GREATER DAYTON ADDITIVE MANUFACTURING LEADERSHIP CONFERENCE

August 24, 2017

Hilton Garden Inn, 3520 Pentagon Park Blvd, Beavercreek

AGENDA

8:15 – 9:00  Registration and breakfast

9:00 – 9:10  Opening remarks, Jim Bowman, Chairman, Dayton Region Manufacturers Association

9:10 – 9:30  Dayton’s Additive Manufacturing Ecosystem, Adam Clark, CEO, Tangible Solutions

9:30 – 9:50  Composite Tooling, Tailored Fiber Placement Preforms, Scott Huelskamp, P.E., Composites Engineer, University of Dayton Research Institute

9:50 – 10:10  Maker to Manufacturer: Moving the Maker Movement beyond Hobbyists, Dr. Emily Fehrman Cory, Founder, Make It Dayton

10:10 – 10:40  Additive Manufacturing with Metals and its Impact on Tooling, Scott Young, Engineering Manager, and Ben Staub, President, BasTech, Inc.

10:40 – 11:00  Reverse Engineering for Additive Manufacturing, Kelly McClary, Additive Manufacturing Product Design Engineer, University of Dayton Research Institute

11:00 – 11:15  Break

11:15 – 12:00  Industry Panel: Emerging Additive Technologies. Industry experts from BeAM Machines and Markforged will showcase several emerging additive technologies. Moderated by Adam Clark, Tangible Solutions.

12:00 – 1:00  Lunch and keynote address: GE’s Additive Story, Perspective from User and OEM, Greg Morris, GE Aviation

1:00 – 1:15  Additive Manufacturing Workforce Resources, Toni Overholser, Director, Workforce and Business Solutions, Clark State Community College

1:15 – 1:30  Expertise and Funding Support for Manufacturers using Additive Manufacturing, Phil Ratermann, Director, FASTLANE

1:30 – 2:30  Small and Medium Company Showcase: sharing quick capability overviews from regional companies, as well as examples of how traditional manufacturers and service providers are using additive manufacturing to enhance their business. Featuring FibreTuff Medical Biopolymers LLC, JZ Technologies LLC / ChalkLine4D, Prosthetic Design Inc., SEPMATech, and Skyward, Ltd.

2:30  Closing remarks, depart for reception

3:00 – 5:00  Open House and Networking Reception at Tangible Solutions, 678 Yellow Springs-Fairfield Rd, Fairborn 45324
Opening Remarks

Jim Bowman, Chairman, Dayton Region Manufacturers Association

Jim Bowman has been Senior Vice President and Chief Operating Officer of Rack Global Enterprises since 2012. Rack Global is headquartered in Dayton and is the parent company of Rack Processing of Dayton, Ohio, Grand Rapids, Michigan, and Irapuato, Mexico. Rack is the leading manufacturer of electroplating on plastic tooling for the automotive industry.

Jim has been a senior manager in manufacturing organizations for over 30 years. Jim serves on the advisory board for FASTLANE, the West Central Ohio’s Manufacturing Extension Partnership affiliate.

Jim received his bachelor’s degree in engineering and his master’s degree in business administration from The University of Dayton. He has lived in the Dayton area for over 36 years, is married, and has two sons. He speaks conversational German, and he enjoys UD basketball, bicycling, SCUBA diving, and coaching high school volleyball.
Dayton’s Additive Manufacturing Ecosystem

Adam Clark, CEO, Tangible Solutions

Tangible Solutions is pioneering the field of additive manufacturing to cutting-edge contract manufacturing solutions within the medical, aerospace and other commercial industries. The company has gone from a garage in Fairborn, Ohio to a 25,000 sq ft production facility, and experiencing exponential growth. Some of that success is tribute to the 150 years of manufacturing heritage this region already has established. Adam Clark will discuss why the Dayton region is a major player for Additive Manufacturing, while the opportunities to lead the 4th industrial revolution sit on the horizon.

Adam became a Managing Partner at Tangible Solutions in 2013. Tangible Solutions is pioneering the field of additive manufacturing to provide large-scale, cutting-edge contract manufacturing solutions within the medical field. Upon joining Tangible Solutions, Clark leveraged strategies he perfected in his military career to increase the company's market share, expand service offerings and propel the company from its humble beginnings to a position as a recognized trailblazer in additive manufacturing.
Composite Tooling, Tailored Fiber Placement Preforms

Scott Huelskamp, P.E., Composites Engineer, University of Dayton Research Institute (UDRI)

Composite Tooling – An overview of UDRI’s efforts to use additive technology to significantly reduce cost and lead time of composite tooling. FDM and BAAM processes will be highlighted, as well as case studies performed on Air Force and Navy components.

