DoD Awards New Revolutionary Fibers and Textiles Manufacturing Innovation Hub

by Bob Bengel, NWIRC President/CEO

On April 1, Secretary of Defense Ash Carter announced an agreement with Advanced Functional Fabrics of America (AFFOA) Alliance, a new non-profit research and development consortium organized by the Massachusetts Institute of Technology. The consortium, which is comprised of 89 universities, manufacturers, and non-profits, will spearhead a new manufacturing innovation institute to secure U.S. leadership in revolutionary fibers and textiles manufacturing. In addition, novel fabric properties developed through the consortium such as exceptional strength, flame resistance, reduced weight, and electrical conductivity will lead to significant advancements in private industry.

The agreement combines $75 million in Department of Defense (DoD) funds and nearly $250 million in cost sharing from non-federal investments.

The new institute seeks to integrate fibers and yarns with integrated circuits, LEDs, solar cells, and other capabilities in order to create textiles and fabrics that can see, hear, sense, communicate, store energy, regulate temperature, monitor health, change color, and more.

For example, the institute will pair the likes of leading audio equipment maker Bose, computer chip maker Intel, and nanofiber manufacturer FibeRio with textile manufacturers and textile users like Warwick Mills, Buhler Yarns, and New Balance. In doing so, the institute hopes to enable revolutionary defense and commercial applications such as shelters with power generation and storage capacity built into the fabric; ultra-efficient, energy-saving filters for vehicles, and uniforms that can regulate temperature and detect threats like chemical and radioactive elements.

For more information visit www.manufacturing.gov.

Your Robot Colleague is Coming Out of Its Cage

by Ben Mintz, Sales Engineer, Intek Systems

When asked how they envision a robot, most people think of huge, unwieldy robots working in fenced off areas in large factories. Or, they think of futuristic cyberbots mimicking human behavior.

Somewhere between these two scenarios a new reality is emerging: a new class of robots, dubbed collaborative robots or - simply cobots - poised to bridge the gap between fully-manual assembly and fully-automated manufacturing lines. Unlike their big brothers working inside safety fencing at automobile plants and other large assembly lines, collaborative robots are lightweight, flexible and can easily be moved and reprogrammed to solve new tasks. This makes them perfect for companies which require more advanced processing capabilities in smaller batch sizes. Innovative force-sensing enables the Universal Robot (UR) to automatically stop operating (Continued on Page 2)
Robot Coming Out of Its Cage (Continued from page 1)

if it encounters obstacles in its path. This means the robot can work alongside employees with no safety guarding after performed risk assessment.

Lowering the entry barrier

The rule of thumb has always been that a robot costs about the same as two year’s salary of a human worker. Collaborative robots are closer to one fourth of that price.

Capital costs of traditional robots account for only 25 to 30 percent of the total system costs. The remaining costs are associated with robot programming, setup, and dedicated, shielded work cells. The “out of box experience” with a collaborative robot is typically less than an hour. That’s the time it takes to unpack the robot, mount it, and program the first simple task through an intuitive touchscreen user interface.
Or, by simply grabbing the robot arm and showing it the desired path of movement.

These were some of the benefits experienced by injection molder Dynamic Group, a contract manufacturer that wanted to maximize their existing labor force. Three collaborative robot arms from Universal Robots have now taken over several repetitive tasks resulting in improved product consistency and a 400% increase in production capacity.

Dynamic Group uses UR robots working collaboratively in three different applications: the first two robots tend complete machine cycles – picking and placing “book frames” into an injection molding machine, and transporting molded parts to trimming and degating fixtures, where the parts are then placed in front of employees for further handling. The third robot is deployed in a kitting application, placing sterile wipes and saline solution in a clam shell that is placed on a conveyor.

Companies, like Intek Systems who is a distributor of Universal Robots, can provide technical design and support for clients seeking robotic solutions in a wide range of industrial and manufacturing applications. They can discuss how collaborative robots can successfully enhance a manufacturer’s capacity and bottom line,

Co-Owner of Dynamic Group, Joe McGillivray, stresses the UR robots’ ease of use and fast ROI. “Having this type of success out of the gate with little prior experience with robots has been phenomenal and totally unexpected. The return on investment was less than two months.”

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Photos: A vision sensor detects if the table is empty before placing the finished part on the table in front of the operator. If an object is detected, the robot automatically stops.

