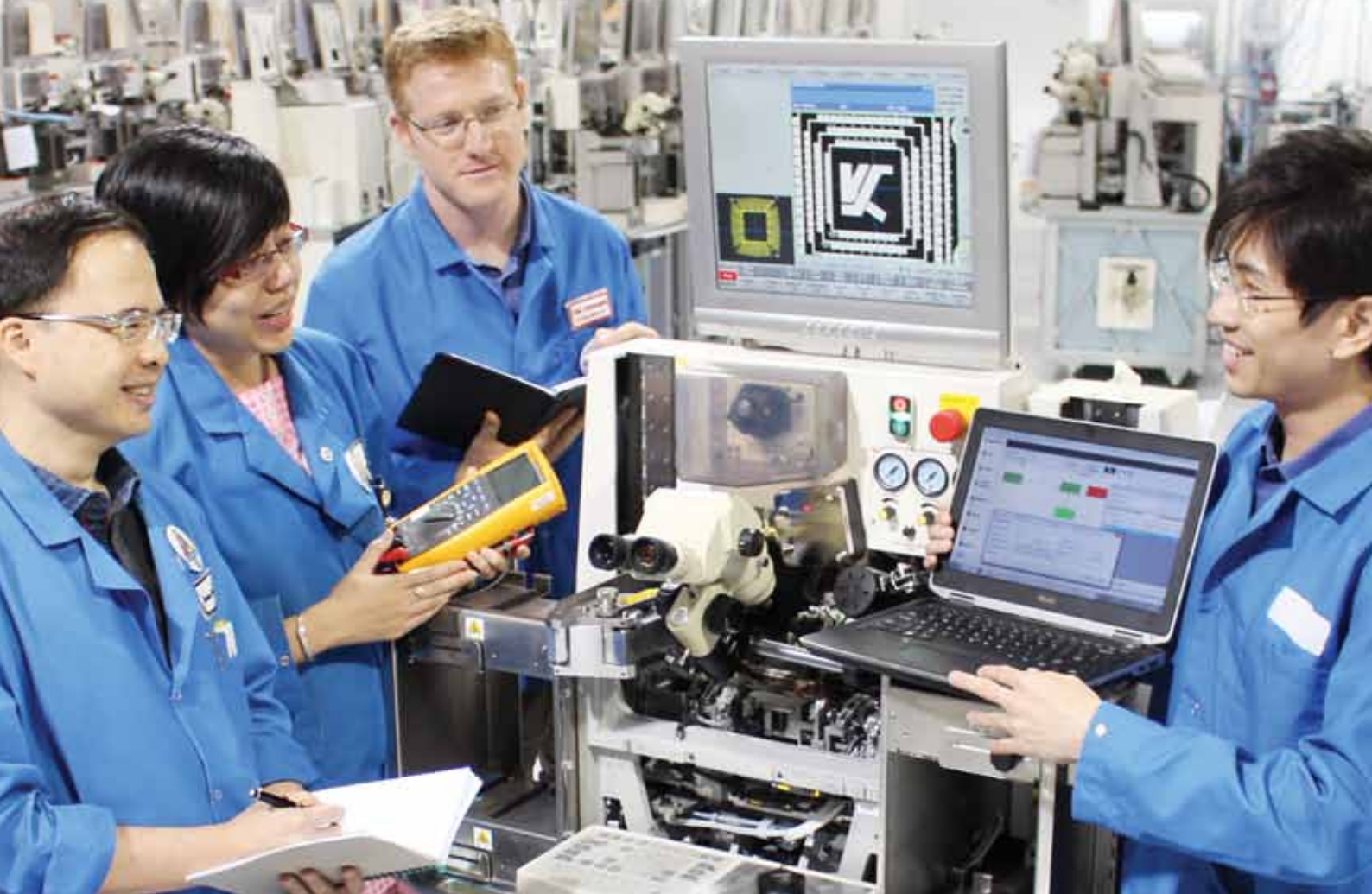


# MANUFACTURING MATTERS

January 2015 | Issue 1

A publication of the Singapore Institute of Manufacturing Technology



2-3 Feature

## CARBON FOOTPRINT REDUCTION CREATES VALUE

Communicating company's contributions and achievements towards a **SUSTAINABLE** future

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## NOTE FROM EDITOR...

Dear Friends and Industry Partners,

Increasingly, business entities are creating value through sustainability in their processes and operations. Such efforts gain competitive advantage and enable companies to venture into new business opportunities.

NIKE, Autodesk and Schlumberger are solid case studies. Our Singapore-based enterprises—LHT Holdings, Maek Consulting, Biomax Technologies and Kulicke & Soffa have successfully adopted carbon footprint reduction technology, techniques and practices to add value to their businesses. These are some success stories of the Sustainable Manufacturing Centre (SMC), at SIMTech which was set up in 2009, to assist industry to take the sustainability path.

