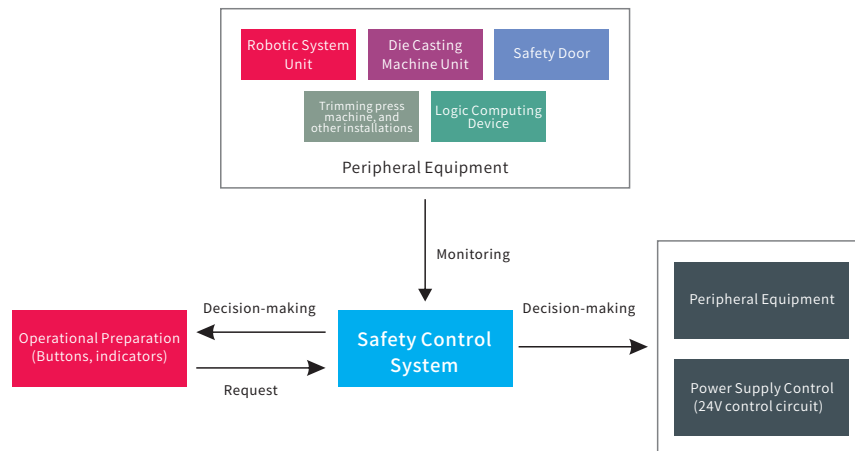


Figure 1: Safety Control System Schematic Diagram

2. Outline of Principles

In accordance with many years of cumulative expertise and experiences, it concluded the customer needs and worked out a set of comparatively comprehensive safety control system solutions. The electrical circuit are shown in Figure 2.

that there are no errors, press the corresponding button. The anomaly in any one unit will result in the termination of the power supply within the whole die casting cell.

c) The safety testing signals of the whole system will be transmitted to the actuating element or logic computing device. From the

b) By checking the electronic control elements, it can monitor the operating state of each unit within the whole die casting cell, providing a huge convenience for the troubleshooting work.

c) Leveraging on the indicators, it can intuitively understand the current system status. When the indicator is off, it indicates that the whole system is in an emergency or abnormal mode that requires relevant staff to resolve it before re-activating the operating preparation by pressing on the button.

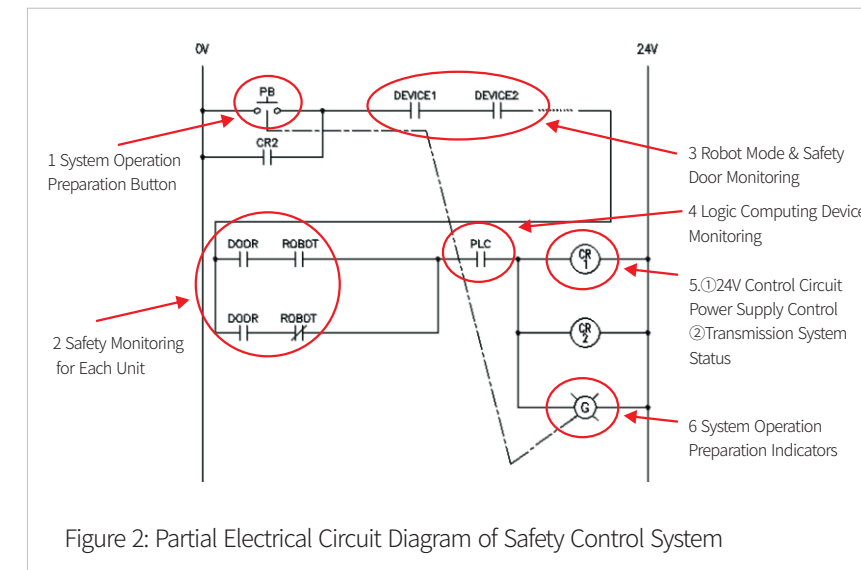


Figure 2: Partial Electrical Circuit Diagram of Safety Control System

a) The whole system is generally formed with various units such as robotic system unit, die casting machine unit, safety door, trimming press machine unit, and other units. Each unit is a correspondingly independent entity and it is respectively configured with safety control functions. When safety control function of any one of the units is activated, the whole die casting cell will be subject to monitoring in order to achieve the emergency stop separately on each unit.

process perspective, it will implement multi-layers of protection for the entire system, ensuring the safety of all staff and equipment to the maximum extent.

d) Configuring the safety zone via robots; handling the whole range of procedures with logic computing devices; performing the detection function with each detection element; these have further ensured the safety between the equipment in an independent manner.

b) The operating conditions for the activation of the whole system must ensure that the safety control function of each unit is not started up and it shall also be in a state of non-abnormal and non-emergency stop. The power supply for each installation within the die casting cell shall also be in a state of non-abnormal and non-emergency stop. In addition, after the relevant staff has verified

3. Advantages

a) It allows to add safety functions of other peripheral units into the system conveniently. Moreover, it shares the safety protection function of the same class. On the foundation of the software as well as the hardware, it further ensures the safety of the whole system.



