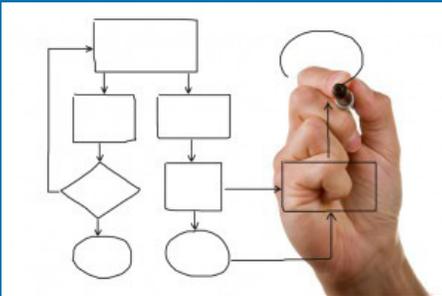


# From Idea to Design to Manufacturing to Market

Manufacturing Extension Partnership's service with SBIR/STTR programs



The Hollings Manufacturing Extension Partnership (MEP) helps accelerate technological innovation in U.S. manufacturers. MEP is a program of the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) and is located in all 50 states and Puerto Rico. MEP is a public/private partnership that works with small and mid-sized U.S. manufacturers to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from innovation strategies to process improvements to green manufacturing. MEP also works with partners at the state and federal levels on programs that position manufacturers to develop new customers expand into new markets and create new products.

The federal funding programs: Small Business Innovation Research (SBIR) & Small Business Technology Transfer (STTR) open opportunities for manufacturers to receive assistance with the creation of innovative products or services. These programs are designed to promote technological innovation and economic growth. The MEP program has expert field staff to identify companies that would benefit from SBIR/STTR and help with the critical commercialization plan.

In addition, MEP can play a pivotal role in moving SBIR/STTR research results to market. Often there are disconnects between the technology developer and the end user requirements resulting in delays in transitioning new technologies and solutions to market. These disconnects can be associated with technology readiness level (TRL), manufacturing readiness level (MRL), funding to advance either of those levels, and the evolution of end user needs. For the promise of technology to be realized, it must be commercialized. MEP provides the commercialization assistance needed in areas such as product design, manufacture engineering, product concept testing, quality control/management and certifications. Through MEP, SBIR/STTR awardees have access to services and support to facilitate connections and offer assistance to move from ideas to design to manufacturing to market.

The following four U.S. manufacturers leveraged MEP services to effectively and profitably accelerate their technological innovation. Their stories cover the multiple touch points where the local MEP Center made a difference in getting the product from idea to market.

## Surface Cleaning Technologies LLC



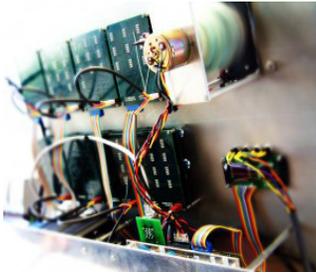
Surface Cleaning Technologies, LLC (SCT) is a spin-off company created by Hans Vogel, the founder of Triverus, LLC and inventor of an aircraft carrier runway cleaning vehicle. His invention, developed through the Department of Defense (DoD) Small Business Innovation Research (SBIR) program, cleans and removes

grime, oil, and heavy metals from hard surfaces. The vehicle-mounted machine also recycles cleaning water, which prevents runoff pollution and reduces water consumption.

Vogel was confident his green technology could be adapted to industrial and commercial customers and also benefit them by reducing water use and improving the 'restorative' cleaning reduced storm drain runoff. The re-scaled vehicle would clean parking garages, commercial runways, maintenance shops and other concrete surfaces that collect grime. In addition, his military spin-off would offer a new technological level of Best Management Practices in the cleaning industry. The problem facing Vogel was that he needed a partner to champion the industrial side of the business while he maintained his focus to the Department of Defense, delivering his services to the military customers.

Vogel's company, SCT, contacted Alaska Manufacturing Extension Partnership (AMEP), the NIST-MEP affiliate for Alaska. AMEP worked with SCT to conduct a partner search to find a company that would operate the cleaning service in commercial and industrial markets. They developed partner criteria and interviewed individuals and companies. Together they identified and partnered with a group of individual investors, led by a committed entrepreneur with a perfect skill set for the task at hand. The partnered company then moved to the Pacific Northwest, where polluted salmon streams and a high market acceptance of green technologies combined created favorable market conditions for an innovative product that recycled water, and reduced storm drain and runoff pollution of waterways. SCT now provides a green benefited hard surface cleaning service to the Pudget Sound region of industrial and commercial customers. Because of AMEP's assistance, Vogel and his company secured \$226k in investment capital, created two jobs, and has attracted attention of key decision makers at some of the largest companies in the Pacific Northwest.

## Archinoetics, LLC



Archinoetics, LLC, located in Honolulu, Hawaii is a high tech company that focuses on multi-disciplinary engineering, scientific research and development. The company creates cutting edge, patented technologies for military, media, sports, commercial

and rehabilitative applications. Archinoetics successfully spun off a company called Fatigue Science, which manufactures an integrated hardware/software product called the Readiband. The device is worn on the wrist and monitors fatigue risk by evaluating the quality, quantity and timing of sleep.

Archinoetics had developed very promising cutting edge video analysis software as part of an Hawaii Technology Development Venture (HTDV)-funded project called TREE (Temporally Recurrent Event Elimination) with the intent to integrate with Space and Naval Warfare Systems Command's (SPAWAR) robotic surveillance system and the Coast Guard's maritime surveillance program. Unfortunately because of funding and support, SPAWAR and the Coast Guard withdrew from the program.

