

January 2019 | Issue 1

# FEATURE UP TUMESED GONFAMMERE

#### NOTE FROM EDITOR...

#### Dear Friends and Industry Partners,

Over the past 20 years, global container tra c has grown. In future, although worldwide container tra c is predicted to grow with increasing population, wealth, consumption and industrialisation trends, weaker economic growth and rising cost are expected to intensify competition in the shipping industry.

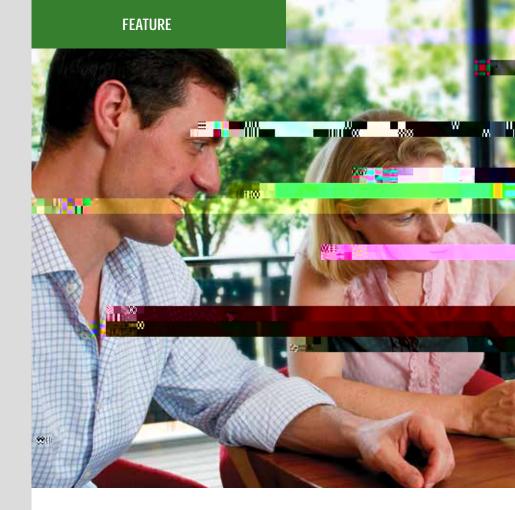
To survive such volatile business environment, more innovative ways to overcome such challenges are adopted by companies. CEC Systems Pty Ltd has chosen this option through its innovative COLLAPSECON®, a 40-foot container when empty, can be folded to save space and thus, cost on return port trips. Collapsing empty shipping containers during transfer between ports lowers the use of space, reduces costs of relocation, increases security, generates greater visibility and minimises waste at every point in the supply chain for the shipping and logistics industries.

Read on in the following pages for the full story on CEC Systems' journey to upgrade its COLLAPSECON® in a collaboration with SIMTech.

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



**S** ee He Editor, Manufacturing Matters Email: shlee@SIMTech.a-star.edu.sg



#### **OPTIMISED CONTAINER**

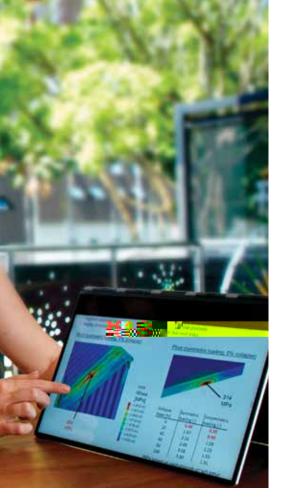
## Collapsible container lightened through weight and material optimisation

To maximise space utilisation of empty shipping containers on return port trips after dropping o goods, collapsible containers are a logical choice. Especially so in a volatile global trade environment characterised by cutthroat competition. The collapsible container system improves operational e ciency, enhances return on investment and reduces the impact on the environment.

CEC Systems Pty Ltd, an industrial technology company, develops integrated solutions to the complex global challenges facing the shipping and logistics industries. Its COLLAPSECON® system enables 4 empty containers to be folded sideways and then combines them to form a single container—t for transport and storage. This feature achieves at least a quarter size space saving of the 40-foot container. Unlike other collapsible containers, the COLLAPSECON® system's end frame designs enables it to be stacked like a standard container even in its collapsed state. This means that it can be stored at empty container parks or at the bottom of a vessel during transit, with no disruption to the loading/unloading process.

#### Collaboration with CEC Systems

A major issue faced by the company was its rst iteration of COLLAPSECON® units were nearly 2 times heavier than an industry standard container due to over-engineering to meet industry ISO standards and to pass





product certi cation. High strength steel hinges for the load-bearing frame connectors were costly to procure and machine. Additionally, the moving wall and oors introduced advanced sealing requirements. SIMTech was



Being a young start-up company in additive manufacturing, Forefront Additive Manufacturing Pte





## BIG REWARDS AFTER OPERATIONS AND TECHNOLOGY ROADMAPPING

Apart from productivity gains, company initiated expansion, new plans and innovative products

Rigel Technology (S) Pte Ltd which participated in SIMTech's Operations and Technology Roadmapping (OTR) programme in August 2015 gained big from the journey. A provider of eco-friendly bathroom solutions, it aims to chart their R&D direction and innovate on their future product lineup for the next 5 years. Other objectives were to increase worker productivity and capitalise on the various external trends of the ageing population and environmental sustainability to capture changing market sentiments. Moving up the value chain by using sensor technologies and Internet of Things to become a world renowned sanitary brand powered by smart technologies is also the company's goals.

