Anderson COMPASS

2016.08

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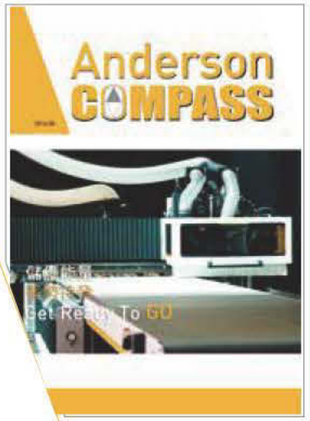

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拿出你的 "熱忱 "，賣力工作

讓你的熱情引導你，做你熱愛的事，財富自然隨之而來。大部分人都不相信，但這千真萬確。(Oprah Winfrey)

追尋一份讓你無比熱愛的工作，熱愛到你甚至等不及太陽升起，就要再做一次
(The Pursuit of Happyness—Chris Gardner)

Show your "enthusiasm", Work Hard

"Let your passion guide you, do what you love to do, and wealth will follow. Most people do not believe it, but it's true." - Oprah Winfrey

"Find something you love to do so much, you can't wait for the sun to rise to do it all over again." - Chris Gardner (The Pursuit of Happynessr).

恩德公司已有四十多年歷史，從開始迄今一直都在非鐵金屬 CNC ROUTER 領域 (NON-FERROUS INDUSTRY) 深耕，非鐵金屬工具機其應用範圍非常廣泛，舉凡實木、人造板、裝潢、公共工程、電子載板、塑膠、複合材、鋁合金、銅等，這些自然或人造材料均可使用恩德集團的工具機來加工，製造出高品質、高精度的產品供消費者使用。所以我們橫跨了家具、塑膠、複合材、電子、汽車、航太、戶外用品等數種產業。

而工具機本身之製造是最高科技、最先進技術、最新尖端材料、友善又好用的軟體，由高素質的組裝人員組裝，並且需一流的結構及時髦外觀設計。加以公司佈局已久且有成效的國際化通路。只能說恩德在對的產業、有合適的產品、加上完善的通路，這是許多人夢寐以求想進入的公司殆無異議，不論從任何方面來評估公司，穩穩當當為台灣眾多中型企業中的隱形冠軍並不為過。

「我想各位只要拿到這隻手機就會同意，我們重新發明了手機」，賈伯斯說這一句話表達對蘋果公司以及對 iPhone 產品的熱情，不僅感染了消費者瘋狂買進，也感染了員工以在蘋果公司服務為傲。

在恩德科技多年以來，由小公司變成國際化企業，成就了家具業為實木輸出王國，引進板式家具機械，代理歐洲板材及北美木材，日本切削刀具。工具機由三次元到五次元，開發了電子載板用工具機，由單功能到複合機，技術水準提升到國際級，參加國際展覽屢獲技術及設計獎項，我們跨足不同產業接受不同客戶的要求與挑戰，能一一克服讓客戶滿意因而贏得名聲，公司得以持續壯大。都是每位同仁在工作崗位上，付出熱情及敬業又樂群而得來。無論在台灣、中國、美國、歐洲、巴西的員工都是如此熱愛公司、熱愛產品又熱愛工作十分感動，恩德公司持續壯大是可行、可期待的。

熱情存在每一位員工心中，在工作上表現出來。你就會自我超越、時時進步，你會樂觀自信，你會更有幹勁與韌性不怕挫折，好學不倦且心胸開闊，所有成功特質將浮現在你身上。

"尋常一般窗前月、一有梅花就不同 "，梅花讓你有詩意，熱情會提升你繁複工作的情境。 僅以一句話和每位同仁共勉之：

~天下事、人間情，俯而就之則易、仰而求之則難 ~

總經理

Anderson Group was founded over 40 years ago. From the very beginning, it has been dedicated to the field of non-ferrous metals CNC ROUTER. Non-ferrous metal machine tools are widely applied in a variety of fields, such as wood, wood based board, decoration, public constructions, electronic substrates, plastics, composite materials, aluminum alloys, and copper. These natural or artificial materials can all be processed with our machine to manufacture high-quality and high-precision products for consumers. Therefore, our clients come from a wide range of industries including furniture, plastics, composite materials, electronics, automotive, aerospace, and outdoor supplies.

Our machine tools are manufactured with the highest technology, the most advanced skills, the latest cutting-edge materials, and easy-to-use software. They are assembled by highly qualified personnel and have first-class structure and fashionable design. In addition, the company has established effective international channels. All I can say is that Anderson is at the right industry, has the right products, and owns complete channels. Without doubt, Anderson is the dream company of many people. No matter from what perspective the company is assessed, it is surely the invisible champion of medium-sized enterprises in Taiwan.

As Steve Jobs said "I think when you have a chance to get your hands on it, you'll agree; we have reinvented the phone." He showed his passion for Apple and iPhone products, which affected consumers and employees, so that consumers buy Apple products madly and employees feel proud to work in Apple.

You have been in Anderson for so many years to witness our transformation from a small company to an international one. We have helped the furniture industry to become wooden furniture kingdom, introduced board furniture machines, and imported boards from Europe and wood from North America and cutting tools from Japan. Our machine tools range from three dimensions to five dimensions. We developed machine tools for electronic substrates. From single functional to multifunctional machine tools, our technical standards are raised to the international level. We have won several technology and design awards in international exhibitions. We also reached out to different industries to accept challenges from different clients and won reputation because of client satisfaction. Our company continues to grow because our employees are enthusiastically and diligently dedicated to their work no matter they are in Taiwan, China, the United States, Europe, or Brazil. Their love for the company, products and work is so influential that the continuous growth of Anderson Group is possible and can be expected.

Enthusiasm exists in every employee and shows in their work. With enthusiasm, you will always transcend yourself, you will be confident and optimistic, you will be more motivated and not afraid of setbacks, and you will be diligent and open-minded. All successful traits will manifest in you. "An ordinary window becomes different once there are plum blossoms." Plum blossoms make you become poetic and passion will enhance your work even in complicated situations.

I would like to encourage you with this sentence:

~For everything in this world: it's easy to accept how things go, while it's difficult to pursue what we don't have. ~

by General Manager ***Simon Lin***

Anderson
Compass

蛻變中的恩德
Transformation of Anderson

蛻變中的恩德
Transformation of Anderson

\林 成偉 by Speed Lin

近幾年來，全球的木工機械競爭激烈詭譎多變，在這個競爭的時代恩德唯一的不變就是變。在過程中恩德極具蛻變的能力，現在需要的是心態的轉變。從董事長管理層包括制度面的一些修正及改變，其實都是為了迎合未來的競爭所做的改變，尤其是面對紅色供應鏈的衝擊，現在是恩德蛻變的最好時機，也是蛻變的最關鍵時刻。

蛻變需要勇氣、判斷、智慧還有整合的能力，所以對於未來整個市場的結構面趨向於 NC ROUTER 為主導的生產結構，就是恩德如何承接時代蛻變中所予的一顆變化球。個人認為，恩德的同仁必須要做一些以下的幾個調整，個人也希望可以拋磚引玉，讓恩德的同仁及相關夥伴們可以共襄盛舉，多多參與及提供更好的力量。

In recent years, the competition in the global woodworking machinery is fierce. What Anderson can do in this competitive era is to change. Anderson already has the ability to transform; now, what it needs is the mentality to change. Some modifications and changes from the management to systems are needed to face future competition. In particular, facing the impact from the red supply chain, now is the best time and the most crucial moment for Anderson to transform.
Transformation requires courage, judgment, wisdom, as well as the ability to integrate. Since NC ROUTER will be the trend of future market, we must be ready to grab the opportunity to change. Personally I think Anderson's employees have to make some of the following adjustments. I would also like to take the lead to invite more colleagues and relevant partners to join the transformation and help make Anderson better.

臺灣木工機械的整合行銷計畫

Taiwan Woodworking Machinery Integrated Marketing Plan

為因應時代潮流，仲德預計整合行銷臺灣木工機械，以滿足未來市場需求，帶動和提升木工機械行業的整體水準，建立一體化、一站式服務的綜合性服務平臺。仲德除了銷售恩德生產的機械外，將協助客戶進口臺灣豐原生產的機械。更有利於發揮產業聚集效能，邁向創新發展道路。按照規劃通過整合資源，目前已經協助四川林豐向臺灣的木工機械業採購機械設備，從機械下單進口到物流運輸，全方位滿足客戶要求。

未來，可透過與臺灣木工機械產業鏈企業進行合作，充分調配有利於企業發展的資源，從而提高競爭力，創造更多的商業機遇。這不僅有利於提高資源配置效率、降低企業成本，同時也有利於形成創新氛圍，推進區域經濟的跨越式發展。並通過成本的簡化、交易的創新、影響力的提升，交叉影響，進而提高對客戶的影響力，真正開拓出一個強而有力的交易市場，形成推動企業不斷向前發展的力量。臺灣木工機械業近年來，在大陸最大的障礙是後續的業務服務及行銷整合，其實產品的競爭力是具足的，藉由恩德的平臺可以提升所有臺灣木工機械在大陸的曝光度，進而對臺灣木工機械貢獻一份心力。

In response to the trend of the times, Zhongde expects to integrate and promote Taiwan's woodworking machinery to meet future market demand, improve the overall level of woodworking machinery industry, and establish an integrated, comprehensive one-stop service platform. In addition to selling Anderson's machinery, Zhongde also helps clients import machinery manufactured in Fengyuan, Taiwan, which is conducive to reach industry gathering effect and move towards innovation and development. Integration of resources is completed according to the plan, and we now have purchased woodworking machinery from Taiwan instead of Lin Feng in Sichuan. We will meet clients' requirements from machinery ordering to logistics and delivery. In the future, through cooperating with enterprises in Taiwan's woodworking machinery industry, we can deploy resources conducive to the development of the company, and thereby enhancing our competitiveness and creating more business opportunities. This will not only help to improve the efficiency of resource allocation and reduce costs, but also is conducive to forming of an innovation atmosphere, promoting regional economic development by leaps and bounds. And by cost-down, innovation of transactions, enhancement of the influence, our influence on clients will be increased, creating a strong market, which, in turn, is the force to push companies forwards. The biggest obstacle for Taiwan's woodworking machinery industry in China in recent years is the follow-up business services and integrated marketing. In fact, its products are competitive. Through Anderson's platform, the visibility of Taiwan's woodworking machinery in China can be improved, which is what we would like to do for Taiwan's woodworking machinery.

整合臺灣與上海技術，建立服務據點，開發客服維修架構

Taiwan and Shanghai technical integration, the establishment of service locations, and development of customer service

由恩德王舜平經理、吳彥彬副理、林榮裕副理、周勇副理及程建明主任等人領軍，負責人員培訓、建立強大的服務團隊，提供顧客滿意、高效的服務，深得使用者的信賴和廣泛的讚譽。恩德嚴格按照標準製造、檢測，且確保所有機械出廠後都能有快速且技術熟練的售後服務品質。以上海為據點，充分利用區域和行業優勢，積極提升企業綜合實力，擴大市場佔有率，致力於為國內木工機械設備搭建一強大的客服維修團隊，最大限度地擴大服務的廣度和深度，為客戶實現商機！

Leaded by general manager Shun-Ping Wang, assistant manager Yan-Bin Wu, assistant manager Lin-Rong Yu, assistant manager Yong Chou, and director Jian-Ming Cheng, a staff training program and a strong service team are established to provide clients with efficient and satisfactory service, winning the trust of and praises from users. Anderson strictly follows standards to manufacture and test products and guarantee fast and skilled after-sale service to all machinery. With Shanghai as the base, we take full advantage of regional and industrial advantages to actively enhance the overall strength of our enterprises and to expand our market share. We are dedicated to building a strong customer service team for domestic and foreign woodworking machinery and equipment to maximize our services and create opportunities for our clients!

1. 組織分配：按目前各區服務人員分配
2. 客服營運方向：
a. 增加有形收入，降低無形支出
b. 提升無形收入，減少無形支出
3. 服務技能的提升：
a. 控制器：外訓課程的安排
b. 主軸：主軸廠巡迴訓練
c. CV 軟體：隨機械增派學習
d. 裁板機：上海 / 佛山開課（周勇較有經驗）
e. G 4: 隨機械增派學習（台灣派陳俊文隨機教學）
f. 五軸機：隨機械增派學習
c. 高階訓練：外訓課程 / 專案 / 五軸機台灣培訓 / 建立成熟技術運用

1.Organizational assignments: Assign duties according to current regional staffing status.
2.Direction of Customer Service Operation:
a.Increase tangible revenue and reduce intangible costs
b. Enhance intangible revenue and reduce intangible costs
3.Service skills upgrade:
a.Controller: Arrangement of external training courses
b.Spindle: Spindle factory training tours
c.CV software: Addition of learning courses based on machinery.
d.Panel Saw: Shanghai / Foshan courses (Yong Chou is more experienced.)
e. G4: Addition of learning courses based on machinery (Taiwan factory will send Jun-Wen Chen to train staff.)
f.Five-axis machine: Addition of learning courses based on machinery.
4.Staff training:
a.Basic training: mechanical/electrical/software/machine delivery(Location is arranged by each district; 3 weeks for each training.)
b.Intermediate training: mechanical/electrical/software/machine delivery(Location is arranged by each district in Taiwan or Shanghai. The time for training is 3 weeks for mechanical/2 weeks for electrical/1 week for software/1 week for machine delivery.)
c.Advanced training: external training courses/projects/5-axis machine training in Taiwan/mature technology applicati

OEM & ODM 量化生產

OEM & ODM Mass Production

OEM 和 ODM 是現代工業高度分工下的產物，現今以這兩種方式生產銷售的產品越來越多，因為這兩種模式能更加有效地整合資源，達到雙贏的目的。
OEM（Original Equipment Manufacturer）意為 " 原始設備製造商 "，是指一家公司根據自己的規格設計和生產產品，再將其出售給另一家公司來冠注商標和分銷。一家公司 OEM 其它公司的產品，是指該公司從另一公司（即 OEM 公司）處購買完整並且已設計好的成品（即原始設備）。大多數時候，購買方要求出售方只改變產品的品名和顏色，而對產品的其它方面不作修改。只有產品品名和型號是不同的。
購買方會具體地列明產品的外觀要求，如機械的尺寸規格外形顏色和技術要求等，此外，有時還會具體列明對產品的主要內部細節或控制器的規格要求。但是，購買方並不設計圖樣。這些都是 ODM 的工作。ODM 根據購買方提出的規格要求設計和生產機械。有時候，ODM 也可根據現有樣品生產。ODM 方式往往更加注重合作，而在 OEM 的情形下，購買方對產品的具體規格基本不參與意見。
利用 OEM & ODM 代工生產，幫量化客戶貼上自家商標批量生產，降低工廠的生產成本，提升企業的製造力。基於製造成本、運輸方便性、節省開發時間等方面的考慮，為有一定數量的客戶單一產品 OEM 或 ODM。在為別的企業進行 OEM 或 ODM 時，企業也要承擔不少責任。畢竟產品冠的是恩德的品牌或恩德製造，如果產品品質不佳的話，少則有顧客找上門投訴，重則有法律責任。所以，在委託加工期間定要進行嚴格的品質控制，以保障公司的品質和信譽。

OEM and ODM are developed due to modern industrial division of labor. Nowadays, more and more products are produced and sold by these two methods. This is because these two models can effectively integrate resources to achieve win-win situation.
OEM stands for "original equipment manufacturer," meaning that a company designs specifications and produces products, and then sells them to another company for trademark and distribution. When one company uses OEM products from other companies, it means that the company purchases complete products (i.e. original equipment) from another company (i.e. the OEM company). Most of the time, the purchaser requires the seller to change only the product name and color, and will not change other aspects of the product. Only the product name and model number are different.
The purchaser will specifically require the appearance of the product, such as mechanical shape, color, dimension and technical requirements. In addition, the company will sometimes specifically list their specification requirements for internal details or controllers. However, the purchaser does not design drawings. These are all done by ODM. ODM designs and manufactures machines according to the buyer's specification requirements. Sometimes, ODM can also manufacture products according to existing samples. The ODM method tends to require more cooperation, while in OEM case, the purchaser of the product does not have opinions on product specifications.
With OEM & ODM production, products are affixed with their trademark and can be mass produced to reduce production costs of the factory and to enhance the manufacturing capacity. Considering manufacturing costs, transportation convenience, time saving in development and many other factors, a certain number of clients have single products produced by OEM or ODM. When performing OEM or ODM for other enterprises, companies have to bear a lot of responsibility. After all, the product bears the brand name of Anderson or are marked "Made by Anderson". If product quality is poor, there may be customer complaints. What's worse, there is legal liability. Therefore, we must ensure strict quality control during processing to protect the company's quality and reputation.

提供經濟型機械給東南亞區域的經銷商

Provision of economical machinery to distributors in Southeast Asia

為降低生產成本及提升企業的製造力，恩德積極致力於生產經濟型的機種提供予東南亞經銷商。東南亞地區成為恩德集團經濟型機械出口的銷售大本營。

In order to reduce production costs and enhance the company's manufacturing capacity, Anderson Group actively engages in producing economical models to dealers in Southeast Asia, which has become a major sales stronghold of Anderson Group's economical machinery.

軟體整合

Software integration

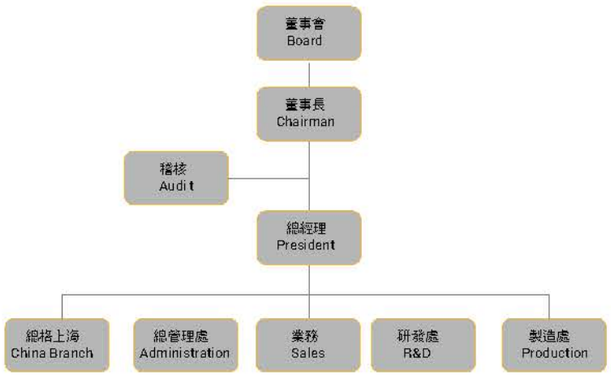
目前恩德共計已開發出以下軟體：CV(1 電子鋸 +1NC)、CV(1 電子鋸 +2NC)、Campro、Campro Hybrid nest、China Cam、Smart（無排版）。一直以來，恩德致力於開發具現代化、高整合度可用於所有木工機械的軟體系統，該系統可支援木工機械的每一個模組，可以與系統整合或作為單獨模組使用，且大幅降低軟體持有成本。目前已有重大的突破：由軟體應用部江邵華自行研發的 Cabinet Model 軟體，可使用在單一作業 10 個模組，產能約 3.5 萬公里（單板 200 件）。未來可望整合軟體系統，使其在規格化及應用上都能更加便利。

Anderson Group has been committed to developing software that is modern and highly integrated and can be used in all woodworking machinery. The software system can support each module in woodworking machinery, can be integrated with the system or used as a separate module, and can significantly reduce software costs. At present, we have a major breakthrough: the Cabinet Model software developed by Shao-Hua Jiang from the software application department can be used in 10 modules in a single operation, with the production capacity of about 35,000 kilometers (200 pieces for single board). In the future, it is expected to integrate software systems to facilitate standardization and application.