Tailored Fiber Placement Preforms – An introduction to a new technology for building net-shape composite preforms using an additive fiber stitching process will be given.

Scott Huelskamp is a composites engineer at the University of Dayton Research Institute specializing in advanced manufacturing techniques for the fabrication of composite and polymeric structures. He has over 13 years of intensive composite/polymer experience ranging from materials development and component design to hands-on fabrication and production. His work at UDRI includes leading efforts on designing, printing, and finishing additively manufactured tooling for composite fabrication. This experience extends to large format AM processing, including Big Area Additive Manufacturing (BAAM). Mr. Huelskamp is also leading efforts on developing low cost composite preforms using Tailored Fiber Placement technology. Prior to joining UDRI, Mr. Huelskamp spent five years in the aerospace tooling industry, developing and implementing shape memory polymer mandrel systems for large aerospace manufacturers. He has also served as a Principle Investigator on a Navy SBIR Phase 2 program and successfully transitioned the resulting in-field repair technology to commercialization. Mr. Huelskamp holds a BS degree in Mechanical Engineering and a MS degree in Materials Engineering and is a registered Professional Engineer in the state of Ohio.
Many would argue that the Maker Movement exists because of the recent accessibility of 3D printing technology for the home consumer market. Following the trail blazed by the democratization of additive manufacturing, other advanced manufacturing techniques are now finding their way into our homes and schools. In this presentation, I will provide an overview of the impact that the Maker Movement is having on our local Dayton entrepreneurial and manufacturing ecosystem, and how this trend can be harnessed as part of a broader regional economic revitalization strategy.

Emily Fehrman Cory received her PhD in Electro-Optics from the University of Dayton in 2014. Since then, she has held diverse positions in innovation and entrepreneurship, starting as the Chief Technology Officer of America Makes, the National Additive Manufacturing Institute and then founding the Air Force Research Laboratory's first makerspace, the AFRL Maker Hub. Dr. Cory is also an active force in the Dayton region, as co-founder of the Dayton Maker Faire and associated action group, Make It Dayton. She also sits on Mayor Whaley's Manufacturing Task Force and is the founder of the Southwest Ohio Makerspace Alliance. Dr. Cory is now Faculty of Practice in Innovation and Entrepreneurship at the University of Dayton School of Engineering where she will be active in both the KEEN entrepreneurship grant as well as the university's newly established makerspace.
Additive Manufacturing with Metals and its Impact on Tooling
*Getting the most out of Additive Manufacturing on your shop floor*

Scott Young, Engineering Manager, and Ben Staub, President, BasTech, Inc.

The tooling industry has been looking for an Additive Manufacturing (AM) solution for many years. Today, technologically sound (additive) machinery using true ferrous and non-ferrous materials, coupled with the ability to rethink how we design components, are giving this massive industry new tools in its tool-box that provide game changing opportunities.

In this presentation, we will be reviewing ways to incorporate additive manufacturing that will change how we look at tool design and manufacturing. Through incorporating what would have traditionally been multiple parts into one component, including complex electrical/thermal passage ways and minimizing machining time; additive tools will give the designer and tool maker more creativity, time savings on the shop floor and the ability to provide higher quality tooling to the production line.

Actual case studies will be presented to help validate AM as a viable solution to create more efficient and cost effective production tools. In addition, BasTech will be providing an overview of results from their participation in the Ohio Advanced Manufacturing Program (AMP).

Scott Young leads BasTech’s design engineering group and additive production including; stereo lithography, wax and plastic printers (MJP), color jet printers, direct metal and laser sintering (DMLS) and reverse engineering. Scott has worked in the injection molding industry for over 30 years. He has extensive experience designing injection and compression molds from prototypes to complex, multi-cavity, multi-shot production molds for aerospace, automotive and consumer products. His career has also provided opportunities for process engineering and product design/development to further round out a solid understanding of injection molding from beginning to end. Combining the capabilities of today’s technology with solid design knowledge, Scott is building on ways to improve injection molds for the production side of the industry as well as using DMLS to reduce cost for the mold makers.