After 5 gruelling half-days of brainstorming and consensus-building, Rigel emerged from the OTR exercise ready for business model innovation, a new focus on sustainability and the development of multiple new products and initiatives. Some of their new products include the RiNano Antibacterial Sanitary-ware that involved a material embedded

with sanitary agents, the disable-friendly Smart Mirror that also assists the elderly, and sensor development and embedding to bring predictive maintenance and analytics to the bathroom. Rigel has also clinched a project with National Centre for Infectious Disease to simulate and design sanitary spaces in hospitals.

With regards to user experience, Rigel plans to go digital with its online customer service form, introducing Alenabled help chat robot and is creating an FAQ/database for frequently queried issues. Rigel has expanded its overseas presence to China, Vietnam, Malaysia, Indonesia and South Asia.

Rigel has implemented CO<sub>2</sub> emission control at its overseas factories and has begun a ceramic recycling



programme to convert scrap ceramics into construction materials. Researchers and engineers alike are housed in Rigel's new R&D Innovation Centre, where they innovate on anti-bacterial and self-cleaning technologies. After extensive internal restructuring, Rigel experienced productivity gain per worker by 20 per cent, with revenue increase from 2015 to 2017. Overall, Rigel has achieved approximately 70 per cent of what they planned to do in the OTR, and are already seeing great success.

The OTR is very systematic and methodical. The OTR team did their best to consolidate our ideas to make the sessions very comprehensive and constructive ""

Mr Christopher Ng, Group CEO, Rigel Technology (S) Pte Ltd

For more information, please contact: Mr Je rey Pan at je rey\_pan@scei.a-star.edu.sg



## ADVANCED CORROSION PROTECTION - FROM ASSESSMENT TO TRAINING

#### Many companies have bene ted from the assistance

SIMTech has established a comprehensive set of capabilities and expertise on corrosion assessment of coated and uncoated metals and alloys to assist both research and industrial needs. Accelerated tests and assessment, electrochemical tests, advanced scanning techniques and atmospheric eld exposure tests are some of these capabilities.

These capabilities are critical to support various needs of product/process developments such as coatings, alloys surface treatments, materials selection, mechanistic studies, benchmark of materials and quality control etc. Numerous corrosion related initiated Collaborative Industry Projects (CIPs), industry assist and consultancy projects have bene ted many companies.

One of the CIPs, Assessment of Zinc Coatings, participated by more than

20 companies from various sectors enabled participants to gain valuable insights on performance benchmarking of commercially available zinc coatings, strategies for solution selection and proper coating application methods to optimise performance. In one of the industry projects with Nipo International Group, a manufacturer of industrial coatings and warehouse/logistics service provider, SIMTech has contributed to improving their PC based anti-corrosion coating.

As part of a holistic approach, SIMTech also provides training on understanding corrosion failures and protection to local technical industry professionals. The training equips participants with the critical skills for real-time evaluation and pertinent remedies or preventive strategies to combat corrosion-related issues. Over the past 6 years, the corrosion protection training has

bene ted over 98 participants from 61 companies. The next Corrosion seminar will be conducted in March 2019 followed by training programme - Module 2 (Apply Advanced Coating Technologies for Corrosion and Wear Prevention) and Module 1 (Implement Fundamentals of Corrosion & Corrosion Prevention) in January and April 2019 respectively. For details, visit https://www.a-star.edu.sg/kto/Courses/Modular-Programmes/Corrosion-Protection.

