MEDIA RELEASE

SINGAPORE ESTABLISHES THE FIRST-OF-ITS-KIND REMANUFACTURING R&D CENTRE IN ASIA

The Advanced Remanufacturing & Technology Centre will drive value-added manufacturing activities here through private-public R&D collaborations

Singapore, 31 May 2012:

1. Singapore today announced the establishment of the Advanced Remanufacturing & Technology Centre (ARTC), the first centre in Asia to look into research and development (R&D) to develop technologies for remanufacturing that can be readily adopted by industry. These technologies will enable companies and businesses to translate end-of-life products into “good as new” ones for the market through a sustainable process, contributing to greater cost and materials savings and, potentially, higher profit margins.

2. Six industry leaders, namely Boeing, Rolls-Royce plc, Siemens Industry Software, ABB, FUCHS Lubricants and Carl Zeiss, have signed a Memorandum of Understanding with the Centre to look into collaborative R&D to bridge technological gaps in remanufacturing for the aerospace, oil & gas, marine, energy, automotive and engineering industries. In doing so, ARTC will tap on A*STAR’s Singapore Institute of Manufacturing Technology’s (SIMTech) R&D expertise in automation, manufacturing systems and processes, as well as the strong capabilities of local universities such as Nanyang Technological University, to carry out R&D in production-ready technologies in the areas of repair and restoration, surface enhancement and product verification.

3. Eight local small and medium enterprises (SMEs) have also joined the Centre to co-develop technologies along with leading multinational corporations (MNCs). By engaging local SMEs and MNCs, ARTC is encouraging leading companies to develop new high value manufacturing activities in Singapore while cultivating the local supply chain in this new growth area.

4. Said Dr Raj Thampuran, Executive Director of the Science and Engineering Research Council, A*STAR, “The Advanced Remanufacturing & Technology Centre will help industries realise remanufacturing’s economic and environmental potential through public-private collaborative R&D. Member companies can leverage on our spectrum of relevant capabilities, advanced infrastructure and high quality talent, while at the same time contribute to value-added
manufacturing activities here. The Centre also represents the way in which high value manufacturing is advancing globally.”

5. The Centre is modelled after successful manufacturing R&D centres in the United Kingdom. It will provide a platform for local SMEs to work with global leading MNC’s to develop their capabilities even in the early stages of product development, and enable them to seize business opportunities in remanufacturing.

The Benefits of Remanufacturing

6. Remanufacturing is a sustainable process that involves transforming a recovered part or product through disassembly, cleaning, testing and other operations into like-new products to be reintroduced to the markets. Remanufactured products are tested and certified to meet technical and safety specifications of new products, and are therefore sometimes sold with warranties comparable to the original. The process is more efficient than recycling because it conserves not only the raw material content, but also retains much of the value added during the manufacturing of the product.

7. Remanufacturing is already commonly applied in the aerospace, marine, automotive and engineering industries. A report by Global Industry Analysts (GIA) predicts that the global automotive remanufacturing market is expected to reach US$104.8 billion by 2015. In the USA, the remanufacturing industry constitutes US$53 billion employing 480,000 workers.

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AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH (A*STAR)

Enclosed:

Annex A – Members of ARTC
Annex B – ARTC Technologies

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About the Agency for Science, Technology and Research
A*STAR is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovative-driven Singapore. A*STAR oversees 14 biomedical sciences, and physical sciences and engineering research institutes, and seven consortia & centres, which are located in Biopolis and Fusionopolis, as well as their immediate vicinity.

A*STAR supports Singapore's key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in the universities, hospitals, research centres, and with other local and international partners.

Please visit www.a-star.edu.sg for more information.
ABB

ABB is a global leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact.

Website: www.abb.com

Abrasive Engineering

Abrasive Engineering Pte Ltd was established in 1990 to design and fabricate blasting and shot peening machines, and providing surface treatment through blasting and shot peening services.

Website: www.abrasiveengineering.com.sg

Ark-Vision Spare and Engineering Pte Ltd

ARK VISION is a leading marine spare parts and machinery supplier for shipping related establishment. Through investment in people, systems and ready stocks, it strives to supply quality and ready spare parts / machinery at cost effective prices. It endeavours to grow by building sustainable relationships and forming alliances with like minded establishment.

Website: www.ark-vision.com

Boeing

Boeing is the world's leading aerospace company and the largest manufacturer of commercial jetliners and military aircraft combined. Additionally, Boeing designs and manufactures rotorcraft, electronic and defense systems, missiles, satellites, launch vehicles and advanced information and communication systems.

Website: www.boeing.com

Carl Zeiss AG

With its global headquarters at Oberkochen near the famous industrial town of Stuttgart in Germany, Carl Zeiss AG is an international group of companies in the optical and opto-electronic industry.

Website: www.zeiss.com

CEL Coatings Industries Pte Ltd

CEL Coatings is a provider of surface finishing services and innovative surface engineering solutions to the data storage, electronic, telecommunication, beauty, medical and automotive industries. Its production lines are completely automated to ensure consistent quality and reliability on all its finished surfaces.
The ability to produce large volume of quality finishing at competitive pricing allows customers to reap maximum economic value from its services.

Website: www.celcoatings.com

FUCHS

FUCHS, founded in 1931 as a family firm in Mannheim, Germany, is nowadays a globally operating corporation, and the world's leading supplier of lubricants among the independent companies. FUCHS is a top-ranking front-runner: with a complete range of lubricants as its core programme. With customized specialty solutions for multifarious market niches to complement its standard products. With comprehensive consultancy and service capabilities. FUCHS offers lubricants for hundreds of applications - including lubricants for car-drivers and motor-cyclists, goods transport, passenger traffic, mining companies, the steel industry, vehicle and machinery construction, the building trade and agricultural equipment.