Archinoetics felt that their object detection, change detection, and scene tracking technology was an advancement to all the state of the art products out there, but needed guidance on how to commercialize that technology. For help Archinoetics turned to Hawaii HTDC- MEP, a NIST-MEP network affiliate for Hawaii. Archinoetics attended an MEP workshop and together the company and Hawaii MEP brainstormed and identified two possible avenues for commercialization of their video analysis technology: commercial video analytics and smartphone deployments. As a result, Archinoetics was able to secure follow-on funding from HTDV and rebranded the TREE program as Corvid Video Analytics. With Hawaii MEP's assistance, the company was able to build a video analytics system that integrated with Lenel OnGuard, a market-leading security software suite. In addition the company partnered with IST, a Honolulu-based video surveillance reseller, and secured a letter of intent with the City and County of Honolulu to demonstrate its software on surveillance deployments within Honolulu County. Archinoetics also applied for new SBIR (Small Business Innovation Research) grants to move its video technology into the mobile phone sphere for several exciting, dual-use applications. As a result of Archinoetics' affiliation with Hawaii MEP, the company was able to identify new market opportunities and achieve a more competitive and profitable position.

## Diffinity Genomics, Inc.

Diffinity Genomics is a Rochester, New York-based life science start-up company with technologies that enable the development of high margin, single use disposable products for medical, industrial and research applications in two markets: DNA extraction and purification and molecular diagnostics. The company's innovative product, the Diffinity RapidTip for PCR purification, provides dramatic improvements in the way DNA is purified prior to follow on use and analysis.

Through the research process of applying technology developed at the University of Rochester, Diffinity demonstrated that its proprietary reagents and consumables



would allow very rapid purification of DNA sample material. Much of this early work was funded by an NIH Phase I (product feasibility) STTR grant. To support these initial experiments, the company had assembled product prototypes by coating particles with its proprietary reagents and

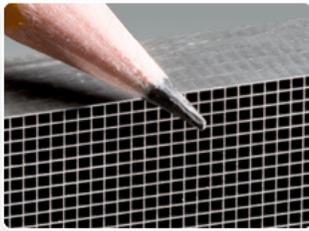
manually filling pipette tips with these particles. In early 2010, the company received a Phase II STTR (project development to prototype) grant to commercialize its first DNA purification product.

In order to support product and market development activities and attract investors to the company, Diffinity CEO, Jeff Helfer, knew that it needed to have a robust process for producing its proprietary materials and assembling the final (consumable) product. Jeff contacted Ed Sullivan, a manufacturing product design and prototyping expert for HTR Manufacturing Extension Partnership, the NIST-MEP network affiliate for New York. Working with Ed, the company first developed simple measurement tools to ensure that manually assembled product consistently met performance requirements. Data from field trials of this product allowed detailed product design and manufacturing process specifications to be established for higher volume production. Ed then engaged a local machining company to build a pilot scale assembly device. Because of the product and market development progression, Diffinity was able to launch their initial product, the Diffinity RapidTip. As a result the products revenue has grown from sales worldwide. In addition Diffinity RapidTip for PCR Purification was named a Top Life Science Innovation for 2010 by The Scientist magazine. The Company has grown from zero paid employees to 12 high tech positions filled by locally displaced workers and graduates from the University of Rochester and Rochester Institute of Technology.

## Mikro Systems, Inc.

Mikro Systems, Inc. is a high-technology manufacturer located in Charlottesville, Virginia. The company has a patented technology that facilitates the practical, low-cost manufacture of complex mechanical components and systems for a broad range of industries including aerospace, medical imaging, biomedical, electronics, recreational products and energy generation. Furthermore they partner with international, high technology companies, as well as government and academic institutions to develop advanced high-performance products and manufacturing processes.

Until 2007 Mikro was primarily a research-based company focused on technology development and demonstration of concepts through prototype and small scale manufacturing. In



2005, Mikro was awarded a SBIR Phase II (project development to prototype) grant by the National Institutes of Health (NIH). NIH later entered into a partnership with NIST MEP, a collaboration in which NIST MEP would provide assistance to companies that had been awarded

SBIR Phase II grants. Mikro connected with Genedge Alliance, Virginia's Manufacturing Extension Partnership. Genedge Alliance assisted Mikro in moving toward commercial levels of production. The primary project objective was to facilitate implementation of Lean concepts, and to build on the Lean Six Sigma principles of Define Measure Analyze Improve Control (DMAIC). Specific goals included training and analysis of product capability to assist Mikro in setting realistic product specifications, assistance in implementing 5S (Sort, Set in Order, Shine, Standardize, Sustain)/Visual Workplace systems, and revisiting their Quality System. As a result of Genedge Alliance assessment and input, Mikro was able to save \$500,000, increase throughput by 90 percent, increase product quality and reliability by 40 percent and increase capacity by 93%.

These stories are a sample of the success U.S. manufacturers are experiencing when they turn to their local MEP affiliate to accelerate innovation. Innovation is at the core of what MEP does. Manufacturers that accelerate innovation are far more successful and realize greater opportunities to participate in the global economy. The nationwide network has over 1,300 technical experts – located in every state – serving as trusted business advisors, focused on solving manufacturers' challenges and identifying opportunities for growth through product and process innovation.

For more information, visit [www.nist.gov/mep](http://www.nist.gov/mep) and join the conversation on MEP's blog *Manufacturing Innovation* at [nistmep.blogs.govdelivery.com](http://nistmep.blogs.govdelivery.com).

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