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The Fundamentals of Machine Intelligence and AIoT, Shaping the Future of Business

The remarkable pace of machine intelligence and AIoT is fuelling machine tool innovations worldwide. What was considered science fiction a few years ago is fast becoming present day reality. But while it is fundamental to remain aware of the latest technology trends to stay informed many misinterpret technology as the only component essential to drive innovation. Sustainable business success also relies on

the implementation of innovation in practice, which requires fostering innovation culture and using design for human-centered digital transformation.

The TIMTOS 2019 Summit was designed to offer machine tool builders and component makers the ability to achieve unprecedented levels of productivity, quality, and efficiency. While many CEOs understand the importance of Machine Intelligence and

AIoT for their company, there is still a huge percentage who are moving too slowly on putting a concrete AIoT strategy in place.

Creating Value with Industry 4.0 and Internet of Things

Bernhard Meyer, SAP Global Solution Manager, Industry Business Unit, Industrial Machinery & Components (IM&C) began

his keynote with a quote from Bruce Sterling: "The Internet of Things is not about THINGS," and also "Not about INTERNET", says unnamed SAP colleagues.

So how can SAP help customers create value with Industry 4.0 and Internet of Things in discrete industries? He explains that the key technology trends shaping the discrete industry are: Mobile Network Computing-

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>> From C1

affordable access to information; Social Media- knowledge shared in communities; Internet of Things- connected via one protocol; Machine 2 Machine- self regulation; and Big Data & Predictive Analytics- understanding and extrapolation.

Industrial machines are incredibly complex and manufacturers are under pressure from customers to meet several new production requirements. This includes designing tools that can be rapidly adapted to new products and building machines that can be quickly integrated into existing plants. Customers expect these machines to achieve maximum daily uptime. The machines must also be built with enough forward-thinking design flexibility that they remain useful and productive as technology continues to evolve.

In order to meet the innovation challenges of smart machine era, business owners and leaders will need to be on top of their game when it comes to understanding these trends. Smart machines will have to be matched by 'smart businesses' that know how to compete and stay relevant as digital technologies and automation become even more ubiquitous and start to dominate the workplace.

He added that the real reason for IoT and Industry 4.0 projects are to lower cost, increased uptime, new products and services, optimized productivity, less waste, improved turnarounds, new revenue, faster deliveries, usage-based pricing, greater capacity, better efficiency and new business models.

According to Bernhard, SAP's framework for the intelligent enterprise connects the four worlds of data, intelligence, enterprise processes, and business networks. This framework lays the foundation of the Intelligent Enterprise that is going to dominate all industries in the future, and will allow businesses to achieve desired outcomes faster, with less risk, and become a smart best-run business.

Bernhard encourages attendees to stay curious and change now while they can, rather than when they will have to. The sooner they start, the more time they will have to address the challenges that are waiting ahead, and improve processes with more data and intelligence.

Intelligent IOT in Smart Factory

With the increasing number of smart factories, the skills gap among employees expands. Modern technologies implemented in production require qualified specialists and data scientists who understand new processes and can manage them.

Arthur Liu, Vice President of ITTS justified the facilitator of smart factory, he said that it is composed of Digital Twin, Smart Product Lines & Machine, Smart Devices, and AR/AI Optimization.

It can be also difficult for industry executives to make decisions due to lack of knowledge and IoT competencies. To address this problem, educational training on the Internet of Things and other technologies should be implemented as soon as possible.

One more challenge is how to seamlessly incorporate all devices into a huge manufacturing infrastructure. In this case, other intelligent solutions such as artificial intelligence, machine learning or augmented reality should be used to simplify the process.

Arthur proposed a useful platform: IAMP for Smart Service. Here he mentioned Cloud Adaptor framework to rapidly enable two-data flow with external device platforms, feeds and services. Next is Device Management Dashboard tools to monitor fleets of devices, diagnose performance issues, and manage remote firmware OTA updates. Last is Application Enablement Tools, SDK frameworks, and template applications to enable rapid development of business apps and mobile experiences.

To sum up, Arthur said that the potential of smart manufacturing is enormous and should not be overlooked. The main task of business leaders is to realize this power and trust in the success of the digital transformation.

Realization of Taiwan Industrial Internet of Things

Wen-Yuh Jywe, President of National Formosa University disclosed that given the breakneck pace of technology innovation, machinery equipment companies don't



have a choice but to face disruption head-on. But the question is, will they be open to reinvent themselves, approach an expert to understand the trends behind the latest disruption? Wen-Yuh would like very much to help companies in Taiwan companies about their problems. "The best solutions happen when you bring different perspectives together," he said.

Wen-Yuh explained that smart machine server (SMS) is mainly connecting controllers of CNC, Robot, or PLC and other related sensors through OPC, UA specification of international communication format to convert into a secure communication mechanism, which provides people to be online at the same time and can be networked on multiple platforms. Through this mechanism, all the equipment in the factory can be connected rapidly and can develop more related application services.

Industrial AI and Industrial Internet

Jay Lee, Professor at the University of Cincinnati, and Vice Chairman of Foxconn Industrial Internet, explained that AI is a cognitive science with rich research in the areas of imaging analysis & machine vision, natural language processing, robotics and machine learning etc. It has been perceived as a black art and often lacks of compelling evidence to convince industry that these techniques will work repeatedly and consistently with a sound return on

investment.

"The industrial internet refers to a network of combined, advanced machines with internet-connected sensors and big data analytics, which is expected to boost productivity and reduce costs in industrial production. It is set to transform the traditional manufacturing sector thanks to quality and productivity improvements," he stated.

Key Takeaways

Companies that design, create, and sell products must change how they manufacture and the way they connect with customers or accept defeat. We are talking about every product company in every industry - cars, electronics, machinery, components, and so much more. They're all facing disruption, and it's very real because what businesses used to do before will not help them survive in the near future. They must keep evolving.

But because of the Internet and the availability of information, people feel freer to make informed decisions on their own. It's not top-down anymore. The information is available to everyone. However, it is important to also meet with the thinkers and makers who can help you in your business success.

On another note, the best way for business leaders to prepare for the future is to stay up on current emerging and disruptive trends and be ready to adapt when more and more smart machines come online. Become an early adopter of the latest and greatest, and look for opportunities to beta-test the newest technologies as well. Get outside the office and look at how the world is changing. Make periodic assessments of your innovation best practices, recognize the latest tech trends throughout your industry, and do whatever it takes to stay ahead of the competition.

Finally, for a technology enthusiast, it is hard to leave the summit not inspired and enthused by all that you hear, see and even more impressed by how technology is moving. The technology industry seems to accelerate a little more each year and change gets faster and faster. The future will be a break-out for many technologies and it is truly exciting to imagine what might be developed in the years to come. ■



TIMTOS 2019 EVENT / SEMINAR PROGRAM

Date	Time	Event/Seminar	Organizer	Venue	Remarks
3/4 (Mon.)	10:30	Opening Ceremony	TAITRA, TAMI	Lobby, 4F, Taipei Nangang Exhibition Center, Hall 2	By Invitation Only,Miranda Chien +886-2-27255200#2867
	8:00-17:00	Bfuture Global Launch & Products Announcement	Ching Hung Machinery & Electric Industrial Co., Ltd.	Room 402c, Taipei Nangang Exhibition Center, Hall 1	+886-4-23509188#527
	8:00-17:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558
	13:30-16:30	TIMTOS 2019 Procurement Meetings	TAITRA	Room 504, Taipei Nangang Exhibition Center, Hall 1	Tina Ko +886-2-27255200#1573
	14:00-15:00	Press Conference, TIMTOS 2019	TAITRA TAMI	Room 403, Taipei Nangang Exhibition Center, Hall 1	Savannah Hou +886-2-23494677
	16:00-17:30	Market Briefing of Machinery Industry in Malaysia & Signing Ceremony for the Memorandum of Understanding between Penang Foundry & Engineering Industries Association (PENFEIA) and Taiwan External Trade Development Council (TAITRA)	TAITRA	Room 404, Taipei Nangang Exhibition Center, Hall 1	Melody Chen +886-2-27255200#2693
3/5 (Tue.)	8:00-17:00	Bfuture Global Launch & Products Announcement	Ching Hung Machinery & Electric Industrial Co., Ltd.	Room 402c, Taipei Nangang Exhibition Center, Hall 1	+886-4-23509188#527
	8:00-17:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558
	8:30-12:00	Intelligent Manufacturing and Machine Tool Key Component Application Technology	Intelligent Machinery Technology Center, ITRI	Room 505a, Taipei Nangang, Exhibition Center, Hall 1	Helena Chang +886-49-2345309
	9:00-12:00	台日機械企業經貿交流會	TAMI	Room 504bc, Taipei Nangang Exhibition Center, Hall 1	+886-2-23494668
	9:00-16:00	TIMTOS 2019 SUMMIT	BOFT, MOEA	Room 101, TICC	Lilyan Kao +886-2-27255200#2679
	16:00-17:00	German Company Talk @ TIMTOS	TAITRA German Trade Office Taipei	Room 101, TICC	Suzie Cheng +886-2-7735-7524
	10:00-12:00	Renishaw's XK10 alignment laser system-new tool for machine tool assembly and alignment	Renishaw (Taiwan) Inc.	Room 402a, Taipei Nangang Exhibition Center, Hall 1	Eric Chuang +886-4-24603799
	10:30-12:00	TNC 640 高效率五軸輪廓控制器 - 高可靠度創新加工技術的優勢	HEIDENHAIN Co., Ltd. (Taiwan)	Room 403, Taipei Nangang Exhibition Center, Hall 1	Gloria Tsai +886-4-2358-8977 #1035
	13:00-15:00	NIDEC- Commander C Product Launch	Raise Precision Co., Ltd.	Conference Room 4, TWTC Exhibition Hall 1	Judy Chen +886-4-22606502
	13:00-15:00	Industry 4.0– Intelligent Manufacturing Conference/Mold intelligent production unit	Accutex Technologies Co., Ltd.	Room 402ab, Taipei Nangang Exhibition Center, Hall 1	+886-4-23599688#226
	14:00-15:00	JIMTOF 2020 Press Conference	Japan Machine Tool Builders'Association	Room 404, Taipei Nangang Exhibition Center, Hall 1	Keiko Honda +81-3-34343961
	14:30-16:30	智慧製造聯網數據加值產業聯盟會員大會	ITRI	Room 504a, Taipei Nangang Exhibition Center, Hall 1	+886-3-5916720
	15:00-16:00	臺灣機械工業同業公會與馬來西亞檳城機器廠商會簽訂合作協議	TAMI	VIP Briefing Room, 4F, Taipai Nangang Exhibition Center, Hall 1	Ryan Lin +886-2-23494694
	15:00-17:30	Litz Hitech Global Dealer Meeting and New Product Announcement	Litz Hitech Corporation	Room 401, Taipei Nangang Exhibition Center, Hall 1	Lisa Mo +886-4-26815711#246
	18:30	Reception for TIMTOS 2019 and the Ceremony of Taiwan Machine Tool Industry Awards for Excellence in Research & Innovation	TMTF, TAITRA, TAMI	The Banquet Hall, 3F, Taipei Nangang Exhibition Center, Hall 1	Bonnie Tsai +886-2-23110358
3/6 (Wed.)	8:00-17:00	Bfuture Global Launch & Products Announcement	Ching Hung Machinery & Electric Industrial Co., Ltd.	Room 402c, Taipei Nangang Exhibition Center, Hall 1	+886-4-23509188#527
	8:00-17:00	TIMTOS 2019 High School, University Students Guided Tour	TAMI	Room 500, Taipei Nangang Exhibition Center, Hall 1	+886-2-23494672
	8:00-17:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558
	9:00-16:00	TIMTOS 2019 SUMMIT	BOFT, MOEA	Room 101, TICC	Lilyan Kao +886-2-27255200#2679
	16:00-17:00	German Company Talk @ TIMTOS	TAITRA German Trade Office Taipei	Room 101, TICC	Suzie Cheng +886-2-7735-7524
	8:00-17:00	The Trend of Industry 4.0 and Intelligent Machinery Technical Application Seminar	igus Taiwan Company Ltd. CTIMES	Room 505, Taipei Nangang Exhibition Center, Hall 1	KF Sun +886-2-25855526#225
	9:00-11:00	YCM Dealer Meeting	Yeong Chin Machinery Industries Co., Ltd.	Room 401, Taipei Nangang Exhibition Center, Hall 1	Claire Chen +886-4-25623211#1812
	10:30-12:00	選擇美國投資研討會 - 錢進美國教戰守則	AIT TAMI	Room 501, Taipei Nangang Exhibition Center, Hall 1	Jackie Hong +886-2-27201550#334
	13:00-17:00	New Product Launch	Vision Wide Tech Co., Ltd.	Room 502, Taipei Nangang Exhibition Center, Hall 1	Michelle Huang +886-4-22712000#231
	13:00-17:00	Goodway Group New Product Launch Event	Goodway Group	Room 504a, Taipei Nangang Exhibition Center, Hall 1	Lisa Chiang +886-4-24629698#62107
	13:30-16:30	Application of mineral casting (polymer composite) in machinery field	Shandong Nano Advanced Materials Technology Co., Ltd.	Room 304, Taipei Nangang Exhibition Center, Hall 1	+86-531-88917773
	13:30-17:00	中國砂輪新產品發表會	KINIK COMPANY	Conference Room 2, TWTC Exhibition Hall 1	+886-2-26791931#3309
3/7 (Thu.)	8:00-17:00	直得科技新品說明會	Chieftek Precision Co., Ltd.	Room Happiness, 3F, Taipei Nangang Exhibition Center, Hall 1	+886-6-5055858#162
	8:00-17:00	Bfuture Global Launch & Products Announcement	Ching Hung Machinery & Electric Industrial Co., Ltd.	Room 402c, Taipei Nangang Exhibition Center, Hall 1	+886-4-23509188#527
	8:00-17:00	TIMTOS 2019 High School, University Students Guided Tour	TAMI	Room 500, Taipei Nangang Exhibition Center, Hall 1	+886-2-23494672
	8:00-17:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558
	13:30-17:00	2019 台北國際工具機展 GLORIA 智慧製造創新應用論壇	MOST , TAITRA, TAMI	Room 402ab, Taipei Nangang Exhibition Center, Hall 1	Jessica Guo +886-2-25774249#827
	14:00-16:00	Energy Saving Technology for Hydraulic System and Filtration of Cooling Lubricant	HYDAC Technology Ltd. Sterling TSI Co., Ltd.	Room 502, Taipei Nangang Exhibition Center, Hall 1	Jojo Yang 886-4-22602278
	14:00-16:00	Improving the quality and efficiency of grinding processing	Join Star Trading Co., Ltd.	Room 505b, Taipei Nangang Exhibition Center, Hall 1	Jamie Chang +886-2-29115226#607

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This is the second time Stephane visited Taiwan, Maschinen Markt Magazine editor Itasse found that Taiwanese machine tools makers are vibrant and very smart. He finds those high-end machine tools will be close to German products maybe 5 years in quality. He is also very impressed with the software performance of machine tools.

Stephane Itasse
Maschinen Markt Magazine
Germany



Fascinated by the variety of products exhibited in TIMTOS 2019, Colin used “Amazing!” to describe how he feels. He had put his videos of Taiwanese machine tools on air back in England starting the first day. He showed a footage of a boring and milling machine to Show Daily and said that the biggest one on site weighs 15 tons, which is truly “amazing!” He hopes to see more 3D printing products in the next TIMTOS.

Colin Griffiths
MTD CNC TV Network
England



Hirsch had been in TIMTOS 30 years ago. After his first visit in Taiwan, he comes to buy machine tools almost every year. He plans to place more orders this year, because he has found many more advanced machines in TIMTOS 2019. Hirsch is very interested in industrial robots, called robotic-arms. He visited a lot of vendors on site. Hirsch is thinking to order some if the price is good.

David Hirsch
Dealan Machine Tools Ltd.
Isreal



Noaghiu appreciates Taiwanese for being modest, well-educated and dynamic. He found that Taiwanese companies are prepared for globalization. With TAITRA and TAMI organizing TIMTOS, Taiwan SMEs are given big chances to connect with the global market. After two days visiting the show, he plans to buy welding robot system, lasers, folding tubes and welding robot arm.

Ioan Ciprian Noaghiu
Biotechnik
Romania



Specializing in making precision parts, Setos had been to TIMTOS six times. Starting in 1999 when he first bought machining centers from Taiwan, since then they prefer Taiwanese products. Of course, price is an important factor, but they like to use MIT machine more because of quality. They never miss TIMTOS in the last 12 years. This year, they are already planning to buy some products.

Marinus Maglyono Seto
PT. Nurindo Sukses Abadi
Indonesia



Representing thirty Taiwan manufacturers selling machine tools in the Philippines, Chen and his agent company are very familiar with the advanced machines from Taiwan. He comes to TIMTOS not for purchasing but for visiting those companies in one time at one place. In the mean time, he brought his customers to see TIMTOS. Compared to other products, Chen likes to buy MIT more.

Nicklaus Chen
Nicklaus Machinery Corporation
Philippine

TIMTOS 2019 EVENT / SEMINAR PROGRAM

3/8 (Fri.)	8:00-17:00	直得科技新品說明會	Chieftek Precision Co., Ltd.	Room Happiness, 3F, Taipei Nangang Exhibition Center, Hall 1	+886-6-5055858#162
	8:00-17:00	Bfuture Global Launch & Products Announcement	Ching Hung Machinery & Electric Industrial Co., Ltd.	Room 402c, Taipei Nangang Exhibition Center, Hall 1	+886-4-23509188#527
	8:00-17:00	TIMTOS 2019 High School, University Students Guided Tour	TAMI	Room 500, Taipei Nangang Exhibition Center, Hall 1	+886-2-23494672
	8:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558
	9:30-18:00	智慧製造論壇	Fusionmedium TAITRA	Conference Room 4,5, TWTC Exhibition Hall 1	Sica Lin +886-2-87715865#180
	9:30-14:00	Diplomatic Motion Solution Product Training and Conference	Diplomatic MS S.p.A Ace Pillar Co., Ltd.	Room 502, Taipei Nangang Exhibition Center, Hall 1	+886-2-29958400#1232
	10:00-17:00	中興大學與精密機械研究發展中心智慧機械產學論壇技術成果發表會	國立中興大學 & 財團法人精密機械研究發展中心	Taipei Nangang Exhibition Center, Hall 1	+886-4-22858139
	13:00-16:00	3D Printing+3D Scanning	Road Ahead Technologies Consultant Corp	Room 404, Taipei Nangang Exhibition Center, Hall 1	Evelyn Lin +886-2-2999-6788#284
3/9 (Sat.)	8:00-17:00	TIMTOS 2019 High School, University Students Guided Tour	TAMI	Room 500, Taipei Nangang Exhibition Center, Hall 1	+886-2-23494672
	8:00-17:00	Fagor CNC & Feedback Systems Products Introduction	Fagor Automation Taiwan Co., Ltd.	Room 602, Taipei Nangang Exhibition Center, Hall 2	Samuel Wen +886-4-23851558

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The Future of Metal Additive Manufacturing

With customization and Industrial 4.0 growing rapidly, metal 3D printing technology is gradually being applied to production processes during initial stages. Many are interested in securing a position in the 3D printing market, whether it is a supplier of metal powders, manufacturing tool giant, or even supporting software system integrator. Nowadays, 3D printing of metal parts is becoming more and more specialized and in-depth.