Ben is a 1990 graduate from the University of Dayton with a B.S. in Mechanical Engineering Technology. He inherited an entrepreneurial spirit from his father and uncles who had started and grown their own manufacturing companies. In late 1994, Ben ventured out on his own and began BasTech, Inc. as a rapid prototyping service bureau.
Reverse Engineering for Additive Manufacturing

Kelly McClary, Additive Manufacturing Product Design Engineer, UDRI

The ability to reverse engineer products is vital in the sustainment of aging equipment where original manufacturing data is no longer available. At the University of Dayton Research Institute (UDRI), a dedicated reverse engineering team is committed to providing necessary support to recreate models for aging products using both traditional and modern reverse engineering techniques. Additionally, 3D models of components are generated using FARO Arm Laser Line Probe scanner and GeoMagic DesignX software which allows reconstruction of the geometry using the point cloud collected by the scanner. This information is further used in the reproduction and/or redesign of the parts for various manufacturing methods such as additive manufacturing (AM). Additive manufacturing of aged equipment would be impossible without these reverse engineering capabilities.

Kelly McClary graduated from Wright State University with a B.S. in Mechanical Engineering. After graduating, she started her career at PAVE Technology Co, where she was a design engineer for five years working on electronic feedthroughs for pressure and vacuum applications. In September 2016, she started working at the University of Dayton Research Institute as an Additive Manufacturing Product Design Engineer where she is designing and optimizing mechanical components for additive manufacturing, as well as developing an additive manufacturing product design process.
Industry Panel: Emerging Additive Technologies

Industry experts from BeAM Machines and Markforged will showcase several emerging additive technologies.

Moderated by Adam Clark, Tangible Solutions

Jason Rose
Regional Sales Manager - Midwest
Markforged

Reinventing manufacturing with high strength composites and metals, Massachusetts-based Markforged shocked the world with its award winning composite technology. Now, they have their sights on scalable metal printing technology.

Tim Bell
VP Business Development and General Manager
BeAM Machines Inc.

Tim Bell is a seasoned Manufacturing veteran and Cincinnati Ohio native. He has spent more than 30 years in manufacturing, and was trained as a Journeymen Toolmaker. He spent the next 20 years as a Machinist, Programmer, Designer and Entrepreneur. The last 10 plus years have been totally focused on Metal Additive Manufacturing specifically supporting the Aerospace and Defense industries. He has successfully launched several US companies, taking them from ground zero to profitability and becoming leaders in their respective fields. Tim is considered a pragmatic, go-getter who thrives in tackling new challenges with creativity and experience. BeAM is a leading European manufacturer of AM machines using the Laser Metal Deposition process.
Greg Morris, GE Aviation

Greg joined GE Aviation in late 2012 with the acquisition of his two companies Morris Technologies and Rapid Quality Manufacturing. Greg is one of the Leaders of Additive Technologies within GE Aviation and works closely with all of GE’s businesses to promote and integrate additive manufacturing into a broad array of products and processes. Greg has been involved in the Additive Manufacturing industry since 1994 and has written numerous related articles and presented at various trade shows, including SME’s RAPID Show, Aerospace Design Expo, EuroMold, AeroTech, MoldMaking Expo, IMTS, PDx/Amerimold and AIRTEC. Greg is a current Board member of SME, the Dayton Defense Board and Boston University's Industrial Advisory Board. Greg, his wife and two daughters live in Cincinnati, OH.
Additive Manufacturing Workforce Resources

Toni Overholser, Director, Workforce and Business Solutions, Clark State Community College

How do we generate the workforce necessary to meet the demand in Additive Manufacturing? Toni Overholser will address current resources in the region; including training programs, student access, employer engagement, and financial support programs for employers. In addition, she will discuss the need to quickly adapt training and prepare students for jobs that may not yet exist.

Toni Overholser is the Director of Workforce and Business Solutions for Clark State Community College. In this role, she works to create partnerships with business and community organizations in the Dayton/Springfield region. She collaborates with business organizations, economic development departments, chambers of commerce and businesses to provide business development and workforce solutions throughout the state.