We are thankful to SIMTech for a holistic approach to our coating development. SIMTech not only developed corrosion testing methodologies which met our objectives, but also discovered weakness in our coating system and made suitable recommendations to improve the production and application process. Nipo is planning to launch this new product by mid-2019. It would not have been possible if not for the expertise and recommendations made by Dr Sudesh and his team. SIMTech not only provides reliable testing services, but more importantly practical solutions to problems

Mr Steve Tan, Business Development Director, Nipo International Group



#### PAPERLESS TRACKING OF SOP COMPLIANCE

#### wfMOBILE™ ensures SOP compliance reliability and quality audit consistency

Founded in Singapore with o ces across Asia, SFS Global Logistics Pte Ltd a freight forwarding company operates a pharma logistics division specialising in the transportation of cold chain pharmaceutical shipments globally.

SIMTech helped SFS Global Logistics to implement Work ow MOBILE™ (wfMOBILE™) system to go paperless to track Standard Operating Procedures compliance during the transportation of temperature-control logistics for pharmaceutical and life science products and samples by its logistics and warehouse sta . wfMOBILE™ is a platform for mobile workforce to

perform user-con gurable business/ operational transactions using Android devices.

The implementation of a cloud-based wfMOBILE™ solution enables paperless quality auditing by customers to improve productivity by 70 per cent. Reliability in SOP compliance, a critical requirement in the Pharma Industry, is improved by 30 per cent. Work ow in di erent o ces in the region is standardised to ensure consistency in quality audit, another must of the Pharma Industry.

The easy-to-use wfMOBILE™ also

enables SFS Global Logistics non-IT Sta to self-create about 10 applications. A full-time engineer is hired to handle SOP standardisation, auditing and compliance to further strengthen its leadership in pharma-logistics. Its 1,000 sq ft ful Iment centre for preconditioning of thermal packaging solution has recently expanded six-fold.

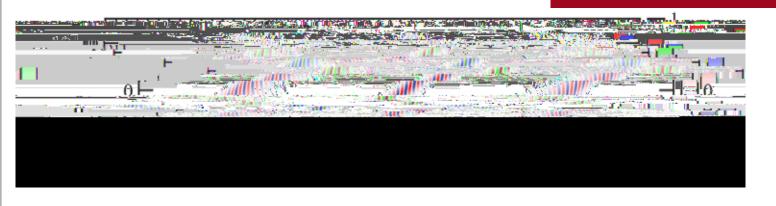
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From Left to Right: Mr Lok Boon Keng, Principal Re Pawan Gandhi, CEO & Founder, KaHa Pte Ltd; Mr Tar Tex Line Associates Pte Ltd; Ms Sim Seo Lay, Head Operations, KaHa Pte Ltd; Mr Rick Yeo, Director, En SIMTech and Mr Ryan Seet Yu Liang, Technology Proc





## NOVEL LASER PULSES FOR COST-EFFECTIVE, HIGH-PRECISION, VERSATILE LASER MACHINING AND HEATING APPLICATIONS

Innovation opens up laser micromachining, deep hole drilling and laser-annealing

This breakthrough also has the potential to advance other applications including terahertz lasers, X-ray generation and ultrafast electron imaging, which rely on tilted laser pulses to synchronise interactions between light and matter, enhancing

The theme, **Digital Transformation and Innovation**, was well received by the 535 participants from government agencies, trade associations and industry who attended the Manufacturing Productivity Technology Centre (MPTC) Annual Conference 2018.

Mr Kwek Kok Kwong, CEO, NTUC LearningHub Pte Ltd, shared his experience in leading his company's digital transformation journey.

Several Memoranda of Understanding (MOUs) were signed. One of these is the MOU with Korea Smart Factned u44 (i) 0.5 (the) 0.5 (MOU) 0.5

Fanuc Singapore Pte Ltd, Hexagon Manufacturing Intelligence, Makino Asia Pte Ltd, Pepperl+Fuchs Pte Ltd and SICK Product Centre Asia Pte Ltd is for the setting up of a new Smart Engineering System (SES) in the Model Factory@SIMTech, and digital technologies R&D collaborations.

At this event, 19 companies received the Productivity Partners Recognition Award. In its fourth year, this award is presented to companies that have successfully adopted technologies or engineered innovations that led to productivity improvements and continue their productivity journeys.

Senior Minister of State for Trade & Industry and Deputy Secretary-General of National Trades Union Congress, Dr Koh Poh Koon, who was the Guest-of-Honour, toured the Smart Engineering System at the Model Factory@SIMTech.