In addition to Carbon Management (see Feature in pages 2-3), SMC has in place Energy Efficiency, Green Manufacturing, Remanufacturing and relevant training programmes for industry to tap on.

Do not hesitate to contact Dr Chen Wei Long, Director of SMC at wlchen@SIMTech.a-star.edu.sg for assistance to create value for your business.

**WISHING OUR INDUSTRY PARTNERS A HAPPY AND PROSPEROUS LUNAR NEW YEAR**



Swee Heng



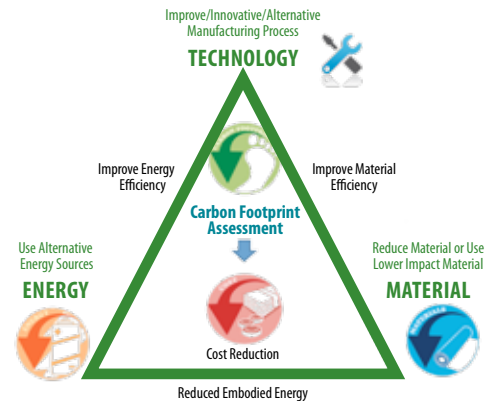
# CARBON FOOTPRINT REDUCTION CREATES VALUE

Carbon footprint assessment, toolkit and training are offered by the Sustainable Manufacturing Centre (SMC) to assist the manufacturing and building industries

## CARBON MANAGEMENT INITIATIVE

This initiative aims to help companies establish their carbon footprint baseline and strategic sustainability improvement plan through the SIMTech-developed Carbon Footprint\* Assessment and Reduction for Resource Efficiency (CAR<sup>2</sup>E)<sup>TM</sup> Methodology. SMC assists companies to:

- identify performance problems, reduce business risks and establish a baseline for improvement
- identify resource inefficiency hotspots at their root causes, highlighting key resource inefficiency sources
- prioritise and allocate resources efficiently and effectively
- increase energy efficiency, reducing material consumption and waste



## CARBON FOOTPRINT TRAINING PROGRAMMES

To meet growing interest from industry, SMC launched the **Workforce Skills Qualifications (WSQ) Carbon Management Training Programme** jointly with the Singapore Workforce Development Agency (WDA) as well as the **Integrated Carbon Footprint Assessment Reporting Essential (i-CARE) for Building Products** with Singapore Green Building Council (SGBC) and Building Construction Authority's Centre for Sustainable Buildings and Construction (CSBC) to train industry in Carbon Footprint

\*Carbon Footprint is the measurement of the total amount of carbon dioxide and other greenhouse gases caused by an organisation, project or product, and expressed as kilogrammes of carbon dioxide equivalent (CO<sub>2</sub>e). An effective key performance indicator for meeting a company's environmental and cost improvement goals, it is also an ideal tool for communicating company's contributions and achievements towards a sustainable future.



Assessment. These consultancy and mentorship-based training programmes guide companies in performing their own product/service carbon footprint assessments.

- **WSQ Programme in Carbon Management** is a 3-module programme to train managers, engineers and consultants in carbon footprint quantification and communication. At the end of the course, companies are able to develop a carbon footprint initiative and link it to improvements, effectively strengthening their competitiveness. Participants, equipped with both methodology and hands-on experiences, can assess carbon footprint in compliance with international standards, effectively communicate their eco-performance, and formulate action plans to improve energy and resource efficiency.

“Participating in the Carbon Management Programme has helped Biomax, a green technology company, to identify hotspots for potential carbon footprint reduction in converting organic waste into organic fertiliser”

Derek Cheong, Engineering Manager,  
BioMax

- **Integrated Carbon Footprint Assessment Reporting Essential (i-CARE) for Building Products** provides an in-depth understanding of the carbon footprint of a product to enable participants assess carbon footprint of their products competently. Delivered through both classroom and hands-on practice, participants learn robust and reliable methodologies in compliance with international standards to effectively communicate a product's environmental performance.

“The i-CARE course will go a long way in building up the industry's capabilities and knowledge of carbon footprint, helping industry players to make more informed, environmentally-friendly decisions”

Er Ng Eng Kiong, President,  
Singapore Green Building Council

SMC has trained 6 batches of the Carbon Management Programme and 1 batch of the i-CARE Programme helping 49 participants from 32 companies from the construction and PE industries as well as NGOs since its launch in 2013.

#### SUCCESS STORIES:

##### GreenHub

Greenpac, a local eco-friendly industrial packaging products and solutions company, engaged SIMTech to calculate the carbon footprint of the entire construction process of GreenHub, its new factory. By identifying areas that contributed significantly to the building's carbon footprint, Greenpac made changes to the building design to reduce its carbon footprint which contributed to its Green Mark Gold-certification.



##### Kulicke & Soffa

Kulicke & Soffa (NASDAQ: KLIC), a global leader in design and manufacture of semiconductor assembly equipment, provides customers with market-leading interconnect solutions. Kulicke & Soffa has embarked on a sustainability journey by participating in PE WSQ Carbon Management Programme conducted by SIMTech. Through this programme, Kulicke & Soffa has identified hotspots for improvement, and could potentially achieve 20 percent of carbon footprint reduction.