Toni previously held the position of President/CEO for the Beavercreek Chamber of Commerce, where she served a diverse group of business members. She also worked with over 100 chambers throughout Ohio as the Executive Director of the Southern Ohio Chamber Alliance. Toni is passionate about economic development and helping to build the workforce our state and region needs to flourish.
Expertise and Funding Support for Manufacturers using Additive Manufacturing

Phil Ratermann, Director, FASTLANE

Phil will describe FASTLANE’s Additive Manufacturing Program which brings both expertise and financial incentives to manufacturers who engage in AM projects to improve their business. The goal is to inspire clients to brainstorm where this technology can make a meaningful or unique impact to their operation/business, pursue the use of the resources being offered, and take action to implement the technology. He will briefly describe the benefits clients have garnered from past projects.

Mr. Ratermann is the Director of FASTLANE, an affiliate of Ohio’s Manufacturing Extension Partnership (MEP) organization covering the Western Ohio region. The program, part of UDRI, is focused on helping manufacturing companies grow via projects targeting innovation, continuous improvement, supply chain and workforce development. FASTLANE quickly connects firms that have technical or business growth challenges with regional solution providers.

Prior to launching FASTLANE 5 years ago, he gained over 25 years of experience in industry at ITW - Hobart Corp a global commercial food equipment manufacturing firm. He was VP/GM for his last 12 years at ITW, and prior to general management he spent 17 years in new product development. He has a Bachelor’s degree in Mechanical Engineering, and an MBA from the University of Dayton.
Small and Medium Company Showcase

**FibreTuff® Medical Biopolymers LLC**  
Robert Joyce, President

Robert Joyce is the owner and founder of FibreTuff®, a two year old biomaterials company located in Northwest Ohio that has an exclusive license for FibreTuff technology owned by Innovative Plastics and Molding. The company has been developing biomaterials in the last two years with FDA compliant ingredients to produce specialized and master batch compounds for molding and extruding and producing 3D filaments and powders. The company will be commercializing three biomaterials in the next 8-10 months for 3D printing Class I wearables in the medical industry. FibreTuff® has passed preliminary sterilization testing in an autoclave and Gama radiation, as well as skin irritation and cytotoxicity testing performed by NAMSA earlier this year.

**JZ Technologies, LLC / ChalkLine4D**  
John Buckles, COO

JZ Technologies, LLC has created ChalkLine4D technology to accurately project 2-dimensional CAD drawings of electrical, plumbing, and walls on the floor for the construction industry. This solution will eliminate the need for chalk lines and measuring tapes. In this talk, John Buckles, COO, will discuss the journey of selecting additive manufacturing to house the components and what was learned from the first print.

**Prosthetic Design Inc.**  
Tracy Slemker, CPO, FAAOP, President

Prosthetic Design Inc. (PDI) is a manufacturer, distributor, and innovator of prosthetic devices and components. As a company, PDI specializes in modular componentry, CAD/CAM and 3D printing technology. They are the developer of the Squirt Shape™ industrial 3D printer. PDI is based out of Clayton, Ohio with a vision to develop and provide technology that allows global access to prosthetic care.

**SEPMATech**  
Enrico Ferri, Ph.D., President

With expertise in laminate design, filament winding and CNC lathe turning, SEPMATech is a one stop shop for any of your composite manufacturing needs. SEPMATech provides design and prototyping, manufacturing services and turn key solutions in applications like tubes, threaded fittings, pressure vessels and hydraulic cylinders and much more.

At SEPMATech, we pride ourselves on the use of the latest manufacturing techniques, which includes additive manufacturing and 3D printing. Our 3D printed parts are being used every day to aid our filament winding operation mainly to generate special shaped molds or even novel ways to control fiber
path or prototype new equipment. We are also exploring the integration of 3D printed metal parts into our composite parts where composites do not fare well, such as threading and tight tolerances.

**Skyward, Ltd.**
Marcus Miller, Director, 3D Services

Skyward Ltd. is a small business headquartered adjacent to Wright-Patterson Air Force Base in Dayton, Ohio, providing the highest quality professional engineering services and custom solutions to its Government and Industry partners. Relative to additive manufacturing, Skyward provides 3D scanning, 3D modeling, and reverse engineering services for the Department of Defense and commercial customers. Mr. Miller will share a project example in which Skyward assisted an entire class from the Springfield-Clark Career Technology Center with their Senior design project. “Project Helping Hand”, as the Computer-Aided Design and Drafting (CADD) class describes it, involved designing and 3D printing a prosthetic hand for one of their classmates.