集團新成員 - 總格精密

The New Member of the Group Sogotec Precision

侯 建寓 by Jeffery Hou



總格精密前身為總格實業公司，於 2014 年 9 月份進行組織整併，將原恩德科技電子機械部及翔德雷射技術部門相關人員整併入總格實業，過程中同時將上海仲德電子機械部納入旗下，並重新更名為總格精密（股）公司。員工人數由原 50 名迅速擴充約達 110 員。新組織圖如左：

總格精密成立初衷及使命係利基於整合集團內電子相關部門暨產品，以集中管理集團資源，制定符合市場及產業管理模式及策略，最終利益最大化回饋於集團及員工。

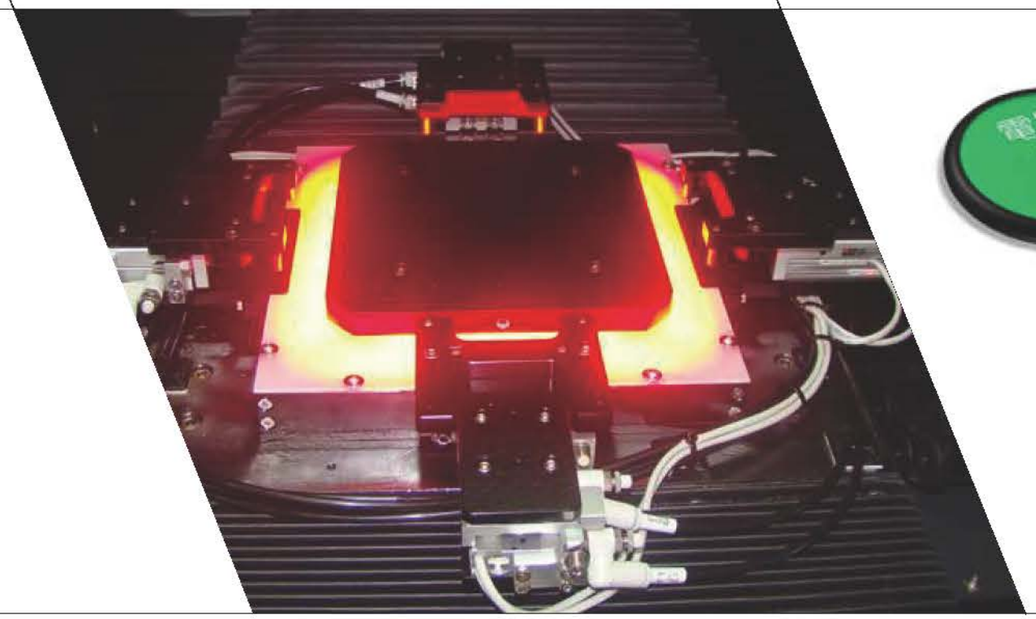
Formerly Sogotec Enterprise Co., Ltd., Sogotec Precision was founded in September, 2014, after staff from the Electronics and Machinery Department of Anderson Industrial Corp., staff from the Laser Department of Digital Photonics Corporation, and the Electronics and Machinery Department of Shanghai Chungde were incorporated into its former body. Later, the company was renamed Sogotec Precision Co., Ltd., and the number of its employees grew from 50 to 110.The organization chart is shown as left:

總格精密未來使命及營運策略版圖分佈如以下兩分佈圖表示：

Our future goals and management strategies are shown in the following charts:

產業策略分佈圖 Industrial Stratgey Distribution Chart

主要著重於原印刷電路板業 (PCB)、印刷電路板軟板產業、半導體 (Semicom)、及專用機整線輸出產業 (TurnKey)。



產品策略分佈圖 Product Strategy Chart

除了現有產品印刷電路板鑽孔機及成型機之外，過去三年集團投資開發雷射相關加工機具也順利推入市場。以目前總格精密內 UV 雷射鑽孔及切割製程能力已達 30μm。另自動化製程開發未來三年內也能符合市場對工業 4.0 龐大需求。

產業別 /Category	產業應用 /Applications
印刷電路板 PCB	3C 產品、汽車、太陽能、照明等 3C products, cars, solar power, illumination,
軟性印刷電路板 FPCB	穿戴式及 3C 產品 Wearable devices and 3C products
半導體 Semiconductor	IC 晶圓加工 IC wafer processing
整線專用機輸出 TurnKey	觸控、電池等產業 Touch screen, batteries, etc.

Our strategy pivots on the PCB industry, the FPCB industry, the semiconductor industry, and the turnkey industry.

總格精密 2014 年起三年營運目標已朝集團期望，期營業額於三年內翻一倍，一年超過新台幣二十億元門檻 (USD $ 62Million)。為能朝目標邁進，總格精密更於 2014 年啟動證券商輔導機制，2015 年完成減 / 增資作業程序，預計 2016 年公開發行、上興櫃。2017 年正式掛牌。如一切進度符合預期，總格精密將是集團內另一支強力勁旅，未來必能為集團實現更大利益及貢獻。

From 2014 onwards, Sogotec Precision has aimed to double its turnover in three years and crossing the 62 million USD thresholds yearly. To that end, we kicked off a broker counseling mechanism in 2014, went through all capital increase/decrease procedures in 2015, making its public issuance and go into emerging stock market, and go public in 2017. If everything stays on track, Sogotec Precision is set to be the next formidable force in the group that will undoubtedly generate greater profits and make substantial contributions in the future.

產品產業別 Category	產業應用 Applications
印刷電路板 PCB	印刷電路板鑽孔／成型機 PCB drilling/ forming machines
雷射 Laser	細微 UV 雷射鑽孔／切割機 Precise UVlaser drilling/cutting machines
代工 ODM	專用整線輸出 TurnKey
自動化 Automation	RTR、Load/UnLoad、Robot

In the past three years, aside from producing PCB drillers and forming machines, we have successfully rolled out relevant laser processing machines invested and developed by our group. So far, our UV laser drilling capability and cutting precision have reached the 30μm level. In the next three years, our automatic manufacturing process will also be capable to meet the growing demand of the market in Industry 4.0.

最佳加工與合作夥伴－祐德機械與成都仲德數控機械

Best Processing and Cooperation Partners - Youde Machinery&Chengdu Zhongde NC Machinery

\ 謝子銓．胡增榮 by Tzu-Chien Hsieh & Kevin HU

祐德機械是恩德集團到中國擴大經營體制的另一個關係企業，前身是 1997 年與日本丸仲、飯田兩家公司共同成立的協德機械（上海）有限公司，於 2010 年底由恩德集團獨資收購，更名祐德機械（上海）有限公司，目前主要的營業項目有：精密加工部門、圓鋸機製造、四面鉋設備、生活日用品整線的機械設備。

Youde Machinery is an affiliate of Anderson Group in China to expand the business system. It was formerly Xiede Machinery (Shanghai) Co., Ltd. which was jointly established by Japanese companies Marunaka and Iida in 1997.At the end of 2010, Anderson Group acquired it solely and changed the name to Youde Machinery (Shanghai) Co., Ltd. Its current major businesses include: precision processing, manufacturing of circular saws, four-side planing machines, and machinery and equipment for daily life necessities.

四、圓鋸機製造

祐德所生產製造圓鋸機 NCB70 與 NCB100 可提供鋼材相關行業高精度快速鋸切效能，適用鍛造鋼鐵業、汽車零件業、製管業、保險櫃業、齒輪業、自行車業、運動器材業、建築器材業、鋼管傢俱業、農用機製造業、壓縮機製造業等行業。

IV.Circular sawing machinery manufacturing

The circular sawing machines NCB70 and NCB100 manufactured by Youde provide high precision and fast cutting performance for steel related industries, such as forging steel, auto parts, pipes, safes, gear, bicycles, sports equipment, construction equipment, steel furniture, agricultural machine manufacturing, compressor manufacturing and many others.

一、精密加工部

仲德實業自 1997 年在上海設立以來，所生產的木工加工機在中國已建立了自有品牌與相當的口碑。然而品質是製造業的根基命脈，有鑒於此，為確保產品最佳品質，由祐德加工部門提供仲德與祐德兩廠的加工物料，嚴格把關每個加工物料的精準度，以確保良好的機械品質，進而提升品牌形象。

為提供品質優良的零組件，精密加工部門目前備有五面體加工機、龍門鉋床、龍門磨床、臥式及立式加工中心等先進設備，由具備豐富經驗與訓練精良的同仁操作，以確保加工零件的品質；並採二班制工時，充份利用機台稼動力，以維持零件產量可以穩定提供仲德實業生產之所需。

為提升生產效率與零組件品質，祐德透過以下方式以獲致與集團母廠恩德科技一致之品質要求。

1. 設設立品保部門：設立品管部門針對產品品質制定最嚴格的要求與控管。

2. 零組件模組化：零組件進行模組化改善，除可提升效率及產品質量的穩定，亦相對提升了後端機械組裝的幾何公差與縮短組裝工時。

3. 協力廠商品質要求：對外協力廠商品質亦以集團母廠標準要求一致之品質，例如：銲接的密集、回火的穩定性、與大型加工件的標準工差等。

二、四面鉋機械設備

與日本 IIDA 公司合作，生產全球著名的四面鉋機械設備。

三、生活日用品整線線設備

與日本飯達公司合作，生產生活日用品整線的機械設備

I. Precision processing department

Since established in Shanghai in 1997, Zhongde Industrial has established a brand name and good reputation for its woodwork processing machines. However, quality is the foundation of manufacturing industry. With this in mind, in order to ensure the best quality of products, Youde processing department provides processing materials for Zhongde and Youde. With strict control on the precision of processing materials, good mechanical quality can be ensured and brand image can be enhanced.

To provide high quality components, the precision processing department currently owns planing Mill, gantry grinding machines and processing machine, planers, grinders, and horizontal and vertical processing machinery. The advanced equipment is operated by highly experienced and well-trained colleagues to ensure the quality of processing parts; two-shift work is adopted to take full advantage of the machine utilization rate to maintain the desired output quantity of parts that can meet the production need of Zhongde Industrial.

To enhance production efficiency and component quality, Youde applies the following ways to obtain consistent quality as required by the mother plant Anderson Group.

1. Establishment of QC department: The establishment of quality control department is to develop the most stringent requirements for product quality and control.
2. Modular components: Modular components can enhance efficiency and product quality stability, as well as improve the geometric tolerances of rear end mechanical assembly. In addition, assembly man-hours are shortened.
3. Quality requirements for subcontractor: subcontractors are required to meet consistent quality standards as the mother plant, such as intensity of welding, tempering stability, and standard tolerance of large workpiece.

II.Four-side planing machines and equipment

We cooperate with Japanese company IIDA to produce the world's leading four-side planing machines and equipment.

III. Machinery and equipment for daily life necessities

Cooperate with Japanese company to produce machinery and equipment for daily life necessities.

成都仲德數控機械有限公司成立於 2014 年 12 月 25 日，註冊資金 800 萬元，是臺灣恩德集團與四川瑞豐農林生態科技有限公司共同投資成立的，由臺灣恩德集團控股。

公司坐落於四川省成都市大邑經濟開發區，專業生產製造非鐵金屬 CNC 加工中心，成都仲德承襲恩德集團長期深耕 CNC 精密加工機械領域的豐富經驗及專業技術，就近提供中國大西北部客戶專業而即時的在地支援與服務，以確保購買恩德集團機器的每一位客戶，都能得到最好且最快的售後服務品質與技術諮詢服務。

成都仲現有員工 20 人，主要部門有綜合管理部、生產部、財務部。公司生產鏈管控皆嚴格依循集團母廠授權的 ERP 系統作業。

Chengdu Zhongde NC Machinery Co., Ltd. was established in December 25, 2014, with a registered capital of 1.25 million USD. It is a joint venture of Taiwan's Anderson Group and Sichuan Ruifeng Ecological Technology Co., Ltd., with Taiwan's Anderson Group controlling the Holdings.

The company is located in Dayi Economic Development Zone, Chengdu, Sichuan Province, specializing in the production of non-ferrous metal CNC processing centres. Chengdu Zhongde obtains experience and expertise in the field of CNC precision working machinery from Anderson Group and can provide professional and immediate local support and service to customers in northwestern China; in order to ensure that every customer purchasing machines from Anderson Group can receive the best and fastest service and technical advice.

Chengdu Zhong has 20 employees at present, with main departments of General Management, Production, and Finance. The company production chain follows strict management and control system of ERP authorized by Anderson Group.

滿足客戶全方位之需求 - 仲德佛山分公司

To meet the customer's overall needs- Zhong-de Foshan Branch Profile

\黃 民鋒 by Min-Feng Huang

2015 年 5 月仲德實業（上海）佛山分公司於廣東佛山市順德，中國的木工機械製造重鎮 倫教鎮設立了新據點。倫教鎮地處珠江三角洲家具製造區塊的中心區域，在此設立據點除了更貼近市場外，更可快速的就近服務現有的舊客戶，滿足客戶服務時效的需求。

佛山分公司除了是恩德集團在廣東的機械服務的新據點，並設有下列三個功能單位，以滿足客戶全方位之需求。

1. 機械展示中心：這個展示中心陳列了恩德一系列的數控設備，客戶可就近可參觀各機種，不需再長途跋涉至其他據點參觀。
2. 主軸部門：集團母公司 恩德科技專設維修服務據點，可更快速滿足大陸地區對於主軸維修的殷切需求，並針對客戶開設主軸教室，教導客戶主軸保養與維護的正確觀念。
3. 噴繪應用中心：除上海之外，更進一步在佛山設立了廣東噴繪應用中心，以就近滿足客戶對噴繪的各種應用與需求

廣東佛山分公司與東莞分公司分別立足於珠江兩岸，開啟了恩德集團對深耕華南地區的用心與企圖心，對於拓展大陸華南市場的版圖區塊將有如虎添翼之效。

In May 2015, Zhongde Industrial (Shanghai) Foshan branch established a new stronghold in Lunjiao town, Foshan City, Guangdong, where is the major woodworking machinery manufacturing city in China. Lunjiao town is located in the central furniture manufacturing area in the Pearl River Delta. In addition to getting closer to the market, establishing a base here can help us serve our existing customers more quickly to meet customer demand.

In addition to being a new base of Anderson Group for machinery service in Guangdong, Foshan Branch has the following three units to meet the customer's overall needs.

1. Machinery Exhibition Center: The exhibition center shows a series of numerical control equipment of Anderson Group . Customers can see various models nearby without travelling long distances to other locations.

2. Spindle Department: A technical service base of the Group's mother company—Anderson Science and Technology. It can quickly meet the strong demand for spindle repair in China and open spindle courses for customers to train them how to maintain spindles correctly.

3. Inkjet Application Center: In addition to Shanghai, we also establish Guangdong printing application center in Foshan to meet customer demand for a variety of inkjet applications.

Guang-dong Foshan Branch and Dongguan Branch are located on both sides of Pearl River, showing Anderson Group's dedication and ambition to establish in southern China. These two branches will add power for our company to expand our market in South China..

The new member of Anderson group- 恩德新夥伴

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\ Gabriele Vonberg
from Monforts CNC „Werkzeugmaschinentechnik

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Monforts 是 2015 年新加入恩德集團的成員。

可預期該項投資計畫將在 2016 年為集團展現其優勢及潛力。而 2015 年的業務，主要還是在透過恩德團隊進行投資、推行和建立工作，同時雙方展開磨合。2015 年 8 月初，信譽最佳的德國 CNC 車床製造商之一：Monforts 工具機公司 (Monforts Machine Tools) 加入恩德集團旗下。

Monforts 品牌代表了德國著名的高品質精密技術，這皆歸功於 Monforts 極具創新能力及對工業技術充滿熱情的員工。

Monforts 產品範圍聚焦在擅長的高階精密車床運用領域。Monforts 為航太業與汽車業巨頭，及其他精密與創新產業提供服務，供應二軸至五軸高性能最高精度 CNC 設備。包括以鈦或鎳鉻合金製成的渦輪葉片及貨車使用的高合金鋼打造的引擎曲軸都是典型的運用範圍。

因此，接下來的部份將論及 Monforts 的發展歷史、現今情況和未來展望。這初步印象有助於提升企業間的了解和合作。

Monforts 精密技術來自悠久傳統

1884 年，August Monforts 在德國 Mönchengladbach 成立了紡織機械公司。不久後，於 1897 年增設鑄造廠。自 1915 年啟用自動車床以來，今日 Monforts 品牌等同全世界工具機領域技術性高價值產品的代名詞。放眼未來，開發、設計、生產和組裝工作均在 **Mönchengladbach** 完成，以確保任何時候技術皆維持在頂尖水準。

Mönchengladbach

August Monforts (1850 – 1926)，
公司創辦人 (the founder of Monforts)

Monforts is the new member of Anderson group.

It is planed and expected; this invests will show its benefit and potential for the group in 2016. The abbreviated business period of 2015 however is dedicated to investment, implementation and setup through the Anderson team and to adjust to each other.

Early August 2015 one of the most reputable German CNC lathe builders, the company Monforts Machine Tools, became member of the Anderson Group.

The name Monforts is standing for well-known German high quality precision technology. This is due to the fact that there are employees disposing about innovative capacity and enthusiasm for technology.

Monforts product range focusses on the high precision lathe application in sophisticated niches. High power cutting on highest precision, from 2 up to 5 interpolating CNC-axes, Monforts serves the premium players in aerospace and automotive and other exacting and innovative businesses. So creating turbine wheels from titanium or Inconel as well as engine crankshafts from high alloy steel for trucks are typical applications.