##### Maek Consulting and ARQIMAT:e

Maek Consulting and subsidiary ARQIMAT:e which are third party specialist consultants providing technical support services, were able to identify opportunities to lower the carbon footprint of their Portland cement. By using alternative fuels and replacing equipment with more energy efficient ones, the product's carbon footprint was reduced by 9.3 percent which translated into potential energy savings of \$473k. Maek Consulting and ARQIMAT:e also set up the Eco Building Material Centre (EBMC), a one-stop showcase of wide ranging green building products, materials and components. One of the centre's focuses is to promote the awareness of carbon footprint and lifecycle assessment.

For enquiries, please contact

**Dr Chen Wei Long**, Director,

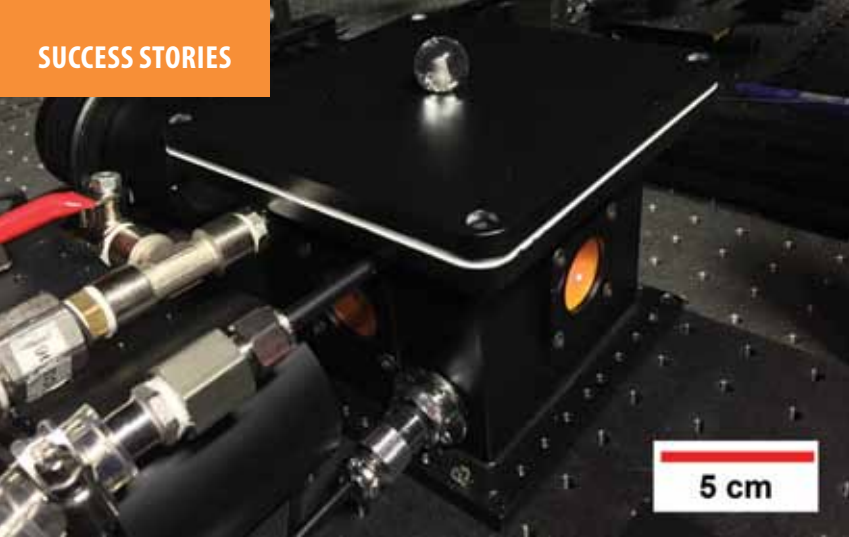
Sustainable Manufacturing Centre

Email: [wlchen@SIMTech.a-star.edu.sg](mailto:wlchen@SIMTech.a-star.edu.sg)

Web: [www.SIMTech.a-star.edu.sg/SMC](http://www.SIMTech.a-star.edu.sg/SMC)

Scan for more information  
on Sustainable  
Manufacturing Centre





## NEW BUSINESS OPPORTUNITY IN COMPLEX EQUIPMENT FOR SME

The delivery pricing of infrared optics components require quantitative specifications and grade classification of the products. The challenge of grading the lenses lies in the characterisation of lens absorption as no commercial systems are available. Lens makers usually keep the lens characterisation capability as their internal core competitive competency.

“ **The IR laser-calorimetry tools garnered interests from various manufacturers. It greatly improved our manufacturing processes and the classification of optics components to enable us to sell the components for higher value-add applications** ”

Mr Robert Huang, Chief Executive Officer, WOE

To improve the quality of lenses and price the lenses with the right value-add, Wavelength Opto-electronic (S) Pte Ltd (WOE), a SME manufacturer of infrared optics components, turned to SIMTech to establish lenses characterisation capability. Leveraging research competences in middle infrared optics, SIMTech developed a CO<sub>2</sub> laser vacuum calorimeter capable of measuring the absorption coefficient of their infrared optical lenses and mirrors.

The first of its kind compact instrument for characterisation of absorption of optical components used for high power laser applications, it is suitable for in-situ inspection in optical component manufacturing.

Since the calorimeter was implemented in the production lines for grading lens quality, the company's annual sales increased by more than 20 percent. The business portfolio of WOE has also expanded from optical components manufacturers to complex equipment.

For more information, please contact **Ms Wan Siew Ping** at 6793 8298 or email to [spwan@SIMTech.a-star.edu.sg](mailto:spwan@SIMTech.a-star.edu.sg).

## NEW BUSINESS OPPORTUNITY IN CHEMICAL USE REDUCTION AND METALS RECOVERY FOR START-UP



In conventional metal stripping processes of a metal finishing plant or a metal recycling plant, large amounts of chemicals are used to remove metals from substrates, generating large amounts of wastewater adding to cost of waste treatment including environmental and disposal problems. A new technology developed by SIMTech involves the use of a specially designed electrochemical cell that significantly reduces process and operational costs.