Website: www.fuchs.com.sg

Hi-Yew Technology

Hi Yew Laser Welding Services is a welding jobshop centre dedicated to providing diverse industries with new innovative technology and cost effective welding/joining processes or services to enable customers to stay competitive and relevant in a rapidly changing environment in Singapore.

Website: www.sgweld.com

MMI Holdings

Serving world technology leaders, MMI provides engineering, manufacturing and assembly expertise for performance-critical Electro-Mechanical Components and Assemblies for multi industries covering aerospace, data storage, oil & gas, and other industrial equipment sectors. Its facilities are strategically located with multiple sites in Singapore, Malaysia, Thailand, China and USA.

Website: www.mmi.com.sg

Plasma Precision Technology

Plasma Precision Technology is synonymous with quality and on time delivery, offering solutions to problems encountered in aggressive working environment. It is the leading company in surfacing technology, supported by the latest technology from its principals in US and Europe. Plasma Precision Technology's equipped facilities provide a unique range of specialized surfacing processes.

Website: www.plasma.com.sg
Rolls-Royce plc

Rolls-Royce is a world-leading provider of power systems and services for use on land, at sea and in the air, and has established a strong position in global markets - civil aerospace, defence aerospace, marine and energy.

Website: www.rolls-royce.com

Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with 7 million licensed seats and more than 71,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies, delivering open solutions to help them make smarter decisions that result in better products.

Website: www.siemens.com/plm.

Sunny Instruments Singapore Pte Ltd

Sunny Instruments Singapore Pte Ltd provides measurement and inspection solutions that harnesses the powers of optics and electronics. It provides solutions for dimensional measurement, vibration testing, and close-up inspections. Its products include 3D automated Vision Measuring Machine, Dynamic Laser Interferometer and a great variety of microscopes.

Website: www.sunnyinstruments.com.sg

USI Technologies

Headquartered in Singapore, USI Technologies is a niche equipment manufacturing and engineering service provider. It is focused on delivering complete engineering and manufacturing solutions to Cleantech companies.

Website: www.usi-tec.com
(1) Repair & Restoration

Repair and restoration is an essential part of remanufacturing. The theme aims to develop adaptive machining, additive build-up, and profile finishing technologies to provide an integrated solution that enables complete repair cycle of valuable and complex parts.

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<td><strong>How it helps the industry?</strong></td>
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<td><strong>Applications</strong></td>
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Adaptive Machining Dynamics

What it does?
Through modelling and simulation of machining process based on machining mechanics and dynamics, a toolkit is developed to identify optimal machining parameters. This helps to eliminate chatter marks on the machined surface and results in better surface integrity.

How it helps the industry?
The developed machining vibration solver enables customisation of machining parameters according to the machine characteristics and environment. The toolkit improves the productivity of milling process based on its optimisation procedure.

Applications
Precision engineering, aerospace, machine tools, tooling, bio-medical, defense, oil and gas.

(2) Surface Enhancement

Surface enhancement is an integral part of remanufacturing operations. It encompasses processing technologies for restoration of the component surfaces to the desired surface finish, surface durability improvement, fatigue enhancement, as well as creation of functional surfaces that meet application needs.

Physical Vapour Deposition System

What it does?
It involves the transfer or deposition of coating material on an atomic level in a vacuum chamber.

How it helps the industry?
PVD coating technologies is widely used to reduce friction, or improve tooling performance such as hardness, wear and oxidation resistance. The use of such coatings is aimed at improving performance and prolongs component life.

Applications
They are targeted for application on various kinds of cutting and forming tools, moulds & dies and wear components.
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(3) **Product Verifications**

Inspection is necessary in almost every stage of remanufacturing. The main activities are complex geometric and surface measurement, defect detection and location, functional characterisation and product assessment and remaining lifetime estimation. The activities are supported by capabilities in metrology, material assessment, simulation and modelling, and product and process health monitoring.
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<th><strong>Intuitive Robot Teaching</strong></th>
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<td><strong>What it does?</strong></td>
<td>It is a fast robot teaching technology that can be implemented on an industry robot for a wide range of processes.</td>
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<td><strong>How it helps the industry?</strong></td>
<td>It is developed for automating the processes involving parts of small lot size but high batch mix. It replaces the hard-to-use teach pendant with a user-friendly interface for teaching complex robot paths.</td>
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<tr>
<td><strong>Applications</strong></td>
<td>It is suitable for processes involving 3D path following and surface scanning. These include welding, surface finishing, cladding, cleaning and inspection processes.</td>
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<th><strong>Sonic Non Destructive Testing</strong></th>
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<td><strong>What it does?</strong></td>
<td>This is a hand-held NDT system that allows user to scan the composite for detecting wide range of defects. It can display different types of defects in a map form.</td>
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<td><strong>How it helps the industry?</strong></td>
<td>It is able to detect tough defects in composites such as delaminations, disbonds, kissing bonds, crushed core, and water ingress cores.</td>
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<tr>
<td><strong>Applications</strong></td>
<td>It is suitable for industry in composite maintenance, repair and overhaul, as well as composite manufacturing.</td>
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<th><strong>Predictive Health Monitoring</strong></th>
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<td><strong>What it does?</strong></td>
<td>By using signal processing algorithms and statistical model, faults in machine tools are detected and correlated to the process parameters so that the equipment health can be determined.</td>
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<td><strong>How it helps the industry?</strong></td>
<td>It can detect and identify sources of faults in machine tools, spindles and cutters. As a result, quality of the machining process and the tool usage can be prolonged.</td>
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<tr>
<td><strong>Applications</strong></td>
<td>Heath monitoring and fault detection for machining processes and rotary equipment.</td>
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