As an important session of TIMTOS 2019 Summit, several topics on additive manufacturing were discussed. The speakers are all from the global giants, such as DMG MORI, Optomec and Road Ahead. They paid great attention to the following issues: How to Realize the Benefits of Additive Manufacturing, Make Metal 3D Production Real, The integration of 3D Printing and Digital Technology, The Frontier Metal 3D Printing Technology, such as DED (Direct Energy Deposition) and so on.

the basis for its survival and development. As Mr. Oscar Yang, Sales Director of Great China Road Ahead said, productivity, durability, repeatability and TCO (Total Cost of Ownership) are the critical elements during evolution.

Mr. Oscar Yang also shared the application of 3DS DMP Factory Printing System to explain how to keep balance of the above elements. According to reports, 3D System's Direct Metal Printing (DMP) platform is a scalable factory solution for metal 3D production. It is designed for wide applications and easy repeatable production of metal parts. It can also achieve higher repeatability and uniformity, thus greatly improving printing efficiency. What's more 3DS DMP Modular adds integrated powder management system and real-time process monitoring function to enable users to analyze and optimize printing parameters in order to obtain higher qualities.



In his opinion, there are two common ways to creating value with additive manufacturing. First, people should realize benefits of 3D printing during the whole process from design to logistics. Second, integrated digitization should be worked out. Dr. Neun Harald emphasized the importance of software in his speech. He believed that processing parameters must be optimized by software, because the same kind of materials from different suppliers will have different parameters. In order to better manage these data resources, a strong software system is necessary.

Dr. Neun Harald also explained the relationship between additive manufacturing and digitalization with an existing practical application from DMG MORI. For example, DMG MORI's digital user interface, Celos, has been put into use on the Lasertec 3D combined machine tool. The collection and management of other materials and the use of operator-friendly applications also support job preparation and the entire production process. Thus, performance, flexibility and productivity have the biggest impact. In the industrial series production, digitalization has revolutionized the production of each series. Even if you replace parts, you no longer need inventory, you can print them "on demand." Finally, Mr. Neun Harald stressed that digital and additive manufacturing are moving forward together and will continue to develop greater potential.

method of Powder Bed Fusion can obtain good surface finish and internal details but with high system and powder cost, slower deposition rate and limited parts size. While Direct Energy Deposition technology boasts many advantages, such as lower system and powder cost, fast deposition rates, superior mechanical properties and unlimited parts size.

The principle of DED technology is that laser produces a molten pool in the deposition area and moves at high speed. The material is directly fed into the high temperature melting area in powder or filament shape, and deposited layer by layer after melting. Therefore, it is possible to repair, process and add materials to high performance metal components (such as titanium alloy, stainless steel, superalloy, etc.) at lower cost. Mr. Pascal Pierra also pointed out that the application prospect of DED technology in the future will be very broad, especially in full part printing, feature printing, repair & coating, with US\$10 billion opportunity.

During the panel discussion, the speakers shared their opinions on some social problems which will be brought by 3D printing. For example, whether the use of 3D printing technology should be restricted, whether the government has the obligation or right to supervise the use of 3D printing technology, whether the use of 3D printing guns and other dangerous goods is illegal, and so on.

Several years ago, additive manufacturing technology was considered to be "a technology that will change the world". The British Economist magazine once believed that additive manufacturing would "promote the third industrial revolution together with other digital production modes". Now, this technology has been gradually applied to the production and manufacturing. As an important branch, metal 3D printing also shows strength in development. Although there are still many problems that need to be solved, the future is still promising. ■



Productivity and Repeatability

Although the advantage of 3D printing technology in customization production has been widely recognized, its repeatability and stability have always been challenging. It seems that customization and scale production cannot be achieved at the same time. But as a manufacturer, profit is always

Create Value through Integration

Dr. Neun Harald, COO, DMG MORI, focused on the topic of "How to Realize the Benefits of Additive Manufacturing". He pointed out that additive manufacturing is just another way of metal forming in order to bring more profits through creating new values.

DED: A frontier Metal 3D printing Technology

During the forum, Mr. Pascal Pierra, Director of Asia-Pacific, Optomec, shared the principles and advantages of DED (Direct Energy Deposition). Mr. Pascal Pierra pointed out that there are currently three methods for metal processing: Metal Jetting, Powder Bed Fusion and Direct Energy Deposition. Although the cost of metal spraying technology is low, the size of the parts that can be printed is very limited, as well as lower end mechanical properties. The

TIMTOS 2019 Summit

Time: 09:00-17:00, Tuesday, March 5, 2019
Location: Room 101, TICC (No. 1, Sec. 5, Xinyi Road, Taipei)

Session 1: Machine Intelligence and AIoT	
Time	Agenda / Speaker
09:00-09:20	Registration
09:20-09:30	Opening Remarks Leonor F. M. Lin, Executive Vice President of TAITRA Alex Ko, Chairman of TAMI
09:30-10:10	【Keynote】How SAP helps Customers to Create Value with Industry 4.0 and Internet of Things in Discrete Industries Bernhard Meyer, SAP Global Solution Manager, Industry Business Unit, Industrial Machinery & Components (IM&C)
10:10-10:50	【Keynote】The Intelligent IoT Asset Management Platform for Smart Factory Arthur Liu, Vice President, ITTS
10:50-11:30	【Keynote】Realization of Taiwan Industrial Internet of Things Application from Industry-University Cooperation Wen-Yuh Jywe, President of National Formosa University
11:30-12:10	【Keynote】Trends of Industrial AI and Industrial Internet Jay Lee, Professor at the University of Cincinnati
12:10-12:30	【Panel Discussion】The Future of Work Moderator: K.C. Chuang, Honorary Chairman of TAMI Panelists: All Speakers
Session 2: Additive Manufacturing	
Time	Agenda / Speaker
13:00-13:30	Registration
13:30-14:10	【Keynote】Advanced Machining Solutions for the Future of Manufacturing Dr. Neun Harald, COO, DMG MORI
14:10-14:50	【Keynote】The Evolution of Metal Additive Manufacturing: Leveraging the Machine Tool Infrastructure Pascal Pierra, Director of Asia-Pacific, Optomec
14:50-15:20	【Keynote】Making Production Real Oscar Yang, Sales Director of Great China, Road Ahead Technologies Consultant
15:20-16:00	【Panel Discussion】Metal Additive Manufacturing - Now & Future Moderator: Catherine Lu, TV Journalist focused on Global Technology
16:00-17:00	【Side Event】German Company Talk @ TIMTOS

*Topics are subject to change and will be updated anytime.
*Chinese/English onsite simultaneous interpretation provided.

Time: 09:00-17:00, Wednesday, March 6, 2019
Location: Room 101, TICC (No. 1, Sec. 5, Xinyi Road, Taipei)

Session 3: Innovation in Aerospace Manufacturing	
Time	Agenda / Speaker
09:00-09:30	Registration
09:20-10:00	【Keynote】Master highly dynamic machining strategies with innovative solutions in the field of drive and control technology Peter Topol, Senior Product Manager, Heidenhain
10:00-10:40	【Keynote】Embracing Industry 4.0 and Transform towards a Digital Future with Siemens Tino Hildebrand, Vice President, Siemens Ltd., Taiwan
10:40-11:20	【Keynote】The role of the digital collaboration and innovation in the renaissance of the Aerospace Manufacturing Rémi GERMAIN, Aerospace & Defense Industry Sales Director, Dassault Systèmes
11:20-12:00	【Keynote】Advanced manufacturing technologies Cyrille SCHWOB, Head of Technology, Asia-Pacific, Airbus
12:00-12:30	【Panel Discussion】Transforming Manufacturing - what can we see in the next 5 years Moderator: Jwu-Sheng Hu, Vice President and General Director, Mechanical and Mechatronics Systems Research Laboratories, ITRI Panelists: All Speakers
Session 4: Automotive Manufacturing Revolution	
Time	Agenda / Speaker
13:00-13:30	Registration
13:30-14:10	【Keynote】The Technology and Application of Industrial Robotics to New Era of Smart Manufacturing HT Choong, Regional Manager- Service Sales (SAS & Taiwan), ABB
14:10-14:50	【Keynote】CNC Systems for Factory of the Future Charlie Chen, Division Manager of Industrial & Mobile Application, Bosch Rexroth Taiwan
14:50-15:20	【Keynote】Intelligent Factory Automation (iFA) for Industry 4.1 Fan-Tien Cheng, Director, Intelligent Manufacturing Research Center, National Cheng Kung University
15:20-16:00	【Panel Discussion】The Revolution is Speeding Up - Are We Ready? Moderator: Jwu-Sheng Hu, Vice President and General Director, Mechanical and Mechatronics Systems Research Laboratories, ITRI Panelists: All Speakers
16:00-17:00	【Side Event】German Company Talk @ TIMTOS

Speakers / Moderators

Bernhard Meyer
SAP Global Solution Manager, Industry Business Unit, Industrial Machinery & Components (IM&C)



Dr. Neun Harald
COO, DMG MORI



Peter Topol
Senior Product Manager, Heidenhain



Jwu-Sheng Hu
Vice President and General Director, Mechanical and Mechatronics Systems Research Laboratories, ITRI



Arthur Liu
Vice President, ITTS



Pascal Pierra
Director of Asia-Pacific, Optomec



Tino Hildebrand
Vice President, Siemens Ltd., Taiwan



HT Choong
Regional Manager- Service Sales (SAS & Taiwan), ABB



Wen-Yuh Jywe
President, National Formosa University



Oscar Yang
Sales Director of Great China, Road Ahead Technologies Consultant



Rémi GERMAIN
Aerospace & Defense Industry Sales Director, Dassault Systèmes



Charlie Chen
Division Manager of Industrial & Mobile Application, Bosch Rexroth Taiwan



Jay Lee
Professor, University of Cincinnati



Catherine Lu
TV Journalist Business Next Media Corp



Cyrille SCHWOB
Head of Technology, Asia-Pacific, Airbus



Fan-Tien Cheng
Director, Intelligent Manufacturing Research Center, National Cheng Kung University



Laser Cutting Machines Market to Post 9.3% Growth

Global laser cutting machines market is expected to reach US\$5.7 billion by 2022, growing at a CAGR of 9.3% from 2016 to 2022. Laser cutting machines involve casting a laser beam on the work piece, melting it and subsequently evaporating the targeted area by using enough heat by the laser.

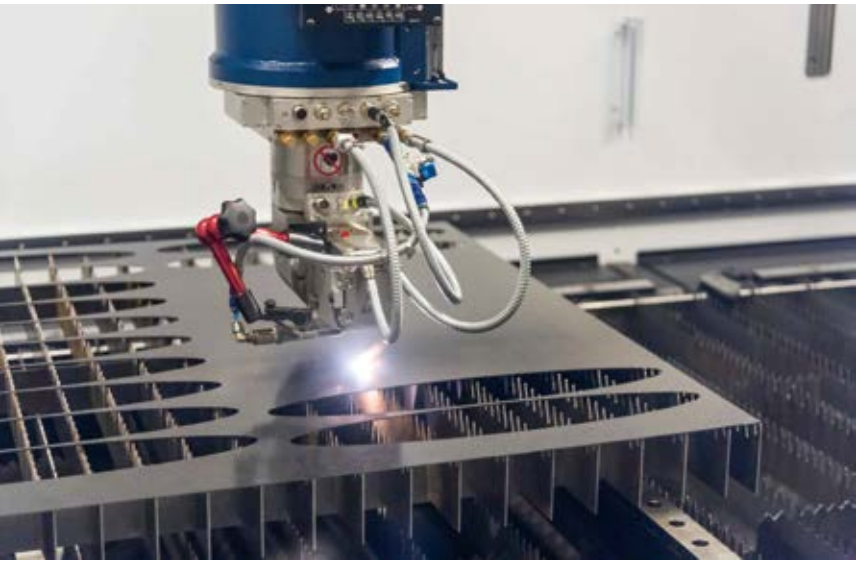
The increase in production requirements in various industries and the need to reduce human involvement for improving the metal processing quality drive the need for automation in manufacturing industries. These requirements are fulfilled by the laser cutting machines.

Increase in sales and production in the respective markets of automotive, consumer electronics, and defence boost

the requirement of these machines to be installed for manufacturing. The decrease in lifespan of products also supports the sales growth phenomena. The machines are required for keeping up with the demand for products.

There are substitutes available in the market that help in cutting; these offer similar features but use different cutting tool instead of laser. These substitutes affect the market in current scenario by offering alternate solutions for the shortcomings of laser cutting machines. The effect of these substitutes is expected to reduce in the future as the laser cutting machines undergo continuous improvements to counter the technological shortcomings. ■

Source: Int'l Metalworking News for Asia



Global Hydraulic Press Market to Beat US\$14 Billion by 2026



The hydraulic press market is estimated to grow with a CAGR of 5.04% during the forecast period from 2018 to 2026, according to ResearchAndMarkets.com.

Hydraulic systems are always known for their power and control compared to pneumatic and electric systems for heavy duty applications and a hydraulic press is no exception to that. Hydraulic press machines offer an almost endless solution in the form of compression moulding, embossing, stamping, forging, lamination, and trimming among other for several end-use industries.

All the aforementioned operations are few of the most prominent metal machining processes and cannot be performed with an accurate and reliable hydraulic press.

Consequently, perpetual demand from end-use industries certainly encouraged the demand for hydraulic press allowing the market to grow with a rate of more than 5%. The growth is projected to remain constant

to reach a market value of more than US\$14 billion by 2026.

The market in China is expected to register highest CAGR of over 24% in the global market in terms of revenue and is expected to continue its growth over the forecast period in the global metal 3D printer market. Increasing demand for metal 3D printers from various end-use industries, especially from automobile industry, is a major factor driving growth of the China market currently. Moreover, increasing government initiatives for boosting production and exports of automobiles is another factor supporting growth of the China market. According to the U.S. Department of Commerce, China is the world's largest vehicle market with a sales volume of over 28 million units in 2016, with a year-on-year growth of 9% as compared to previous year. ■

Source: Int'l Metalworking News for Asia

Indonesia Shows Strong Steel Sector

Indonesia is a growing hotspot for the export market as steel production is shifting from mature to emerging economies.

“This bodes well for Indonesia and the region as the industry prepares for growth and development. Although steel from China is still expected to dominate for many years, strong global demand is driving efforts in countries like Indonesia and Vietnam to build more modern plants to better compete with China’s enormous mills,” said Ms Beatrice J. Ho, Project

Director of indometal co-organised by Messe Düsseldorf Asia.

Efforts are already underway to improve local processing and smelting industries to reduce the nation’s dependence on imports.

With domestic manufacturers only able to produce a fraction of Indonesia’s steel needs, the country imports nearly half of its steel demands. The Indonesian government aims to see domestic steel production capacity rise to 12 million tons by 2019,

followed by 17 million tons by 2024, and to 25 million tons by 2035. However, this target - set in the National Industry Development Masterplan by Indonesia’s Ministry of Industry - will require private investor involvement.

“Against this backdrop, Indonesia is a model location for a specialised trade fair such as indometal which presents a comprehensive spectrum of products and solutions in the metal and steel value chain which will be critical for domestic producers looking to upgrade their technology and to remain competitive in the industry, as well as provide a one-stop platform for international companies looking to invest and enlarge their footprint in Indonesia and the region,” added Ms Ho.

Expanding on the optimistic stance of the Indonesian market, Mr Sofianto Widjaja, General Manager, WAKENI, said Indonesia’s focus is on improving the quality of and infrastructure development, from new roads and irrigation channels to large-scale

power transmission projects to completion of the high-speed rail line. “Indonesia’s economic transformation is picking up steam and it is at the very forefront of the boom in infrastructure redevelopment taking place across Southeast Asia. Companies should prepare themselves for a whole new world of opportunities.”

According to industry analysts, Indonesia is expected to be the 6th largest economy worldwide by 2020, meaning that it will have grown bigger than both Brazil and Russia. This is partly due to a growing middle class, expected to reach 250 million consumers by 2030 – and partly due to its richness in natural resources, as well as its young and increasingly well-educated population. While for the Southeast Asian region, the shortage of adequate infrastructure will see the region needing some US\$26 trillion of investment by 2030 according to the Asian Development Bank. ■

Source: Int'l Metalworking News for Asia



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COMPACTB

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- Box-in-Box symmetrical design
- Column and base one piece design
- X/Y - axis linear motor drive
- Direct-drive motor two-axis milling head



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- Suitable for high titanium materials of aerospace industry



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WALRUS: Pumping the Industry with Excellent Solutions

Before the launch of TIMTOS, the Show Daily production team went to Sanzhi, the northernmost coast of Taiwan to visit WALRUS - the expert in pump and water solution who was founded in 1967. At the beginning of its existence, Walrus Pump mainly supplied Taiwan's domestic market and gradually began to strengthen the International Standard Quality Assurance System certification to accelerate the export expansion in the 1990s. It was also the first producer in Taiwan to start producing industrial pumps in 1993, this helped improved Taiwan's dependence on foreign imports for industrial pumps, which makes service and maintenance more difficult. In recent years, Walrus is redifing its new brand image – with a large yellow walrus as their logo, WALRUS is reminding every households and the industry of their presence, which positions them to leap forward with more innovative products. The half-century-old brand WALRUS is ready to let the market recognize once again the estranged old friend of everyone.

As the leading company in the water solution field, Walrus applies strict specifications in quality management. Each pump quality adheres to the high standards of quality requirements. WALRUS actively obtains international certification, including IE specifications to ensure that motors meet energy-saving standards and are suitable for Europe, America and the global market. The company is also the first manufacturer of pumps to set up pump performance and motor dynamics laboratory, as well as motor power labs in Taiwan. All the products

manufactured are tested in TAF, ILAC, TÜV certified laboratories, including in-house motors and key components in the pumps. At the same time, WALRUS also ensure that the noise from pump operation is measured to the strictest standard. The final goal is to increase the life span of pumps and maintain high quality during their operation in clients' factory. WALRUS is also a winner of many awards, such as the Taiwan Excellence Award, the Yushan Award and the Energy Efficiency Award.

At TIMTOS 2019, WALRUS will exhibit high pressure TPRK_HSIC series pump with 40bar above. The TPRK_HSIC series pump is driven by inverters, which can be used in different environments accordingly to different equipment factory automation requirements. It can be used in different segments of water pressure for equipment processing. The TPRK_HSIC series pump is equipped with inverters and the interface of control system is continuous.

WALRUS has long provided professional services to mechanical equipment factories, assisting customers in pump selection planning, efficiency, energy saving, streamlining and cost control, and hopes to put good products in the right position. The cutting fluid pump is inserted inside the machinery and the proportion of the cost is relatively low. Therefore, under the consideration of industrial 4.0 smart manufacturing, as well as cost, the product lost its price competitiveness after it become intelligent. But WALRUS will not cease in improving the application and diversify its



product choice for clients. It will react to the widening applications in the machine tool sector.

First, WALRUS will enhance its intelligent product applications and help customers in providing professional consultancy, as well as improve and extend the life of the product to meet the automation requirements of unmanned factories. Second, WALRUS will improve customized design for specific customer application environments. Third, the company will strengthen the top tier pumps and extend the intelligent design, so that the process of pump operation allows the mechanical equipment to communicate with each other. Finally, WALRUS will facilitate their capacity of laboratories to test greater energy-efficient pumps.