Preliminary pilot plant results indicate an 80 percent reduction in chemical usage and high purity metal recovery achieved for a typical metal stripping process. With the successful pilot plant results, the technology can be applied in many industry manufacturing operations of metal and surface finishing, electronics, waste management and metal recycling sectors, benefitting them economically and in carbon footprint.

Envichem Technologies Pte Ltd, a recipient of SPRING Technology Enterprise Commercialisation Scheme (TECS) Award, is in various stages of trial runs with companies in metal recovery.

“ **The technology can potentially be applied to many processes and the opportunities are immense** ”

Mr Chang Jen Heng, Director,  
Envichem Technologies Pte Ltd

For more information, please contact **Dr Alex Thoe** at 6793 8571 or email to [tbthoe@SIMTech.a-star.edu.sg](mailto:tbthoe@SIMTech.a-star.edu.sg)

## MPTC Annual Conference and Technology Exhibition 2014 cum MOU Signing Ceremonies

Guest-of-Honour

Mr Teo Ser Luck, Minister of State for Trade and Industry  
9 October 2014, Thursday | 8:30am - 5:00pm | SIMTech Auditorium



# TECHNOLOGY ASSISTANCE TO BOOST PRODUCTIVITY

SIMTech signed collaborations with 19 industry partners in three MOUs

Witnessed by Mr Teo Ser Luck, Minister of State for Trade & Industry, the MOUs are for: **RFID Laundry Consortium** which involves the use of RFID technology to automatically count and track laundry items that move between hotels and laundry service providers. The consortium is participated by 2 hotels and 4 laundry service providers.

SIMTech carries out RFID tag testing, RFID gantry design, RFID middleware software, handheld and application software development. Participating industry collaborators provide domain-specific and application scenarios including the linen. The participants will jointly test the RFID tags with SIMTech and pilot the RFID systems. The time taken to separate and manually count the laundry items are expected to reduce from 6-10 hours to minutes. The results will lead to industry-wide full-scale technology adoption.

“We leverage SIMTech’s RFID capability to help us automate the counting and handover process. Potentially, we can save half the manpower in counting and our drivers would be able to pick up from more customers”

Mr Harry Toh, Director,  
Orchid Laundry Dryclean Express Services

In another MOU, the development of a **RFID Palletised Goods Management System** (RFID PGMS) is a tripartite partnership among SIMTech, LHT (manufacturer of wooden pallets whose subsidiary leases standard Efficient Consumers Response (ECR) pallets for the fast moving consumer goods (FMCG) industry) and its customers and distributors. The new RFID PGMS increases visibility and productivity for better control, monitoring, planning and prompt response at the sending and receiving points of the supply chain.

“RFID technology authenticates proof of delivery of right goods, right condition, right location, right receiver and right time”

Mr Thomas Yeo, RFID Project Manager,  
Kim Hiap Lee Co (Pte) Ltd, Subsidiary of  
LHT Holdings Limited

The collaboration comprises the development of a RFID PGMS, system. SIMTech will focus on the design and development of RFID PGMS. LHT will provide ECR RFID pallets, PGMS package, including hardware, and bringing in their customers to adopt the RFID PGMS system. Productivity is expected to improve as handling of goods and pallets in the delivery and stock management is reduced by 30 per cent.

“While Antuit has deep expertise in today’s tools and methodologies, we believe it is essential to invest in R&D to build next-generation methodologies and tools which will bring supply chain analytics into the Big Data era and create business benefits and outcomes which are potentially 5-10 times of what is achieved today through traditional solutions”

Mr Arjit Sengupta, Founder and Managing Partner, Antuit Pte Ltd

The third MOU on the **Antuit-SIMTech Supply Chain Analytics Lab** will leverage the institute’s capabilities and technologies in addressing problems associated with complex supply chains, such as disruptions caused by external events and the use of big data to provide clarity in decision-making. The outcome will benefit companies with tools and technologies developed; from real-time analysis of customers’ demand to understanding of complex inter-relationships between companies in the supply chain for effectiveness and also optimisation across the supply chain. The focus will be discovering emerging trends arising out of volatile disruptions such as demands and quality, and methods to minimise these impacts on normal operations. SIMTech will focus on developing techniques and frameworks. Antuit will provide the business problems including data from clients, and responsible to productise and commercialise the solutions. The new solutions are expected to shorten time-to-market to capture business opportunities for supply chains.

For more information, please contact **Mr Wong Ming Mao** at 6793 8381 or email to [mmwong@SIMTech.a-star.edu.sg](mailto:mmwong@SIMTech.a-star.edu.sg).



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Manufacturing Productivity  
Technology Centre



# RELEVANT TECHNOLOGY-BASED TRAINING FOR MANUFACTURING INDUSTRY

Nineteen WSQ Training Programmes comprising Graduate Diploma in Manufacturing Technologies, Specialist Diploma in Precision Engineering, modules in specific technologies and Master Classes are available

## Knowledge Transfer

Training of industrial manpower skills to upgrade manufacturing value chains or to transform local SMEs to high value manufacturing business and improve manufacturing productivity is essential. With the strong R&D capabilities, industry knowledge and relevant experience accumulated through two decades of industry collaborations, SIMTech offers uniquely designed industry training programmes to transfer SIMTech knowledge and expertise to bridge the technology gaps of manpower demands for the Singapore manufacturing industry.