4 Reasons to Evaluate Additive Manufacturing for your Business

by Michael Griffith
Manufacturing Technology Engineer, NWIRC

It remains to be seen whether additive manufacturing, or its synonymous term 3D Printing, actually transforms manufacturing. GE is one of many companies leading the development of additive manufacturing as an advanced manufacturing technology to improve its products and production. GE describes its new Center for Additive Technology Advancement (CATA), located outside Pittsburgh, as a “new manufacturing facility that will drive

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innovation and implementation of additive manufacturing across the company...(CATA) will be the flagship center for additive manufacturing, focused on developing and implementing industrial applications from which all GE businesses – and in turn customer – can benefit.”1

While small and medium-sized manufacturers do not have the luxury of their own dedicated additive manufacturing research facility, individual manufacturers of all industries can radically transform their business by implementing additive manufacturing into their operations.

A PricewaterhouseCooper (PwC) survey suggests that 66.7% of manufacturers are either using or testing 3D printing in their manufacturing operations, with an additional 24.7% planning to adopt 3D printing in coming years.2 Adding 3D printing to a company’s capabilities can increase value to customers, reduce operating costs, improve manufacturing processes, and engage employees to increase productivity.

Manufacturers can increase value to their customers by providing additional engineering services. Additive manufacturing engineering services gives manufacturers an opportunity to partner with their customers on product development. Original Equipment Manufacturers (OEMs) don’t always have the design-for-manufacturability expertise that their suppliers can offer. Partnering with a customer in their product development; offering expertise that is not had by the customer, is truly adding value for the customer.

Ever increasing material availability for additive manufacturing, especially metals, increases the potential to fulfill low volume orders, orders that might otherwise be turned away where they cannot be economically produced utilizing traditional manufacturing processes. A significant opportunity for manufacturers to be a value add to their customers is by consolidating vendors for low volume parts. The up-shot is that there is always potential for low volume orders to become high volume orders that can be switched to conventional production methods.

Additive manufacturing is not likely to ever completely replace subtractive manufacturing. Additive manufacturing can, however, be a compliment in part production. Typical uses are in tool and die builds, injection molding inserts, tools, jigs and fixtures. Complementing traditional manufacturing processes with 3D printing capabilities can significantly reduce costs and improve manufacturing processes.

Adding 3D printing capability into production processes as described above can energize the workforce and encourage employees to think of new, creative ways to innovate their own work space. Employees engaged in improving production processes can not only reduce production costs but encourage further increases in productivity.

Additive manufacturing has the potential to positively impact all manufacturing businesses, no matter the size or industry. Contact your NWIRC Strategic Business Advisor to learn more about additive manufacturing and its potential impact on your operations. If your business has already implemented 3D printing, let us know the ways this emerging technology has impacted your operations.


Michael Griifith is NWIRC’s Manufacturing Technology Engineer. He has a B.S. in Chemical Engineering and MBA, both from Penn State University, plus over 15 years of manufacturing sales and development experience.

Energy Round Table Meetings
The next meetings of the Energy Round Table are scheduled for May 5 and June 16. Both meetings will be held at the Tom Ridge Environmental Center, 301 Peninsula Drive, Erie PA starting at 9:00am. The May meeting is sponsored by Penelec and will focus on low-cost power quality (PQ) solutions and efficiency applications. You can find additional information about topics, speakers, and a link to register at www.nwirc.org/events.
YOUR STRATEGIC BUSINESS ADVISORS

If you have questions, or would like to speak with someone from NWIRC about services, please contact your Strategic Business Advisor:

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**UPCOMING EVENTS**

**Arc Flash Safety**  
May 12  
Location: Erie  
This half-day program will cover OSHA regulations pertaining to NFPA 70E, arc flash hazard assessments, and electrical hazards. It will review the potential injuries, safety-related maintenance requirements, protective equipment, employee responsibilities, and more.

**Root Cause Analysis**  
May 18  
Location: Erie  
Root Cause Analysis (RCA) is a methodology for finding and correcting the most important reasons for performance problems. Don’t just put a bandage on a problem- discover a disciplined approach to problem solving.

**Statistical Process Control (SPC)**  
May 24  
Location: Erie  
SPC can be part of your quality management system. This hands-on class will teach you integrated SPC charts, how to select and use the proper control chart, and how to establish control limits. Exercises will demonstrate data gathering, constructing a control chart, and continuous monitoring.

**ISO 9001:2015 Internal Audit**  
May 24-26  
Location: Meadville  
This 3-day workshop will provide a detailed review of the quality standard, including all the standard revisions. Participants will learn how to conduct an audit, write the audit report, and take corrective actions.