Hence the subsequent article deals with the past, the present and the future of Monforts. It should leave a first impression which helps to enhance the understanding and synergy between the companies.

Monforts, precision by tradition

In 1884, August Monforts founded the textile machine company in Mönchengladbach. Soon after, in 1897, a foundry was added. Since 1915 automatic turning lathes are built. The name of Monforts today is synonymous for technically high valued products in the fields of machine tools worldwide.

Development, design, production and assembly are carried out in Mönchengladbach with a view to the future, in order that top-class technique is assured.

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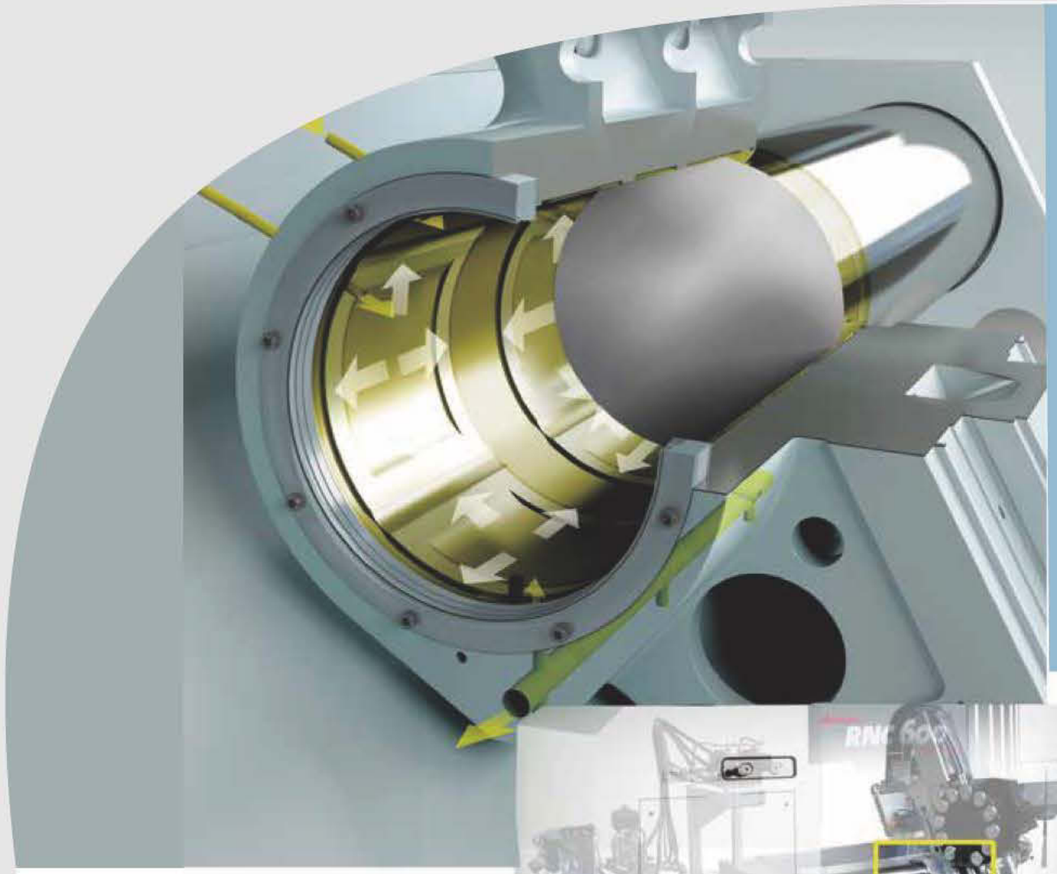

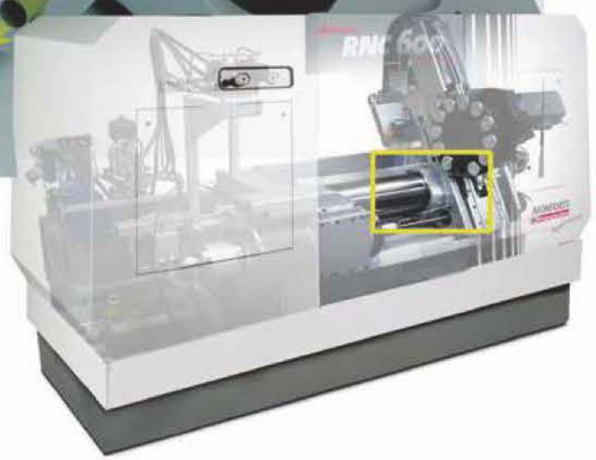

Monforts 車床適用於最惡劣的加工條件，特別是在處理體積龐大、材質剛硬沈重的工件時，其獨特的靜壓導軌便顯現其重要性。所有 Monforts 的電腦數控機床 (CNC-machines) 皆配置有靜壓導軌系統，具有免維護、無磨耗的特性。靜壓導軌摩擦力與速度成正比，不會有金屬面接觸。即使是 0.001mm 微量進刀也不會產生黏滯滑動現象。

圓導柱具備其它優點，如：

- 高剛性足以承受切削力
- 高抗震阻尼
- 刀具使用壽命長
- 極致加工精度
- 長期抗壓性能，絕對無磨損

針對上述優點 Monforts 提供至少 10 年的保固。對生產條件要求最嚴苛的行業，如航空、風力發電、驅動技術、汽車、水泵及零配件等，這是決定性因素。

RNC 系列 - 高標準的質量和配備

系列產品生產達高水準：RNC 系列幾乎適用於所有需求。具備 Y 軸、硬車削精密配置、自動上下料裝置以及後期處理量測站可供選配。車削長度從 600 mm 至 1500 mm，旋徑從 420 mm 至 720 mm。

RNC 系列可搭配發那科 (Fanuc) 或西門子 (Siemens) 控制器。工作安全性和人體工學各方面當然也納入考量。工作空間操作容易，機器門板運作靈活以及操作介面清楚明確。雙層安全門板配置耐壓特殊視窗面板並以電力聯鎖。

Monforts turning lathes are suitable for applications under the harshest conditions. In particular, in the processing of large, hard and also heavy workpieces, the unique hydrostatic guide comes to the fore. All Monforts CNC-machines have this characteristic in common, the maintenance- and wear-free longitudinal guiding system. The hydrostatic main guide is free of any frictional contact independent of the rate of traverse. Even increments of 0.001 mm are traversed without any stick-slip.

The round guiding column provides further advantages, such as:

- High stiffness to counteract the cutting forces
- Very good damping of vibrations
- Long tool lives can be achieved
- Ultimate turning accuracy
- Resistance to long-term stress
- Absolutely no wear

These advantages Monforts guarantees for at least 10 years.
This is a decisive criterion in sectors with the toughest manufacturing conditions like
Taviation, wind energy, drive technology, automotive, pumps and fittings.

RNC-Line - High Standard in Quality and Equipment

Series production on a high level: The RNC-line suits almost every requirement; Y-axis, precision parts for hard turning, automatic loading and unloading unit as well as post-process gauging station are available. The spectrum covers turning lengths from 600 mm up to 1500 mm and swing diameters from 420 mm up to 720 mm.

The RNC-Line is available with either Fanuc or Siemens control. Of course all aspects of safety at work and ergonomics are taken into account. The working spaces of the machines are easily accessible, the doors operate smoothly and the operating panel is clear cut. The double walled safety door features a blow resisting special window panel and is electrically interlocked.

DNC 系列 - 呈現完美整體加工的雙主軸車床

Monforts DNC 500 DuoTurn 的設計概念，成功的將二個高效能工序置於一個機台內同時完成，備有雙刀塔雙主軸的結構，可搭配發那科或西門子控制器。操作者不須移動就能完成工件雙側的車削、鑽孔或銑削作業。整體加工降低了工件成本，省去儲存和裝卸作業，生產時間因而縮短，儲存成本可降至最低。這有助於提升用戶的競爭優勢並有利於經濟上獲得成功。

DNC-Line - The Twin-Spindle Turning Lathe for perfect complete machining

The Monforts DNC 500 DuoTurn with two turrets and two spindles is a successful integration of two high-performance machines in a single machine concept available with either Fanuc or Siemens control. The right and left side of the workpiece is turned, drilled or milled without any action on the part of the operator. This complete machining reduces part costs. Storage and transportation is not necessary, hence the production time is reduced. Storage costs are minimized. All this enhances the competitiveness of the user and benefits the economic success.

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MNC 系列 - 高精度和高靈活性的多軸加工

MNC 系列是配備 12 把上刀塔和下刀塔（選配）加工的重切削車床。驅動工具可執行偏心搪孔加工、攻螺紋或平面銑削的工作。工件的第二側採用副主軸進行加工以達成在同一台機器完成零件整體加工的目的。MNC 系列動力主軸可搭配發那科或西門子控制器使用。

MNC-Line - Precision and flexibility for multi-axis machining

The MNC is a heavy duty turning lathe for machining with upper and lower (option) 12-fold turret. Driven tools permit the machining of eccentric bores, threads or milled faces. The second side of the workpiece can be machined by means of the sub-spindle in the true sense of complete machining. The MNC-Line is available with either Fanuc or Siemens control.

UniCen 系列 – 提供最大彈性的經濟整體加工

UniCen 系列是帶有 B 軸的車銑複合機床，可在同一台機器上提供整體加工的操作執行，如：車削、銑削、鑽孔和攻螺紋。工件裝夾在同一台機器上就可以完成所有工序。即使是加工複雜的自由曲面，UniCen 多至五軸的加工控制能力亦能輕鬆處理。 UniCen 系列可搭配發那科或西門子控制器使用。

UniCen-Line - Maximum Flexibility for an economic Complete Machining

The UniCen is a turning and milling center with integrated B-axis where all requirements for complete machining have already been implemented: turning, milling, drilling and thread-cutting all on one machine. The workpiece is loaded on one machine only and can then be finished completely. With up to five interpolating axes even complex free form surfaces can be machined. The UniCen-Line is available with Siemens control.

MHC 系列 - 臥式送料機 ，生產車削零件最經濟的解決方案

為達成縮短加工閒置時間及降低生產成本目的，只能透過快速自動化零件處理達成。為滿足市場需求，Monforts 的臥式數控車床 MHC 送料機為各種系列生產提供解決方案。MHC 送料機的標準機台可搭配發那科或西門子控制器使用。可選配棒材送料機或零件上下料系統。MHC 系列機台工作空間寬敞也可進行手動加料。水平設計可允許直徑達 520 mm、工件長度達 260 mm 的加工。

MHC-Line - Horizontal Pick-up Machine - Most economical solution for the production of turned parts

Short idle times and low production costs can only be achieved with fast automation of component handling. With the Horizontal-CNC-Lathe MHC PickUp Monforts presents a solution to meet the market requirements, for all kinds of series productions. The MHC PickUp is a standard machine available with either Fanuc or Siemens control. It can optionally be equipped with a bar feeder or a component loading and unloading system. A comfortable access to the work area also enables a manual loading. The horizontal design allows for turning diameters up to 520 mm and component lengths up to 260 mm.

Monforts 的服務套裝

如果客戶對 Monforts 產品有任何疑問或需求，Monforts 將提供能快速解決問題的技術人員予以回覆。我們針對目標客戶提供全面性、有意義與協同服務靈活性的套裝服務，包括：

> 服務合約　　> 機床改造
> 技術諮詢　　> 保養及維修
> 人員培訓

更深入的實例

在開發新機概念時，Monforts 與研究夥伴和大學共同研究，並在以結果為導向的方式與客戶共同合作。

至今，Monforts 已在全球售出超過 12,000 台機器，包括配置靜壓導軌系統的 4,500 台 CNC 車床。

Monforts service-packages

If any customer's questions, issues or demands concerning a Monforts machine should arise, Monforts will provide qualified persons with keen problem-solving abilities to answer them. Targeted customer support packages are available that provide comprehensive, meaningful and coordinated

service flexibility including:

> Service Contracts　　> Retrofit
> Technology Consulting　　> Maintenance & Repairs
> Training

Further Facts

When developing new machine concepts, Monforts collaborates with research partners and universities and works cooperatively with its customers using a results-oriented approach.
Until now Monforts sold worldwide more than 12.000 machines including 4.500 CNC-turning-lathes with hydrostatic guiding system.

Anderson
Compass

恩德的發展 - 新產品技術
Progress of Anderson-New Product & Technology

雷射切割機簡介

\ 彭 建銘 by Alex Peng

恩德雷射切割機發展至今，已有六年時光，期間不斷吸收新知及精進技術，更深入客戶，積極開發符合客戶使用的新功能。希望透過以下介紹，可以對恩德雷射切割機有更進一步的認識。本篇針對恩德雷射切割機介紹，主要分為光學元件及設備功能兩部分；光學元件部分包含 CO_2 雷射、鏡片、光路設計、輔助氣體，設備功能部分包含浮動頭組、自動分區功能、升降台面功能、夾置具。

光學元件介紹

CO_2 Laser

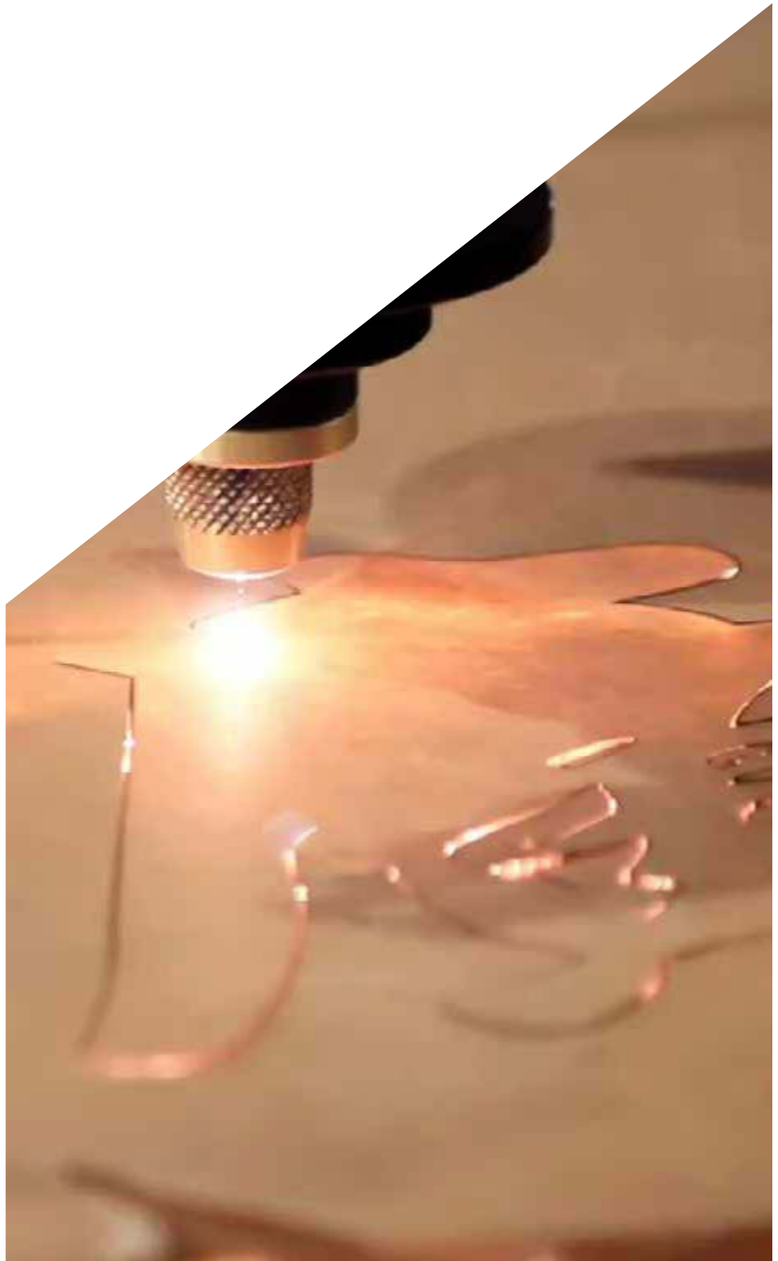
連續式雷射就似水龍頭水流連續流泄一樣，固定每秒中輸出多少功率，雷射輸出功率固定、不隨時間改變。也因此連續式雷射只能夠標示平均輸出功率為多少瓦特。

脈衝式雷射是由一秒鐘雷射輸出多少發脈衝的頻率(Hz)，乘上每一發脈衝能量(J)，可獲得平均輸出功率(W)。而加工移動速度與脈衝頻率的搭配，決定脈衝的重疊性，由重疊性分佈的疏與密決定加工面的粗糙與細緻，每發脈衝能量大小與脈衝的重疊性，決定可加工的工件板厚。

光學元件 - 鏡片

反射鏡是將光作反射的光學元件，一般以反射率的大小作為選定標準，目前技術仍無法做到百分百全反射，不反射部分能量則被反射鏡吸收產生熱能，進而使反射鏡產生熱變形，造成光的路徑產生偏位或散射，形成加工品質不穩定之現象。再者，不反射之能量，即代表著雷射能量的損失。

聚焦鏡是一個平凸透鏡的光學元件，將光的能量聚焦集中於焦點上，熱熔或氣化該點的材料，以達成穿孔或切割等加工之應用。焦距有長短，長焦距會產生較大的切割縫，因為單位面積的能量密度較低，相對較難以切割，也因此，使得在厚板切割時，切面能有較小錐度現象的產生；短焦距則反之。



CO2 雷射切割壓克力圖
CO2 Laser Cutting Acrylic

Introduction on Laser Cutting Machine

Anderson Industry has developed laser cutting machines for six years. During this period, we constantly absorb new knowledge and dedicate to enhance technologies; we focus on customers' need to actively develop new features that meets their demands. Through following introduction, you will have a further understanding on laser cutting machines developed by Anderson Industry. The introduction is mainly divided into two parts, namely optical elements and equipment capacities. Optical elements include CO_2 lasers, lenses, optical design and auxiliary gas. Equipment capacities include floating head set, automatic partitioning feature, table lifting feature, and clamps and fixtures.