In partnership with Singapore Workforce Development Agency (WDA), technology courses enhanced with case-studies and hands-on practical sessions trained manufacturing professionals, managers, engineers and technicians (PMETs) from industry to meet the technology and skills gaps.

“Given our industry’s specialised needs, most of the training available are conducted overseas. Only SIMTech offers such niche training that is highly relevant to our Singapore industry. We sent over 20 percent of our staff to attend a number of courses at SIMTech”

Kevin Kee, General Manager,  
Unicast Engineering & Trading Pte Ltd

The WSQ training programmes are established through an innovative Learn-Practice-Implement model which has proven to be effective. An example is the Operations MaNagement Innovation (OMNI) WSQ Programme launched jointly with WDA in 2010 and to date, successfully trained more than 300 productivity managers or drivers for 120 companies from various manufacturing industries. This WSQ training model, successfully

“OmniMethodology introduced us to the application of Value stream Map on Jackup’s Jackcase fabrication, machining, and installation processes. I am now able to identify area of improvements and generate initiatives to achieve 15 percent productivity improvements. I recommend this course to anyone looking to enhance their productivity”

Lim Kuok Wei, Deputy HOD (Machining Department), Jurong Shipyard

implemented, was demonstrated to Deputy Prime Minister and Minister for Finance Mr Tharman Shanmugaratnam and the National Productivity and Continuous Education Council (NPCEC) Members during their visit to SIMTech in January 2014.

More than 1,400 PMETs, have graduated. Of the 600 companies, about 70 percent are local SMEs which have benefited from SIMTech’s WSQ training programmes. 11 WDA Master Classes by internationally renowned experts on their respective topics were organised to assist companies to capture the emerging innovative technologies for new business opportunities or for improvement in production efficiency and productivity.

“Joining the Graduate Diploma in Metal Manufacturing Processes put me in a better position to address real-life industry issues”

Tee Ming Chuan, Operations Director,  
Professional Testing Services Pte Ltd

For more information, please contact **Dr Goh Kiah Mok** at 6793 8420 or email to [kmgoh@SIMTech.a-star.edu.sg](mailto:kmgoh@SIMTech.a-star.edu.sg).



Scan for more information on SIMTech Knowledge Transfer Office



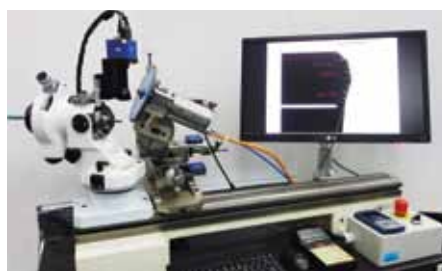
## OVERCOMING CHALLENGES IN HIGH ASPECT DEEP HOLE DRILLING

These were achieved through the holistic Collaborative Industry Project (CIP) in both unsupported gun drilling as well as customised tool grinding and measurement system

The precision machining community faces severe challenges to retain a straightness deviation within 1/1000 during the drilling of small diameter holes of less than 8mm and beyond depths greater than 1 metre on high yield strength material. In addressing these multiple gaps systematically, SIMTech is developing the critical technology, equipment and process and tooling engineering capability at the shop-floor level; innovatively create the critical equipment; and explore complementary sciences with leading universities to create robust and practical cost effective industry-driven solutions.

SIMTech collaborated with leading service providers and manufacturers of machine, tooling, material and coolant, to resolve some of the immediate challenges through the cost-effective CIP which allows members to leverage each other's strengths. SIMTech transferred to the industry participants the ideal parameter required for piloting, gun drilling and cooling in an unsupported manner using a horizontal machining centre; determination of

the maximum depth allowable per pass; establishment of the ideal cutting edge geometry for Inconel 718 drilling; methodology and equipment for the measurement of the cutting edge geometry, radius, wear and degradation behaviour; techniques to characterise the performance of the various tool under different drilling and piloting conditions.



In addressing the unreliability of traditional tools and their effect of straightness deviation, a 7-axis horizontal high precision integrated customised tool grinding and apex measurement system was developed by SIMTech. The integrated machine allows gun drills and customised tools with different geometry to be ground with a resolution of less than

3 $\mu$  and angularity error of 2 minutes; allowing in-situ inspection without loss of data and need for re-alignment; minimises vibration during grinding; accommodates drills below 8mm in diameter and beyond 3.5m in length to be effectively ground.

SMEs participating in both the unsupported gun drilling; customised tool grinding and measurement system can seek capability development support from SPRING Singapore. MNCs can request for assistance from the Production Innovation Credit scheme.