In addition to improving its product line, WALRUS also hopes to enhance

the user's knowledge of pump selection. At present, the machinery industry is developing to fulfill small batches high diversity productions. The choice of pump must also be altered to provide appropriate water conditions so that the pump can be used in the right position. Therefore, WALRUS devotes to educating and training customers to convey the pump theory. The export market will continue to cultivate the strong Southeast Asian and American markets, and promote the competitive high-end series in Europe.

WALRUS Pump Co., Ltd.

Tel: +886-2-2636-1123*7

Fax: +886-2-2636-3628

E-mail: samuel@walrus.com.tw

james@walrus.com.tw

Website: www.walruspump.com/zh-tw

Booth No.: S0916

Clamptek: Sharing Professional Skills with Customers

Clamptek displays its hydraulic and pneumatic clamping system at TIMTOS 2019, which is widely used by companies, such as Victor Taichung, YCM CNC, YOU JI Machine Industrial and KAO FONG Machinery, etc.

According to David Chiu Wei, CEO of the Clamptek, their clients can be divided into two categories. The first category is the "users", which will purchase molds, fixtures, and machine tools from mechanical equipment manufacturers. The second major category is "machinery manufacturers", which is the mechanical equipment supplier of the above-mentioned users.

"The former one is relatively unfamiliar with operating the equipment. Therefore, our company will provide related technical services and suggestions to the users. For example, one of our Taichung users bought the new mold, and the life time of the mold has increased by 5% after the technical guidance of our company. We also have another customer who is a mechanical manufacturer from Chiayi, because of the excellent performance of our products, the machining accuracy and efficiency

are improved. Moreover, their end-user customers are really satisfied with their fixtures and even assist our customer expand the market in Southeast Asia," said Mr. Chiu.

Facing the trends of automation, and the rise of unmanned factory in the 4th industrial revolution, Clamptek provides products with function of airtight inspection. This function is using the balance of air pressure to ensure that the hydraulic cylinder in the fixture clamps releases the workpiece exactly.

Clamptek is striving to expand overseas markets since it has been one of the top leading companies that specializes in manufacturing manual toggle clamps, pneumatic and hydraulic clamping system in Asia. The division company in the US has been growing at a phenomenal rate over the years. Clamptek USA, Inc. was founded in Brea in 2015. With professional sales team and spacious warehouse which is more than 3,800 sqm, Clamptek provides comprehensive solution and rapid order processing service to its clients. Clamptek Taipei has doubled its performance in less



than two years. With the advantages of high quality and high cost-performance ratio, Clamptek has gradually shown our possibility and sales capacity in Taiwan market.

Mr. Chiu said, "our company has developed two major sharing. The first one is sharing with the customers. Let customers enjoy the biggest services at the

most reasonable prices. The second one is sharing with the employees. Let employees get better treatment and benefits while the company grows."

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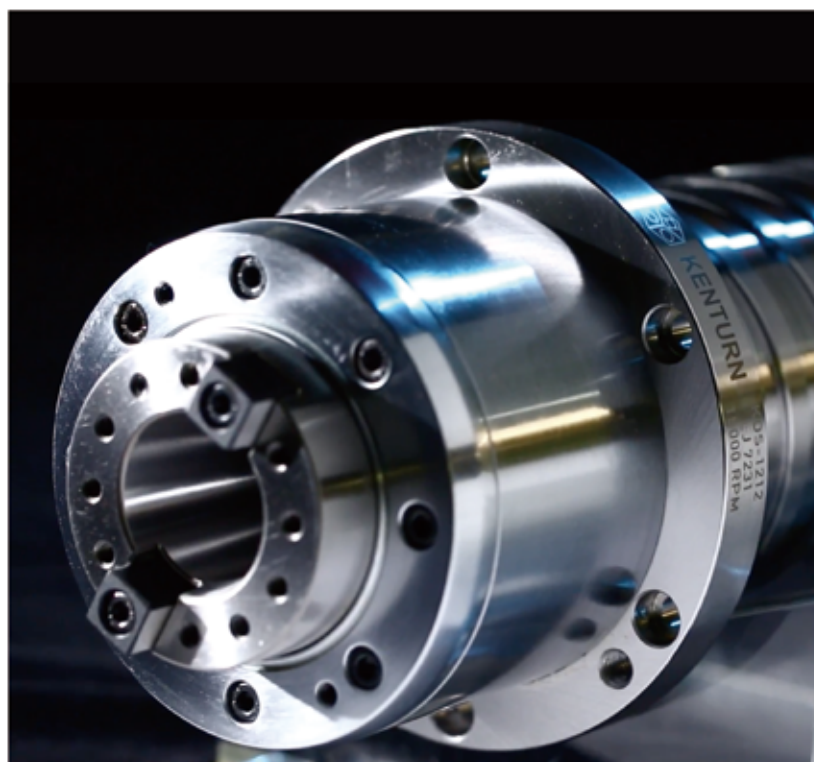
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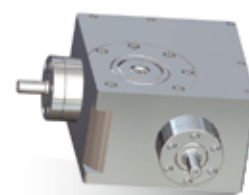
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EVERISING: Making High Quality, Intelligent Band Saws



EVERISING's heavy duty bandsaws are built to the highest standards in the market. The machines' productivity and cutting performance are tremendous and always are the first choice. At TIMTOS exhibition, EVERISING highlights Fully Automatic Band Saw Machine H-360HB and Hi-Tech Band Saw E-830.

EVERISING model H-360HB fully-automatic column type band saw provides not only united and heavy-

duty construction but also durability of production. Heavy-duty cast iron head and wheels designing capable to cut maximum 360mm always gives users good performance cutting. H-360HB model is one of the best saws in the market for the small or large shop.

Hi-Tech Band Saw E-830 comprehensively meets the requirements of "speed, economical, accuracy", and takes band saws into a new cutting territory. The

remarkable feature of the saw offers good cutting performances and absolute reliability. The saw is designed with high rigid double column guide that could achieve higher cutting rate with less vibration and stringer capacity in cutting hard material. It is suitable for using carbide tip saw blade. The guide arm and material feeding move on linear guides are extremely precise. It is set with HMI for cutting data input and self-diagnosis system, making the operation easy and quick. Furthermore, E-830 has the feature of auto trim cut and back gauge function for remnant cut.

In recent years, band saw machine continues to develop along with the goal of Industry 4.0. E-830 therefore provides the in-house software - I TECH System. I TECH contains the function of Big Data database and machine network, which is available to access internal database to collect sawing data after uploading to the customer service system on the machine. Pre-diagnosis includes machine warning system, motor failure diagnosis, blade utilization analysis, supplying the users with more direct understanding on the status of the machine. The latest introduction is the QR CODE management system, with QR CODE, managers can more accurately grasp the machining records. QR CODE

management incorporates the information and actual recording of operators and workpiece data. It substantially increases management and efficiency.

EVERISING band saws always have the most reliable quality and feature the maximum stability and trouble-free operation. Specializing in mid to large size band saws and circular saws, EVERISING now has two factories in Taichung, Taiwan and another in Kunshan, China, with the yearly output of more than 2,000 units. The company has more than 40 sales distributors around the world, with equipment serving over 60 countries worldwide.

Employing a superior R&D team of distinguished engineers, EVERISING has been the winner of Taiwan Excellence Award in the past 5 consecutive years. Looking forward, as a major manufacturer of sawing machine worldwide, EVERISING will keep serving global clients with its highest quality and efficiency ensured by the management principals of scientific, computerized and institutionalized.

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Tel: +886-4-2350-5300

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Booth No.: I0408

PROMPT Integrated Technology: a Brand-new Vision of 7-axis EDM Machine with Automatic Shake Head and Knife Change

A young, energetic and professional machine tool manufacturer - PROMPT with its new product, 7-axis EDM machine, attends this year's TIMTOS. This advanced machine, developed in one year based on demands from European customers, is the first product of its performance level in Taiwan, that has a two-way rotary table, BC axis, with automatic shake head and knife change.

The main shaft of 7-axis EDM machine does not use the back-pull type counterweight block, with 1KW servo motor and bilateral six sliding block structure design, so that the spindle in the oblique processing, positioning accuracy (not biased) and improve the service life of the ball guide screw. Its six-axis programmable control, XYZ+ABC (can be replaced by XYZ+ABW or XYZ+ACW), W-axis head tilt can do $\pm 60^\circ$ tilt machining, with industrial grade computer (IPC), in any processing conditions, can show the most stable state. In addition, the system adopts Windows CE controller, which is presented by dialog window and matched with 3D dynamic graphic description function. The 15-inch color LCD touch screen can make

the operation easier and more convenient for customers, and has a special repair screen to speed up maintenance.

The control panel, EDM and controller of this product are all self-made. The 7-axis controller plus animation system are easy to get started, and the 3D operation interface is also self-developed, more humane and easy to understand. All three axes of the machine are designed with the full closed-loop of digital ruler feedback, so the positioning accuracy, machining accuracy and efficiency of orbit-cut can be greatly improved. Moreover, the position control of optical ruler close-loop is adopted for high precision. Its dialogue program can provide a variety of reaming mode, according to the material, area, depth of processing, one side clearance, final current, electrode wear and other settings can be automatically edited. CNC model, also has the traditional energy release function, stable and fast processing, small electrode consumption, uniform surface accuracy.

PROMPT has strict quality control in both software and hardware - from casting mold design to process, sheet metal design to cable wiring, from parameter adjustment



to work piece performance testing, in order to achieve the maximum work efficiency. In recent years, PROMPT had a rapid expansion of overseas sales territory. With the establishment of the Indian sales office, its sales network has been expanded to about 30 countries.

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E-mail: paul@promptenc.com

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Booth No.: TaiNEX 2, P0806

Production Economic Realities Today

Machine shops seek to produce a specific number of parts of a true quality, in a certain amount of time, at a fixed cost. Consistently achieving those goals involves controlling a myriad of factors including cutting parameters, tool cost and changeover times, machine tool utilisation, workpiece handling expense and material and labour costs.

Production economics is the art and science of balancing process factors to achieve desired results. Over more than two centuries of machining history, the elements of production economics have multiplied in number. Manufacturing first evolved from craft-level single-item output to mass production of standardised parts using machine tools. Improving manufacturing methods brought about a second generation of mass production featuring production lines and output of increasingly greater numbers of identical parts: a high volume, low product mix (HVLM) scenario. Then CNC machines and robots fostered a third generation of mass production efficiency. Most recently, digital technology applied in programming, machine tool controls and workpiece handling systems is facilitating a fourth generation of manufacturing production, known as Industry 4.0, that

enables cost-efficient, high-mix low-volume (HMLV) production.

To effectively accomplish the shift from HVLM to HMLV production it is crucial that manufacturers recognise the changing and growing realities of production economics and take advantage of the information and technology available to analyse their operations and meet their goals. A key element of the transformation involves abandoning overly simplistic beliefs and practices and uncovering hidden costs that can undermine attempts to maximise productivity.

High volume, low mix, simple economics

Standardised machining processes were developed in the 19th century to speed production of identical products with interchangeable parts. Automotive manufacturing refined this HVLM approach to a maximum degree, establishing transfer lines and other methods to make hundreds of thousands or millions of the same part over and over for years.

The long-term nature of HVLM production allows manufacturers to fine-tune multiple process factors for maximum

output, consistency and low cost. Ancillary technology including tool and pallet changers and robots further minimise variability. It is assumed that the operation runs perfectly and provides 100 percent yield with predictable costs, no unplanned idle times, no rejects, no rework and no secondary operations such as deburring.

One assumption is that tool cost is typically about three percent of total production cost. The three percent number is a convenient benchmark but is rarely valid. Workpiece material machining characteristics, for example, have great effect; a switch from steel to titanium in machining a part can increase tool usage by a factor of five. The three percent proportion becomes 15 percent, all else being equal.

Focusing solely on tool engagement time results in neglect of other factors such as idle times for tool changing. This approach is effectively hiding from reality. Manufacturers should understand that machining time, setup time, tool change time, loading and unloading, and other factors affect and interfere with each other.

A simplified example of unanticipated interaction of process factors involves a shop machining a part that requires two minutes to load and unload the workpiece. Indexing the tool consumes a minute, and tool life is five workpieces, making tool indexing time 0.20 minutes per part. Because every part requires 4.2 minutes processing time, output is slightly more than 14 workpieces per hour. Each tool costs 15 euro, and tool life of five workpieces dictates that 2.8 tools (42 euro) are needed to produce 14 workpieces. Machine cost is 50 euro per hour. Altogether, production cost for 14 workpieces in one hour is 92 euro.

Then, attempting to speed output and productivity, the shop increases cutting speed by 10 percent. That reduces cutting time by 10 percent (to 1.8 minutes) but also cuts tool life roughly in half, meaning that one cutting edge will produce only two and half workpieces before indexing is required. Tool indexing time is still one minute and workpiece load/unload two minutes. Production time for one workpiece remains 4.2 minutes (1.8 minutes cutting, 2 minutes workpiece manipulation, and 0.4 minutes tool indexing) or 14 workpieces per hour. The machine and tool costs are the same, but now 5.6 tools (84 euro tool cost) are required to run for an hour. Despite the effort to speed output, production time for 14 workpieces is the same and cost rises from 92 euro to 134 euro.

In this case, increasing cutting speed does not make the operation more productive. Changing cutting time affects other factors in the machining system, in

this example tool life and tool indexing time. Accordingly, a shop must carefully consider the full consequences of process changes.

Another form of hidden cost involves execution of steps in the process. In many machine shops the time spent indexing inserts, for example, is a textbook case of hidden cost. The designated time to index an insert may be one minute. However, when measured in actuality on the shop floor, it can be two, three or ten minutes, a difference of 60 to 600 seconds

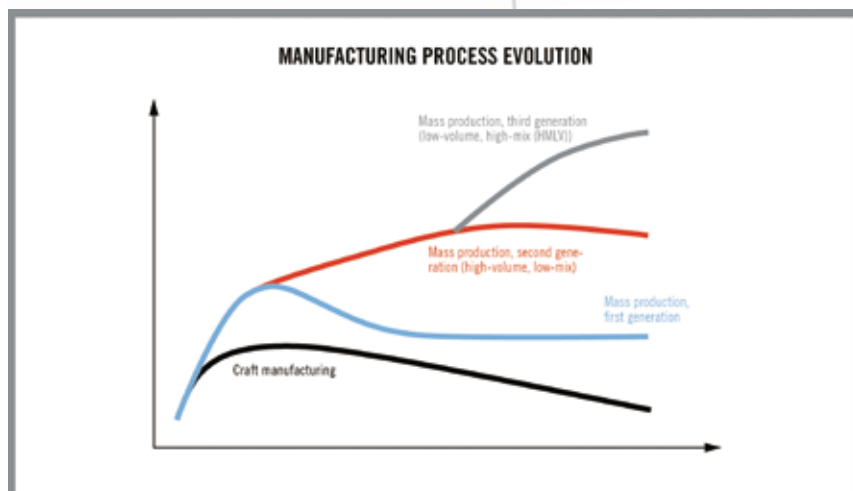
High mix, low volume, complex considerations

More recently, global competition is prompting manufacturers to create different versions of their products to match the needs of smaller subsets of users. Advanced computing technology permits rapid change of part designs and machining programs and also enables easy tracking of product variations and inventory. The result has been a shift to higher mix, lower volume (HMLV) production scenarios. Today, that approach has been developed sufficiently to enable efficient manufacture of single-digit or even single-item production runs.

The extended time horizon of HVLM production permits deliberate planning and fine-tuning of process factors. Planning is different in HMLV situations. Computerised engineering and inventory technologies support rapid changes in product type and output, but consequently the HMLV planning process must be complex and reactive. An order for ten parts may be followed by two, five, or even single-item lots of different parts. Workpiece materials may change from steel to aluminium to titanium, and part geometries from simple to complex. There is not enough time available to determine tool life through trials.

To manage tool life in HMLV situations, a workshop typically makes a conservative guess regarding a tool's projected life and, to be safe, employs a new tool for each run, discarding it well before it reaches its full productive lifespan. Cutting time is only one factor in the overall picture. In HMLV production, the time required to manipulate different workpieces and fixtures, change tools and index inserts will often be longer than the actual cutting time. Tooling, machine tool, idle time, direct labour and workpiece material factors may contain hidden costs. The most recent approach to production economics takes into account tool and workpiece material costs, equipment and production cost, equipment cost during downtime and salary and maintenance costs. ■

Source: *Int'l Metalworking News for Asia*





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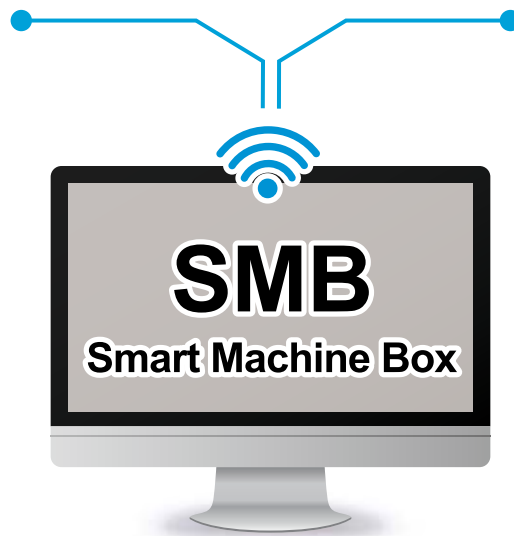
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CHINA MARKET

- ◆ High-efficiency Machining Intelligent Automation Summit 2019 | 06-07 MAR, Chongqing
- ◆ Foshan High-efficiency Processing Manufacturing Technology Summit 2019 | 11 APR, Foshan
- ◆ High-efficiency Machining Conference 2019 - Beijing | 14-15 APR, Beijing
- ◆ Difficult Processing Materials High-efficiency Processing Manufacturing Technology Forum 2019 (customized Conference) | 15 APR, Beijing
- ◆ High-efficiency Machining Conference 2019 - Nanjing | 22 MAY, Nanjing
- ◆ The Mold Technology (Ningbo) Forum 2019 | 30 MAY, Shanghai
- ◆ 2019 Global Laser Processing Technology Summit | 06 JUN, Shanghai
- ◆ The 6th Mould High Efficiency Manufacturing Technology Summit 2019(semi-customized Conference) | 10-11 JUN, Shanghai
- ◆ Global Smart Factory Summit 2019 | 28 JUN, Shanghai
- ◆ Implantable & Interventional Medical Device Manufacturing & Technology Conference 2019 | 8-9, AUG, Suzhou
- ◆ The 2nd New Energy Vehicle Manufacturing Conference 2019 | 04-05 SEP, Shanghai
- ◆ China International Internal Combustion Engine Advanced Manufacturing Technology Summit 2019 | 06 SEP, Suzhou
- ◆ China International Internal Combustion Engine Advanced Manufacturing Technology Summit 2019 | 17-18, OCT, Suzhou
- ◆ 2019 China Intelligent Laser Manufacturing Technology Forum | 24 OCT, Shenzhen



S.E. ASIA MARKET

- ◆ ASEAN Automotive & Motorcycle Parts Manufacturing Summit | 02-03 APR, Hanoi Vietnam
- ◆ India Automotive & Motorcycle Parts Manufacturing Summit | 16-17 JUL, Pune India
- ◆ ASIA Plastics Processing Technology and Innovative Materials Summit 2019 | 29-30 AUG, Jakarta Indonesia
- ◆ ASEAN Automotive & Motorcycle Parts Manufacturing Summit | 05-06 NOV, Jakarta Indonesia



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Tel. +886-4-2262-2340 Fax. +886-4-2262-2402

Exhibit Highlights

Pocket Pulls HP-006, HP-007

At LEEKA, we design and manufacture the highest quality hinges, latches, handles, and other hardware for a wide range of industries, including electronic enclosure, transportation (buses, emergency vehicles and RVs), HVAC, crating, medical, commercial kitchen and marine sectors.