YFO-based Instant Prime Service

Timely, Professional, Customer First

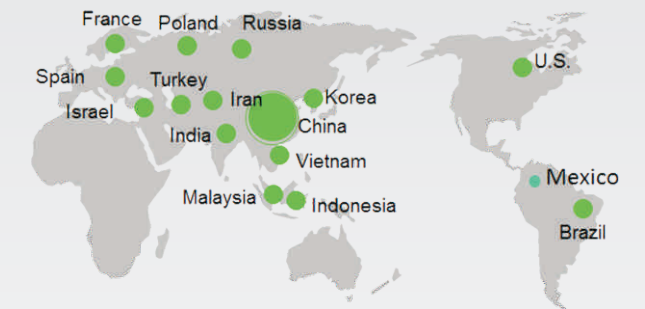
YFO (Yizumi Factory Outlet) model ensures high response speed and controllability of the service and it is also Yizumi's new global service strategy for the future. As regards the service concept, we not only ensure the safety of customer's production activity, but also endeavor to fulfill the ultimate goal of reducing the risk of downtime through every detail and improving customer's productivity.



From pre-sales consulting to on-site installation and commissioning, from after-sales regular inspection to spare part delivery and customer training, every YFO service engineer has successfully handled over 300 cases and their high-quality professional services will ensure your machines operate normally.

The worldwide part supply network ensures smooth, prompt and accurate part distribution

- China** A total of 35 spare part centers and maintenance part warehouses
- Abroad** Spare part warehouses in 15 overseas countries



YFO one-stop spare part service solution Save your time, worry and money

- Shorter waiting time**
Unified service channel, hour-level spare part delivery service available
- Cost-effective**
Key spare parts are purchased from manufacturers, ensuring the price transparency and economy.
- Some spare parts imported**
More durable and applicable.



365/24	72	8,000 +	10+	5,000+m²
24-hour hotline available for 365 days, nearly 200 maintenance experts ready to respond to your needs.	YFO service network in 35 Chinese cities and 37 overseas countries provide better access to service.	So far the service team has provided YFO service support for over 8,000 machines to ensure they function normally.	Over half of YFO service engineers have over 10 years of professional experience.	Powerful spare part warehouse system covers warehouses in 35 Chinese cities and 15 overseas spare part centers, total warehousing area up to 5,000m ² .

Eight YFO Commitments

Focus on machines; greater focus on customer experiences

8 specialized services allowing you to have a better customer experience



Presales Consultancy & Technical Support

Delivering exhaustive die casting machines and auxiliary equipment selection solutions, professional configuration and optimization solutions of its manufacturing technologies.



Professional Technical Training

Exquisitely designed, nationwide standardized courseware menu selection system, the national instructing team will personally visit the sites to customize the trainings.



Professional Parts Supply

5 warehouse agencies and 2 service centers with warehouse inventories overseas, spanning across Asia, America and Europe, achieving a 24-hour turnaround of common parts delivery.



PLC Remote Service Mode

Remote process support within the whole world. It can rapidly resolve the customized requirements for the customer processes.



GPS Vehicle Monitoring System

Over 50 service vehicles with real-time online monitoring control nationwide. Timely nearby dispatch services ensuring its response speed.



e-service 24-hr Online Services

One button to report any repairs with the mobile apps. Swiftly search for malfunctions, building the mobile after-sales experiences for the customers.



Technology Service Center

The service center, which is directly under the management of Yizumi's headquarters, the service engineers deliver timely and effective services. Meanwhile, there are 2 technology service centers in India and Vietnam.



Permanent Engineers' Services

In view of the key markets already developed, Yizumi will dispatch the Chinese engineers to reside at the markets permanently, providing timely and highly efficient services to the customers.

YIZUMI e-service 24

Delivering a 24-hr real-time service system for its clients

Through YIZUMI e-service.24, you can have a full-day, 24-hr online support, mobile and rapid remote repair and maintenance as well. Regardless of where you are, it can deliver a rapid, convenient, online after-sales service, ensuring the equipment to be maintained in the best condition for the long term.

- Rapid
- Reliable
- Effective
- Visual
- Recordable
- Can be evaluated
- Cost effective

YIZUMI e-service 24 can deliver the followings to you



Mobile Operation: Smart Phone/Tablet/PC Multiplatform available.

Download the APP, enter equipment serial number /scan equipment QR code and the registration is completed.



IOS

Android