DEARBORN, Mich., March 1, 2013 – Highlighting

Society of Manufacturing Engineers

SME Unveils its 2013 Annual Manufacturing Innovations List

DEARBORN, Mich., March 1, 2013 Highlighting new technologies and advancements in manufacturing, the Society of Manufacturing Engineers (SME) [1] announces its 2013 list of *Innovations That Could Change the Way You Manufacture.* [2]

Selected by SMEs *Innovation Watch Committee* [3], the new and emerging technologies on this list have already shown successful implementation and are making a difference in manufacturing today. Manufacturers can adopt the materials and processes to reduce costs and develop innovative products that will keep U.S. manufacturing strong.

While much of the tech world discusses the latest phone, computer, etc., the SME *Innovation Watch Committee* discusses what makes that new gadget possible, said Lauralyn McDaniel, manager of the Innovation Watch Committee. They dont stop at what we can do today, but look to what is possible.

2013 Innovations That Could Change the Way You Manufacture [4]

Robotic Insects Inspire Mass Production Technique
Robotic insects can be mass produced by the sheet with the monolithic fabrication of three-dimensional structures. Printed circuit MEMS (PC-MEMS) combines advanced materials and geometries of conventional manufacturing with one-piece construction microelectromechanical systems (MEMS) below the submillimeter scale. While insect-scale unmanned aerial vehicles are a direct application, PC-MEMS could be used to create a wide variety of machines and mechanisms. With great advantage at the millimeter to centimeter length scale, the technique applies to a wide variety of advanced materials including glass composites and plastic. (**more** [5])

Superhydrophobic Coatings Could Save Your Mobile Phone and More
Inspired by lotus leafs and the namib beetle, superhydrophobic coatings use surface roughness and chemistry to amplify water repellency. Capable of being applied to any surface and complex geometries, the coating can also have nearly perfect optical clarity. Like the lotus leaf, the coating also has a self-cleaning effect. Applications include avoiding the biofouling of medical devices, preservation of monuments and buildings made of stone and protective coatings for furniture.

(**more** [6])

Welding Process Increases Use of Lightweight Materials for Increased Fuel Efficiency
Multiring domed electrode for aluminum resistance spot can be used for the welding of aluminum sheet, extrusion, casting or combinations, while also achieving high weld quality and eliminating surface expulsion. The rings of the electrode induce high levels of local strain on the outer surfaces of the aluminum to be welded, breaking down the aluminum oxide layer enabling intimate contact between the electrode and aluminum. The cost benefit for the transportation industry is approximately $0.05/joint compared to self-piercing riveting. This savings helps support the new global CO2 emission targets taking effect in 2020 and 2025. (**more** [7])

Stronger, Lighter and Cheaper with Carbon Nanotubes
Carbon nanotubes (CNTs) are approximately 50,000 times thinner than a human hair with unique properties including high electrical and thermal conductivity. With a strength-to-weight ratio 117 times greater than steel, CNTs are the strongest and stiffest materials yet discovered. There are more than 100 CNT manufacturers and more than 1,000 organizations engaged in research and development. Applications in development include: artificial muscles for robots and prosthetic limbs, oil-spill cleanup processes, printable electronics and sensors that can detect chemical vapors or bacteria in drinking water. (**more** [8])

Everyday Spectrometer: True Color Detection with Rainbow Polymer
A one-step, low-cost holographic lithography method to fabricate a polymer with extraordinary properties can significantly reduce the cost and size of the current state-of-the-art multispectral analyzer from about $250 to $10/piece. Used as a filter for light, this material could form the basis of handheld multispectral imaging devices that identifies the true color of objects examined. Accurate color detection has applications in anti-counterfeiting and remote sensing for military and defense applications. The graded photonic bandgap (PBG) structure could be easily coated on cell phone cameras to analyze the real color of food and medicines. (**more** [9])

In reviewing submissions for the *Innovations That Could Change the Way You Manufacture*, the committee also highlights an **Innovation Watch List** [10]. These technologies are showing great promise but, as yet, are unproven in the manufacturing setting. This years list includes:

- Aerovoltaic wind technology with no moving parts
- Manufacturing method for cheaper solar
- Air fuel synthesis
- 3D printing of silicon nanostructures
- Robotic self-modeling
- Ultrafast camera that sees around corners
- Nanoscale light conduits
- Quantum memory storage using gaseous atomic vapor to store information
- Silicon surface patterns that use less material and increase efficiency

- Metamaterials that bend light

The Innovations That Could Change the Way You Manufacture will be a featured session at the SME Annual Conference [11], June 2-4, 2013, in Baltimore. The conference brings together manufacturing professionals and leaders from throughout North America and beyond who are interested in innovations and exchanging ideas in one place.

NOTE TO MEDIA: Visit the SME Media Center [12] for the latest Society news, one-stop access to SME Events, Manufacturing Quicklinks, SME social media sites, SME News Feed and more.

About SME:
The Society of Manufacturing Engineers (SME) [1] is the premier source for manufacturing knowledge, education and networking. Through its many programs, events, magazines, publications and online training division, Tooling U [13], SME connects manufacturing practitioners to each other, to the latest technologies and to the most up-to-date manufacturing processes. SME has members around the world and is supported by a network of chapters and technical communities. A 501(c)3 organization, SME is a leader in manufacturing workforce development issues, working with industry, academic and government partners to support the current and future skilled workforce.

Contact:
Lori Ann Dick, APR
Senior PR Representative
communications@sme.org [14]
Tel 313.425.3187

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