“ This vision-assisted grinding system will allow semi-skilled operators to create different gun drill nose designs so that hole straightness can be maintained or corrected when there is a deviation ”

To meet the longer-term capability development, a 2-metre counter-rotation, off-centre gun drill machine was installed and commissioned at the SIMTech-NUS Joint Lab on Large Format Machining last November. This lab allows innovative ideas to be developed. These include the study of the physics, dynamics, thermal and degradation behaviour of the cutting edges and the establishment of the optimum drilling, cooling, grinding, edge radiusing and texturing to prolong tool life and retain straightness under the most extreme drilling conditions.

For enquiries, please contact  
**Dr John Yong**, Director,  
 Precision Engineering Centre of Innovation  
 Email: [msyong@SIMTech.a-star.edu.sg](mailto:msyong@SIMTech.a-star.edu.sg)  
 Web: [www.SIMTech.a-star.edu.sg/PECOI](http://www.SIMTech.a-star.edu.sg/PECOI)

Scan for more information  
 on Precision Engineering  
 Centre of Innovation





# LEAN BENEFITS PROFOTO DIGITAL SERVICES PTE LTD

After the successful adoption of LEAN practices, the company is set to meet the demands of its clientele to expand its business in the region

A chance introduction led Profoto Digital Services Pte Ltd, a commercial photographic digital printing lab, to the LEAN Implementation Programme initiated by SIMTech. The LEAN approach was aligned with Profoto's belief in continuous improvement and the focus on adding value for the customer. Under SIMTech's mentorship, Profoto set out to identify and implement Kaizen Projects for improvement by identifying and eliminating wastes inherent in any operation. A LEAN Steering Committee was set up to ensure the sustainable implementation of all improvement projects.

Over 30 Kaizen Projects were launched within three months from the commencement of the programme. Guided by SIMTech, the respective Profoto teams methodically analysed the problems, proposed possible solutions and implemented solutions.

The LEAN Implementation Programme consists of a suite of tools and techniques applied by all employees

were relevant and beneficial. One of these is the identification of the 8 Wastes: Defects, Overproduction, Waiting, Non-utilised People, Transportation, Inventory, Motion and Extra Processing (DOWNTIME). Other tools include Kaizen Newspaper (summary of improvement projects), A3 Report (analysis and sharing tool), 6S (workplace organisation and discipline), Visual Management (displaying key information for communication) and Standardised Work (defining the current best work method and using it as a base line for improvement).

Visual Management was one of the often employed LEAN tools for Profoto. Tagging, labelling, colour coding and



clearer signboards were employed to ensure effective communication of key information. This in turn enabled prompt and accurate decisions to be made.

By implementing a colour coding system and clear visual information for outgoing materials, sorting was reduced from 60 minutes daily to 20 minutes registering a 67 percent improvement, while the pick-up time for courier delivery was lowered from 90 minutes daily to 2 minutes, an improvement of 98 percent.

**“Changing for the better is now a key performance indicator at Profoto®. The greatest satisfaction is in seeing the commitment and involvement of ALL staff in embracing change”**  
 Kennedy Lee, Deputy General Manager (Operations) of Profoto Digital Services Pte Ltd

By implementing 6S (Sort, Set, Shine, Standardise, Sustain and Safety) and the use of a Shadow Board for tools, tool search time was reduced from 20 minutes per day to 5 minutes or a 75 percent improvement. The rate of tool loss or damage was halved to 20 percent, registering a 50 percent improvement.

Profoto® engages employees, rewards and recognises staff who helped to improve the company's productivity.

For enquiries, please contact  
**Dr Lee Eng Wah**, Director,  
 Manufacturing Productivity  
 Technology Centre  
 Email: ewlee@SIMTech.a-star.edu.sg  
 Web: www.SIMTech.a-star.edu.sg/MPTC



Scan for more information on Manufacturing Productivity Technology Centre





# A FIRST FOR INDUSTRY & SIMTech BREAKING BARRIER IN ACTUATORS

Invention can be used in an array of industries, and is critical for next-generation ultra-precision systems

A Flexure-Based Electromagnetic Linear Actuator (FELA) developed by SIMTech is a new class of nano-positioning actuators that have successfully broken through the millimetres travel range, a limit encountered by other nano-positioning actuators. FELA is unique and applicable to the precision instruments and equipment industry. It is able to deliver superior nano-positioning capability with the flexibility to configure the output resolution at an extremely affordable price, all contained within a single package.

This technology is critical for next generation high-precision nano-imprint lithography systems, micro-/nano-scale positioning systems, micro-/nano-metrology systems, micro-/nano-machining systems, micro-/nano-manipulation systems, and bio-medical instruments. Its high energy-efficiency and simplicity of construction, coupled with its maintenance-free and low cost bearings help make FELA a cost effective solution that will bring about game-changing impact in a wide range of high-precision systems.