About our latest products HP-006 and HP-007, it takes very little time to install. Beautifully crafted pocket pulls made from stainless steel 304 with a satin finish will look great inside any enclosure. The finger slot is smooth so that users will not get hurt. Customers can choose outside stationary type or in stationary type.



LEEKA Industrial Co., Ltd.

Tel: +886-4-2359-8798

Fax: +886-4-2359-8762

E-mail: info@leeka.com.tw

Booth No.: B0128

Rotary Broaching Tools

The ADONAI broaching tools is simple, easy to operate attachment, which produces regular or irregular polygons in blind or through holes having sharp or chamfered edges. The attachment operates with a hunting rotary motion which, in addition to the standard hexagonal and square holes, can also produce grooves, Torxs and other special profiles.



The ADONAI broaching tools can also be used on lathes, CNC automatic lathes, machining centers, drilling machines and special purpose machines for wide variety of standard or special internal and external forms.

PRAISE Precision Ind. Co., Ltd.

Tel: +886-4-2281-0909

Fax: +886-4-2281-0923

E-mail: seven.hero@msa.hinet.net

Booth No.: A0206

MFH03 High Feed Milling

The high feed milling cutter MFH03 offers low resistance and it is applicable for multi-functional working, such as ramping, face milling and helical machining, etc. It performs in



a new process of high cutting speed with shallow working depth to enhance the efficiency.

Further, this tool is made of hard steel design to perfect the performance of high feed machining. It works efficiently with 4 insert edges and increases chip evacuation and improve productivity. The coolant design also increases the life-span of insert. This cutter is definitely your best option to save your time and money.

HON JAN Cutting Tools Co., Ltd.

Tel: +886-4-2529-1553

Fax: +886-4-2523-2792

E-mail: info@shangintool.com

Booth No.: B0812

Grinding Machine

Model :
IU (Table fixed type) /IT (Table adjustable type)



With both Dry and Wet grinding process, our machine is able to:

1. Remove the oxide layer on interior and exterior contours of laser-cut steel sheet.
2. Edge rounding by disk brush of aluminum or steel and stainless-steel sheets.
3. Deburring for every application area, such as punched, laser, water stream, plasma or autogenously cut workpieces.
4. Hair-line processing for metal surface.
5. Compare with standard roller brush, the disk brush is able to make the edge smooth and will not easily hurt the conveyor belt.

Ming Ping Machinery Co., Ltd.

Tel: +886-4-2512-3228

Fax: +886-4-2512-0828

E-mail: sales@mingping.com.tw

Booth No.: C1127

ByStar Fiber 3015 6kw

1. World-class high-speed cutting with up to 10 kilowatts of laser power for exceptionally high parts output and a Bystronic cutting head for the widest variety of materials and thicknesses.

2. Large batches and jobs with a wide variety of metals are cut reliably in record time. Be it steel or non-ferrous metals, the cutting quality is impressive both with thin and thick sheet metal and profiles.

3. The cutting area is accessible from the long side of the machine and allows additional residual sheets or urgent jobs to be inserted in spite of running high-volume jobs.

4. The ByVision Cutting software, a Bystronic in-house development, is operated just as simply as a smart phone using a 21.5-inch touch screen. New operators master the machine in next to no time. ByVision Cutting supports the operator with a



database of parameters for all common sheet metal types and cutting technologies.

5. Unparalleled productivity and low cutting costs increase profitability and enable higher job volumes. Low maintenance requirements and high energy efficiency reduce process costs even further.

6. Versatile automation solutions optimize machine utilization and increase process reliability from the loading and unloading right through to the sorting and storage of raw material and finished cut parts.

Bystronic International Laser Ltd.

Tel: +886-2-2299-2699

Fax: 886-2-2299-2668

E-mail: Dorothy.lin@bystronic.com

Booth No.: B1012

SB-22x8A-MR-V-U

This CNC tube bender series features all-electric tube bender which is equipped with Left + Right Bending Technology for maximum flexibility and minimal interference, with capacity of up to O.D. 20 mm. The new SOCO CNC Tube Bender combines Draw + Roll + Dual Direction Bending Way technology. This line is especially suitable for complex parts and shapes, such as automotive exhaust pipe, health care and fitness equipment.



SOCO Machinery Co., Ltd.

Tel: +886-4-2359-1888

Fax: +886-4-2359-2386

E-mail: patrick@soco.com.tw

Booth No.: B0612

Drill Chuck Holder / SPH

Model: NT40-SPH13-105

1. Max torque can be up to 600 kgf-cm.

2. The drill will not be dropped out when the main spindle of machine stops instantly.

3. The rotation speed can be up to 6000 RPM.

TUNG CHERNG Industrial Co., Ltd.

Tel: +886-4-2563-1992

Fax: +886-4-2563-1816

E-mail: yl-tools@yl-tools.com.tw

Booth No.: A0217



Maglev Cutting Tools

1. Through our technique, our products have been minimized the coefficient of friction to nearly glossy surface and put processing materials with few deviations on measurement.

2. Non-stick surface on cutting tools avoids generating static electricity and heat free from chippings, which brings about longer durability and product lifespan.

3. Our products are suitable for super high-speed metal processing, and improve the working efficiency by 50%.

Lin Tong Sheng Cutting Tools Co., Ltd.

Tel: +886-7-3723-988

Fax: +886-7-3721-131

E-mail: aaa@ts-cutting.com

Booth No.: A0303



Gantry Type 5 Axis Machine



Kessler Built-in spindle: 20000rpm, DD A/C Axis

X/Y/Z: 800 x 1010 x 650mm

Table Size: Ø800mm

MAXIMART Corporation / Fintek Industry

Tel: +886-2-2523-6891

Fax: +886-2-2523-5419

E-mail: fintek.tw@gmail.com

Booth No.: D0224

Internal Coolant Carbide Drills - CDAC Series

In the metalworking field, in addition to milling, drilling also influences production speed and productivity directly. Speed plays a crucial role in this competitive industry. Of course, drills also determine competitiveness. Internal coolant carbide drills of CDAC, CDBC and CDCC series, deliver coolant directly to the tip of the drill when drilling. That helps to extend tool life and enhance processing efficiency.

HG Technology Co., Ltd.

Tel: +886-4-7362-725

Fax: +886-4-7368-357

E-mail: service@hgt.com.tw

Booth No.: B0308

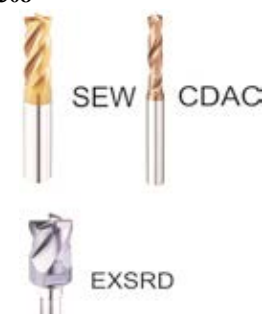


Exhibit Highlights

8-251 Super Point

1. 360° rotation and 230° pivot
2. Rotatable under load due to its unique ball bearing design
3. Manufactured in accordance with EN1677-1 and the requirements of ASME B30.26
4. Certified by DGUV GS-OA-15-04
5. Forged alloy steel, quenched and tempered
6. With the Grade 100 High-strength alloy steel, WLL is increased without increasing swivel size compared to other Yellow Point models
7. 4:1 Design factor
8. 100% Magnaflux crack detected
9. Proof load at 2.5 times the WLL
10. Fatigue rated for 20,000 cycles at 1.5 times the WLL

YOKE Industrial Corp.

Tel: +886-4-2350-8088

Fax: +886-4-2350-1001

E-mail: sjuno_wang@mail.yoke.net

Booth No.: B0328

TUN03X High-feed Milling Cutters

High feed milling is a method that allows three times faster machining than conventional methods.

TUN03X series is manufactured by state-of-the-art tool image inspection device and 2D projection machine.

The advantage is to increase the rate of metal removal and reduce the processing time. Additionally, it goes well with insert made by specialized manufacturer in Europe.

TAI JENG Machinery Tool Co., Ltd.

Tel: +886-2-2996-7563

Fax: +886-2-2997-4671

E-mail: taijeng@ms24.hinet.net

Booth No.: A0133

Adjustable Reamers

You can get diameter adjust using one adjustable reamer that functions as dozens of solid reamers.

CHENG HUI Machinery Tools Factory

Tel: +886-4-2265-9360

Fax: +886-4-2265-6692

E-mail: service@yjmttools.com

Booth No.: A0538



CNC Compression Coil Spring Machine

Model: SY-680-CNC-MT

6 Axis type: 11 sets of servo motor control, compression/coil spring machine, design-change the traditional CAM driving mechanism to No-CAM operation. Using servo motor to control the precision ball screw drive the heavy-loaded slide movement to actuate and operate the Spring OD forming operation. Modifying the input specification data on the touching screen, the Spring Diameter and shape change activity becomes easy

and fast. The Syntec PC Based CNC 16-axis controller self-development compression spring automatic editing software, has built-in basic compression spring patterns. The operator just needs to select the desired spring pattern to be produced, enter the basic data and the computer will automatically edit program. Handwheel simulate single spring produce sample, easy to fix and achieve the required specification of the produced spring. User-friendly graphics-dialogue type operation interface that is easy to learn, within a very short period of time.

AN SU YI Industry Co., Ltd.

Tel: +886-4-7352-312, 7270-368

Fax: +886-4-7361643

E-mail: suyimc@ms49.hinet.net

Booth No.: C0738



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Exhibit Highlights

Gear Coupling-TY Series

For Steel\Paper Mill\Rubber Plastic\Cable\Heavy Horse Power Industry
Features:

1. Crowned tooth allowed larger tolerance in shafts and higher loads.
2. Special hardening treatment with high strength and anti-abrasiveness.
3. Closed type coupling--easy lubricate & anti dust as well as no leakage.
4. The type of TIEN YI GEAR SHAFTS COUPLINGS is successful during the first processing. A second procedure for heat treating according to material must be done. At last removing gravitation by striking-ball bearing when those steps all finished.

TIEN YI Gear Works Co., Ltd.

Tel: +886-3-5970-206

Fax: +886-3-5970-210

E-mail: sales122@tienyigear.com.tw

Website: www.tienyigear.com.tw

Booth No.: G0231



Indexable Spot Drill 90°

1. Close to zero point eccentricity, high accurate centering position, will reduce tap breakage.
2. Our special grade C350 provides strong cutting edge and higher cutting speed ranging from 300% ~ 1000%.
3. It has multi-function features such as chamfer, engraving and V-grooving. There will be two cutting-edges available when used for chamfering process. It can also be used on drilling machines.
4. Zero centric design. Maximum eccentric $\pm 0.008\text{mm}$.
5. Special grade C350 provides strong cutting edge and higher cutting speed ranging from 300% ~ 1000%. Two cutting edges available for chamfering process.
6. Multi-functional: Spot drill, Side chamfering, V-grooving, and engraving.

YIH TROUN Enterprise Co., Ltd.

Tel: +886-2-8521-3035

Fax: +886-2-8522-3039

Email: a003@cut-tools.com.tw

Website: www.cut-tools.com.tw

Booth No.: A0424



Hydraulic Deep drawing Press

The hydraulic deep drawing press is a specially designed machine in high accuracy and excellent performance, for deep drawing and forming metal plates. The capacity range from 10 tons to 3,000 tons is available as customers' demands.

1. Safe and precise control systems are easy to handle and work with great efficiency.
2. Systemized hydraulic unit is designed of leak-prevention, anti-vibration and easy-maintenance.
3. Each hydraulic press is manufactured under strict quality control process to assure the best performance and accuracy.

HSIN LIEN SHENG Machinery Co., Ltd.

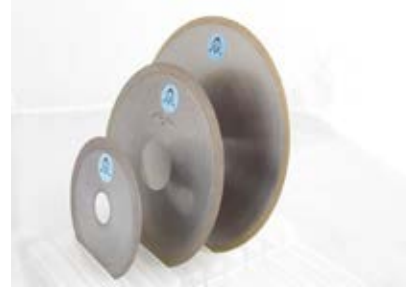
Fax: +886-4-2350-4118

E-mail: info@prosperous.com.tw

Booth No.: D0524



Thin Cutters (Resin Metal Bond)



Grinding wheels for CNC controlled tool grinding machines.

Cutting Applications: Carbide rod cutting.

Advantages: Sharp cutting, Good self-sharpening, Long working life and nice surface of the cut.

Metal and Resin bond cutting discs for grooving and cutting.

Grinding wheels for CNC controlled tool grinding machines-cutting. Carbide rod cutting.

LEADRANK Co., Ltd.

Tel: +886-37-3511-68

Fax: +886-37-3515-25

E-mail: leadrank@leadrank.com.tw

Booth No.: A0119



**Integration of High Performance Technology
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台中市40643北屯區松竹路一段530號
<http://www.twspindle.com>

Exhibit Highlights

TIMI TeleCenteric Image Measurement Instrument for Screw, Bolt, Punch and other Shaft

TIMI TeleCenteric Image Measurement Instrument is particularly suitable for the measurement of automotive fasteners, the shaft parts and punch.



Desktop TIMI is designed for use in Lab inspection and Stand-up TIMI is designed for use in in-process QC. The QC operator can execute the first-piece inspection, configure the measuring script and precise measurement of R&D parts. The manufacturing worker can measure the parts by pressing one key. TIMI's features include:

1. Large field-of-view measurement with micron-level precision.
2. Measure upright object in a 360° rotation without tool clamping.
3. User-friendly interface and area-selection measuring method makes

measurement easy to get started.

4. Configure a measurement script and press a button to measure full size of the part.
5. Hands-free input. Data 100% accurate.
6. Real-time monitor in-process QC with fast, dense and accurate measurement. Save time, labor and material.
7. In-process inspection preformed automatically in minutes.
8. Instantly display X bar and R charts, and analyze the process capability.

Universal Standard Vision Technology Corporation

Tel: +886-4-2359-8363#530

Fax: +886-4-2359-8365

E-mail: maryanne@usdvision.com

Booth No.: G0204

CNC Turning and Milling Center TM series

TM-Series, CNC Turning and Milling Center, performs different tasks simultaneously. With TM-Series, there will be no need to keep loading and unloading materials between a lathe and a machining center. TM-Series provides excellent turning and milling ability on just one machine with



high rigidity and high accuracy that would be your new alternative for metalworking.

- Rigid machine structure.
- Multitasking: turning and milling on the same machine
- Maximum turning/milling length: 2000mm to 10000mm
- Maximum milling dia. 800mm
- Standardized 12 tools for turning tasks; up to (additionally more than) 24 optional tools for milling tasks available.

TM-Series has patents registered in the following countries: China, German, Japan, Taiwan, Russia.

Welltech Machinery Co., Ltd.

Tel: +886-4-2615-1620

Fax: +886-4-2615-1621

E-mail: info@cncservice.com.tw

Booth No.: G0318

Vacuum Chuck

Suitable for aluminum, plastic, circuit board, carbon fiber, quartz and other processing.

The use of convenient vacuum

modules, to provide a general air pressure source can generate suction (recommended 5kg/cm³ above).

For drilling, milling, sawing, cutting, module with vacuum meter can monitor the vacuum state at any time, manual control valve can be switched suction, stop, blow and other states.

Independent vacuum module design can be combined with various types of vacuum suction cups, the change is much practical.

The vacuum generator with high vacuum is used to enhance the stable adsorption force.

Fixture design can be 3D curved surface fixation, improve workpiece clamping efficiency, rapid positioning, can choose electromagnetic switch and automatic production line for series, towards industry 4.0.

WEI-SHIN Precise Co., Ltd.

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Booth No.: G0512



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3.2M



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GROUP

Go Taiwan

Hualien

Hualien County is situated in eastern Taiwan Island. It faces the Pacific Ocean to the east, Central Mountain Range to the west bordering Taichung City, Nantou County and Kaohsiung City, Yilan County to the north and Taitung County to the south. It occupies one eighth of Taiwan's total area.

Despite its vast area, only 7% of the county area is populated. The remaining area is occupied by rivers (7%) and mountains (87%). Mountains are composed of Central Mountain Range in the west and Haian Range in the east. The main rivers in the county are the Hualien River, Xiuguluan River and their branches.

Qixingtang Beach

Located in Beipu Village of Xincheng Town in Hualien County, Qixingtang is one of the most popular beach sightseeing spots of Hualien for it lies at the tip of a crescent bay offering extensive sceneries overlooking the Pacific Ocean. Qixingtang is consisted of a scenic area, geological area, the Katsuo Museum, as well as a stargazing observation area allowing visitors to have a wonderful experience stargazing by the sea.

Qixingtang is not just a scenic area for recreations, but also an important area for seafood as there are 3 fisheries in Dongchan, Chaojing, and Jiafeng, thus Qixingtang Scenic Area is also a good place for ones to savor fresh seafood.

Qixingtang is also consisted of a 21-kilometer long bike trail that stretches from Nanbin Park through Nanbin Harbor, a stone sculpture park, stargazing area, as well as children's playground offering a nice place for one to enjoy extensive ocean views while surrounded by a complete set of recreations. Also, Qixingtang is a popular place for collecting stones.



Dongdamen Tourist Night Market

With an area of about 9 hectares and a total of about 400 vendors, Dongdamen Tourist Night Market is composed of Futing Night Market (former Rainbow Night Market), streets of aboriginal cuisines, and streets of China cuisines. Fried crab, stinky tofu, shaved ice, steamed clams, millet wine are strongly recommended. The opening hours is 5-11 P.M. every day.

Qingshui Cliff

Qingshui Cliff, located on the section of the Suao-Hualien Highway that stretches between Heping and Chongde stations, is one of the most spectacular sights on Taiwan's Pacific coast. The cliff is more than 1,000 meters high and drops almost vertically into the sea. The highway snakes along its curving face more than 20 kilometers, with the sheer cliff rising on one side and a sheer drop to the ocean on the other.



Source: Sabrina Feng Travel King

SOLPOWER

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SOLPOWER SERVO MOTORS

SVM系列 (IP54)感應伺服器馬達

Compact Asynchronous motors Quick positioning. High torque moment.

產品特性

定位快速、精準、瞬間扭力大、低慣量設計、反應靈敏，高精度製程設計、符合您精密機械的需求。

應用

工具機主軸、印刷機械、塑膠射出成形機、分條/複捲機械、包裝機械、紡織機械、一般產業機械。



DD馬達 第四、五軸機構 · 內藏式主軸定轉子

Rotor&Stator(ER16,ER20,ISO250,BT30,BT40,P.C.B...等) / (100NT-M,200NT-M...等)

產品特性

定轉子特性媲美進口產品，規格參數齊全，適合各廠牌驅動器，控制器、規格產品齊全，亦可訂製。

應用

內藏式主軸、DD馬達。



SVMA系列 (IP23)感應伺服器馬達

(IP23)Compact Asynchronous motors Quick positioning. High torque moment.Efficient cooling

產品特性

定位快速、精準、瞬間扭力大、低慣量設計、反應靈敏，高效率冷卻設計，抗圖波線圈，高精度製程設計、符合您精密機械的需求。

應用

工具機主軸、印刷機械、塑膠射出成形機、壓鑄機、分條/複捲機械、包裝機械、紡織機械、沖床(延伸膜)、一般產業機械。



LINEAR MOTOR 線性馬達

The ironcore design for the higher efficiency of linear motor, and the higher speed and positioning accuracy than ball screw.