MPTC Annual Conference 2018 was organised by A\*STAR SIMTech. It was supported by Employment & Employability Institute, Economic Development Board, Enterprise Singapore, Skills Future Singapore and Workforce Singapore. Some of the partners are Singapore Manufacturing Federation, Singapore Precision Engineering and Technology Association and Singapore Association of Ship Suppliers and Services.

#### 3D Additive Manufacturing (AM) Capabilities of Metal and Polymer Parts

This programme aims to demonstrate 3D AM process capability from design and process optimisation, material preparation and handling, product processing to secondary operations and to provide a platform for quicker adoption of 3D AM technology.

For enquiries, please contact **Mr Tan Lye King** at tanlk@SIMTech.a-star.edu.sg

#### **Freeform Lens Design and Fabrication**

Freeform lenses are advantageous in the replacement of bulky spherical optics with a single element or in improving the lens performance. This programme equips companies with competencies in freeform lens design, fabrication and characterisation.

For enquiries, please contact **Mr Tan Chee Tat** at cttan@SIMTech.a-star.edu.sg

#### **Food Waste Management Toolkit**

This toolkit enables food manufacturing companies to do realtime tracking of food waste, auto alert of process ine ciencies, hot spot identications and automated food waste reporting.

For enquiries, please contact Mr Yon Xing Ye Cedric at

#### SIMTech Partnership Night 2019

13 February 2019 I 6.30pm-10.00pm I Furama Riverfront, Singapore, Venus Grand Ballroom, Level 3

This annual Lunar New Year celebration dinner brings together SIMTech's partners from industry, trade associations and government agencies for networking as well as to connect for future collaborations. At the event, SIMTech will share its major initiatives in 2018 and upcoming activities. The Lunar New Year will be celebrated with a Lion Dance performance and a Lo Hei dinner.

For enquiries, please contact Ms Joan Chien at joan\_chien@SIMTech.a-star.edu.sg

## PE WSQ Graduate Diploma in Additive Manufacturing Module 2: Powder-bed Additive Manufacturing Processes for Complex Functional Metallic Components

15 January 2019 | 6.30pm - 9.30pm, SIMTech, Fusionopolis 2

#### **PE WSQ Graduate Diploma in Mechatronics**

**Module 1: Design Precision Machines** 

15 January 2019 | 6.30pm - 9.30pm, SIMTech, Fusionopolis 2

## Master Class in Mastering Sales and Operations Planning (S&OP) Process to Align Strategies for Operational Excellence

17 - 18 January 2019 | 6.30pm - 9.30pm, SIMTech, Fusionopolis 2

### PE WSQ Evaluate Advanced Metal Machining Techniques

18 February 2019 | 8.30am - 5.30pm, SIMTech, Fusionopolis 2

## PE WSQ Improve Machining Productivity through Dynamics Analysis and Simulation

19 February 2019 | 2.00pm - 9.00pm, SIMTech, NTU Valley Block

## PE WSQ Perform Integrated Forming Process Technology for Metals

19 February 2019 | 8.30am - 5.30pm, SIMTech, NTU Valley Block

### PE WSQ Understand the Micro uidics Manufacturing Processes

4 March 2019 | 6.30pm - 9.30pm, SIMTech, Fusionopolis 2

## PE WSQ Graduate Diploma in Advanced Welding Technologies

Module 3: Review High Speed Laser Welding and Additive Manufacturing

5 March 2019 | 6.30pm - 9.30pm, SIMTech, Fusionopolis 2

#### PE WSQ Programme in Precision Engineering

Module: Employ Laser for PE Industry

11 March 2019 | 8.30am - 5.30pm, SIMTech, Fusionopolis 2

#### PE WSQ Apply Integrated Carbon Footprint Assessment Methodology (i-CARE)

11 March 2019 | 9.00am - 6.00pm, SIMTech, Fusionopolis 2

#### **Editorial Committee**

Dr John Yong Advisor Editor Ms Lee Swee Heng Ms Lin Jiamin Member Dr Goh Kiah Mok Member Mr Peter Shi Member Mr Cedric Yon Member Ms Connie Ng Member Mr Kelvin Goh Designer Ms Nurul Ain Designer

#### About SIMTech

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,