Introduction of Optical elements

CO_2 Laser

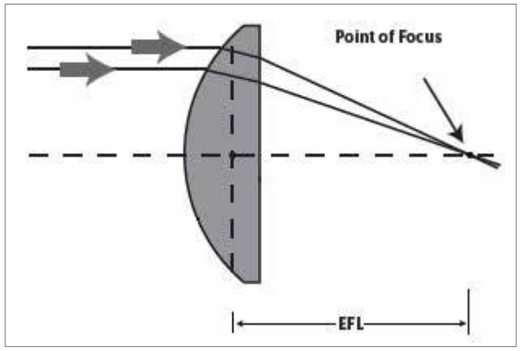
Continuous wave laser is like continuous flow of water running out of a faucet; the output power per second is constant. Laser output power is constant and does not change in time. Therefore only average output power (in watts) can be labeled in continuous wave laser.

The average output power (W) of pulsed laser is obtained by the pulse frequency (Hz) per second times pulse energy (J) of each laser pulse. Processing moving speed and pulse frequency determine the overlapping of pulse. The distribution of overlapping density determines the roughness of processing surfaces. The overlapping of pulse energy and pulse of each laser determines the workable thickness of workpiece.

Optical Element-Lenses

Reflector is an optical element which reflects lights. Selection of reflectors is generally by the reflection rate. It is not possible to achieve one hundred percent reflection with current technology. Non-reflected energy is absorbed by the reflector to produce heat, thereby causing thermal deformation of reflector and resulting in deviation or scattering of light path. This in turn results in unstable processing quality. Moreover, non-reflected energy means loss of laser energy.

Focus lens is a plano-convex optical element that concentrates energy of light on a focus point to hot melt or vaporizes material at the point, thereby achieves the application of perforation or cutting. Long focal length produces a greater cutting seam because of the lower energy density per unit area; it is therefore relatively more difficult to cut. As a result, in cutting thick plats, smaller taper phenomenon on the cutting section is seen if focal length is long; and vice versa for short focal length.



光聚焦圖
Light Fousing


COHERENT 雷射外觀圖
OHERENT Laser

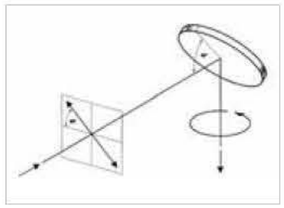

反射鏡
Reflector


聚焦鏡
Focus Lens


擴束鏡
Beam Expander

擴束鏡主要功能是將光束輸入後，轉換成大光束輸出，以獲得較大光束直徑進入聚焦鏡聚焦成較小的光斑，光斑是指焦點截面積，應用於要求品質更精細之加工。

圓偏振鏡可以將線偏振光 (linearly polarized)，以 45 度角入射後，轉換成圓偏振光 (circle polarized) 輸出，使得金屬切割時，可獲得穩定的加工品質。因金屬切割面反射 S 偏振光比反射 P 偏振光強，導致在不同切割方向有不同加工品質的差異。


線偏光轉圓偏光圖
Linear Polarized Light Converted into Circular Polarized Light


圓偏振鏡
Circular Polarizer

光路設計

雷射設備製造技術與 CNC 設備不同處在於多了光路的調校，等於是雙重精度的設備，缺一不可。光路調校是由光的直度校正及中心的對正組成，對此，市購的鏡座調整組成本高，且較難以滿足調校的需求。因此，恩德自行開發設計符合需求的鏡座調整組，並加入了鏡片冷卻功能，以降低鏡片熱變形的加工不穩定性。在光路設計上，除選用高反射率的反射鏡片外，採用最少化的三組反射鏡方式設計，可使雷射的能量損失降至最低。因雷射光為不可見光，因此在光路中設計了紅光模組，藉以輔助光路調校及加工對位，並以紅光有無出光方式，明確告知操作員，雷射是否處於關閉狀態。

The main function of the beam expander is to output bigger beams directly into a focus lens for small light-spot output. Light-spot refers to the cross-sectional area of focus, which applies in processing requiring finer quality.

Circular polarizer converted linearly polarized lights, after an incident angle of 45 degrees, to circle polarized lights, so that a sable processing quality is achieved in metal cutting. Since reflection of S polarized light is stronger than the reflection of P polarized light in the metal cutting surface, different cutting direction may result in different processing qualities.

Optical Design

The difference in manufacturing technology of laser equipment and CNC equipment is optical path adjustment. Laser equipment is dual-precision. Optical path adjustment is composed of straightness adjustment and center alignment of lights. To achieve optical path adjustment, the cost of using commercially available lens set is high and it is difficult to satisfy the adjustment. Therefore, Anderson designed and developed lens adjustment set meeting customers' needs and incorporated the feature of lens cooling to reduce the instability of thermal deformation in lens processing. In the optical design, in addition to selection of reflective lens with high reflectivity, we adopt the minimized three-set reflectors design to minimize energy loss of laser. Since lasers are invisible lights, Anderson adopts red light module in optical design to assist in adjustment and alignment. The operators are clearly informed whether the laser is on or off with the presence or absence of red lights.

rofin 雷射外觀圖
rofin Laser


光路機構圖
Optical Structure

光學元件輔助氣體要求

雷射共振腔所產生的熱能及內部鏡片吸收的熱能，透由水的循環將熱能帶走，以達冷卻之效果，另以氣體對著鏡片表面吹氣，以防止空氣中的粉塵黏附於鏡片表面，以避免粉塵吸收雷射能量產生高溫，於鏡片表面形成破壞。因氣體是直接吹向鏡面，因此，對於氣體的要求格外嚴格，一般要求使用氮氣或含油水量極低的壓縮空氣，因油比水的氣化點高，油氣化的熱量，足以破壞鏡片上的鍍層，因此，對油的含量更是要求，幾乎是完全不可以接受。如果使用者無法提供合格的氣體，建議不要對光學元件提供不正確的氣體，以免獲得反效果。

加工材料及加工輔助氣體

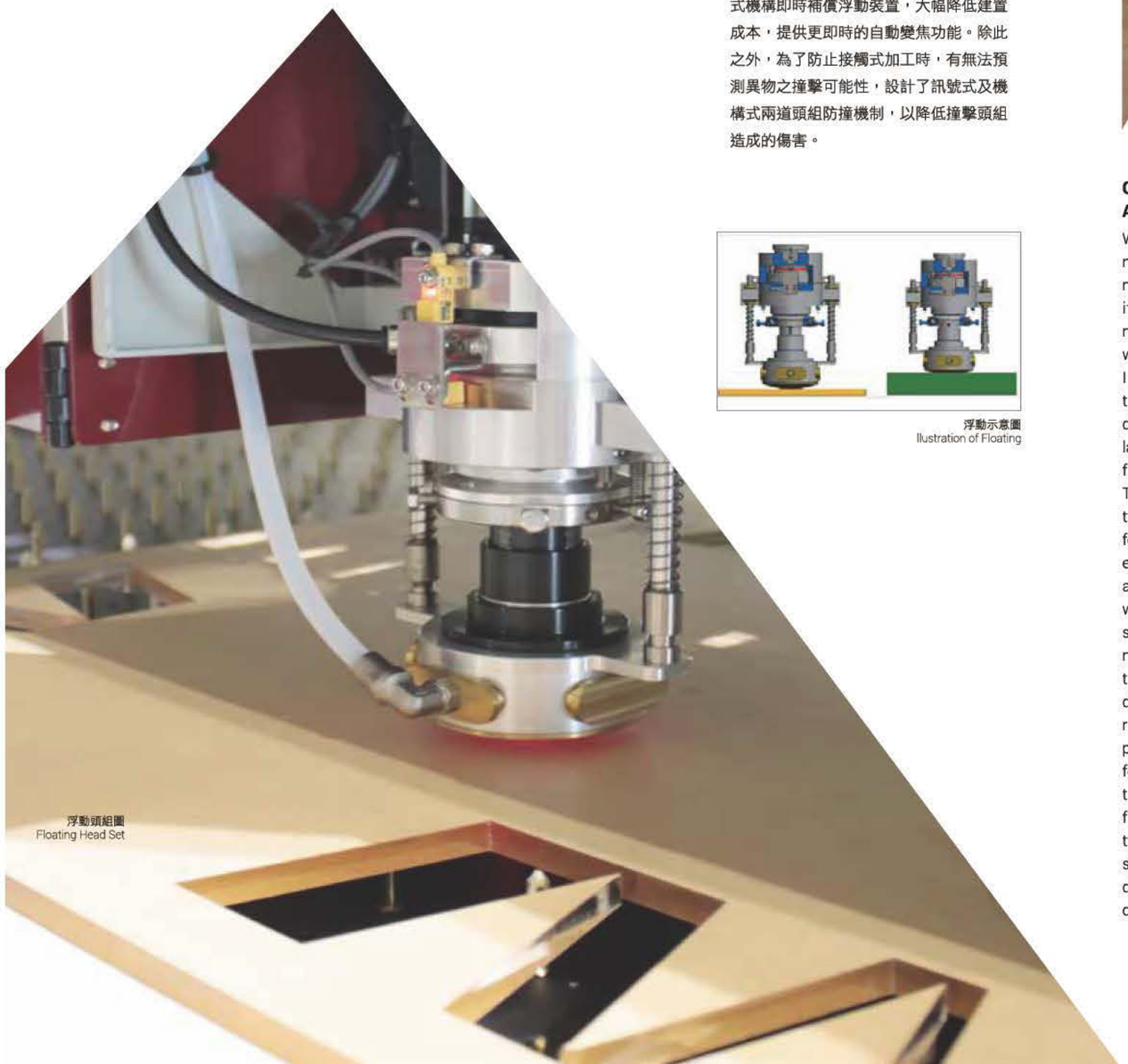
非金屬材料幾乎完全吸收 10640nm 波長的雷射能量，一般使用空氣作為輔助氣體。碳鋼的輔助氣體為氧氣，因碳鋼含鐵，鐵的氧化反應會產生大量熱能，以氧助熔，可以減小雷射能量的要求。不銹鋼一般採用高壓氮氣輔助切割，因無氧化切口顯得較白亮。鋁、銅對 CO_2 雷射有較高的反射率，不易加工，且反射絕大部分能量易造成相關光學元件，如：聚焦鏡、反射鏡等損壞。

Requirement of Auxiliary Gas of Optical Element

Heat produced by laser resonator and heat absorbed internally in lens are taken away via water circulation to achieve cooling effect. Furthermore, blowing gas against surface of lens to prevent dust from adhering to the surface; this is to prevent high temperature produced by dusts adsorbing laser energy and causing damage to the surface of lens. Since the gas is blowing against the surface of lens directly, requirement of gas is highly strict. General requirement is to use nitrogen or compressed air with extremely low air/oil content. The vaporization point of oil is higher than water; heat generated by oil gasification is enough to destroy the coating of lens. As a result, the requirement of oil content is even stricter, almost unacceptable. If users cannot provide qualified gas, it is recommended not to provide incorrect gas for optical elements to prevent opposite effects.

Processing Materials and Auxiliary Gas

Non-metallic materials almost completely absorb the laser energy of wavelength of 10640nm; air is generally used as the auxiliary gas. Auxiliary gas of carbon steel is oxygen because carbon steel contains iron and oxidation of iron produces large amount of heat. Using oxygen as flux reduces laser energy requirement. High-pressure nitrogen is commonly used to assist cutting stainless steel; the cut appears to be brighter since there is no oxidation. Aluminum and copper have a higher reflectivity to CO_2 laser and are thus more difficult to process; also their reflect most of energy to cause damages on related optical elements such as focus lens and reflectors. the optical design, in addition to selection of reflective lens with high reflectivity, we adopt the minimized three-set reflectors design to minimize energy loss of laser. Since lasers are invisible lights, Anderson adopts red light module in optical design to assist in adjustment and alignment. The operators are clearly informed whether the laser is on or off with the presence or absence of red lights.



浮動頭組圖
Floating Head Set

接觸式浮動變焦之防撞頭組

當在雷射功率上限值附近加工應用時，會因為工件厚薄不均或工件不平整，造成離焦加工，而導致工件無法切斷之現象。因應此類之需求應用，相關的浮動裝置因應而生。雷射加工速度快，相對浮動裝置的響應也必須快。此類裝置大都為接觸式或非接觸式的訊號回饋 Z 軸補償機制，設備建置成本高，相較於加工單價不高的廣告業之加工應用，顯得不符合經濟效益，為了滿足此類市場之需求，進而開發接觸式機構即時補償浮動裝置，大幅降低建置成本，提供更即時的自動變焦功能。除此之外，為了防止接觸式加工時，有無法預測異物之撞擊可能性，設計了訊號式及機構式兩道頭組防撞機制，以降低撞擊頭組造成的傷害。

浮動示意圖
Ilustration of Floating

Contact-Type Floating Zooming Anti-collision Head Set

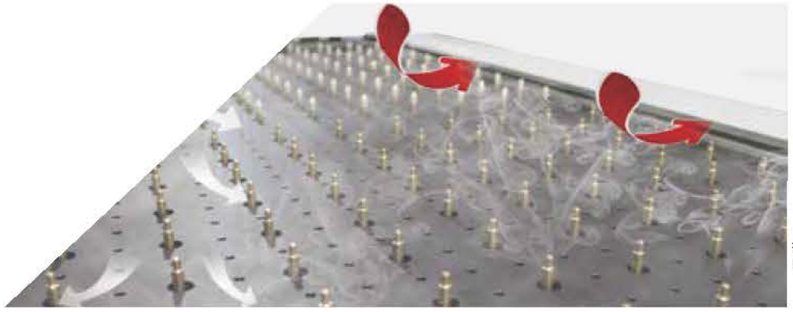
When processing is taking place near upper limit of laser power, it may result in defocus processing if the thickness of the workpiece is not even or not flat. This may cause workpiece not to be cut thoroughly. In response to the demand for this type of application, related floating devices are developed. As speed of laser processing is fast, corresponding floating devices should response fast. This type of devices is mostly contact-type or non-contact type signal Z-axis feedback compensation. Cost of such equipment setup is high; in processing application of advertising industry where processing unit price is low, such setup is not cost-effective. In order to meet the needs of this market, contact-type instant compensation floating devices are developed to dramatically reduce implementation costs, and provide more immediate automatic focusing function. In addition, in order to prevent the possibility of collision from foreign matters during processing, two anti-collision mechanisms that are signal-type and mechanical-type are designed to reduce the hishi damage caused by collision.

頂針式活動升降平台組

雷射設備的台面設計，大多為劍山式或平台式的台面設計，劍山式台面排風效果不佳，平台式台面上料耗時，因而無法勝任在大型板類的加工應用上。頂針式活動升降平台，是針對大型板類加工應用的台面設計，具有較佳的排風效果、大型工件上料輕易省時，可避免工件刮傷，藉由台面升降功能，自由調整工件掉落距離，以避免工件掉落時，被雷射擊中而報廢。

Top Pin Lifting Table

Table design of laser equipment is mostly sword-type or platform-type. Ventilation effect of sword-type table is not good. Material feed-in on platform-type table is time consuming and therefore not capable of processing large plates. Top Pin lifting table is designed for processing of large plates; it has better ventilation effect. It is convenient and easy to feed in large workpieces hence preventing workpieces from scratching. With the lifting function of table, the falling distance of workpiece can be adjusted freely to prevent scrapping items caused by laser hit.



排風台面示意圖
Exhaust Table

分區自動切換排風模組

廣告業常加工的壓克力材料，因為要求視覺效果，對於切割面的亮度、透明度非常重視，但因為壓克力材料加工，是使壓克力材料氣化，氣化之氣體需要即時排走，如無法即時排走，就會因冷卻固化在切割面上，使得切割面呈現霧狀面；再者，如壓克力的氣體濃度過高，則會因雷射聚焦能量，到達燃點而著火，火增加的熱能，使得切割面呈現過熔現象，由此可知，排風系統的重要性。為了開放式空間能有良好的排風效果，採用低靜壓高風量的鼓風機，結合多孔式風箱設計，依據頭組行進的加工位置判斷，自動分區切換，使得加工位置可獲得最大的排風量，除風箱台面進行正面排風外，也在前後兩側，設計了排式側抽風，以加強排風效果

Partitioned Automatic Switching Exhaust Module

Acrylic is a common material used in processing of advertising industry. Due to the required visual effects, it is important to maintain the brightness and transparency of cutting surface. Acrylic material processing is to make the acrylic material gasification; gas produced in gasification should be exhausted immediately otherwise it will solidify on the cutting surface when it cools down, making the cutting surface mist-like. Moreover, when the gas concentration of acrylic is too high, it may get on fire as laser focusing energy reaches the flash point. The heat increased by the fire may cause undercut phenomenon on the cutting surface. The importance of exhaust system goes without saying. In order to main good ventilation effect in

輔助夾置具

材料因變形，易造成失焦，造成加工品質不良或報廢，藉此需要輔助夾具以固定材料。

Auxiliary Clamps and Fixtures

When materials are deformed, it causes out of focus and resulting in poor processing quality or scrapping. Therefore auxiliary fixtures are needed to secure the materials.

夾置具示意圖
Clamps and Fixtures

Diverse UV Digital Printing Applications

多樣化的 UV 數位噴繪應用

\ 林 旺昇 by Elephant Lin

數位噴墨技術的發展在最近的10年內受到極大的關注，尤其是UV固化墨水的開發與應用更是將數位噴墨技術延伸到原來的廣告應用以外的領域，恩德集團從2005年開始數位噴墨技術的開發，除了著重在機台的效能設計與製造外，也投入相當資源與國內外主要的墨水供應商合作開發適應在各種不同應用的墨水，我們將在本文中介紹除了原有主要的TOP-R系列墨水外，更具有獨特性的幾款墨水。

The development of digital inkjet technology attracts a lot of attention in the last 10 years. In particular, the development and application of UV curable ink helps extend the digital inkjet technology to other areas outside the original advertisement application. Anderson Group started to develop digit inkjet technology from 2005. Except focusing on the effectiveness and manufacture of machinery, Anderson also cooperates with major domestic and foreign suppliers by investing considerable amount of resources in developing ink used in various applications. This text will introduce several unique inks in addition to the original major TOP-R series of ink.