產品特性

有鐵心設計提高線性馬達效率。高效率的冷卻系統及較高佔槽率大大提高線性馬達的功率體積比。

應用

P.C.B鑽孔機、工具機、產業機械。



SPMA系列 同步伺服器馬達

Compact Synchronous motors Good speed control & torque control.

產品特性

高精度、低慣量設計、反應靈敏，速度控制、位置控制、轉矩控制、特性優越符合您精密機械的需求。

應用

工具機主軸、印刷機械、塑膠射出成形機、分條/複捲機械、包裝機械、紡織機械、一般產業機械。



DDM系列 直驅伺服器馬達

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機器智慧和 AIoT 的飛速發展正在推動全球工具機的創新。數年前還被認為是異想天開的事情，今天正迅速實現。但是，儘管保持對最新技術趨勢的瞭解至關重要，許多人卻誤以為技術才是推動創新的唯一要素。可持續的商業成功還取決於在實踐中實施創新，這就需要培養創新文化，並且設計以人為本的數位轉型。

TIMTOS 2019 高峰論壇旨在為工具機製造商和零組件生產商增進更多能力，使之實現前所未有的產能、品質和效率水平。雖然許多總經理們都理解機器智慧和 AIoT 對其公司的重要性，但仍有很大一部分人遲遲無法有效落實 AIoT 戰略。

利用工業4.0 和物聯網創造價值

SAP 公司工業機械與零組件 (IM&C) 事業部工業業務部門的全球解決方案經理 Bernhard Meyer，在其主題演講伊始，引用了 Bruce Sterling 的話語“物聯網不是關於‘物’”，也“不是關於互聯網”，來自 SAP 的未具名同事補充道。

那麼，SAP 如何幫助不同行業中的客戶利用工業4.0 和物聯網創造價值呢？他解釋說，影響不同產業的關鍵技術趨勢是：移動網絡計算——低成本的訊息訪問；社交媒體——社群內的知識分享；物聯網——基於統一協議的連接；設備交互——實現自我管理；以及大數據和預測分析——理解與推演。

工業設備的複雜程度超乎想像，而為了滿足客戶的生產新需求，設備生產商可謂壓力山大。這其中包括：設計可快速適應新產品生產需要的設備，以及製造可快速集成到現有工廠的機器，客戶期望這些機器能夠實現最長的日常正常運行時間，這些機器還必須具有足夠的前瞻性設計靈活性，隨著技術的不斷發展，它們仍能保持可用和高效。

為了應對智慧設備時代的創新挑戰，企業主和主管們需要站在產業全

的高度來瞭解這些趨勢。隨著數位技術和自動化日益普及並開始主導生產，智慧設備需要懂得如何保持競爭力和相關性的“智慧企業”。

他補充說，物聯網和工業4.0的真正目的是降低成本、延長正常運行時間、增加新產品和服務、優化生產力、減少浪費、改善周轉、新增收入、加快交付、基於使用的定價、提高產能、增加效率以及商業新模式。

Bernhard 認為，SAP 的智慧企業架構將數據、智慧、企業流程和業務網絡這四個世界連通，奠定了智慧企業的基礎，賦予企業在未來主導所有產業，能夠以更快速度、更低風險實現預期結果，並成為一個智慧的最佳運營企業。

Bernhard 鼓勵與會者，要盡可能保持好奇、立即行動，而不是等到被迫改變的時候。越早開始，就有越多時間應對攔路虎的挑戰，並通過改進流程獲取更多的數據和洞察。

智慧工廠中的智慧物聯網

隨著智慧工廠的數量不斷增加，員工之間的技能差距也在擴大。在生產中使用的現代技術，需要有能力理解並管理生產新流程的專業人士和數據科學家來駕馭。

ITTS 東捷資訊服務副總經理劉新正解釋智慧工廠的驅動因素包括：數位雙胞胎技術、智慧產線與機械、智慧設備、以及利用擴增實境 (AR) / 人工智慧 (AI) 的技術。

如果缺乏知識和物聯網能力，即使是產業主管也很難做出決策。為解決這一問題，應儘快開展關於物聯網和其他技術的教育培訓。

另一個挑戰是如何將所有設備無縫整合到龐大的生產體系中，這就需要運用人工智慧、機器學習或擴增實境 (AR) 等其他智慧解決方案來簡化這一過程。

劉新正提出了一個有用的平臺：提供智慧服務的 IAMP。他提到運用雲端配接器架構以快速啟用與外部設備平

臺對接數據輸入和服務的兩個數據流；其次是設備管理儀錶盤工具，用於監控設備組、診斷性能狀況和管理遠程固件 OTA 更新；再者是應用程序啟動工具、SDK 框架和模板應用，以實現業務應用程序和移動體驗的快速開發。

劉新正總結道，智慧製造潛力巨大，不容忽視。企業領導人的主要責任是認清這種力量，堅信數位化轉型的成功價值。

臺灣工業物聯網之路

國立虎尾科技大學校長覺文郁表示，技術革新來勢洶湧，機械設備公司別無選擇，只能迎頭趕上。但問題是，他們願不願意重塑自身，向專家請教新問題背後的趨勢？覺校長非常樂意為幫助臺灣企業解決問題建言獻策，他說：“一人計短，眾人計長。將不同專長的人匯聚起來，最佳解決方案往往就會出現。”

覺校長解釋說，智慧設備服務器 (SMS) 連接數控工具機、機器人、PLC 以及其他相關傳感器的控制器，通過 OPC 和 UA 規範的國際通訊格式轉換為安全的通訊機制，支持多人同時在線和多平臺聯網。通過這種機制，工廠的所有設備都可以快速連接，並能開發出更多相關應用服務。

工業AI與工業互聯網

美國辛辛那提大學教授、富士康工業互聯網副董事長李傑解釋說，AI (人工智慧) 是一門認知科學，基於對成像分析與機器視覺、自然語言處理、機器人和機器學習等領域的深入研究。它被認為像魔法一樣神秘，難以通過有效論

證使業界確信。這種技術能夠持續、穩定地帶來令人滿意的投資回報。

李教授說：“工業互聯網是指，通過連接互聯網的傳感器和大數據分析，將成套的先進設備組成網絡，使工業生產的效率激增、成本大降。由於品質和產能提高，它勢必改變傳統製造業。”

重點結論

設計、製造和銷售產品的公司，必須改變生產方式及其與客戶連接的方式，否則可能面臨失敗。這裡講的是每種產業的產品——汽車、電子、機械、零組件等等，都毋庸置疑的面臨這個困境，因為要不了多久，傳統套路就會過期作廢，不變則亡。

但由於互聯網和訊息更易獲得，人們能夠更自由自主地做出明智決定，而不再是自上而下地被決定。訊息人人可得，但是，與思考者和塑造者見面也很重要，因為他們可以幫助你取得商業成功。

另一方面，企業領導人為未來做準備的最好方式是，密切關注當前新興和顛覆性的趨勢，並在越來越多智慧設備上線時及時切入，成為最新、最棒技術的早期採用者，並伺機測試最新技術。走出辦公室，去看看世界在如何變化。定期評估你的創新實踐案例，瞭解整個產業的最新技術趨勢，並盡一切努力保持競爭優勢。

最後，對於一個技術愛好者來說，在峰會上所聽到、看到的一切必能令你有所啟發、感到興奮，而技術如何發展也令人印象深刻。技術產業似乎每年都會加速，變化也會越來越快。未來有許多技術會突破，想像過幾年可能會發展出什麼，這確實讓人興奮。■



透視金屬3D列印的變革

——TIMTOS 2019高峰論壇之積層製造篇

隨著客製化、工業4.0的風潮愈演愈烈，金屬3D列印技術已從最初的概念層面，逐漸被應用到實際生產過程中。無論是金屬粉末原材料供應商還是生產工具機的巨頭，亦或是配套的軟體系統整合商，都顯示出搶灘3D列印市場的野心，業界關於金屬3D列印的討論也日趨專業和深入。

作為引領臺灣機械製造發展的風向標，TIMTOS 2019高峰論壇將3D列印做為關鍵的研討主題之一，邀請了DMG MORI、Optomec、馬路科技等積層製造領域的標竿企業，集中探討如何將3D列印技術更好地應用到金屬零件的製造和修復中、如何充分利用金屬3D列印技術的自身優勢、3D列印與數位化技術的融合，同時也分享了DED直接能量沉積等先進的金屬3D列印技術。這些議題雖然有著不同的著重點，但都直指3D列印的經濟性和實際生產價值，這也反映出對於3D列印這一新興技術，大量生產製造商已從

單純的技術崇拜，進入到向生產要效益的務實階段。

批量生產和穩定性，變革的關鍵

儘管3D列印技術在突出生產個性化上的優勢已被廣泛認可，但其可重複性和穩定性，一直是令人頭疼的問題，生產的個性化和規模化，似乎是魚與熊掌不可兼得。但作為生產商而言，利潤又永遠是其得以生存和發展的基礎。正如，馬路科技大中華區銷售經理楊奇杰先生在報告中所言，生產效率、穩定性、可重複性、TCO（總成本）是影響金屬3D列印技術是否能實現快速生產的關鍵因素。

如何在上述關鍵因素上進行突破，楊奇杰先生分享了3DS DM Factory列印系統。據介紹，3D System的直接金屬列印（DMP）平臺是一種可擴展的金屬增材製造解決方案，專為強大的應用和全天候可重複的金屬零件生產而



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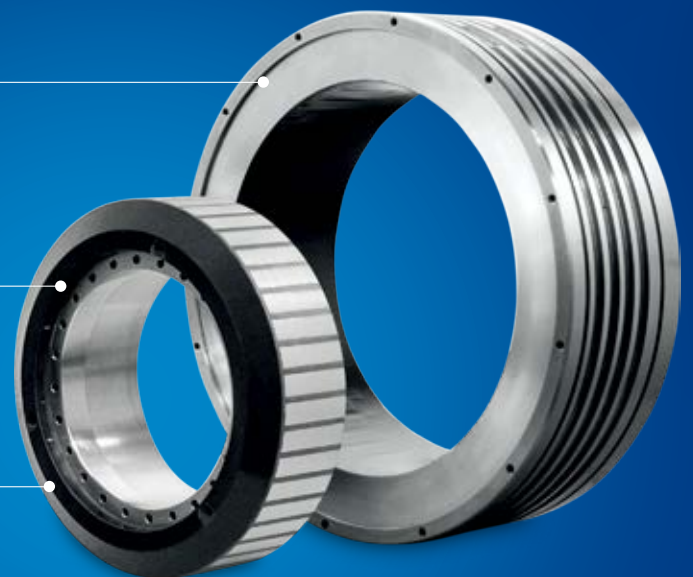
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設計，可實現更高的重複性和列印均勻性，從而大幅提升列印效率。並且DMP Factory還增加了集成粉末管理系統，以及即時過程監控功能，使用戶能夠分析和優化列印參數，以獲得更高品質的產品。

注重融合，創造新價值

除了對3D列印成本的關注外，來自DMG MORI的營運長Neun Harald先生還拋出了“如何充分利用3D列印來創造價值”這一話題。Neun Harald先生認為，3D列印只是生產製造的另一種方式，我們應用3D列印的目的不是為了增材製造而增材製造，最終所有的技術應該服務於同一個目的——創造新的價值。



至於如何更好地創造價值，Neun Harald先生進一步指出，我們應考慮兩大融合：一是在設計、生產到物流等所有過程中，都應該發揮3D列印相應的優勢，而不僅僅是在設計和製模階段；另外就是增材製造與數位化技術的融合。在演講中，Neun Harald先生強調了軟體的重要性，他認為通過軟體可以對加工參數進行優化，因為同樣的材質，如果來自不同的供應商，其參數是不一樣的。為了更好的管理這些資料資源，需要一個強大的軟體系統。

Neun Harald先生還以DMG MORI現有的實際應用，對增材製造和數位化相輔相成的關係進行了解讀。譬如，DMG MORI的數位化使用者介面Celos已經在Lasertec 3D組合加工工具機上投入使用；其它資料的收集和管理以及操作員友好型APP的使用，也支持了作業準備和整個生產工序，數位化對能力的最佳發揮以及生產靈活性具有很大影響。在工業系列生產中，數位化使各個系列生產發生變革。甚至是更換零件，也不再需要庫存，可以“即需”列印。最後，Neun Harald先生還強調，數位化和增材製造正在攜手前進，並將繼續開發更大潛力。

DED技術，3D列印的另一思路

此次論壇上，來自Optomec的亞太總監Pascal Pierra先生還分享了DED直接能量沉積技術的原理及優勢。Pascal Pierra先生指出，目前金屬加工有三種方法：金屬噴射成型

（Metal Jetting）、金屬粉末床熔化（Powder Bed Fusion）、直接能量沉積（Directed Energy Deposition）。其中金屬噴射技術雖然成本較低，但是能夠列印的零件大小非常有局限性，並且列印的部件結構和表面品質都會精度較低；金屬粉末床熔化技術的優勢是可以獲得較好的零件表面精度和內部結構，但成本非常高，並且不能對既有的零組件進行修復；而DED直接能量沉積，既可以有性價比較高的列印成本，又可實現各種尺寸零件的快速成型。

因為DED技術的原理是由雷射在沉積區域產生熔池並高速移動，材料以粉末或絲狀直接送入高溫熔區，熔化後逐

層沉積。因此，可以通過使用大功率雷射器直接從粉末金屬、合金、陶瓷或複合材料一層一層地進行結構構建，可在整個產品生命週期中以更低成本對高性能金屬材料組件（如鈦合金、不銹鋼、超合金等）進行修復、加工和增材製造。Pascal Pierra先生還指出，未來DED技術的應用前景將會十分廣闊，尤其是在整體組建列印、局部細節列印、缺陷零件的修復方面潛力十分龐大，預計總體的市場規模將達10億美元。

在最後的主題對談環節，來自數位時代的路怡珍主播還引導幾位主講人和觀眾進行了熱烈的互動，並且針對3D列印會帶來的一些社會問題進行了相

應的討論。譬如，關於3D列印技術的運用是否應該受到約束，政府是否有義務或權利對3D列印技術的使用進行監管，3D列印槍支等危險物品是否違法等等。

幾年前，增材製造技術被認為是“一項將要改變世界的技術”，英國《經濟學人》雜誌曾認為增材製造將“與其他數位化生產模式一起推動實現第三次工業革命”。而如今，這一技術已被逐漸應用到實際的生產製造中，金屬3D列印作為其中的一個重要分支，也展現出蓬勃發展的趨勢。儘管目前的發展還有著不少亟待完善的問題，但未來仍然可期！■