Dr Lim Ser Yong, Executive Director of SIMTech said, "The ground-breaking FELA which yields millimetres travel range with nanometre-level positioning accuracy offers a new generation of cost effective high-precision systems for the Precision Engineering industry. We are inspired that FELA, an outcome of a local research institute, made it to the ranks of the global R&D 100 Awards."

The invention was licensed to MicroSteel Precision Pte Ltd, a manufacturer of precision components, in January 2013. This award winning technology has since transformed the local SME from a machining house to a precision machine developer for leading manufacturers and suppliers of optoelectronics components and sub-systems. With the added services, the company could also upgrade its engineers' skill set to include machine integration and control programming. This is crucial for the industry to adapt to the changing manufacturing landscape.

The R&D awards, widely known as "Oscars of Innovations", have been

“The award given to SIMTech is a recognition of Singapore research institute’s capability not only in developing but also commercialising valued technologies in advancing high-precision systems”

given out annually by R&D Magazine since 1963 for the most outstanding new products or processes that were developed and commercialised during the previous year. Some past winners include NASA, Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, Massachusetts Institute of Technology, Stanford University, Bell Laboratories, General Electric Co, Hewlett-Packard Co, IBM Corp, 3M, Carl Zeiss, Hitachi Ltd, and Toyota Motor Corp.



The R&D 100 Awards have identified revolutionary technologies newly introduced to the market. Many have become household names, shaping everyday life. Some examples are the colour copier, lithium batteries, the automated teller machine (ATM), high-speed CMOS RAM, the liquid crystal display (LCD), the personal supercomputer, lab on a chip, HDTV and iRobot. More recent breakthroughs include next-generation magnetic resonance imaging machines, laser-based metal-forming tools, and the building blocks for fusion experiments.

For enquiries, please contact **Dr Daniel Teo Tat Joo** at 6793 8285 or email to [tjteo@SIMTech.a-star.edu.sg](mailto:tjteo@SIMTech.a-star.edu.sg)

Scan for more information on SIMTech Awards



A number of events were organised in 2014 to engage the industry and forge partnerships

## MTI Minister Visit to Presto Drycleaners, 30 September

Mr S Iswaran, Second Minister for Trade and Industry, Home Affairs and Minister in Prime Minister's Office, gained an understanding of how Presto Drycleaners benefited from productivity improvements through RFID Technology in consultation with SIMTech. Previously, garments were labelled using conventional Tax Invoice/Contract (TIC) chits. As a result, accurate tracking and tracing of garments were extremely challenging and time-consuming. With the Dry Cleaning Retail Management System in place, sending garments to the wrong retail outlets or customers are occurrences of the past.



## Launch of Energy Efficiency Monitoring, Analysis, Planning and Solution (E²MAPS), 2 October

E²MAPS was launched at the Energy Efficiency National Partnership (EENP) Awards Ceremony 2014 jointly organised by National Environment Agency and NTUC's e2i (Employment and Employability Institute) to develop and train local Professionals, Managers, and Executives (PMEs) in energy efficiency management. E²MAPS equips PMEs with step-by-step energy efficiency techniques to conduct continuous review of activities for energy saving. The first of its kind programme offered by SIMTech, e2i funds up to 50 percent of the course fees.

## Breakfast Talk on WSQ Course in Heat Treatment Process for Metals, 2 October

Attended by 36 CEOs and senior management from 21 metal heat treatment companies, Dr Mehrdad Zarinejad, the PE-Metal Initiative Lead for PE COI, presented the opportunities for collaborations, capabilities, and knowledge transfer from SIMTech to industries. This event also promoted the PE WSQ Graduate Diploma in Metal Manufacturing Processes. Sixteen participants signed up for the course.



## MPTC Annual Conference and Technology Exhibition 2014, 9 October

Industry leaders such as Mr Arthur Fong, Managing Director of 3M Singapore, and Mr Lai Ah Keow, Senior Consultant (Yokogawa Global Manufacturing) Yokogawa Asia Pte Ltd, shared best practices and experiences in their organisation's journey to tap Productivity through Innovation. Mr Teo Ser Luck, Minister of State for Trade & Industry and Guest-of-Honour witnessed the signing of 3 MOUs to use RFID technology to boost productivity and the set-up of the Antuit-SIMTech Joint Lab. Close to 300 participants attended the event.

## SMC Annual Conference 2014, 6 November

SIMTech's SMC brought together leading industry champions to understand how sustainable technologies can create value for manufacturers. Speakers from Nike, Schlumberger, National Environment Agency, SIMTech and Pacific Climate Solutions shared insights of this value creation process with proven strategies and success stories. This annual event attracted 150 external participants.



Collaborative Industry Projects (CIPs) are cost-effective R&D platforms where groups of companies facing similar issues work jointly with SIMTech to develop manpower and technology



## Item Management and Tracking System

15 January 2015 | SIMTech Training Room

The programme aims to help companies deploy an RFID/barcode-based Item Management and Tracking System (IMTS) to better manage, track, and audit their assets to improve productivity, traceability, while minimising errors. This package comprises training sessions and on-site mentoring, including the hardware and software required for pilot system implementations over two months.