由於數位噴繪技術可以直接引用數位的圖文資料，與傳統印刷需要製版的工序，對於現今講求個性化少量多樣的彈性需求有著極大的好處，所以傳統以絲網印刷的應用，已經紛紛考慮導入數位噴繪技術。而UV固化墨水具有環保（無重金屬、無揮發性致癌氣體）、可在多種材料上噴印、即噴即乾可快速進行後製程等優點，因此，UV數位噴繪已經成為導入產業應用的首選技術。目前已經大量應用在日常生活中可接觸到的產品中，例如，個性化紀念品或飾品，如：吸水杯墊、手機殼、婚紗照、紀念冊、潮牌拖鞋；家居裝潢建材，如電梯門、裝飾背牆、玻璃屏風、彩繪天花板、浴室明鏡、系統化訂製家具、立體複製畫及遊艇裝潢建材；告示或標示銘版，如：觀光景點導覽解說牌、機器或儀器操作面板…等等。由此可見應用材料的多樣性！

Digital inkjet technology features an ability to directly use digital graphics and data. In contrast to traditional printing process, which requires platemaking, digital inkjet technology provides great advantages since the demands nowadays are mostly personalized and in small quantity. As a result, traditional screen printing has been gradually replaced by digital inkjet technology. The UV-curable inks are environmentally friendly (without heavy metals or volatile carcinogenic gas), can be applied to a variety of material printing, and become dry quickly for follow-up process. Therefore, UV digital printing has become the preferred technology in industrial applications. It is now widely used in daily life products. For example, personalized souvenirs or accessories like water absorbent coasters, mobile phone shells, wedding photos, albums, and brand slippers; home decorating materials such as elevator doors, decorating walls, glass screens, painted ceilings, bathroom mirrors, custom-made system furniture, three-dimensional copy paintings and yacht decorating materials; notices or label plates such as explanatory signs at tourist spots, machines or equipment operating panels and many others, which shows that it can be applied in various types of materials

在這麼多不同領域的產品應用，同一款式的 UV 固化墨水就能全部適用於 UV 數位噴繪嗎？答案是否定的。UV 固化墨水雖然適應性很高但並不是萬能，針對幾款常用但是密著不盡理想的材料，如：玻璃、磁磚、壓克力、美耐板；或是特別軟又會彎曲的材料，如：TPU 手機殼、EVA 或 PU 拖鞋、皮革；或是特殊的產業應用，如：金屬蝕刻製程。恩德集團在過去針對這些材料應用的開發努力已經有了不錯的成果，在近期相繼推出 TOP-Primer-M 可噴頭噴印架橋墨水、TOP-A 系列墨水及 TOP-E 系列墨水。

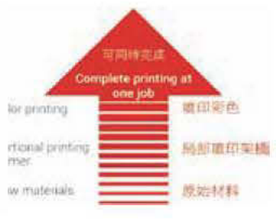
恩德集團了解到 UV 固化墨水對於 UV 數位噴繪技術與應用的重要性，恩德集團一直以十分慎重與嚴謹的態度與各知名墨水供應商進行長期合作進行墨水的研發，不外乎，我們希望能結合了多樣化適當的墨水及噴印驅動控制在多樣化 UV 數位噴繪應用中提供完整的解決方案。

In so many different areas of product applications, can the same type of UV curable ink be used in all UV digital inkjet printing? The answer is no. Although UV curable ink is highly adaptable, it is not a panacea. On several commonly used materials, the adhesion is less than ideal. For example, glass, tile, acrylic, melamine board or especially soft and flexible materials such as TPU phone case, EVA or PU slippers, leather or special industrial applications such as metal etch process. However, Anderson Group has already achieved good results in these materials. Recently, TOP-Primer-M bridging nozzle ink, OP-A and TOP-E series ink are launched successively.

Anderson Group understands the importance of UV-curable ink on UV digital inkjet technology and applications.Also, we has been cooperating with various famous ink suppliers to conduct long-term research and development on ink with careful and rigorous attitude. All we hope is to provide a complete solution for diversified UV digital inkjet printing applications by combining various appropriate inks and printing driving control.

TOP-Primer-M 可噴頭噴印架橋墨水

TOP-Premier-M bridging ink used in nozzles/printers



一般而言，如果墨水與材料的密著性不佳，會引進適用於各種材料的架橋劑（或稱底漆），但是這些架橋劑絕大多數屬於溶劑型，必須另外一道工序來塗佈，而且是全面性的塗佈，將另外衍生耗時耗工、不環保等問題，抵銷 UV 數位噴繪原有的優點；更甚者，塗佈架橋劑的透明材料其原有的透明度將大受影響；或是一整組櫥櫃門片，僅其中幾片有圖案需求，但實務上卻必須全部塗佈架橋，以免底材顏色因有無架橋劑的塗佈而有所不同，形同不完整的整組櫥櫃，這是客戶無法接受的。而恩德集團推出的 TOP-Primer-M 架橋墨水，可以在同一台噴繪機中噴印，而且可以只在相對於圖案需要的區域噴印，同時解決了上述的困擾。目前這款架橋墨水已經成功使用在膠合玻璃、明鏡、美耐板、金屬板及壓克力的室內應用。相對的，恩德的噴繪機也提供了 Primer+ 彩色同時噴印的功能，在同一次的噴印工序中就完成底塗與上色，大大縮短工時並確保品質！

In general, if adhesion between ink and materials is poor, bridging agent (or primer) that can be applied to a variety of materials will be introduced. However, these bridging agents are mostly solvent-based and require the process of painting. And since it must be comprehensively painted, there will be time and labor-consuming problems as well as environmental issues, which will offset the advantages of UV digital inkjet; what's worse, the original transparency of bridging agent will be greatly affected; or all cabinet doors must be painted in order to prevent color difference caused by bridging agents but in fact only a few of them need to be painted, which is unacceptable to the client. Anderson Group launched TOP-Primer-M bridging ink, which can be used on the same printing machine and can be applied to regional areas where patterns are required. The above-mentioned problems are solved. Currently, this bridging ink has been successfully used in indoor applications such as gluing glass, mirrors, melamine boards, metal plates and acrylic. At the same time, Anderson's inkjet printers also provide simultaneous Primer + color printing function. In one printing process, primer and coloring can be done at the same time to greatly shortened working hours and ensure quality!

TOP-E 系列超軟 UV 墨水

因應市場軟質材料的應用，例如：TPU 軟質手機殼、天然或人造皮革的彩繪包包的需求，具有超柔軟及延展適應力的 UV 固化墨水已經被開發完成；這一款墨水不但柔軟還具有延展性 (Elastic)，因此恩德集團將這款墨水型號命名為 TOP-E 系列超軟 UV 墨水。這款墨水十分適合使用在經常需要彎折或是小幅度沖壓成型的應用場合，如：軟性手機殼、彩繪包包、瑜珈墊、夾腳拖甚至是薄膜式開關銘版…等都已經有相不錯的案例。

TOP-E series of ultra-soft UV ink

In response to soft material application in the market such as TPU soft mobile phone shells, natural or artificial leather painted bags, super soft and flexible UV curable ink has been developed; this type of ink is not only soft but also elastic, so Anderson Group names this ink model as TOP-E series of ultra-soft UV ink. This ink is suitable for use in regular bending or minor stamping applications such as soft mobile phone shells, colored bags, yoga mats, flip-flops, and even film switch plates. Successful cases are seen in these areas.

TOP-A 系列泛用型 UV 墨水

壓克力一直是塑膠材料中最被常選用的材料，但一般市面上常見的 UV 固化墨水與壓克力噴印後的密著度一直不甚理想，且壓克力應用上常搭配的雷射切割後製程，也常造成切割邊緣已固化的墨水破碎而無法使用；另一方面，壓克力的透明度相當好，但許多應用在使用全面性的架橋劑塗佈後損失了透明度，也是應用上不能接受的。TOP-Primer-M 墨水雖然可以解決以上的問題，但是以壓克力廣泛的使用性而言，相對加工成品要求很低的成本費用，增加 TOP-Primer-M 的加工成本，還是相當的挑戰。TOP-A 系列 UV 固化墨水，起源於解決上述壓克力應用的問題，在經過多次的測試與驗證後，恩德集團發現，TOP-A 系列 UV 固化墨水不但在壓克力材料有很好的密著特性外，在不鏽鋼板、美耐板、TPU、PET 燈片、內打燈燈布、外打燈燈布等軟性捲材及平板硬質材料都有不錯的密著特性，是一款適用性很高的墨水。相較於恩德集團主推的 TOP-R 系列墨水，TOP-A 系列 UV 固化墨水固化後的表面硬度不如 TOP-R 系列 UV 固化墨水的 3H，僅達到 1H，但也因為這樣的特性，使 TOP-A 系列 UV 固化墨水軟硬皆適用。

TOP-A series universal UV ink

Acrylic has been the most commonly used plastic material, but its adhesion with the common UV curable ink in the market after printing has been less than ideal. Also, acrylic application often comes with laser cutting process, thus resulting in the breaking and uselessness of cured ink at the cutting edge; on the other hand, the transparency of acrylic is quite good; but in many applications, the transparency is lost after bridging agent is applied comprehensively, which is also unacceptable. Although TOP-Primer-M ink can solve the above problems, the processing costs will be increased if TOP-Primer-M ink is used in acrylic which, in terms, is widely used and requires relatively low costs. TOP-A series UV curable ink is developed to solve the above acrylic application problems. After repeated testing and verification, Anderson Group found that TOP-A series UV curable ink has good adhesion on acrylic materials, as well as on soft rolling materials and hard flat materials such as stainless steel plates, melamine boards, TPU, PET light films, inside light cloth, and outside light cloth. The ink can be applied in a variety of areas. Compared to Anderson Group's main product TOP-R series ink, the level of surface hardness of the TOP-A series UV curable ink is not as good as TOP-R series UV curable ink, which reaches 3H. Since TOP-A series UV-curable ink reaches only 1H, it is suitable for both soft and hard materials.

TOP-A 系列 UV 固化墨水在金屬蝕刻的應用

考慮到在不鏽鋼板具有很好的密著特性，恩德集團也使用 TOP-A 系列 UV 固化墨水進行了金屬板的抗蝕刻測試，也一樣達到相當好的結果，甚至蝕刻深度可以高達 1.5mm，對於不銹鋼表面圖案蝕刻加工及刀模應用是一款新而且特性更好的墨水。

有了好的墨水，要讓這些墨水能在噴墨頭順暢的噴印，也要有適當的噴印參數。在這一方面，恩德集團在搭配墨水廠商研發測試墨水的同時，也會針對各款墨水進行觀墨的實驗，透過觀墨實驗可以得到最適化的噴墨頭控制驅動波形，也可以了解到墨滴成型的好壞，進而了解到長時噴印的順暢情形。

Metal etch applications of TOP-A series UV curable ink

Considering that it has excellent adhesion performance on stainless steel sheets, Anderson Group also uses TOP-A series UV-curable ink for etch resistance test on metal plates, which also shows good result. The etching depth can even be up to 1.5mm. It is a new and better ink for stainless steel surface pattern etching and processing and die cut application.

With good ink, appropriate printing parameters are also required to make ink print smoothly from the inkjet nozzel. In this regard, Anderson Group cooperates with ink manufacturers to develop and test ink. We also conduct observation experiments on each type of ink. Through these observations, we can obtain optimized inkjet nozzel driving waveform, understand the formation of ink drop, and thus further understand the smoothness of long-term printing.

應用於木工機械的大推力線馬設計

\ 蔣 繼偉 by Cobb Chiang

近年來隨著客戶加工精度、速度以及效率的要求越來越高的情況下，使用旋轉伺服馬達搭配螺桿進行平面移動加工的木工機械已經難以勝任。有鑑於此，恩德在三年前已經投入更高階傳動元件 - 線性馬達的研發行列，為了就是提供最佳性價比的線性馬達給各種木工機械使用，以滿足客戶更高階應用的需求。

由於一般木工機械 Y 軸部分皆為龍門結構設計 (如圖 1) 且重量很重，要能帶動龍門結構的線馬必須擁有極大的推力，國內能夠生產大推力線馬的廠商少之又少，且外購成本極高，因此許多木工機械廠只好放棄使用線馬做為龍門的傳動元件。近年來恩德投入線馬研發的成功，加上在木工機械產業已經累積豐富的經驗，恩德在今年成功開發出第一台利用線馬帶動龍門結構的木工機械。

從以上的介紹中可以了解大推力線馬在整個木工機械零件中屬於關鍵的零組件，因此本文將針對大推力線馬的設計做更進一步的介紹。

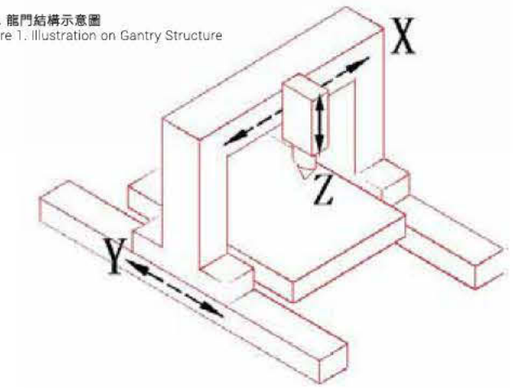
In recent years, clients have increasingly higher demand on precision, speed, and efficiency. Traditional woodworking machinery which uses a rotary servo motor with ball screw for planar moving processing is no longer reach their demand. For this reason, Anderson has devoted to the research of higher transmission system, linear motors, three years ago to provide linear motors with the best price-performance ratio for various woodworking machinery.

Generally Y-axis of woodworking machinery is gantry design (as shown in Figure 1) and the weight is heavy; thrust required by a linear motor to drive the gantry structure is huge. There are very few manufacturers manufacture big thrust linear motors in Taiwan. Moreover, the outsourcing cost is extremely high. Hence many woodworking machinery factories give up on using linear motors as transmission element for gantries. With Anderson's successful R&D in linear motors and accumulated experiences in woodworking machinery industry, we successfully develop the first woodworking machinery that uses linear motor to drive gantry structure this year.

From the above introduction, we can know that big thrust linear motor is a key component in woodworking machinery. We will further introduce the design of big thrust linear motor

Big Thrust Linear Motor in Woodworking Machinery Application

圖 1. 龍門結構示意圖
Figure 1. Illustration on Gantry Structure



隨著國內驅動大廠紛紛推出線性馬達的驅動器，使得驅動器不必再仰賴國外進口，在成本大大降低的情況下，國內 CNC 工具機廠商使用線性馬達取代傳統螺桿或齒排的比例有日漸趨升的傾向。本章節將針對線性馬達的優缺點進行說明，讓讀者了解使用線馬取代螺桿或齒排能夠帶來何種效益。

優點如下：

1. 可靠度高

線性馬達跟螺桿、齒排傳動的方式不一樣，線性馬達採用直接驅動的方式，無需搭配旋轉伺服馬達，因此減少定位系統的零件數目，降低機構複雜度，提高可靠度。由於線馬不需要傳動元件（如滾珠螺桿、齒輪），因此線馬不像螺桿或齒排會產生磨耗或背隙問題，大大降低故障和維修率，提供客戶更高的可靠度。

2. 行程無上限

以恩德的木工機械而言，加工檯面設計較大，為符合客戶加工大門板的需求，因此Y軸龍門移動的距離都很長，由於線性馬達的二次側（磁板）採用模組化設計，可以無限連接模組，所以基本上行程不受限制。理論上只要二次側有多長，移動距離就有多長；但對於滾珠螺桿而言，行程太長會有下垂的問題，因此對於長行程應用線性馬達具有極大優勢。

3. 定位精度高

由於線性馬達屬於非接觸式直接驅動的方式（一次側和二次側有氣隙），因此沒有接觸性震動的問題，所以幾乎可達到無摩擦的直接運動推力，而滾珠螺桿或齒排屬於接觸式驅動方式，因此使用一段時間後會產生背隙、摩擦等問題，導至定位精準度上的誤差。線性馬達配合外部位置回饋部件，故可達到高精度及高重復定位精度，進而提高木工機械的加工精度。

4. 移動速度快

線性馬達屬於直驅式馬達和同步馬達（沒有速差），因此擁有良好的動態響應，使得加工平台能更高速移動，由於螺桿和齒排皆屬於接觸性傳動，所以在高速時噪音非常明顯；對於線性馬達而言，高速移動下的聲音就相對優雅許多。此外線性馬達的加減速比螺桿和齒排都來的快。

缺點

成本較高 - 線性馬達唯一的缺點就是所需的成本太高，由於二次側磁板是採用稀土類磁鐵，因此當機台行程很長時，整體成本就會上升很多，相對於螺桿、齒排來說，線馬成本相對高很多，雖然線馬可以帶來一些優勢，但在成本的考量下，使得許多設備廠懸而不決。

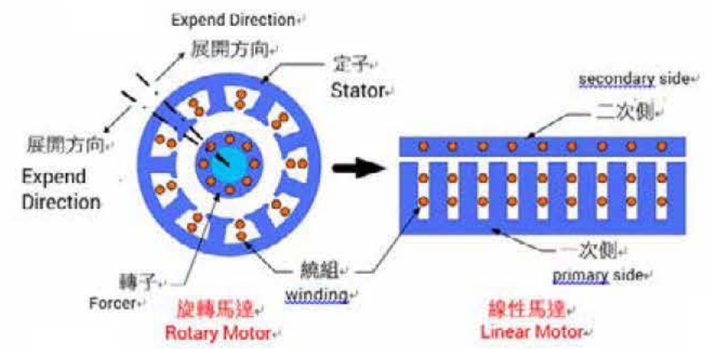


圖 2 旋轉馬達演變成線性馬達之過程
Fig 2. Evolution of Rotary Motor into Linear Motor

線性馬達
Evolution of Rotary Motor into Linear Motor

Domestic manufacturers have launched drivers for linear motors; hence the cost is greatly reduced since imports are no longer required. With the cost reduce, the number of domestic CNC machine tool manufacturers using linear motors to replace traditional ball screws or racks grows. In this section, we will explain the advantages and disadvantages of linear motors that readers can understand the benefits of replacing ball screws or racks with linear motors.

Disadvantage is Higher Cost -The only disadvantage of linear motor is the costly. The secondary side magnetic plate is rare-earth magnet; when the travel length is long, the overall cost increases a lot. With respect to ball screws and racks, the cost of linear motors is much higher. Although linear motors bring some advantages, its high cost makes many factories hanging in the air.