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「2019 年台北國際工具機展」研討會/活動日程表

日期	時間	活動內容 / 講題	主 / 協辦單位	地點	備註
3 月 4 日 (星期一)	10:30	開幕典禮	外貿協會・機械公會	南港展覽館 2 館 4 樓門廳	憑邀請函入場 簡馥茗小姐 +886-2-27255200#2867
	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	13:30-16:30	2019 台北國際工具機展採購洽談會	外貿協會	南港展覽館 1 館 504 會議室	柯采慧小姐 +886-2-27255200#1573
	14:00-15:00	2019 台北國際工具機展記者會	外貿協會・機械公會	南港展覽館 1 館 403 會議室	侯馨青小姐 +886-2-23494677
	16:00-17:30	馬來西亞機械市場說明會暨 TAITRA 及 PENFEIA 合作備忘錄簽約典禮	外貿協會	南港展覽館 1 館 404 會議室	陳冠儒小姐 +886-2-27255200#2693
3 月 5 日 (星期二)	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	8:30-12:00	工具機關鍵模組暨智慧製造應用技術發表	工研院智慧機械科技中心	南港展覽館 1 館 505a 會議室	張惠怡小姐 +886-49-2345309
	9:00-12:00	台日機械企業經貿交流會	機械公會	南港展覽館 1 館 504bc 會議室	王篠傑先生 +886-2-23494668
	9:00-16:00	TIMTOS 2019 高峰論壇	經濟部國際貿易局	台北國際會議中心 101 會議室	高麗茹小姐 +886-2-27255200#2679
	16:00-17:00	德國工藝 享譽國際 - 德國工具機產業發展新趨勢	外貿協會德經處	台北國際會議中心 101 會議室	鄭芳姿小姐 +886-2-7735-7524
	10:00-12:00	《工具機組裝新利器 -Renishaw 全新 XK10 校準雷射系統》新品發表會	雷尼紹股份有限公司	南港展覽館 1 館 402a 會議室	莊詠偉先生 +886-4-24603799
	10:30-12:00	TNC 640 高效率五軸輪廓控制器 - 高可靠度創新加工技術的優勢	海德漢股份有限公司	南港展覽館 1 館 403 會議室	蔡語耕小姐 +886-4-2358-8977 #1035
	13:00-15:00	NIDEC-Commander C 產品發表會	睿欣實業股份有限公司	世貿一館 第 4 會議室	陳曦小姐 +886-4-22606502
	13:00-15:00	工業 4.0 智慧製造研討會 / 模貝智能化生產單元	徠通科技股份有限公司	南港展覽館 1 館 402ab 會議室	張詠晴小姐 +886-4-23599688#226
	15:30-18:00	徠通科技全球代理商會議			
	14:00-15:00	2020 年日本國際工具機展覽會 JIMTOF 記者會	日本工作機械工業會	南港展覽館 1 館 404 會議室	+81-3-34343961
	14:30-16:30	智慧製造聯網數據加值產業聯盟會員大會	財團法人工業技術研究院 ITRI	南港展覽館 1 館 504a 會議室	陳玉雲小姐 +886-3-5916720
	15:00-16:00	臺灣機械工業同業公會與馬來西亞檳城機器廠商會簽訂合作協議	機械公會	南港展覽館 1 館 4 樓貴賓簡報室	林子鈞先生 +886-2-23494694
	15:00-17:30	台灣麗馳全球代理商大會暨新產品發表會	台灣麗馳科技股份有限公司	南港展覽館 1 館 401 會議室	莫金燕小姐 +886-4-26815711#246
	18:30	2019 年台北國際工具機展歡迎酒會暨工具機研究發展創新產品競賽頒獎典禮	工具機發展基金會・外貿協會・機械公會	南港展覽館 1 館 3 樓燴館宴會廳	蔡宜真小姐 +886-2-23110358
3 月 6 日 (星期三)	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	「2019 年台北國際工具機展」高中職、大專、大學、研究所導覽活動	機械公會	南港展覽館 1 館 500 會議室	黃雅華小姐 +886-2-23494672
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	9:00-16:00	TIMTOS 2019 高峰論壇	經濟部國際貿易局	台北國際會議中心 101 會議室	高麗茹小姐 +886-2-27255200#2679
	16:00-17:00	德國工藝 享譽國際 - 德國工具機產業發展新趨勢	外貿協會德經處	台北國際會議中心 101 會議室	鄭芳姿小姐 +886-2-7735-7524
	8:00-17:00	工業 4.0 與智慧機械技術應用趨勢研討會	台灣易格斯有限公司 遠播資訊股份有限公司	南港展覽館 1 館 505 會議室	孫桂芬小姐 +886-2-25855526#225
	9:00-11:00	永進機械代理商會議	永進機械工業股份有限公司	南港展覽館 1 館 401 會議室	陳家欣小姐 +886-4-25623211#1812
	10:30-12:00	選擇美國投資研討會 - 錢進美國教戰守則	美國在台協會商務組 臺灣機械工業同業公會	南港展覽館 1 館 501 會議室	+886-2-27201550#334
	13:00-17:00	新產品說明會	喬崴進科技股份有限公司	南港展覽館 1 館 502 會議室	黃悖密小姐 +886-4-22712000#231
	13:00-17:00	程泰集團年度產品發表會	程泰集團	南港展覽館 1 館 504a 會議室	江苡璉小姐 +886-4-24629698#62107
	13:30-16:30	礦物複合材料 (人造花崗石) 在機械領域的應用	山東納諾新材料科技有限公司	南港展覽館 1 館 404 會議室	崔美麗小姐 +86-531-88917773
	13:30-17:00	中國砂輪新產品發表會	中國砂輪企業股份有限公司	世貿一館第 2 會議室	王文仁先生 +886-2-26791931#3309
	8:00-17:00	直得科技新品說明會	直得科技股份有限公司	南港展覽館 1 館 3 樓福軒	李家慶先生 +886-6-5055858#162
	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	「2019 年台北國際工具機展」高中職、大專、大學、研究所導覽活動	機械公會	南港展覽館 1 館 500 會議室	黃雅華小姐 +886-2-23494672
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	13:30-17:00	2019 台北國際工具機展 GLORIA 智慧製造創新應用論壇	科技部・外貿協會・機械公會	南港展覽館 1 館 402ab 會議室	郭瑀璇小姐 886-2-25774249#827
	14:00-16:00	液壓系統節能技術與切削冷卻液之過濾處理	台灣賀德克技術有限公司 得霖企業有限公司	南港展覽館 1 館 502 會議室	楊雅淑小姐 +886-4-22602278
	14:00-16:00	研磨加工品質、效率的確保與提升	忠達貿易有限公司	南港展覽館 1 館 505b 會議室	張怡婷小姐 +886-2-29115226#607
3 月 7 日 (星期四)	8:00-17:00	直得科技新品說明會	直得科技股份有限公司	南港展覽館 1 館 3 樓福軒	李家慶先生 +886-6-5055858#162
	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	「2019 年台北國際工具機展」高中職、大專、大學、研究所導覽活動	機械公會	南港展覽館 1 館 500 會議室	黃雅華小姐 +886-2-23494672
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	13:30-17:00	2019 台北國際工具機展 GLORIA 智慧製造創新應用論壇	科技部・外貿協會・機械公會	南港展覽館 1 館 402ab 會議室	郭瑀璇小姐 +886-2-25774249#827
	14:00-16:00	液壓系統節能技術與切削冷卻液之過濾處理	台灣賀德克技術有限公司 得霖企業有限公司	南港展覽館 1 館 502 會議室	楊雅淑小姐 886-4-22602278
	14:00-16:00	研磨加工品質、效率的確保與提升	忠達貿易有限公司	南港展覽館 1 館 505b 會議室	張怡婷小姐 +886-2-29115226#607
3 月 8 日 (星期五)	8:00-17:00	直得科技新品說明會	直得科技股份有限公司	南港展覽館 1 館 3 樓福軒	李家慶先生 +886-6-5055858#162
	8:00-17:00	Bfuture 全球新品發布會	慶鴻機電工業股份有限公司	南港展覽館 1 館 402c 會議室	林盈函小姐 +886-4-23509188#527
	8:00-17:00	「2019 年台北國際工具機展」高中職、大專、大學、研究所導覽活動	機械公會	南港展覽館 1 館 500 會議室	黃雅華小姐 +886-2-23494672
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558
	9:30-18:00	智慧製造論壇	流線傳媒股份有限公司 外貿協會	世貿一館第 4、5 會議室	林淑靜小姐 +886-2-87715865#180
	9:30-14:00	迪普馬移動解決方案產品培訓研討會	迪普馬移動解決方案集團公司 羅昇企業股份有限公司	南港展覽館 1 館 502 會議室	吳容睿小姐 +886-2-29958400#1232
	10:00-17:00	中興大學與精密機械研究發展中心 智慧機械產學論壇技術成果發表會	國立中興大學 & 財團法人精密機械研究發展中心	南港展覽館 1 館 403 會議室	葉湘琳小姐 +886-4-22858139
	13:00-16:00	活用 3D 列印與 3D 量測科技，邁入 3D 智能檢測時代	馬路科技顧問股份有限公司	南港展覽館 1 館 404 會議室	林雨潔小姐 +886-2-2999-6788#284
3 月 9 日 (星期五)	8:00-17:00	「2019 年台北國際工具機展」高中職、大專、大學、研究所導覽活動	機械公會	南港展覽館 1 館 500 會議室	黃雅華小姐 +886-2-23494672
	8:00-17:00	發格控制器及光學尺產品介紹	發格自動化股份有限公司	南港展覽館 2 館 602 會議室	溫恕民先生 +886-4-23851558

如有修正，以現場實際狀況為準，不另通知。



德國機械市場雜誌編輯伊塔斯是第二次到臺灣採訪，上次是2008年，這次他看TIMTOS發現臺灣的工具機廠充滿活力，而且臺灣廠商很聰明，尤其一些高階產品的臺廠，技術上與德國差距已拉近到五年左右。伊塔斯熟知臺灣強項的軟體發展，也發現臺廠工具機在軟體的表現讓他也覺得很驚艷。

史帝芬·伊塔斯
Maschinen Markt Magazine · 德國
編輯



用Amazing!形容今年TIMTOS的柯林，這兩天已經把TIMTOS的影片放上網，因為他看到太多太好的產品。他分享拍到展場最大的一臺銼床銑床機，重達15噸。他說：「那真是驚人！」。而這次TIMTOS也讓他們收穫滿滿，因為陳列在所有場館的產品非常多樣化，下次TIMTOS他們想看更多積層製造機。

柯林·格芮菲斯
MTD CNC Network TV · 英國
發行人



荷許30年前就來看過兩年一次的TIMTOS，來臺灣買工具機已經有幾十年的經驗。這次他打算再多採購一些，因為今年TIMTOS 2019有很多更先進的機種展出，尤其是產業用機器人，也就是「機械手臂」，荷許非常有興趣，已在多家攤位探詢價格準備下單。

大衛·荷許
Dealan Machine Tools Ltd. · 以色列
總經理



諾阿各尤對謙虛有教養又積極的臺灣人非常欣賞，他發現臺灣中小企業對進入全球市場已經做好準備，尤其中華民國對外貿易發展協會和臺灣機械工業同業公會做了非常多的貢獻，像是舉辦TIMTOS就為臺灣所有企業創造與全球市場連結的大好機會。他已準備在TIMTOS買焊接機器人手臂、雷射切管機、CNC彎管機等設備。

元契皮晏·諾阿各尤
Biotechnik · 羅馬尼亞
技術總監



在印尼專做精密機械零組件的瑟托夫婦，已經是第六次來看TIMTOS。他們從1999年就用臺灣做的綜合加工機生產，因為發現與日本同等級機器比較，臺製產品價格比日本貨便宜兩到三成，所以每屆TIMTOS他們都一定不缺席。這次也準備下單，雖然還是要選最物超所值的產品，不過他們已經選定目標。

馬提那斯·馬里優諾·瑟托
PT. Nurindo Sukses Abadi · 印尼
企業主



代理臺灣三十家工具機廠在菲律賓銷售的莊翔樟，對臺灣工具機的最新狀況非常了解。他來看TIMTOS的目的不是買機器，因為他經常買，主要是因為可以一次在TIMTOS拜訪到所有他代理的製造商，同時也帶菲律賓的客戶來看。他說，雖然比類似產品價格貴三四成，可是臺灣機器品質好，利潤也比較好。

莊翔樟
Nicklaus Machinery Corporation · 菲律賓
業務工程師

TIMTOS首度推出AR體驗館，打造企業高科技形象

應用AR(Augmented Reality)擴增實境技術與使用者進行趣味互動，不僅增加活動豐富性，亦有助於讓參與者留下更深刻的記憶。前往2019年台北國際工具機展 (TIMTOS 2019)，你也可以體驗到工具機使用AR所呈現的樂趣。

科技日新月異發展，而VR/AR正是當今一股浪潮，許多企業都致力於將此方面的技術融入於生活中，從購物、教育、醫療、廣告、娛樂、工業開發、時尚到建築等領域，並已實際開始應用。

TIMTOS這次首度推出AR體驗館，讓成型機械結合AR擴增實境技術與應用，協助客戶從各種角度觀賞及

瞭解機器的構造，並展現前所未有的視覺效果。

展覽會場運用大螢幕和現場多位買主，同時分享AR互動的樂趣，提供客戶獨特的互動體驗，並協助工具機業者打造絕佳的品牌形象。只要掃描現場的品牌旗幟，即可於平板上秀出業者最新研發的機械設備模型，協助客戶用各種角度觀賞及了解機器的構造。

位於世貿一館入口處（攤位號：D0010）的AR體驗館將有包括一心、久大、千昌、申琦、申皓、立興、協易、尚富、拓城、金上源、金豐、厚銓、研恆、苙億、連傑、富偉、隆佑、道德、曄俊、鑫鑫等20家廠商展出，並提供汽機車鈑金、機器零配件、生活

用品、辦公家俱、各種箱櫃隔板，以及各式沖壓鍛件和鑄件的生產解決方案。

各廠商介紹時間，分別為每天11:00、14:00、16:00及17:00。■



2019 年台北國際工具機展 高峰論壇

時間：2019年3月5日(二) 09:00-17:00
地點：臺北國際會議中心101會議室 (臺北市信義區信義路五段1號)

主題一：智慧聯網	
時間	議程/講師
09:00-09:20	來賓報到
09:20-09:30	開場致詞 林芳苗 / 中華民國對外貿易發展協會副秘書長 柯拔希 / 臺灣機械工業同業公會理事長
09:30-10:10	【主題演講】How SAP helps Customers to Create Value with Industry 4.0 and Internet of Things in Discrete Industries Bernhard Meyer / SAP Global Solution Manager, Industry Business Unit, Industrial Machinery & Components (IM&C)
10:10-10:50	【主題演講】智能IoT智能機器管理平台 劉新正 / ITTS東捷資訊服務副總經理
10:50-11:30	【主題演講】從產學實踐台灣工業物聯網應用 覺文郁 / 虎尾科技大學校長
11:30-12:10	【主題演講】工業AI和工業互聯網未來趨勢分析 李傑 / 美國辛辛那提大學教授
12:10-12:30	【主題對談】未來製造工作型態 主持人：莊國欽 / 台灣區機械工業同業公會榮譽理事長 對談貴賓：所有主講人
主題二：積層製造	
時間	議程/講師
13:00-13:30	來賓報到
13:30-14:10	【主題演講】未來製造業的高端加工技術解決方案 Neun Harald / DMG MORI 營運長
14:10-14:50	【主題演講】The Evolution of Metal Additive Manufacturing: Leveraging the Machine Tool Infrastructure Pascal Pierra / Optomec 亞太區總監
14:50-15:20	【主題演講】增材智造實現快速生產 楊奇杰 / 馬路科技大中華區銷售經理
15:20-16:00	【主題對談】洞悉金屬3D列印未來發展 主持人：路怡珍 / 數位時代科技主播 對談貴賓：所有主講人
16:00-17:00	德國工藝享譽國際—德國工具機產業發展新趨勢

時間：2019年3月6日(三) 09:00-17:00
地點：臺北國際會議中心101會議室(臺北市信義區信義路五段1號)

主題三：航太智慧製造	
時間	議程/講師
09:00-9:20	來賓報到
09:20-10:00	【主題演講】駕馭高動態加工技術的開創性解決方案 Peter Topol / 海德漢資深產品經理
10:00-10:40	【主題演講】實現工業4.0—與西門子共創數位未來 Tino Hildebrand / 臺灣西門子副總經理
10:40-11:20	【主題演講】數位化協作與創新—啟動航太製造的工業復興! Rémi GERMAIN / 達梭系統全球策略聯盟副總裁
11:20-12:00	【主題演講】Advanced manufacturing technologies Cyrille SCHWOB / 空中巴士公司亞太區總監
12:00-12:30	【主題對談】變革中的製造業—預見未來五年 主持人：胡竹生 / 工研院機械與系統研究所所長 對談貴賓：所有主講人
主題四：汽車製造業變革	
時間	議程/講師
13:00-13:30	來賓報到
13:30-14:10	【主題演講】智慧製造全新局面來臨，工業機器人的創新技術及應用 鍾鴻鈿 / ABB區域經理- 服務銷售 (東南亞及台灣)
14:10-14:50	【主題演講】CNC Systems for Factory of the Future 陳俊隆 / 台灣博士力士樂股份有限公司工廠自動化協理
14:50-15:20	【主題演講】實現工業4.1 的智慧工廠自動化 鄭芳田 / 成功大學智慧製造研究中心講座教授兼主任
15:20-16:00	【主題對談】改革正在加速，我們準備好了嗎? 主持人：路怡珍 / 數位時代科技主播 對談貴賓：所有主講人
16:00-17:00	德國工藝享譽國際—德國工具機產業發展新趨勢

* 主辦單位保留議程變更及參加資格審核之權利
* 現場提供中英文口譯

活動嘉賓

Bernhard Meyer
SAP Global Solution
Manager, Industry Business
Unit, Industrial Machinery
& Components (IM&C)



Neun Harald
DMG MORI 營運長



Peter Topol
海德漢資深產品經理



胡竹生
工研院機械與系統研究所
所長



劉新正
ITTS東捷資訊服務
副總經理



Pascal Pierra
Optomec 亞太區總監



Tino Hildebrand
臺灣西門子副總經理



鍾鴻鈿
ABB區域經理- 服務銷售
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Rémi GERMAIN
達梭系統全球策略聯盟
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路怡珍
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Cyrille SCHWOB
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榮譽理事長



印度工業雷射器市場

隨著時代的變革，整個世界對印度的看法正在發生改變，印度有望成為繼中國之後的下一個製造業中心。因此，瞭解印度雷射器市場的發展狀況和來年的增長情況極為重要。

綜觀雷射器市場及其驅動力，雷射器市場主要由鈹金行業主導，而鈹金行業又由汽車和製造業推動。目前，雷射打標和雷射切割是印度雷射器行業的兩個主要市場，而雷射焊接、熔覆、硬化、微機械加工和表面處理技術則不足為道。

雷射切割

印度市場上的雷射切割機的數量正在迅速增長。根據與Sahajanand Laser Technology、Suresh Indu Pune、Laser Technology、Angel CAD CAM、Mehta CAD CAM、Sigma Mechatronics、ProLastec Pune等主要供應商討論的結果，2017年整個市場的機器數量為300-400臺。2018-2019年期間，雷射切割機的數量可能達到600-800臺。佔據市場半數以上的將是中國製造的高性價比機器，如HSG、DNE和Bodor等公司生產的低功率和高功率光纖雷射器，而其餘的市場份額將由當地集成商以及Trumpf、Amada、Bystronic、LVD、Prima Power和Mazak Optonics等國際公司佔據。

一個有趣的現象是，儘管雷射切割機在數量方面增長明顯，但如果從收入角度來看，其數字似乎並未以相同的速度增長。Sahajanand Laser Technology公司的Maulik Patel也對此表示贊同。因此，這是否是印度雷射器市場的實際增長情況還有待商榷。

雷射器市場增長的原因是機器價格的降低，且機器價格將繼續下降。這一趨勢可能持續數年，直到市場在某個價格點穩定下來。

未來展望

未來幾年，雷射切割可能將繼續統領雷射器市場（以1-1.5kW為基準機器，輔以其他更高功率的機器）。但是，從長遠來看，其他領域也可能有助於其增長。例如，印度政府推出“印度製造”計畫的主要目的是建立當地的國防和航空航太等製造業，而且目前已有世界領先的公司和TATA、Reliance、L&T和Mahindra等印度公司共同成立了合資企業。該領域將帶來切割、焊接、熔覆、微機械加工和噴丸強化應用等雷射系統需求，而醫療、包裝和其他領域也有相應的雷射應用需求。

高功率雷射器市場（>2-3kW）也

將實現增長，它們主要用於切割、焊接、熔覆和熱處理。高功率雷射焊接將隨著汽車和其他領域的擴張而增長，而常用於模具修復和電池焊接等不同領域的低功率脈衝YAG/光纖雷射焊接系統將隨著製造業的回升而不斷增長。

表面處理（熔覆和熱處理）市場是一個由Laserline主導的穩定市場。該市場並沒有如預期那般增長，因為等離子轉移弧堆焊（PTA）等傳

統塗層方法對於大多數應用來說是更低價的成熟技術。如果該市場想要繼續增長，那麼這些公司就需要通過特定的應用來向最終用戶證明並展示其優勢，因為這些使用者需要瞭解雷射器，並從長遠看如何通過比PTA更低的成本受益。

未來幾年的另一個驅動因素是增材製造、3D列印和混合製造，它們將充分利用雷射器展開所有工業領域的生

產，包括汽車、航空航太、醫療、珠寶和模具行業。

雷射器在科研領域的增長將保持穩定，因為新的印度理工學院、奈米中心和卓越中心正在建立，而且奈米、太陽能、生物光電等新技術得到了政府的資金支持。同時還有由私人合夥公司為整個專案成本提供部分資金，以便進行以結果為導向的研究。■

來源：《國際工業激光商情》



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人們普遍認為，將AI集成到AV（數位音視頻）中很有必要但卻極具挑戰性。唯一的希望是將來開發人員不必編寫代碼來描述車輛應如何應對每一個可能的情況，而最終由AI系統通過感測器資料和演算法來自行做出有關每個駕駛操作的決定。但是，想讓AI像人類一樣工作還需要很長的時間。

“我們很難進行AV程式設計來讓它應對開放世界中遇到的大量情況。”博世認知系統工程總監Lothar Baum博士說，“人類面臨著同樣的問題，但我們不能僅根據明確的規則——傳統的軟體程式要素來解決問題。直覺無法被編入系統。”

學習曲線

麥肯錫汽車合夥人Kersten Heineke也對AV應對駕駛可能遇到的各種狀況的能力持謹慎態度。“AV的問題終歸能夠解決。”他說，“但是，汽車必須能夠處理的情況一開始就受到汽車操作區域的限制，例如，排除複雜的十字交叉路口的情况。駕駛操作可能會在夜間或惡

劣天氣中暫停。汽車將不斷學習如何應對新的邊界情況，如此我們才能逐漸接近車輛能夠處理各種情況的狀態。”

體驗式學習

機器學習可通過程式訓練來進行演繹，因此被許多人視為開發出接近人類反應系統的前進方向。舉例來說，大眾汽車公司稱其將數千張圖像加入了圖像識別演算法，因此系統能夠學會區分道路使用者。

“深度學習和AI從根本上來說並不新鮮。”博世的Baum博士說，“所改變的只是網路的複雜性，因此我們在很多層面都可以有更好的性能，特別是比人眼更強的視覺能力。”

人類特性

許多AI開發專注於提高處理能力來提升深度學習的能力，有些則專注於更接近人類的特性。例如，從麻省理工學院衍生的一家新創公司iSee正在研究一個基於瞭解人類如何以及為何做出影響他們駕駛方式決