For enquiries, please contact **Mr He Wei** at:

Tel: 6793 8969 | Email: [whe@SIMTech.a-star.edu.sg](mailto:whe@SIMTech.a-star.edu.sg)



## Programme in Carbon Management

9 February 2015 | SIMTech Training Room

The Programme in Carbon Management trains managers, engineers and consultants in carbon footprint quantification and communication. SIMTech helps companies to develop a carbon footprint initiative and link it to improvements, effectively strengthening their competitiveness.

For enquiries, please contact **Mr Jason Yip** at:

Tel: 6793 8430 | Email: [kwyip@SIMTech.a-star.edu.sg](mailto:kwyip@SIMTech.a-star.edu.sg)



## Integrated Carbon Footprint Assessment Reporting Essentials (i-CARE) for Building and Construction

15 April 2015

Jointly organised by SGBC and BCA's Centre for Sustainable Buildings and Construction (CSBC) and the Singapore Green Building Council (SGBC), this is specially designed to provide an in-depth understanding of carbon footprint for building industry participants to undertake a carbon footprint assessment of their products competently.

For enquiries, please contact **Mr Jason Yip** at:

Tel: 6793 8430 | Email: [kwyip@SIMTech.a-star.edu.sg](mailto:kwyip@SIMTech.a-star.edu.sg)

**SIMTech Membership Networking Night**

26 February 2015 | 7.00pm-9.30pm | Grand Corpthorne Waterfront

SIMTech yearly networking and loh-hei dinner is organised during the Lunar New Year to deepen our engagements with our members.

*For enquiries, please contact Mr Leow Kian Lee at [klleow@SIMTech.a-star.edu.sg](mailto:klleow@SIMTech.a-star.edu.sg) or 6793 8363***PE COI Annual Conference 2015 : Technology Innovation and Supplier Development for the PE Industry**

15 April 2015 | 9.00am-5.00pm | Singapore Expo

In its seventh edition, this annual conference enables SMEs to explore business partnerships with leading manufacturers in the oil & gas, aerospace, medtech and complex equipment sectors. MNCs will also share some of the key localisation requirements and case studies. The PE COI initiatives will also be shared to enable local companies to undertake higher precision and higher value manufacturing activities to meet stringent performance requirements.

*For enquiries, please contact Mr Cedric Yon at [xyyon@SIMTech.a-star.edu.sg](mailto:xyyon@SIMTech.a-star.edu.sg) or 6793 8561***Swiss-Singapore Workshop on Large Area Processing Technology**

19 May 2015 | 9.00am-5.00pm | SIMTech Auditorium, Tower Block

The workshop, focusing on Roll-to-Roll Manufacturing of Printed Electronics, includes topics on printed lighting, flexible sensor, wearable technology and solar panel. Overseas and local speakers from industry and academia will share on the trends, developments and applications of these areas.

*For enquiries, please contact Dr Jefferey Chen at [jfchen@SIMTech.a-star.edu.sg](mailto:jfchen@SIMTech.a-star.edu.sg) or 6793 8259*Scan for  
more events**PE WSQ Graduate Diploma in Advance Welding Technologies  
Module 4: Adopt Friction Stir Welding and Diffusion Bonding**

22 January 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ in Carbon Management****Module 1: Apply Carbon Footprint Assessment Methodology**

9 February 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Metal Manufacturing Processes****Module 1: Perform Advanced Metal Welding**

24 February 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in MedTech Manufacturing****Module 1: MedTech Regulatory Overview**

2 March 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Operations Management Innovation (OMNI)  
Programme Batch 29**

4 March 2015 | 8.30 am - 12.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Precision Measurements and Characterisation****Module 5: Materials Characterisation for PE Industry**

10 March 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Precision Measurements and Characterisation****Module 4: Image Processing and Industrial Vision Inspection**

12 March 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Manufacturing Operations Management****Module 2: Operations Analysis**

1 April 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Precision Mechatronics****Module 2: Enhance Control Performance of Precision Machines**

1 April 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in Advance Welding Technologies****Module 5: Evaluate Advanced Brazing**

7 April 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

**PE WSQ Graduate Diploma in MedTech Manufacturing****Module 2: MedTech Manufacturing and Quality System**

22 April 2015 | 6.30pm - 9.30pm, SIMTech, Tower Block

*For course details and registration, please visit  
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The Singapore Institute of Manufacturing Technology (SIMTech) develops high-value manufacturing technology and human capital to enhance the competitiveness of Singapore's manufacturing industry. It collaborates with multinational and local companies in the precision engineering, medtech, aerospace, automotive, marine, oil & gas, electronics, semiconductor, logistics, and other sectors.

SIMTech is a research institute of the Agency for Science, Technology and Research (A\*STAR). With a pool of more than 400 researchers, we are committed to serving the manufacturing industry to develop the human, intellectual, and industrial capital in Singapore.