Advantages are:

1.Reliability

Transmission of linear motors is different from ball screws and racks. Linear motor is direct drive and does not need to work with servo motor; hence the numbers of parts for positioning system is reduced. Mechanism complexity is lower and thereby increases the reliability. Since linear motor does not require transmission elements (such as balls screw and gears), there is no issues such as wearing and backlash as screws or racks. The failure and maintenance rate is highly reduced, providing customers with greater reliability.

2.No Limitation on Travel Length

Anderson provides woodworking machinery with bigger table design to meet customers' need for processing big plates. The moving distance of Y-axis gantry is long. Since the secondary side (magnetic plate) of linear motor is in module design and the modules can be added unlimitedly, basically there is no limitation on travel length. In theory, as secondary side goes on without travel limit, the moving distance can be as long as the former. Nevertheless, there will be sagging problems for ball screws if the trip is too long. So for long travels, linear motor application has a great advantage.

3.High Positioning Precision

Since linear motor is in a non-contact direct drive mode (there is air gap between primary side and secondary side), there is no issue on contact shock. It is almost possible to have direct moving thrust without friction. On the other hand, ball screws or racks are in contact drive mode; after a period of time, there will be problems of backlash and friction, leading to an error on positioning accuracy. Coupling linear motor with external position feedback components makes it possible to achieve high precision and high accuracy in repeat positioning, thus improving the procession precision of woodworking machinery.

4.Fast Moving Speed

Linear motors belong to direct drive motor and synchronized motor (no speed difference); they have a good dynamic response, making the processing table to move in high-speed. Ball screws and racks belong to contact-type transmission. At high-speed, the noise is obvious. On the other hand, linear motors have relatively elegant sound in high-speed movement. In addition, acceleration and deceleration of linear motors are faster than that of ball screws and racks.

應用於木工機械的大推力線馬設計概要

Big Thrust Linear Motor in Woodworking Machinery Application

1. 模組化設計

由圖 2 旋轉馬達演變成線性馬達的過程來看，當旋轉馬達要獲得更大的功率或是扭力時，必須增加定子外徑，因此馬達整體體積變大；就線性馬達而言，要獲得更大的推力時，必須加大動子的寬度，但對模具廠商來說，要沖壓出此種片子是非常困難的。從以上可以了解，當客戶需要大推力線馬的時候，不能一味的加大動子矽鋼片的寬度，這時設計者就可以利用線性馬達左右移動的特性進行模組化設計。

由於線性馬達動子的矽鋼片是同向並列地連接在動子外殼上，對各個動子矽鋼片的線圈分別通予電流，便能讓各個矽鋼片產生磁性，再搭配由 N 極與 S 極磁石交錯排列成直線的定子，便能夠讓各動子矽鋼片產生磁性配合定子進行作動，因為這些矽鋼片的尺寸皆相同，所以只要製作單一尺寸的矽鋼片，便能藉由改變矽鋼片的數量產生不同大小的推力，省去製作多種尺寸矽鋼片的費用。

為使線性馬達產生更大的推力，藉由並聯多組尺寸相同、銅線繞法相同的動子矽鋼片，使得線馬的推力能夠倍數成長，這種方式簡稱為模組化設計（圖 3）。這種設計的好處是當客戶的載重物不同時，所需的推力大小也不同時，可以藉由並聯矽鋼片的數目或是改變矽鋼片的厚度，達到滿足每個客戶的需求，這不僅減少製作多種尺寸模具的費用又可以達到客戶的需求，因此模組化設計對於大推力線性馬達而言是相當人性化的設計。

2. 霍爾效應感測器（Hall Sensor）簡介

[a] 線馬作動原理

在了解霍爾效應感測器之前，讀者要先了解線性馬達的作動原理，簡單來說當驅動器對動子端三相繞組通入三相交流電流，此時動子端會產生移動磁場，有如會移動的 N 極與 S 極，此移動磁場與定子端的 N、S 極磁場產生相互作用，使得馬達產生推力，接著利用磁石與磁石間同極相斥異極相吸的原理，讓馬達動子隨著移動磁場同步運動。

如圖 4 所示，當動子位於 Point A 位置時，此時驅動器會給予動子三相繞阻對應的三相電流來產生磁場，此磁場會跟定子磁場相互排斥，因此動子會移動，當動子移動到 Point B 時，三相電流也要提供相對應的值，從這裡可以看到電流跟磁場都是時變的，所以動子可以任意的前進或是後退。

1. Modular Design

From the evolution of rotary motor into linear motor shown in Figure 2. We can see that to obtain bigger power or torque in rotary motors, the outer diameter of stator needs to be increased and the overall size of motor becomes larger. In the case of linear motors, to obtain bigger thrust requires increased width of forcer. However, it is very difficult for mold makers to stamping out such plates. Instead of obdurately increase the width of silicon steel forcer; designers can use the feature of left-right movement of linear motor for modular design.

Since the silicon steel plate of linear motors are connected to the outer shell of forcers in parallel along the same direction, making the coil of each forcer silicon steel plate on current will produce magnetic on each silicon steel. Staggered North Pole and South Pole magnets in a direct line be arranged as line stators. The magnetic property of forcer silicon steel plates will react to stators. Because the size of silicon steel plates is the same, only single size of silicon steel plate should be manufactured. Changing the quantity of silicon steel plates will produce thrust in different degree that waiving the cost for producing various sizes of silicon steel plates.

In order for linear motors to produce bigger thrust, connecting multiple sets of forcer silicon steel plates that are in the same size and with same copper wiring in parallel will make the trust grow exponentially. Such method is referred to as modular design (Figure 3). Advantage of such design is that, when the load is different and required thrust is different, changing the numbers of parallel silicon steel plates or changing the thickness of silicon steel plates can meet the need of each customer. Not only this reduces the cost of making molds in various sizes, but also meets customers' needs. Therefore, modular design is a rather user-friendly design for big thrust linear motors.

2. Introduction of Hall Sensor

[a]Actuation Principle of Linear Motors

Before understanding Hall Sensor, readers should first understand the actuation principle of linear motors. In simple terms, when drivers input three-phase AC current onto three-phase winding of forcer ends, forcer ends produce a moving magnetic field, like moving N poles and S poles. This moving magnetic field interacts with the magnetic field of N/S poles of stator ends and then produces thrust force. Using the principle of "like poles attract and unlike poles repel," motor forcers actuates along the magnetic field.

As shown in thet Figure 4, when the forcers are at Point A, driver will provide corresponding three-phase current to forcer three-phase winding to produce magnetic field. This magnetic field will repel to stators magnetic field, forcing forcers to move. When forcers move to Point B, corresponding three-phase current is provided. It is shown that current and magnetic field are both time variant so that forcers can arbitrarily move forward or backward.

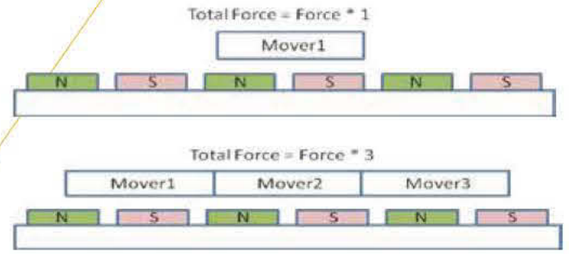
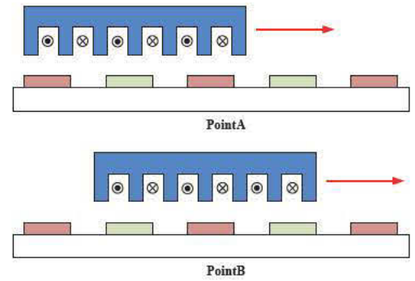


圖 3 模組化設計概念圖
Fig3 Concept of Modular Design



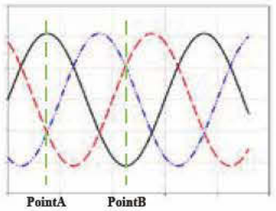


圖 4 線性馬達位置與電流關係圖
Fig.4 Relation Chart of Linear Motor Location and Current

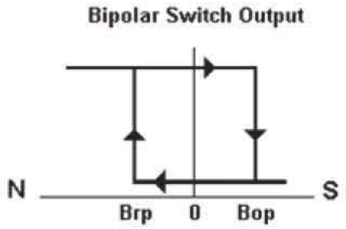


圖 5 Hall Sensor 動作示意圖
Fig.5 Actuation of Hall Sensor

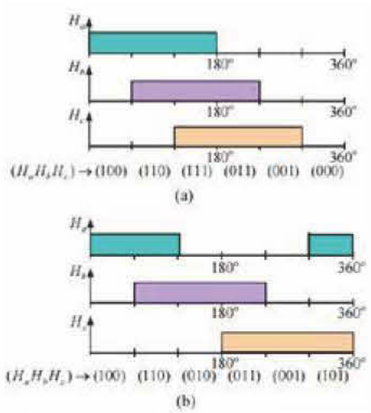


圖 6 霍爾效應感測器訊號輸出狀態 (a) 60°(b) 120°
Fig6. Signal Output of Hall Sensor (a) 60° (b) 120°

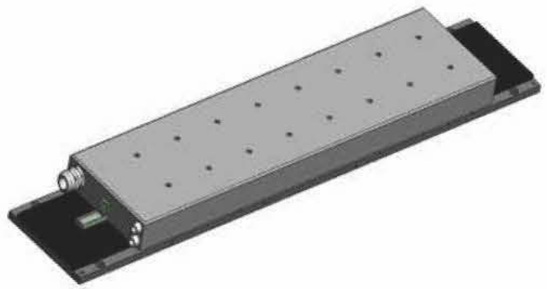


圖 7 恩德線性馬達整體架構圖
Fig.7 Overall Structure of Linear Motor from Anderson

[b] 霍爾效應感測器元件作動原理

霍爾開關是一種基於霍爾效應的磁感測器，可用來檢測磁場及其變化，可使用在各種與磁場有關的場合中。對於馬達產業來說，一般都選用雙極性霍爾開關，雙極性霍爾開關的作動原理如下：由於磁場有兩個磁極 (N or S)，當霍爾開關感應到 N 極磁場時，輸出會由低電位 (low) 轉變為高電位 (high)，當感應到 S 極磁場時輸出會由高電位 (high) 轉變為低電位 (low)，如圖 5 所示，雙極性霍爾開關一般具有鎖定的作用，亦即當磁極離開後，霍爾元件的輸出信號不會發生改變，直到感應到另一個磁極。

2. 霍爾效應感測器（Hall Sensor）簡介

[c]Hall Sensor 訊號種類

霍爾元件使用的數量與馬達的相位數有關，三相馬達擁有三相線圈，三相線圈在空間上各相差 120° ，一般來說 Hall Sensor 排列方式分為三相差 60° 跟 120° ，其中三相 Hall Sensor 的輸出訊號差 60° 的部分，其 a 相 Hall Sensor 的輸出訊號會領先 b 相 Hall Sensor 的輸出訊號 60° ，b 相 Hall Sensor 的輸出訊號再領先 c 相 Hall Sensor 的輸出訊號 60° ，如圖 6(a) 所示，可知三相 Hall Sensor 的輸出訊號狀態依序為 (100)、(110)、(111)、(011)、(001)、(000)。

另外三相 Hall Sensors 的輸出訊號差 120° 者，其 a 相 Hall Sensor 的輸出訊號會領先 b 相 Hall Sensor 的輸出訊號 120° ，b 相 Hall Sensor 的輸出訊號再領先 c 相 Hall Sensor 的輸出訊號 120° ，如圖 6(b) 所示，由圖可知三相 Hall Sensor 的輸出訊號狀態依序為 (100)、(110)、(010)、(011)、(001)、(101)。

驅動器可藉由 Hall Sensor 的訊號輸出獲知道目前線馬磁鐵所在位置，再與馬達的反電動勢進行比對，即可算出馬達的起始角度，再藉由搭配外部位置回饋部件，可以使線馬達到更好的驅動效果，一般線馬用的霍爾效應感測器會獨立設計成單一零件，由客戶自行選擇是否加裝。

3. 線性馬達電氣規格

由於木工機台很多都應用於傢俱櫃子或是門板的加工，所以工件的加工範圍非常廣，因此龍門結構的設計變得相當巨大；此外恩德 SELEXX 系列的 X 軸除了安裝主軸以外，還有排鑽馬達，整體龍門重量會變的非常重，因此帶動龍門機台的線馬必須擁有很大的推力，才能達到高加減速的性能需求。

為了讓組裝人員方便安裝，線馬的整體設計必須更加緊湊且輕巧，表示線馬的推力密度必須變大，亦即相同體積下產生的推力要比較大，為了達到此目的，恩德線馬採用水冷散熱設計，來達到高推力密度的效果，大推力線馬整體架構圖如圖 7 所示，詳細電機規格如表一所示。

[b] Actuation Principle of Elements of Hall Sensor

Hall sensor switch is a Hall Effect-based magnetic sensor used to detect magnetic field and its changes. It can be used in all occasions related to magnetic fields. For the motor industry, generally bipolar Hall sensor switch is used; the actuation principle of hall sensor switch is as follows. Since magnetic field has two poles (N or S), when Hall sensor switch detects N-pole magnetic field, its output switches from low potential into high potential. When Hall sensor switch detects S-pole magnetic field, its output switches from high potential into low potential. As shown in Figure 5, bipolar Hall sensor switch generally has a locking effect. When it is away from a magnetic pole, the output signal of Hall element will not be changed until it detects another magnetic pole.

[c] Types of Signals of Hall Sensor

The quantity of Hall elements used is associated with the number of phases of motor. Three-phase motor has three-phase coils and the gap of each coil is 120°. Generally the arrangement of Hall Sensor is divided into three-phase of difference in 60° and 120°. Where in output signal of difference in 60°, the output signal of phase a of Hall Sensor is ahead 60° of phase b; the output signal of phase b of Hall Sensor is ahead 60° of phase c. As shown in Figure 6(a), the output signal status of three-phase Hall Sensor is respectively (100), (110), (111), (011), (001), (000).

Moreover, in output signal of difference in 120°, the output signal of phase a of Hall Sensor is ahead 120° of phase b; the output signal of phase b of Hall Sensor is ahead 120° of phase c. As shown in Figure 6(b), the output signal status of three-phase Hall Sensor is respectively (100), (110), (010), (011), (001), (101).

表 1 大推力線性馬達之電氣規格
Tabale1 Application of Woodworking Machinery and Future Development

連續推力 [N] Continuous Thrust [N]	3950
瞬間推力 [N] Instantaneous Thrust [N]	7000
連續電流 [A] Continuous Current [A]	20
推力常數 [N/Arms] Cooling System	197
散熱系統 Cooling System	水冷式 Water Cooling

3. Electrical Specification of Linear Motor

Since woodworking machinery is mostly used in processing of cabinets or door planks, the range of workpiece processing is wide and the design of gantry structure becomes enormous. Moreover, X-axis of Anderson's SELEXX series not only equipped with spindle, but also line boring motor. The gantry weight is therefore very heavy. Linear motor driving gantry must have big thrust to achieve the need for high acceleration and deceleration.

To make assembly easy for installation personnel, the overall design of linear motor must be compact and lightweight, meaning the motor thrust density has to be bigger. In other words, produced thrust under the same volume must be bigger. In order to achieve this purpose, Anderson's linear motor uses water-cooling heat dissipation design. The overall structure of big thrust linear motor is shown as Figure 7. Detailed electrical specifications are shown in Table 1.

木工機台實例應用與未來發展

恩德擁有多年木工機台的設計經驗，再加上近年來全力投入線馬設計，透過跨部門合作和電機、機械上下垂直整合的配合下，恩德已經成功將大推力的線性馬達應用在 SELEXX 系列的機械上，是台灣第一台使用線性馬達的木工機械（圖 8），這將幫助恩德在全球的木工機市場跨出領先的第一步。

目前搭配線馬的 SELEXX 機台，Y 軸龍門移動速度可以達到 120 米，直線木板切割速度可以達到 60 米，整個高速移動過程非常靈敏有力，不像螺桿或齒排移動時有不順暢感。由於機台移動速度變快加上軟體快鑽功能的配合，機台整體的加工時間也變快許多，讓客戶在相同的工作時間下可以創造出更多的產能。

未來設備廠將逐漸走向一條龍生產線的方向規劃，為因應客戶未來的需求，使用線馬的 SELEXX 機台將加入自動上下料功能，機台配備吸盤上料裝置將後端工件自動搬上工作區進行加工；完成加工後，機台的推料裝置將自動把加工好的工件推離台面至下料台，減少操作人員的搬運時間，提升整體產能效率。

跨部門整合的能力一直都是每家公司重要的環節之一，恩德不僅自己設計人機軟體、開發內藏式主軸提供自家的機台使用，現又開發出線性馬達，提供機台更廣泛、高速且精密的應用，藉由產品多樣化的跨部門整合，恩德努力達到每個客戶的需求。未來，恩德將一直保持著競爭的心態，面對外界越來越嚴苛的市場挑戰。

圖 (Fig.)8 GS-510

Application of Woodworking Machinery and Future Development

Anderson Group has many years of experience in the design of woodworking machinery. In recent years we has devoted to design linear motors. Through cross-sectoral cooperation and electrical and mechanical vertical integration, we has successfully applied big thrust linear motors on SELEXX series. It is Taiwan's first woodworking machinery using linear motor. It helps us taking the first step into global woodworking machinery market.

The Y-axis gantry moving speed of SELEXX machine that couples with linear motor can reach 120 meters/min; the cutting speed of direct line can reach 60 meters/min. The overall high-speed movement is agile and powerful, unlike the rough feelings of movement in ball screws or racks. With faster moving speed of machine and the function of software fast drilling, the overall processing time of machine is reduced. It allows customers have more production in the same working time.

The trend for equipment plants is one-stop production. To satisfy such future need of clients, Anderson will add automatic loading and off-loading functions to the SELEX machine. The machine will equip with suction loading device to automatically feed in workpiece onto working area for processing. After processing, the material off-loading device will remove the processed workpiece onto feed-off table. Handling time of personnel is therefore reduced, improving overall production efficiency.

The ability of cross-sectoral integration has been one of the important aspects of every company. Anderson Group not only design our own human-computer software and develop integral spindle for our machines, but also develop linear motors for winder and high-speed precision applications. Through cross-sectoral integration of product diversification, we strives to satisfy every customer's need. In the future, we will always maintain the mentality of competition to face the increasingly demanding market challenges.