策的解決方案。“瞭解人類在駕駛時如何反應並將其用於AI進行自動駕駛將為開發過程提供一個重要的缺失環節。”iSee的創始人之一Josh Tenenbaum說道。

與此同時，日產一直在研究如何正確地利用來自人類駕駛員大腦的訊號來說明車輛的自動和手動系統學習駕駛員的駕駛方式。

能力和資料

所有AI開發人員面臨的一個挑戰是如何提供運行複雜演算法並處理海量感測器資料所需的計算能力。麥肯錫公司的Heineke認為在AI取得進展之前必須先解決這一問題。“車載計算能力要求很高，不僅昂貴而且耗能，尤其是當我們進入城市所需要的電子AV

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時代時。”

Heineke還認為，AV應分享它們的資料來改善其效果。“AV有海量的資料，大部分數據只有在車輛停靠進行日常充電時才會傳輸。”他說，“只有有關邊界情況和特定應用情況（如具體的交通情況）的資料才會即時共用。”

愛立信創新部門主管Stefan Myhrberg也指出了V2X在降低AI資料需求方面的作用。“我們創建了一個生態系統來支援我們目前在瑞典斯德哥爾摩的自動駕駛公車試驗。”他說，“我們選擇該地區是看中其5G訊號，它能使車輛與物聯網一起工作。如果要擴展路線範圍，我們將需要更多的感測器，而這需要更強大的計算能力。

測試挑戰

AI開發人員面臨的挑戰之一是必須清除AV測試的監管障礙。愛立信在2018年初開始試驗時，最難的環節就是獲得許可。“首先，監管當局不會將自動駕駛公車視為車輛，因為它們沒有方向盤和後視鏡。”Myhrberg說，“每輛車上都有一名操作人員以防發生安全問題，但他們更大的作用其實是照顧這12名乘客。”

雖然瑞典交通局最後找到了可行的方案，但這對全球大多數AV試驗來說都是個挑戰。此外還有AI立法的問

題。TÜV南德意志集團正與DFKI合作開發自動駕駛AI系統的開放式驗證和認證平臺。

雙神經網路

專家是否認為AI可以通過減少需要測試的場景數量來縮短開發新AV所需的時間？博世的Baum博士建議謹慎行事：“AI可以減少AV測試所需的工作量，但人力投入也有必要，因為與標準測試程式相比，AI無法始終提供一致的結果。”

他說，“攝像頭檢測到的一個小小的變化可能會徹底改變AI的反應或蒙蔽神經網路，而人類卻不會被這種方式所蒙蔽。人們無法理解為什麼人工神經網路會對人類過濾掉的東西做出反應。這就是為什麼我們要使用雙神經網路的原因，雙神經網路由其中一個神經網路識別並解釋另一個神經網路看到並做出反應的原因。此外，我們必須要記住，還有許多人喜歡自己開車，因此人類在測試和開發方面的知識和技能仍然至關重要。駕駛方式將會改變，但人類不會被取代。”

矽谷VS OEM製造商？

隨著AI在主流車輛設計中成為主導力量，科技公司是否將取代現有的汽車

製造商？這是一個關乎數十億美元的問題，因為蘋果、谷歌（Waymo）和特斯拉等公司的目標是通過全自動駕駛的車型來擊敗傳統汽車製造商。

事實並非像選擇題一樣明確，因為科技公司並沒有基礎設施來製造和分配車輛。從汽車製造商的角度來看，開發AI和其他技術需要大量投入。因此，雙方合作進行開發是順其自然的事情。最近，福特承諾向Argo AI投資10億美元來推動其對該技術的開發。他們的目標是在2021年之前推出4級自動駕駛車型。這種合作的另一個例子是大眾汽車、優步和英偉達合資企業，他們實現了車輛製造商、用戶和AI供應商的結合。

學習機會

機器學習和AI開發於2018年6月5-7日在德國斯圖加特舉行的自動駕駛汽車軟體研討會上進行了深入討論。

30多位專家演講嘉賓——包括富豪汽車、英偉達、IBM、Linux基金會、西門子PLM軟體和Autosar Development Partnership等公司的代表分享了他們的專業知識。此外還有全天的研討會。該活動與自動駕駛車輛技術展、自動駕駛汽車測試與開發研討會以及自動駕駛車輛內飾設計和技術研討會同地舉行。

減輕測試負擔

在AI的開發過程中需要證明系統可以處理所有情況。rFpro技術總監Chris Hoyle表示，類比對於實現這一目標至關重要。“真實測試具有巨大的挑戰。”他說，“你如何讓你的AV經歷百年難遇的場景？你如何重複這一過程？你如何安全地進行測試？”

rFpro的類比測試解決方案基於真實模型，專為克服這些挑戰並減少測試和驗證的時間和成本而設計。“模擬可確保您的車輛每隔幾秒就經歷一次千年難遇的事件。”Hoyle說，“它能夠完全控制車輛、場景和所有環境變數，提供可靠、可重複的測試。”

類比還可為AI系統的監督學習創建訓練資料。“手動標記的真實資料用起來非常緩慢，不僅容易出錯而且價格昂貴，每一幀影片通常需要30分鐘來注釋。”Hoyle說，“類比訓練資料無需人力即可生成，沒有錯誤並且即時可用。真實的培訓資料是必需的，但最近的研究表明，高達50%的培訓資料可通過類比環境獲得，從而節省大量資金。”

Hoyle還認為，在模擬測試中加入大量人類測試駕駛員可進一步節省成本。“這使汽車製造商能夠在將乘客和行人置於危險境地但不会有受傷風險的複雜的真實場景中進行AV測試。”他說。■

來源：《國際汽車設計及製造》

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大井：泵浦之王，陪伴工業與家庭半世紀的發展



本刊在TIMTOS開展前，前往位於臺灣最北端海岸線三芝的大井泵浦。大井創立於1967年，在水泵領域以家庭用泵浦起家。創立之初，大井泵浦主要供應臺灣國內市場。並在1990年代開始強化國際標準品係系統認證，加速拓展外銷的力道。同時於1993年開始應用於工業領域，也是臺灣本土第一家開始生產工業泵的生產商，改善臺灣工業用大型的泵浦依賴國外進口，彌補外國廠商在服務與維修上的缺陷。近年來大井大規模的建立大井新一代的創新形象，大井WALRUS黃色大海象的LOGO已經深深的烙印在很多人的腦海，讓超

過半世紀的老字號逐漸發揮更深的品牌力，讓大家重新認識大井這個陌生的老朋友。

嚴格規範 把關每一顆泵浦品質

身為泵業的龍頭，大井對於品質秉持著高標準要求，他們積極的取得國際上的認證，包含IE 規範，確保馬達符合節能標準並適合歐美與全球市場。此外，大井也是臺灣第一家設立的馬達動力實驗室與水泵實驗室的水泵製造商。對於自製的馬達以及泵浦，大井以國際

TAF、ILAC、TÜV認證的實驗室測試，同時進行噪音測試，以最嚴格的標準檢視泵浦的運行，提升泵浦的使用壽命。大井也是許多獎項的贏家，例如台灣精品獎、玉山獎、高效節能獎.....

大井目前除了將產品使用壽命提升之議題持續努力外，在TIMTOS 2019將展出40bar以上高壓TPRK_HSIC系列泵浦，因應設備廠自動化需求，TPRK_HSIC系列泵浦搭配變頻器驅動，與控制系統介面連續，可於不同環境應用，設定不同段位水壓，供設備加工使用。

未來大井將針對無人工廠趨勢發展高度自動智慧產品

大井泵浦長期為機械設備廠提供專業服務，協助客戶於泵浦選擇規劃，朝效率、節能、精簡及控制成本，希望讓好的產品放在對的位置。切削液泵浦於機械設備內，所佔成本比例相對較低，故針對工業4.0智慧製造，往往因成本考量，產品智慧化後，卻損失了產品於市場上的價格競爭力，但大井Walrus泵浦產品持續精進的腳步不會停歇，目前產業設備應用一直改變，大井期望未來可以做到：第一、智慧產品應用，協助客戶提供專業選用，並進行改善及延長產品使用壽命，讓使用上可安心無虞的迎接自動化無人工廠。第二、針對特定客戶應用環境，進行客製化設計。第三、特定高階泵浦，延伸智慧設計，使

泵浦運轉的過程讓機械設備訊息連結溝通。如此一來便提供有效的數據分析，供客戶端不同的加工需求，並且提醒機械設備需檢驗之項目。最後、透過大井水泵及動力實驗室，進行泵浦測試及驗證，並改善水機及電機效能，製作符合節能效果的產品。

幫助客戶進行泵浦知識的培訓，以宣導理念為主軸

大井除了精進自己的產品線之外，也希望強化使用者對泵浦選用的知識。目前機械業往少量多樣的需求發展，泵浦的選擇也必須隨之改變，提供適當的用水條件，讓泵浦可以用在對的位置。因此大井非常重視客戶的教育訓練，傳達泵浦理論。外銷市場，會持續耕耘表現強勁的東南亞與美洲市場、並在歐洲力推競爭力高的HQ高端系列。

今年來到TIMTOS 2019，期望增加南港2館後也吸引更多外國買家。雖然2018年下半年大環境不佳，但長期耕耘客戶有成，讓這些年持續有一定幅度的成長，展望2019年，新產品持續導入，仍有成長空間。

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迅捷整合科技：7軸放電加工機的新視野自動搖動頭自動換刀

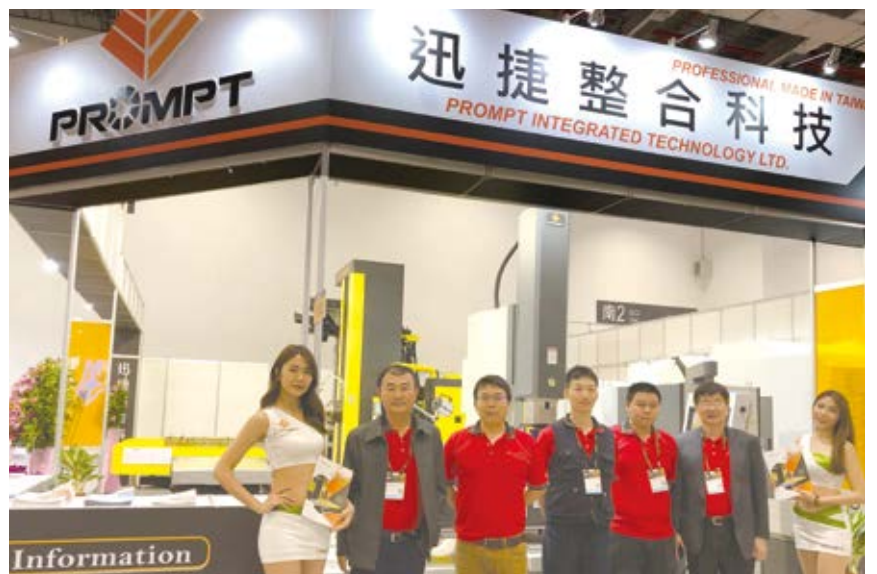
——家年輕、充滿活力和專業的工具機製造商——迅捷攜其新產品7軸放電加工機亮相今年的TIMTOS。該7軸放電加工機是應歐洲客戶要求花了一年時間開發出來的，其擁有雙向rotary table、BC軸，可自動搖動頭、自動換刀，是臺灣首家可以達到該水平的產品。

7軸放電加工機主軸不採用後拉式配重塊，搭配1KW伺服馬達及雙邊六塊滑塊結構設計，使主軸在做斜度加工時，定位精度（不偏擺）及提升滾珠導螺杆使用壽命。其六軸可程式控制，XYZ+ABC（可替換為XYZ+ABW或

XYZ+ACW），W軸機頭傾斜可做±60°傾斜加工，擁有工業級電腦（IPC），在任何加工狀況，都能表現最穩定狀態。此外，該系統採用windows CE控制器，以對話式視窗來呈現且搭配3D立體動態圖示描述功能，15吋彩色液晶觸控螢幕可以讓客戶操作起來更輕鬆便捷，更具有專門的維修畫面來加快維修速度。

該產品控制面板、EDM以及控制器都是自製的，7軸控制器加動畫系統容易上手，3D操作界面也是自行研發，更為人性化和容易理解。該機三軸均採用數字尺回授的全閉環回路設計，因此可以使定位精度及ORBIT-CUT加工精度及效率大幅提升，並且採用光學尺Close-Loop位置控制，精度高。其對話式程式可提供各種擴孔模式，可依材質、面積、加工深度、單側間隙、最終電流、電極磨耗等設定自動編輯。CNC機型，同樣具有傳統式等能量釋放功能，加工穩定快速，電極消耗小，表面精度均勻。

迅捷在軟體和硬體兩方面都有嚴格



的質量控制——從鑄造模具設計到工藝，鈹金設計到電纜佈線，從參數調整到工件性能測試，以期能實現最大的工作效率。迅捷近年來快速擴展工具機在海外銷售的版圖，印度銷售辦公室成立，銷售網絡已拓展到約30多個國家。

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合濟工業：生產高品質、智慧化帶鋸機



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依託最優良的研發與工程團隊，近5年來，合濟優異產品每年均榮獲台灣

精品獎。展望未來，作為全世界知名的鋸床製造廠商，合濟將以其科學化、電腦化、制度化的原則追求最高品質、最佳效率，服務全球客戶。

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合濟的重型切削帶鋸機以市場上最高標準建造，機器的高切削性能始終是客戶的首選。本屆TIMTOS展上，合濟重點展出了帶鋸機H-360HB和智慧化帶鋸機E-830。

H-360HB全自動雙柱式帶鋸機結合了重型結構，更耐用。結合複合材料切削，鋸輪設計能夠切割最大360mm，始終為客戶提供良好的鋸切性能。H-360HB型號是中小型帶鋸機市場上最好的帶鋸機之一。

智慧化帶鋸機 E-830具有切削快速、操作簡易安全、材料損失小、動力消耗低、省能源、鋸帶壽命長與維護成本低等優點，可廣泛適用於許多不同材料與各種形狀、大小尺寸工件的鋸切加工。此機種優點為鋸切速度快且穩定，可得到高生產效率、高精度、不需毛邊去除製程的工件。

近年來合濟依循工業4.0的目標不斷研發，在系統上增加了I TECH System，內含大數據資料庫及機連網的功能，能利用機臺內部資料庫將鋸切資料收集後上傳到後臺，做機臺驅動率及空轉偏移值的計算，讓使用者能更快速的瞭解機台狀況；而目前最新導入QR CODE管理系統，讓管理者能更精確的掌握機台使用記錄，QR CODE管理操作工及工件資料，實際記錄使用者及工作工件資料，藉以能有效管理進而提升效率。



智能化帶鋸機E-830



帶鋸機H-360HB

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參展商採訪

嘉剛：與客戶共用專業技術

此次展覽，嘉剛帶來了自行研發、自行生產的油壓夾具缸，該產品主要使用者為精密零件的加工廠商，例如高雄光陽工業、桃園長榮航宇、桃園六和機械，或是與使用者配合的機械產業，例如台中精機、永進工業、油機工業、高峰工業等等。

自成立以來，嘉剛一直立足亞洲，致力成為油壓治具缸界的龍頭，據嘉剛總經理/CEO邱魏俊愷先生介紹說，嘉剛的客戶主要分為兩類：第一類是“使用者”，這部分客戶會從機械設備廠商那裡採購模具、夾具和工具機，但對於設備的操作比較陌生；第二類是“機械廠商”，是提供上述使用者機械設備的廠商，“對於前者，我們會提供相關的技術服務建議，例如我們在例如我們台中使用者，經過我司的技術指導後，模具的使用壽命比之前提高了5%；我們有一個嘉義客戶是機械廠商，因為我司產品的性能佳，進而提高了加工精度和效率，更讓他們的夾具受到終端客戶的青睞，夾具市場大開，拓展到東南亞地區。”

在第四次工業革命興起的自動化和無人工廠的浪潮中，嘉剛也緊隨潮流，開發

了一系列產品新功能，例如氣密檢支的功能能夠利用氣壓平衡，來確保夾具中的油壓缸確實的夾緊或放開工件，並搭配機械手臂，達成無人化工廠的服務。

面向未來，嘉剛也在積極拓展海外市場，2015年於洛杉磯附近的Brea城市成立美國分公司Clamptek USA, INC.，設有專業的銷售團隊以及佔地3,800平方米的倉庫。除了提供專業意見與親切服務，出貨速度也得到了極大地提高。嘉剛於2016年成立臺北辦事處－皇剛國際股份有限公司，結合銷售與倉儲、備有庫存。短短兩年內，業績翻倍成長。嘉剛以高品質、高CP質的優勢，在臺灣市場逐漸嶄露頭角。

在採訪的最後，邱總不無自豪地說：“我司發展的是兩大共用，第一為與客戶共用，讓客戶以合理的價格買到更大的服務，第二為與員工共用，隨著公司的成長，讓員工可以得到更好的待遇和福利。”

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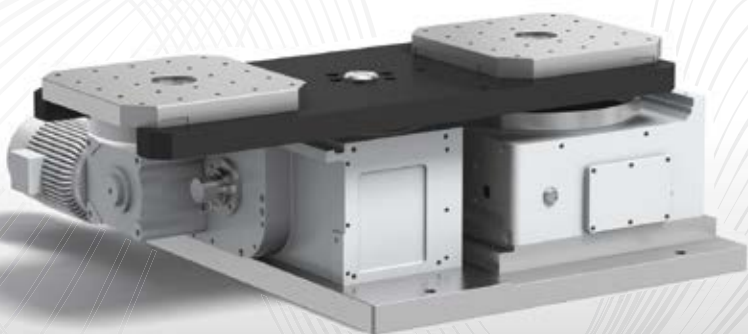


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產品報導

冠狀型聯軸器

型號：TY系列
功能：鋼鐵、造紙、電纜及一般橡膠、重機器馬力負荷大的工廠。

特色：
1. 是一種撓性冠狀齒形經由精密切削而成壓力角20度的短齒且齒端有圓滑的倒角可容許較大的軸與軸間偏差及傳動極大的負荷。



2. 齒面是經過特殊的硬化處理有極大的強度及耐磨性，能夠承受高度負荷及高速回轉的軸與軸的連接。

3. 為一種密閉式的聯結器，潤滑簡便、可使齒面經常保持適當的油膜防止灰塵進入或產漏油，延長聯結器的壽命。

4. 素材經粗加工後必須調質熱處理，使工作物內部組織較緊密增強韌性，整個工作物製作完後，再經珠擊以消除其應力。

天益齒輪股份有限公司

電話：+886-3-5970-206

傳真：+886-3-5970-210

郵箱：tien0206@ms15.hinet.net

網址：www.tienyigear.com.tw

攤位號碼：G0231

伺服平臺上升式拉床

型號：CHU Series
功能：機台線用於拉削生產，適合大量加工，複雜齒型可在一次拉削中完成，大幅縮短加工時間。

特色：由成祐精機新開發的伺服上升式拉床CHU系列，驅動方式由伺服馬達搭配滾珠螺桿，切削速度穩定，震動小。相較於傳統油壓式拉床，刀具壽命能增加20%，省電達40%以上。透過智慧化人機式觸控介面使操作更簡單方便，並能提供機台訊息判讀。機台切削速度及機台行程也能透過人機畫面輸入設定。更換刀具時能透過自動退刀及自動上刀程式，更換拉刀方便快捷且更安全。CHU系列拉床無液壓循環油更為環保。操作員站立於地面操作機台，不須挖坑、爬樓梯，生產效率提高、整合自動化方便，全罩式安全板金為一體式板金，線路無外露，外觀前衛，符合CE安全規範，操作環境乾淨。CHU系列以使用者立場研發設計，相信會為客戶帶來更大的競爭力。