Anderson Compass

KAINDL

系統板材
超耐磨地板
MFC&Floors

歐洲原裝進口 E0-P3(V313) 最高等級防潮防霉抗菌健康板材

Imported from Europe E0-P3 (V313) highest level Moisture-proof, antibacterial and antifungal healthy plates

劃時代的創意與革新

3D 立體同步壓紋技術

KAINDL 有一項獨步全球的專業表面紋路處理技術” 3D 立體同步壓紋” ，目前不論在專利技術及製作水準上均已達到了成熟穩定的地步，在系統板同業間尚無出其右者。何謂” 3D 立體同步壓紋” ？現在以市面上經常看到的木紋 2D 平面與木紋 3D 立體壓紋做比較。

木紋 2D 平面在表面上雖有視覺與觸覺效果，但以鋼板在表面壓模出規則性木紋線條，除紋路缺少變化外，其深壓木紋雖有凹凸不平的觸感，但紋路表現出呆板與缺少視覺上立體感受，置身其中也無法融入大自然之感。

木紋 3D 立體同步壓紋是 KAINDL 的一項創新技術，以呈現出木紋肌理層次的立體感，鋼板壓模順著木質紋路方向且深淺也有差異，表現出原木真實的 3D 視覺與立體觸覺感受，紋理上可見實木的導管在釋放新鮮的氧氣，彷彿置身在大自然寬廣的森林之中。

Landmark creativity and innovation

3D Sync registration technology

KAINDL has a unique surface lining treatment technology that leads the world--"3D sync registration." At present, the technology is mature and stable in terms of proprietary technology and production, and is second to none in the system board industry. What is "3D sync registration"? Let us compare the common 2D grain and 3D grain registration in the market.

Though 2D grain has visual and tactile effects on the surface, the grains lack of changes and 3D visual experience since grain patterns are pressed in the surface by the steel plate. Although it comes with special touch but cannot make people feel like they are in the nature.

Grain 3D Sync registration is an innovative technology of KAINDL, which exhibits three-dimensional grain texture. Steel die follows the direction of grain and there is various depths, revealing actual 3D visual and tactile feelings of timbers. Grains make people feel the wood is releasing fresh oxygen and feel like they are in a wide natural forest.

年度國際參訪

Yearly International Visiting

2016 年度國際行銷會議

2016 Group Marketing Strategy Meeting

2016 年，恩德集團為商討年度全球行銷策略及了解全球市場客戶狀況，特地召集全球各分公司代表至台灣恩德苗栗工廠，進行為期三天的業務行銷市場研討會議。
在市場瞬息萬變的情況下，藉由這次國際會議以期能夠更了解客戶的需求，提供更即時的服務。

2016, the Anderson Group to discuss the annual global marketing strategy and customer understanding of global market conditions, specifically the representatives of all branches of global convened to Taiwan Miaoli plant, a three-day business conference marketing market.

In the case of rapidly changing market, with this international conference with a view to better understanding of customer needs, provide more immediate service

全球合作夥伴
Anderson Global Marketing Parters

scm group Visit 恩德苗栗工廠參訪 Anderson Miao-Li Factory





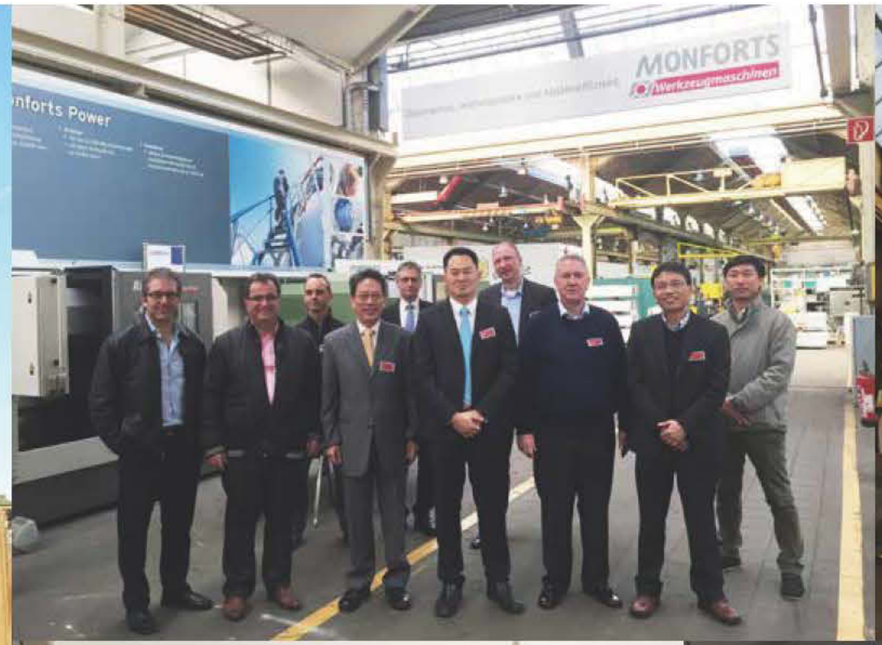
scm group

是一個創造尖端技術用於家具，住宅產業及工匠的專業團隊。集團整合了許多能將複雜的工序及操作轉換成新機會和真正的創新可能性的專家們。藉由這次參訪，互相交流木工家具產業技術及機器製造業相關心得資訊。

is a Group of Specialists creating cutting edge technologies for furniture, housing industries and for artisans. An integrated team of experts transforming complexity into new opportunities and true innovation.
With this visit,we exchange technology of furniture industry in woodworking machinery and manufacturing-related experience and information with each other.

MONFORTS
WERKZEUGMASCHINEN

德國 Mönchengladbach 工廠參訪
Mönchengladbach Factory
Visiting In Germany



恩德歐洲德國工廠參訪 Anderson Europe Factory Visiting In Germany

日本兼房株式會社參訪

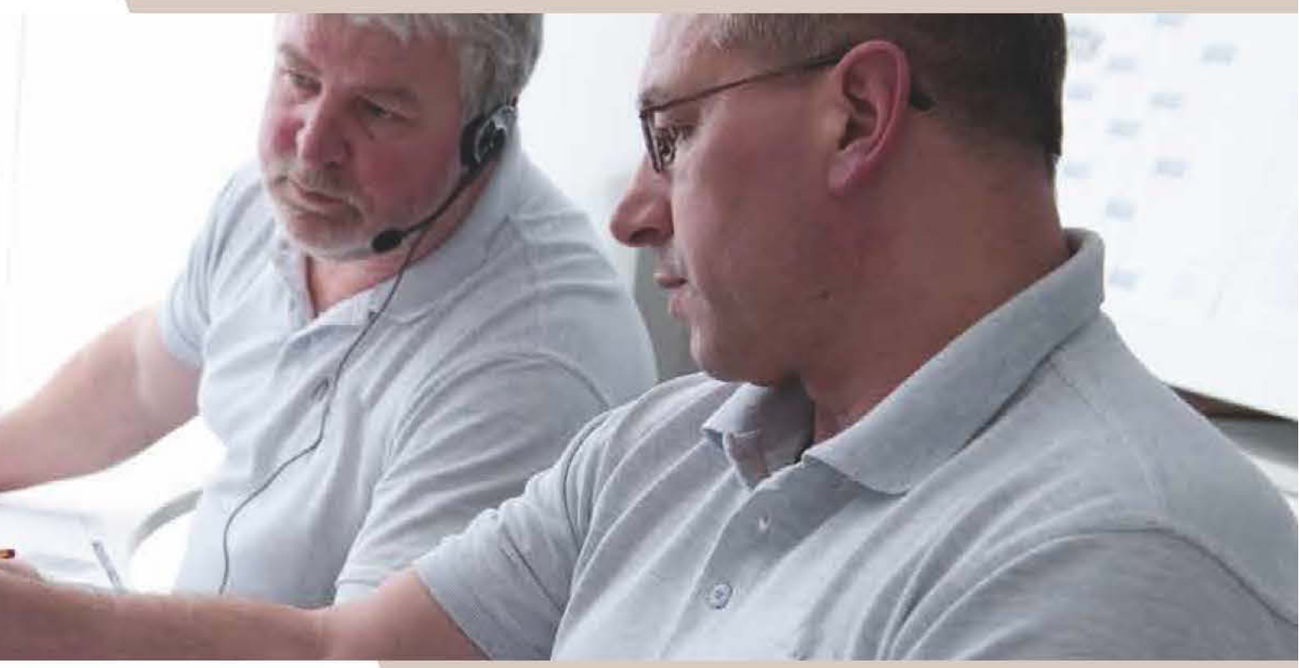
Kanefusa Corporation Visiting In Japan

自 1896 年創立以來，日本兼房積極致力於提供適用於所有加工的工業用切削刀具和機械切削刀具，產品以木材加工用刀片、圓鋸片為首，還包括金屬加工用冷鋸、適用於陶瓷業中難切削材料的金剛石圓鋸片。藉由這次參訪，共同交流市場及機械相關資訊 。

Kanefusa supplies knives and circular sawblades for wood processing, Cold sawblade for metal processing, Diamond sawblade for ceramic industry and other cutting tools for various materials that customer would like to cut.
With this visit, Anderson exchange the market news and the information related machinery with each other.

MANAGEMENT

Service



PROUD

大象會跳舞？
Can elephants dance?

\ 黃 逸嫻 by Daphne Huang

IBM，大家耳熟能詳的美國知名百年老企業，它，在 1980 年之前，是藍色巨人，於中大型電腦銷售中，獨占鰲頭，動見觀瞻，它的管理與技術層次，更是全世界企業競相學習的對象，但這龐大的組織，於 1990 年代，開始出現衰敗，面臨鉅額虧損，差點倒閉，它的演進與組織變革，無疑是管理學及策略管理上，一個力挽狂瀾成功的案例，時至今日，再度談此個案，無非是希望透過它的崛起、崛起後之組織老化、僵固性、及脫胎換骨後再度引領風騷，這過程是否仍有公司可以借鏡探討之處？

1980 年代中期以前，IBM 的一舉一動都對整個產業的走向產生重大影響。當時，IBM 大、中型電腦主機獨占世界市場的 70%，大型機的毛利率高達 85%、中小型機毛利率也高達 50%，如此高的市佔率，不僅掌握訂價權，獲利當然無人可比。但也由於輝煌的成績，沉溺於過去成功，而忽略市場已經悄悄改變。PC 取代大型電腦，導致 1990 年開始業績一落千丈，鉅額虧損，股價也重衰不起，看不到有止血良方，徵詢當時科技事業之 CEO 沒人有興趣接此一燙手山芋。

而讓 IBM 起死回生，力挽狂瀾的卻是一位來自與科技業沾不上邊的食品界 CEO Louis Gerstner，他觀察 IBM，直指的問題如下：

1. 拒絕變革：主事者無視問題存在，不願面對現實，誠心解決，針對長期投資研究卻無法獲利之產品，仍持續燒錢。
2. 驕傲自持心態：經過百年之發展，尊重員工之文化變成個人主義至上，沒有以公司為重之 team work，客戶至上變成口號，追求卓越變成要求完美、單調枯燥之文化。眾多良好之美質，發展到極致均變了樣。
3. 策略定位錯誤：打破 IBM 傳統認為“銷售與服務是營銷功能中不可分離的二部分”此為造成組織過於龐大沒彈性之主因。

由於 Louis Gerstner 非來自科技界，沒有科技人的框框架架，反而更能清楚看出組織問題所在，不是來自 IBM 內升的高階主管，因此能沒包袱的裁員，確定組織輕裝靈活後再出發；並要求業務員改變賣硬體心態，要擔任經驗豐富的顧問角色，完成 IBM 歷史上戰略定位之調整，由賣硬體的供應商轉變為提供 total solution 的顧問角色，以軟體包裝硬體銷售之銷售方式，將經驗、know how 及客製化能力之知識財，轉換為現金流，不僅銷售額回升，利潤也大幅提升。

不論是年輕的組織或是年邁的組織，均有不同之組織問題要面對，而如何因應外在及內部之局勢，調整組織，使之能成為百年企業，最重要的是所有員工要有“無框、無我”心態，不要固執於自己的專長，而忽略別的部門之重要性及與跨部門之合作，創造整體公司最大利益，個人也才能蒙其利！

IBM, a century-old well-known US company, was "the blue giant" before 1980. It took the first place and played a leading role in the market of medium and large-sized computers. Companies around the world were eager to learn from its management and technology. However, this huge organization started to crumble in the 1990s. It suffered from huge losses and almost went bankruptcy. Its evolution and organizational change is undoubtedly a successful case of turning the tide in terms of management and policy management. Today, by talking about this case once again, we hope to learn from its experience through the history where it rises, organizational stiffness after the rise, and take the lead after its rebirth.

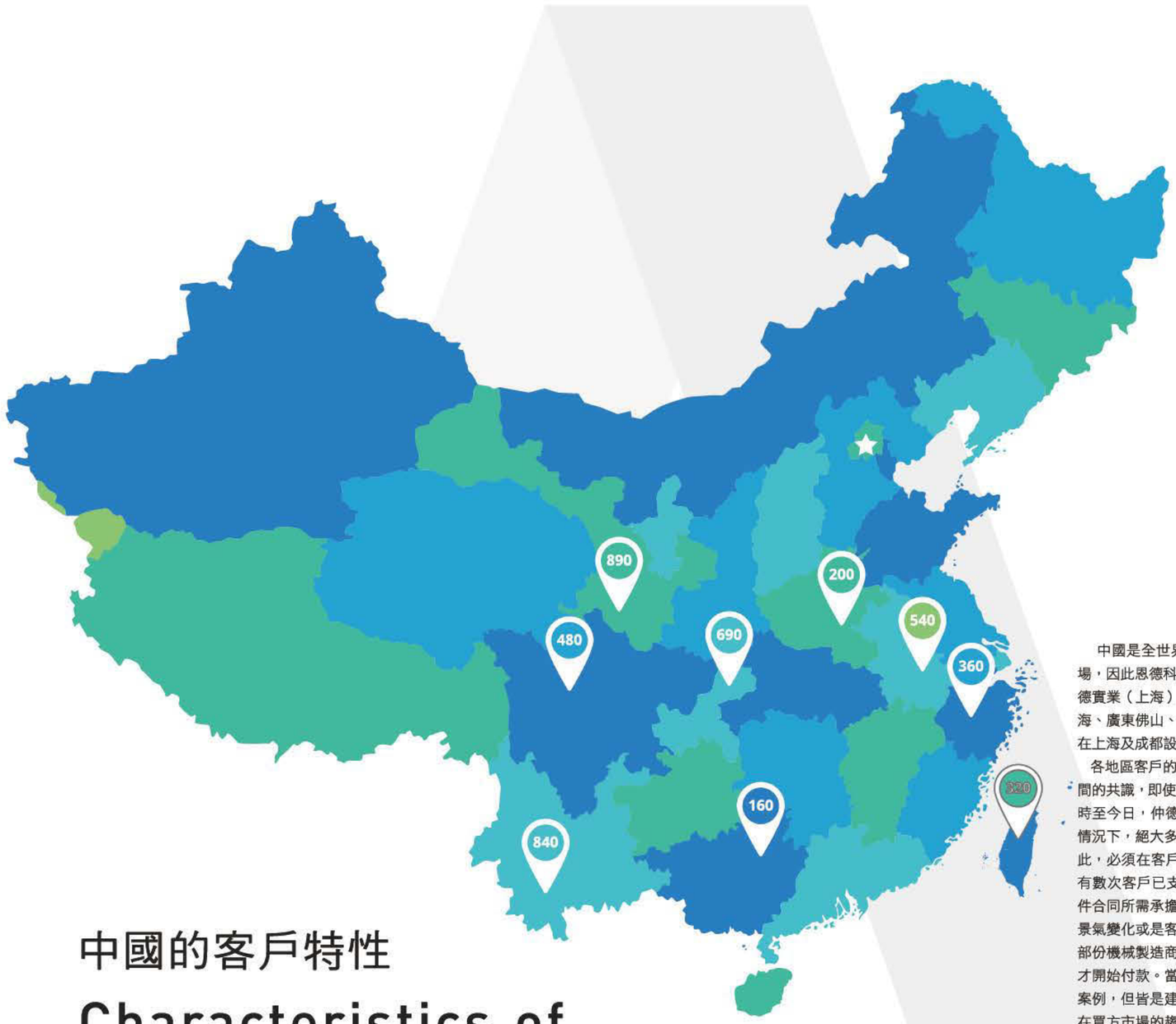
Before the mid-1980s, IBM's every move had a significant impact on the overall industry trend. At that time, IBM's large and medium-sized mainframe computers took up 70% of the world market, and the gross margins of mainframes and small and medium-sized computers were as high as 85% and 50% respectively. Such a high market share allowed it to control the pricing right as well as gained unmatched profits. However, due to brilliant achievements and indulgence in past success, IBM ignored the fact that the market has quietly changed. PC computers have replaced mainframe computers, resulting in sharp sales decline since 1990. It witnessed huge losses and low share price. There was no way to stop the downfall and no CEOs in the science and technology industry was willing to take over the troubled company.

The one who helped IBM come back to life was Louis Gerstner, a CEO from food industry, whose profession is far from technology industry. He observed IBM and pointed out its problems as follows:

1. Refuse to change: The leaders ignored existing problems and were unwilling to face reality and resolve the problems. They continued to waste money on unprofitable products that had been developed and researched for a long time.
2. Arrogant mindset: After centuries of development, the culture of respecting employees became individualism. Team work did not exist. Customer first became a slogan. The pursuit of excellence becomes a dull culture demanding perfectionism. Many good qualities lost their virtues.
3. Wrong strategic positioning: Traditionally, IBM believed that "sales and service are two inseparable parts in marketing," which was the main cause of a bulky and inflexible organization.

Since Louis Gerstner was not from the science and technology industry, he was able to see the organizational problems from a different perspective. And since he was not from within IBM, he could lay off employees without burden and downsize the organization so that it could move forward freely. He asked sales representatives to change their mentality of selling hardware to provide service as an experienced consultant. He successfully adjusted IBM's traditional strategic positioning by selling hardware through software and converted experience, know-how and customization capabilities into cash flow. By doing so, not only sales rose, profits also increased dramatically.

Whether it is a young or old organization, there are different organizational problems to face. All employees must be open-minded in order to respond to external and internal situations and to help restructure the organization so that it can become long-standing. Employees should not stick to their expertise while ignoring the importance of cooperation with other departments. By creating the best interests of the company as a whole, one can also obtain personal benefits!



中國的客戶特性

Characteristics of Chinese Customers

\ 顏 昌耀 by Aber Yen

中國是全世界最大的製造基地，也極有可能成為未來全世界最大的市場，因此恩德科技自 1993 年進入中國，並於 1997 年設立上海工廠。自仲德實業（上海）成立以來，依在中國發展的實際狀況，已先後於北京、上海、廣東佛山、山東濟南、福建廈門及四川成都設立分公司或是據點，並在上海及成都設立組裝工廠。

各地區客戶的特性都不盡相同，但在中國有個特殊的情況，甚至是同業間的共識，即使客戶口頭承諾甚至簽定；蓋章的合同，並不代表交易成立；時至今日，仲德每年仍至少有 10 個類似的合同交易取消。在以和為貴的情況下，絕大多數的廠商，並不會為這些無法成交的合同而鬧上法院。因此，必須在客戶支付 30% 的定金後，合同才有成交的可能性，仲德也曾有數次客戶已支付 30% 的定金，但是仍然一直未交機的案例。因此，每件合同所需承擔的風險，實際上遠比其他各洲分公司還要大很多；此外因景氣變化或是客戶的付款習慣，還有所謂的按揭（分期付款）；更甚者，部份機械製造商彼此間惡性競爭，提供客戶機械試用一定期限至滿意後方才開始付款。當然也有不少信譽卓著的客戶，在支付 100% 現金才交貨的案例，但皆是建立在雙方都已有良好交情的基礎上；但畢竟仍屬於少數。在買方市場的趨勢下，不良的付款方式以及惡性的競爭，對不少製造商造成極大的困擾，以及款項回收期限的困難度。

由於中國區域廣大，客戶的分布也較為廣泛，對客戶的徵信制度極難確定與建立，因此這幾年，仲德開始積極發展經銷商及區域代理商，希望藉由這些當地的合作夥伴，協助仲德更為瞭解每個區域客戶習性與交易方式外，也可以有效分攤風險。

綜上所述，每筆交易，業務員必須對客戶的產品、生產狀況、財務付款等多有熟稔外，甚至上從老闆、老闆娘，下到操作員、掃地阿姨，盡可能都要有多方面的瞭解。另外，建立公司內部風險評估也是極為重要的，越為詳細的雙方瞭解，越有可能大幅降低交易風險。

China is the world's largest manufacturing base, and is likely to become the world's largest market in the future. Therefore, Anderson entered the Chinese market in 1993 and established a factory in Shanghai in 1997. After Zhongde Industrial (Shanghai Branch) was established, in accordance with local development, other branches were set up in Beijing, Shanghai, Foshan (Guang Dong), Jinan (Shang Dong), Xiamen (Fu Jiang) and Chengdu (Sichuan). Assembly factories were also set up in Shanghai and Chengdu.

Clients in different regions have different characteristics. However, in China, there is a special phenomenon, or even a consensus, existing in the industry. Even if the client promises to or signs a contract, it does not guarantee a deal. Nowadays, Zhongde still experiences cancelation of about 10 contracts every year. For the harmony's sake, the vast majority of firms will not take legal actions against these contracts. Therefore, only after the client pays a 30% deposit can one assume that the contract will possibly take effect. Zhongde has also experienced several cases in which clients paid 30% deposit, but did not ask for delivery. Therefore, the risks of each contract are actually higher than those in other countries; in addition, there are economic cycles, the client's payment habits, as well as installments will also make things worse. What's more, some machine manufacturers engage in vicious competition, providing clients with a certain period to try the machines and allow them to pay until they are satisfied with the machines. Of course, many reputable clients will pay 100% cash before delivery. But these terms are built on good mutual interaction. After all, only a few cases are like that. In a buyer's market, poor payment methods and vicious competition cause a lot of troubles for many manufacturers and worsen the difficulties of collecting payments within certain periods.

Since China has a vast land, clients spread around the country. It is difficult to establish a system to check client's credit. In recent years, Zhongde began to actively develop regional agents and distributors, hoping these local partners will assist Zhongde to understand clients' habits of each region and their transaction methods, as well as to effectively share the risk.

In summary, for each transaction, the sales representatives must be familiar with the clients' products, production and financial status as well as payment methods. They must also know more about the owner, the owner's wife, operators, and even cleaners at the client's company. In addition, the establishment of the company's internal risk assessment is also extremely important, as an in-depth mutual understanding will significantly reduce transaction risks.

恩德科技擁有的多項傲人成績……

猶記得在美國麻州的開幕式中，首次接觸到 Omnitech 推出的 Selexx Mate。出色的 Selexx Mate 除了業界已十分熟悉、一應俱全的櫥櫃製造功能外，另外具備了自動換刀裝置、獨立 5x5 排鑽與 FANUC 控制器。恩德科技藉由所推出的 Selexx 系列，重新定位了入門款 CNC Router 的零售價。就早期而言，類似 Selexx Mate 的機械，一般僅有投資大量資本的大型企業才會使用。Selexx Mate 是第一台擁有此等工業水準、精密生產品質，卻又能僅需以 10 萬美元即可購入的機械。成為美國東北部 Omnitech 的經銷商著實令我十分難忘。

在以經銷商身份籌劃推廣 Omnitech 的活動上，遇見了同樣對 Selexx Mate 印象深刻的一個人。對方告之：「我想購買貴公司的機械……」，但當時該客戶資金並不充足。這名客戶提及自己是一家非常小型的家族企業，而他深知唯有仰賴 CNC 自動化技術，其事業才足以在木工和櫥櫃市場上具備競爭力。與購買 Omnitech Selexx 的大部分客戶一樣，該客戶並不曾為了創業購入大型機台，這筆交易甚至比他的第一個家還昂貴！他問道：「請問可以分期支付部份金額，等資金足夠時再下單嗎？」

這名客戶每個月都固定支付部份金額，直到一年後終於付清訂單費用。當機械運抵客戶工廠後，安裝作業和人員訓練都十分順利。在恩德科技美國技術支援團隊的協助下，該名客戶有一個很好的開始。當時，世界經濟一片混亂，在 2009 到 2011 年間，許多競爭對手紛紛停業，有些人削價競爭，以低利潤甚至零利潤的方式維持營運，然而我們的客戶卻生意興隆。後來他告訴我：「……要不是當初買了 Selexx Mate，我絕不可能挺過那次的經濟寒冬。」

這只是現今北美數百台因 Selexx 系列而成功的故事之一。由於我們在台灣苗栗工廠的伙伴們導入值得廣受讚揚的卓越革新及生產技術，端賴這些重要的改變，讓這個謙虛的男人得以撐起一個家。恩德科技未來也將更致力於機械雕刻機市場中，提供價格實惠、效率良好的入門級產品，深受廣大客戶的讚賞和青睞。

在過去五年經濟動盪期間，恩德科技 擁有多項傲人成績。許多機械雕刻機製造商都縮小規模或甚至退出市場，恩德科技卻逆勢崛起。木工機原有的市場雖縮小，但恩德科技更將觸角延伸至應用於航太科技及工程材料的五軸 CNC 工具機中。因為成功的安裝工程以及國際間源源不絕的訂單，台灣苗栗的工程與製造部員工都應以此成就為傲。

儘管與生產航太設備的聲譽相較，Selexx 系列雕刻機可能相形失色。但藉此機會，我們仍將聚焦在另一個恩德科技 的生產成就上——即其展現了不遺餘力地生產品質可靠、功能齊全的機械，更同時專注於價格的控制，使入門級雕刻機的客戶得以成功達到他人未所能及的成果。恩德科技實應以此為傲。

-- 謹此代表 Ominitech Selexx 系列的客戶向恩德科技致上最誠摯的感謝。--

Anderson Industrial Corp. has a lot to be proud of.....

I remember the first Omnitech Selexx Mate that I saw at an open house event in Massachusetts, USA. It was a beautiful machine fully featured for the cabinet making industry with which I was so familiar. But more than the Automatic Tool Changer or independent 5 X 5 drill block or FANUC controller, Anderson had re-defined the market for Entry Level CNC routers with the Selexx Series' retail price. In the past, machines like the Selexx Mate had only been available to large shops with considerable capital to invest in their business. The Selexx Mate was the first machine of this engineering quality and sound manufacture made available for less than $100,000.00 (US).I was so impressed I became an independent Omnitech dealer for the north east United States.

As a dealer I organized events to promote the Omnitech line where I was approached by a man that was equally impressed with the Selexx Mate. He told me,"I am going to buy one of your machines...", but he did not have the funds at that time. He explained that his was a very small family business. He knew that CNC automation was the only way he could make his business competitive in the woodworking and cabinet making marketplace. Like many of our Omnitech Selexx customers, he had never made a purchasethis large for his business before. His purchase was more money than he paid for his first home! He asked, "Can I just send you a little money whenever I have it and you can let me know when I have enough to order your machine?

This man sent me a few dollars every month until after almost a year he was able to place his order. His machine arrived at his shop, his installation and training went smoothly. With the help of Anderson America's technical support team he was off to a great start. Then, the world economy went into a tailspin. The years 2009, 2010 and 2011 saw many of his competitors go out of business. His competitors cut their price to stay in business with little or no profit. However, our customer thrived! He told me, "...without his Selexx Mate, he never would have made it through the downturn!"

This is just one success story from the many hundreds of Selexx machines in service in North America today. It is also to be recognized that this humble man has put food on his family table and a roof over their head in no small part because of the exemplary engineering and manufacturing work our partners at the Miaoli TW factory have brought to our shores. The commitment by our company to serve the entry level CNC router market with dependable cost effective products is honorable and appreciated by our customers.

Anderson Industrial Corporation has many reasons to be proud. During the last five years of economic turmoil, when many other CNC router manufacturers reduced in size or disappeared, AIC has grown. As the market for wood manufacturing machinery collapsed, AIC expanded their market penetration into five axis CNC applications in aerospace and engineered materials. With successful installations and now repeat orders from prominent international corporations in this market, the engineering and manufacturing staff in Miaoli TW should be recognized for this accomplishment.

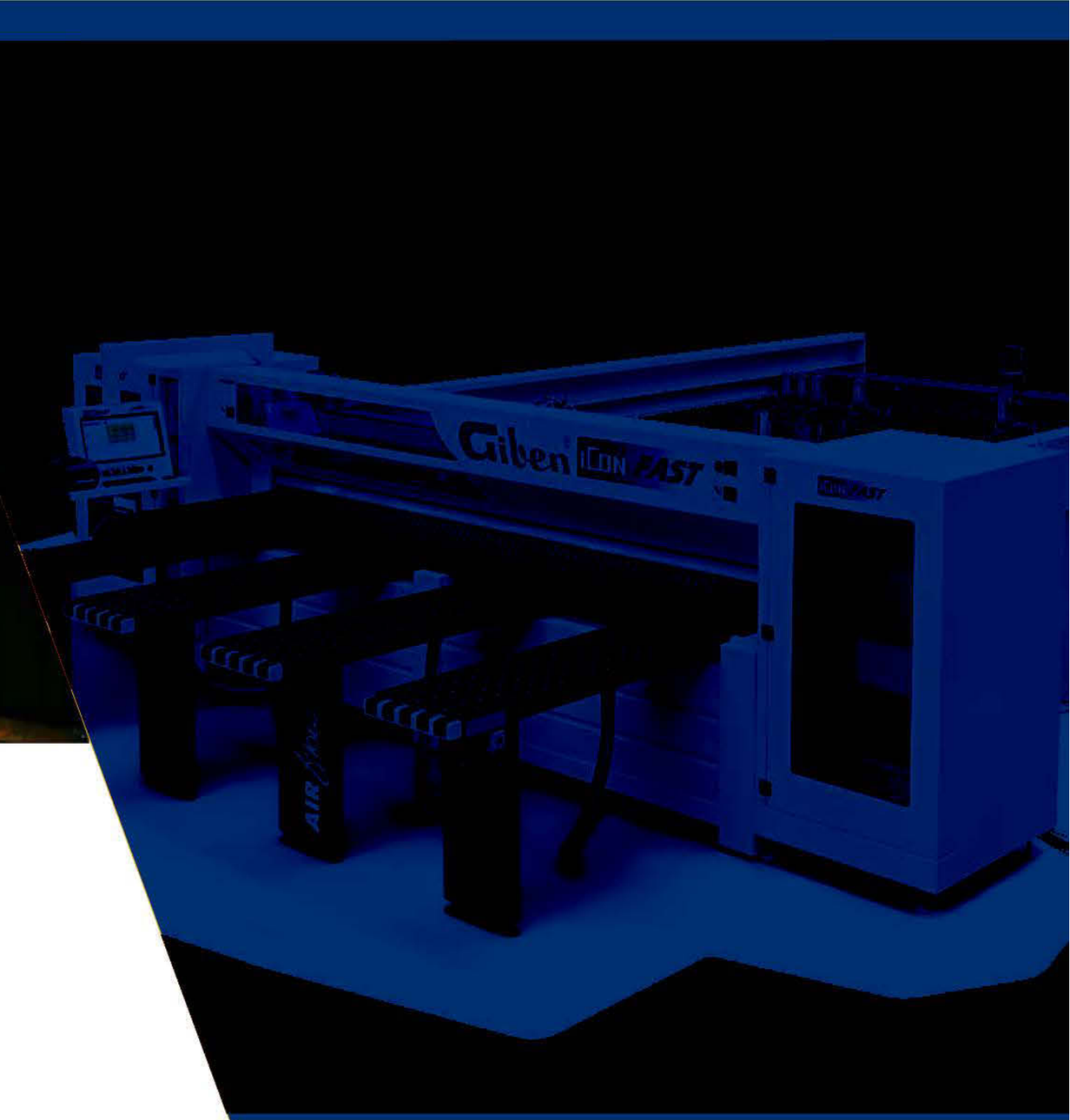
But I would take this opportunity to draw our attention to another AIC manufacturing accomplishment that is perhaps overlooked when compared to the prestige of manufacturing for aerospace installations. Your hard work at engineering a dependable, fully featured, machine with an earnest eye on price control represented by the Omnitech Selexx series of CNC routers has afforded our entry level CNC router customers to succeed where others have failed. Of this, you should be very proud. .

-In the name of our Selexx series customers, I want to thank you.-

David Paine
恩德美國公司 / Omnitech 系統有限公司　全國銷售經理
Anderson America Corp. / Omnitech Systems Inc
National Sales Manager

第十屆巴西各產業心中第一印象品牌獎「Top Mobile」即將在巴西 Curitiba 舉辦頒獎典禮，典禮中將揭曉各產業類別的前三名。為決定入圍名單和最終得獎者，這次也同樣進行了廣泛的市場調查，從第一屆開始，這項調查便是為了得知零售商及製造商印象最深刻的品牌為何，以為此獎項提供重要的評分資訊。從這部份來說，第一印象是品牌等級中最重要的事項，而它來自於自然回想和記憶刺激。此研究為結合問卷調查和電話訪問的量化研究。開放性問題能讓受訪者說出第一個記得的名稱，調查者詢問的基本問題是：「說到裁切機、修邊機、CNC 等機台時，您第一個想到的品牌為何？」問題的答案為自發性，並非來自訪問者的任何提示。訪問對象總共 1200 家，其涵蓋了每個產業的所有類別，其中包括 520 間家具零售商、400 間製造商及 280 間裝潢零售商。在裁切機類別，入圍品牌有 Giben、Homag、Tecmatic 及 Biesse，而 Giben 在本類別奪下第二名。巴西 Giben 目標是在裁切機這個類別拔得頭籌。為了達成目標，巴西 Giben 全力投入新科技（如 CNC WIBJ 機器）協助當地廠商生產、運輸及開發新款定量線入門級產品，以便將 Giben 這個品牌深入至較小型的家具產業，如此必能顯著影響將來的評審結果。

In its 10th edition, the Top Mobile, an award that recognizes the top brands of mind in the sector, held in Curitiba (PR), the award will be unveiled the first, second and third place in each category. To get the finalists and winners, extensive Marketing research is conducted to know the brands most remembered by retailers and manufacturers, which since the first edition provides information for the Top Mobile. The top of mind is the most important reminder of the level of a brand, according to the segment, followed by spontaneous recall and memory stimulated.The survey was qualitative, with structured questionnaire and telephone interviews. The questions were open, allowing the interviewee to express the first remembered name.The basic question asked was: "What is the first brand that reminds you when I say (panel saw; edge bander, CNC etc)"? The answer to this question is spontaneous, with no indication of the interviewer.In total, there were 1200 interviews with furniture retailers (520), manufacturers (400) and decorative retailers (280), covering all categories in each segment. The segment for panel saw the finalists are Giben, Homag, Tecmatic and Biesse, Giben win the second place of this category, our objective will be reach the 1st place of the panel saw segment, in order to achieve this target, we will engage innew technology application, CNC WIBJ machine local manufacture transfer and develop the new entry level product for sizing line which can helpspread Giben brand to smaller furniture industry and it will affect significant award result.



Giben

Anderson Group
恩德集團

IS010

IS20
HSK25E

HSR SERIES

AC馬達-永磁同步馬達主軸專業製造廠

永磁同步
高頻電主軸
PMSM BT30

Permanent Magnet Synchronous Motor
Built-in Electro Spindle

IS025
HSK32E

HSK63F
SK30 SERIES

M22
M16 SERIES

- 高速度、高剛性、高扭力複合型主軸
- 發熱量低，熱誤差小
- 永磁同步馬達特性
- 高動態響應與高速加減速
- 大功率達20kW
- 閉迴路控制
- 電流補償可達 37A (peak 60A)
- 低速下高扭力輸出
- 智能化節能主軸

- High Speed, High Rigidity, High Torque, Multi-functional Electro Spindle
- Less Heat Generated and Less Thermal Error
- Permanent Magnet Synchronous Motor
- High Dynamic Response and Acceleration Speed
- Provides Efficient Power Reach to 20kW
- Close-Loop Control
- Current Compensation Reaches 37A (peak 60A)
- High Torque with Low Speed
- Energy-efficient and Environment-friendly

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