成祐精機股份有限公司

電話：+886-49-2511-395

傳真：+886-49-2512-970

郵箱：info@axisco.com.tw

網址：www.twaxisco.com

攤位號碼：L1230



捨棄式定點鑽90度

型號：13系列
功能：
1. 零偏心的靜點設計，靜點準，可減少絲攻的損耗及斷裂。

2. 特殊鎢鋼材質C350，有效提高刀尖強度，下刀速度快，刀尖不易崩裂。加工速度提高300% - 1000%。

3. 可當倒角使用，有效刀數兩刃，效率加倍。

特色：
1. 幾近零偏心設計，中心準度可達±0.008mm。

2. 刀點準確不易偏擺，特殊刀片材質C350幾何斷屑角度尖點不易崩裂，有效倒角刀數為兩刃，加工效率加倍。

3. 多功能使用：定點、倒(邊)角、V型溝、刻字。

益壯企業有限公司

電話：+886-2-8521-3035

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網址：www.cut-tools.com.tw

攤位號碼：A0424



下拉式高速沖床

型號：BT-10
功能：
1. LED導線架二次加工
2. 印刷材裁切
3. 軟性電路板沖壓
4. 非金屬材料沖壓

特色：
1. BT-10 機身採用高級鑄鐵且經過長時間時效處理，以消除內部應力集中，確保結構之鋼性及穩定性。
2. 加工物的油脂附著徹底排除，使該機構得以適應非金屬加工。

3. 整部沖床人性化設計，該電子監控系統能自動修正煞車角度並能自我診斷機械異常狀況。

立葉機械有限公司

電話：+886-2-2207-1818

傳真：+886-2-2207-1919

郵箱：toddchen@liye-presses.com

網址：www.liye-presses.com

攤位號碼：D0618



傾倒式畚鬥台車

功能：
1. CNC車床加工業(選配洩油桶,用於盛油或清鐵屑倒廢料)。
2. 食品加工業(可選配食品級不銹鋼門(全機不銹鋼接受訂製),可倒麵粉,糖,原料物等...)。

3. 電子業(可倒廢棄的玻璃碎屑)。
4. 塑膠業(可倒塑膠酯粒、瓶胚)。
5. 加工業(可倒螺絲、工件)等...。

特色：



1. 有效提升搬運效率，載重有150kgs. 200kgs./250kgs.可選。

2. 安全踏舉設計亦有電動款系列可選擇

3. 力大順手，省力的得意助手
4. 標準配備有洩油閥與油剷分離蒐集槽。

5. 附安全煞車踏柄穩固機身確保使用者安全。

6. 子母車款-HTR25可於任意角度傾倒，最高傾倒高度為1591mm。

7. 獨家安心設計雙核心：搭配安全防爆閥及安全過載保護裝置。

立善科技有限公司

電話：+886-4-2326-5256

傳真：+886-4-2527-5352

郵箱：accuplus88@gmail.com

攤位號碼：S0316

複合式多功能量測儀

功能：可2D/3D量測，具備雙主軸交換使用，無干涉阻礙，可真正達到2D/3D量測的完全發揮，目前市面上少數具有此機型的開發，對於運用高複雜性量測相當適用。

特色：完全發揮2D/3D真正無干擾量測，全機採花崗石製作，保有高精度結構，提升高精度量測需求，複合式測頭，可同時解決多功能複雜量測使用，避免更換量測機，所造成的累積誤差。

全閱精密科技股份有限公司

電話：+886-2-8990-1658

傳真：+886-2-8990-2188

郵箱：company.top@msa.hinet.net

攤位號碼：P0234



MC定壓式倍力虎鉗(特大開口)

功能：
1. 夾持力可以預先設定，將六角板手插入定壓裝置之缺口，調整至所需要之夾持力刻度，即可重複使用相同的夾持力。

2. Direct1刻度是螺桿夾持的力量，沒有切換成倍力增壓系統，適合夾持材質比較軟的工件如鋁或銅等。

特色：
1. 定壓裝置，夾持力可以預先設定，重複使用相同的夾持力。
2. 虎鉗本台採用球狀石墨化鑄鐵FCD-60材質。

3. 虎鉗滑動面均經硬化熱處理HRC45°，堅固耐用確保精度。



4. 虎鉗本體的高度與導正鍵槽皆做定管制，可以2.3.4台一起使用。

5. 虎鉗本體長度超短，開口超大，適合各式銑床、中心加工機使用。

6. 虎鉗可側立使用。

7. 最新開發，內開口最大805mm，外開口1000mm。

吉益精密有限公司

電話：+886-4-2523-2817

傳真：+886-4-2515-1230

郵箱：liu0930@ms58.hinet.net

攤位號碼：S0708

中心出水系統

功能：用於工具母機加工，高壓沖洗、排屑。

特色：
1. 改善機械精度
2. 提高刀具壽命
3. 降低加工成本
4. 高加工效率

油聖液壓科技有限公司

電話：+886-4-2333-2339

傳真：+886-4-2333-3817

郵箱：twa529@yeoshe.com.tw

攤位號碼：R0226



減速齒輪箱DH經濟型

功能：可搭配各種廠牌的伺服馬達、無刷馬達、步進馬達，降低轉速，提高轉矩。

特色：價格實惠，通用於一般機械傳動機構。

品宏科技有限公司

電話：+886-2-2978-7348

傳真：+886-2-2976-2099

郵箱：pinhong.co@msa.hinet.net

攤位號碼：S1232



工業機器人

功能：應用搬運、碼垛、沖壓搬運、裝料、壓鑄、組裝、去毛刺

特色：
1. 動作範圍大，動態響應快
2. 結構紮實，負載能力強
3. 採用總線結構，擴展方便

勤堃機械(股)份公司

電話：+886-4-2339-8694

傳真：+886-4-2333-9230

郵箱：info@evermore-tools.com

攤位號碼：P0927



油霧回收機

功能：可除去車床、銑床、CNC加工過程中產生之油霧與煙霧，淨化加工環境並符合安全排放標準

特色：

- 1. 低震動、低噪音不影響CNC機台運作
- 2. 獨創警示功能智慧濾材飽和警示燈
- 3. 機械美學設計導入直立式設計，加長馬達運作的壽命
- 4. 高效能過濾回油率99%，濾網有效攔截5μm的懸浮微粒
- 5. 獨創特殊3D渦輪葉片，小功率、大風量。僅需1/2 馬力，即可達到其他同業之1馬力之抽氣量，相對節能省電。噪音值業界最低，運行時平穩安靜。濾心可清洗，免工具即可拆裝，效能與性價比，業界第一

瑞亞精密股份有限公司

電話：+886-4-2535-9633

傳真：+886-4-2535-9522

郵箱：service@rwwa.com.tw

攤位號碼：S0009



MPC位置控制器



功能：MPC位置控制器主要用於行程監控，控制器內可設定三組位置控制定位，有效解決多組近接開關調整定位的不便，滿足多點定位與全程監控的需求，使用位置控制器不需額外購買昂貴的類比卡，有效降低成本，此外，MPC可與PLC程式相容，節省開發時間，滿足主軸、夾頭及行程定位的應用需求。

特色：

- 1. 行程監控、彈性控制，滿足主軸、夾頭、行程定位應用
- 2. 與PLC程式相容，節省開發時間
- 3. 距離單位mm，直覺反應方便使用
- 4. 具外部Teach-in設定功能
- 5. 支援PNP, NPN設定

迦南通信工業股份有限公司

電話：+886-2-2508-2331

傳真：+886-2-2508-4744

郵箱：info@canaan-elec.com.tw

攤位號碼：P0129

CNC六角刀塔鑽床

功能：

- 1. 自動換刀鑽孔
- 2. 機械原點復歸設定
- 3. 控制主軸有正逆轉和停止的操作
- 4. 自動冷卻系統：防濺板設計
- 5. 使用RS232C軟體做程式存、取、讀

特色：興農工業除了致力於專業的技術，同時也重視用戶端操作的流暢度。CNC 六角刀塔鑽床的十字工作臺能輕易於加工機械上作精密定位，方便使用者能加快工作效能。為了零件製造過程管理，利用NC程式將刀具類型做分析：刀具直徑、轉數、切削深度、攻牙間距、切削速度，和其他參數整合。在刀塔的設計上，每次主軸順時針切換時會自動的移動到鑽孔的中心線，使加工零件達到準確且一致性。尤其適合傳動產業、航空工業等孔加工作業。

興農工業股份有限公司

電話：+886-5-2323-482/2132-082

傳真：+886-5-2328-570

郵箱：service@snico.com.tw

攤位號碼：P1302



立式綜合加工中心機

功能：高速高精度，切削加工穩定性佳，提供最佳性價比。內部加工區域寬敞，具高效率切削能力及強力沖屑系統，特別適合模具及刀具製造、各種醫療產品及汽車零組件生產製造等產業。

特色：強化的機體結構設計，優秀的操作性與維護性的設計，三軸配置精密滾柱型線軌，具備穩定的傳動系統，高效率的主軸部件設計，加上X/Y軸特殊防屑設計，達到高效能切削加工，展現令人滿意的加工成果。對於機台品質細節的要求，完全客戶導向的設計精神，兼顧性能與成本考量，充分滿足客戶不同需求。輕量化及高剛性特性，融合速度與穩定性，適用於製作生產醫療、汽車零組件、模具、以及刀具等等產品，是非常具有經濟效益的立式綜合加工中心機。

震澤精密機械股份有限公司

電話：+886-4-2569-0150轉16

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產品報導

水車式伺服展刀主軸頭

功能：展刀主軸頭產品適用於圓孔內/外加工，車銼，車牙，搪溝槽，錐形，凹面或凸面等圓球面加工。

特色：水車式伺服展刀主軸頭為翰坤五金機械有限公司所研發最新產品之一，此產品經由伺服馬達控制展刀行程與主軸進給，而主軸轉速可搭配一般三相馬達或伺服馬達控制。主軸鼻端精度在0.002mm內，展刀重複定位精度在0.01mm以內。展刀行程是由C5等級滾珠螺桿與線性滑軌來傳動拉桿控制。此產品已獲得台灣精品獎正式頒發肯定，是精密專用機械設計最佳自動化工具。

翰坤五金機械有限公司

電話：+886-4-2486-0602

傳真：+886-4-2486-0605

郵箱：hann.kuen-1@hardy.com.tw

攤位號碼：S0924



直結式主軸



功能：直結式透過聯軸器將馬達與主軸聯結，轉速可較皮帶傳動式主軸高。

特色：

- 轉動件全件研磨，徹底免除內外徑不同心所造成之不平衡問題。
- 專利之前端迷宮環設計，完全阻絕切削液進入主軸軸承之機會。
- 拉桿、打刀環與主軸為硬支撐設計，保證拉桿在高速旋轉時，仍保持與主軸同心，避免動平衡變化。

禦成工業有限公司

電話：+886-4-2338-9289

傳真：+886-4-2338-9281

郵箱：yuchenghus2@gmail.com

攤位號碼：Q0932

抵抗式電動黃油注油機

功能：此機型為PLC控制，可搭配「CV型單一循環分配器」，能讓每個潤滑點有固定且精準的潤滑油量。適用黃油黏度NLGI000~0。可安裝於橡塑膠機、沖床、木工機、熱處理機等。

特色：

- 可加裝壓力開關，檢查管路有無破損，確保每個潤滑點皆有潤滑油。
- 無油時會自動發出訊號通知補油。
- 馬達溫控安全裝置。當馬達溫升達100℃，將自動暫時停機5分鐘，確保馬達不過熱。

彰化振榮油機股份有限公司

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砲鑽-CNC-數控BTA大孔徑砲鑽深孔加工機

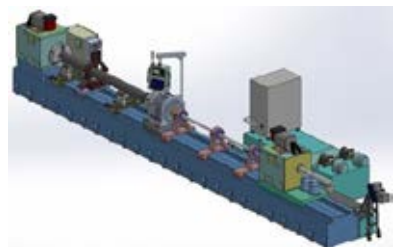
功能：

- 深孔加工能力：孔徑30-150mm，鑽孔鑽深度~1000mm
- 加購實心深孔鑽之砲鑽刀頭及搪孔刀頭，確保內孔徑之光潔度及直度
- 手動強力三爪夾頭或四爪夾頭，固定鎖緊固定工件，工件及刀具旋轉系統，確保孔徑精度
- 強力鎖緊夾頭：25"三爪夾頭，或20"四爪夾頭，輔以另製手動治具，適不規則工件

5. 數控NC-Mitsubishi 控制器，絕對值操作，加購全罩式護罩，自動化深孔加工，節省人力

特色：

- 標準配備：機台自動潤滑系統，數控油壓切削單元，油冷機冷卻系統，電氣箱恆溫控制
- 切削油桶2000 liter上及強力切削油壓幫浦，確保大孔徑深孔鑽加工能力及速度
- 雙重過濾自動排屑系統：適各類鐵屑之排屑機及細屑過濾紙帶過濾機。確保機台正常運轉
- C3級HIWIN滾珠螺桿，搭配高效率伺服主軸頭深孔加工穩定傳動
- 米漢娜鑄體加強鋼構設計，確保機台品質於惡劣環境下正常運轉及機台使用壽命長



超易興業股份有限公司

超奕鑫實業有限公司

電話：+886-4-2520-8152

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郵箱：pioneer.yi@msa.hinet.net

攤位號碼：K0010 / G0464

IFC工業4.0輔助控制平臺

功能：

- 內建各種實用APP
- 透過EtherCAT輕鬆連結多種周邊裝置：伺服驅動器、傳感器等
- 可連結雲端WebAccess進行遠端監控、設備健診、大數據分析...等多項功能

特色：

可與三菱、發那科、西門子控制器連結，讀取控制器資訊，且內建多項APP功能，可整合多種周邊設備，包含：第四軸、視覺系統、機器人、智會感測器...等，另外支援EtherCAT與雲端系統，機台更聰明，實現工業4.0更簡單！

寶元數控股份有限公司

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攤位號碼：Q0904



V型齒研導軌齒條

功能：結合傳統的齒條和線性滑軌，從兩個零件結合為一個零件。不僅降低成本，節省工時，更提升產品的精密度，除去兩個零件的背隙公差。

特色：V型齒研導軌齒條，採用鋼性較強的SCM440材質，經過三面高週波後，硬度可以達到HRC 53-58°，耐磨耗，使用壽命長，經過六面研磨，精度達到歐規DIN6級。每米總齒距誤差在0.036mm以內。主要使用在自動化中，工業4.0的第七軸機器人，桁架式機器人等。

原億昌機械股份有限公司

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▲S56-MT
動柱式立式綜合加工中心機APC
Traveling Column Vertical Machining Center



▲VB-116/127/147/168/208
立式綜合加工中心機(硬軌)
Vertical Machining Center (Box way)



▲SDC-8/10/12
SDC-16/22/32
龍門高速加工中心機
CNC Double Column Machining Center



SV-85S/110S/130S
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42854 台中市大雅區雅潭路三段537-1號
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E forwell@forwellnb.com **Skype:** forwellnb

T +86-517-8565-9196 **F** +86-517-8565-9197
E forwell@forwellha.com **Skype:** forwell.ha



Taiwan



Video Online

AGENT WANTED

花蓮

花蓮縣位於臺灣本島東部，是臺灣高山族最多的區域。舉世聞名的太魯閣峽谷（太魯閣公園）就是位於該縣秀林鄉境內。參攷遊記：天不亮起床，在陽臺看日出，然後繼續回籠覺。睡醒瞭望著太平洋吃豐盛早餐，在陽光還未兇險之前向北騎行或漫步七星潭，回來後躺在天臺玩水發呆喝咖啡。中午去花蓮市區覓食逛商場，完了等待半日包車去清水斷崖和太魯閣入口的小錐麓古道走走。結束後回到花蓮南濱附近的東大門夜市繼續閒逛探索美食，吃飽喝足打車回飯店睡覺。

七星潭

七星潭的歷史可追溯到清朝，原來附近有幾處低窪的濕地，這些大小不等的濕地湖泊就是七星潭；在西元 1936 年日據時代興建沿海飛行場時，日本人將七星潭填實，於是把七星潭地區的居民遷到美侖鼻一側的海灣附近，但是這些居民仍自稱為七星潭人，從此大家就稱居民所居住的海灣為七星潭。



清水斷崖

清水斷崖，是清水山臨太平洋之處的斷崖，位於花蓮縣北部，是崇德、清水、和平安山臨海懸崖所連成的大塊大石崖，前後綿亙達 21 公里，地質以片麻岩和大理岩為主，成 90 度角直插入太平洋，高度均在 800 米以上。斷崖形狀如鞘，絕壁萬丈，腳下白浪滔天，形勢甚為險峻，為太平洋西岸大海崖區。清水斷崖氣派雄偉，號稱世界第二大斷崖。築在斷崖中間的蘇花公路，在這些隧道的阻隔下，斷斷續續地出現，崖壁下方則是驚濤駭浪、波瀾壯闊的太平洋。



美食

● 東大門夜市，分三個區域：福町夜市（原彩虹夜市）、大陸各省一條街、原住民一條街，營業時間 18 點 -23 點。地址：花蓮市中山路 50 號，離南濱公園不遠。曾品深坑臭豆腐、蔣記棺材板、妙不可言果汁、第一燒烤等較為推薦。曾記麻薯，可以現吃或打包，沒有任何的添加劑。



太魯閣國家公園

太魯閣國家公園景色絕美，漫步在步道上欣賞風景更是一大享受，無論是白楊步道的景觀型步道，或是長春祠步道的健行型步道，甚或錐麓古道的登山型步道，都能滿足不同需求的旅人。小錐麓步道全長約 650 公尺，屬於景觀型步道，步道沿線設解說牌、指示牌、護欄、觀景平臺等設施。步道入口位於砂卡礑隧道的東通風口，可以從太魯閣走砂卡礑隧道左側人行道，約 330 公尺到達東通風口，從東通風口進入即可到達小錐麓步道，大約 20 分鐘就可以走完全程。



——來源：馮穎

只要一個步驟即可瞭解TIMTOS展覽訊息

今年您除了由榮格工業傳媒承辦的展會快報瞭解TIMTOS展會訊息之外，還可以通過**現場直播**，通過動態影片的即時報導，您可以無時無刻瞭解展會現況。

直播內容包含開幕典禮、採購洽談會、記者會、2019高峰論壇、學生參觀及導覽、工業4.0智慧製造研討會、智慧製造聯網數據加值產業聯盟會員大會、2019年台北國際工具機展歡迎酒會暨工具機研究發展創新產品競賽頒獎典禮、2019台北國際工具機展GLORIA智慧製造創新應用論壇以及展商採訪等等精彩內容。不論您是否在現場，都可以通過直播間，快速瞭解2019年TIMTOS的最新動態。

我們也誠摯邀請您前來榮格攤位獲取其他更多產業訊息，如金屬加工、汽車、醫療、智慧製造等。
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