

# CMTC Advanced Manufacturing Technologies Group



CMTC provides access to manufacturing applications, workforce skills training and technology research in partnership with organizations throughout the state and the nation.

Flexible Hybrid Electronics



SMART Manufacturing



Advanced Robotics and Automation



Additive Manufacturing



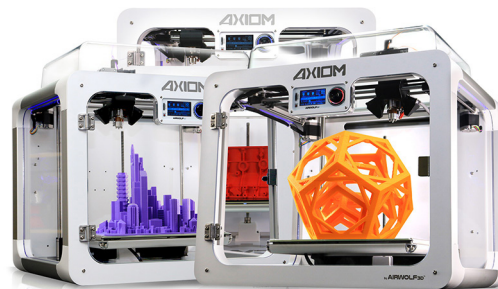
Solving the challenges facing small and medium-sized manufacturers through advanced technology implementation

# Through our technology practices, CMTC is supporting awareness, engagement and the

## Additive Manufacturing

Additive Manufacturing (AM) has evolved and matured rapidly in recent years. It continues to advance with new processes and materials. Today there are a wide range of production grade materials available, such as: tool steel, Inconel, cobalt chrome, titanium, tungsten, aluminum, stainless steel, ABS, PLA, nylon, and resin (printing liquid). Benefits of adopting Additive Manufacturing include:

- Compressed design cycles
- Reduced development costs
- Reduced tooling costs
- Personalized products
- Use of new structures and shapes
- Reduced time to market
- Reduced material waste
- Virtually unlimited design flexibility



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## SMART Manufacturing

Smart Manufacturing (SM) technology provides effective uses of advances in various technologies including sensors, computing power and wireless communications to offer low cost solutions that lead to:

- Higher quality products
- Improved manufacturing productivity
- Increased energy efficiency
- Safer plant floors
- Improved preventative maintenance
- Better production line work flow



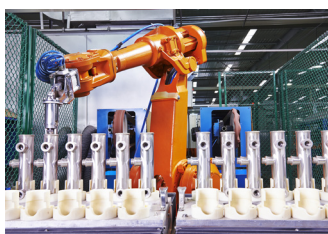
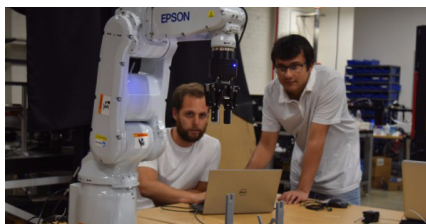
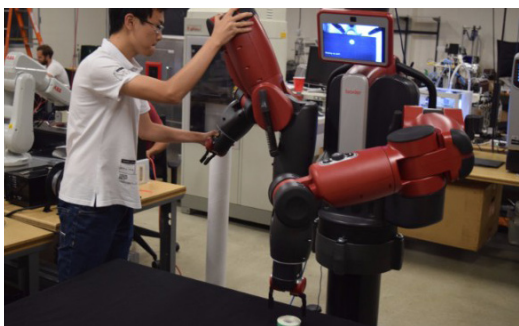
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# transfer of advanced manufacturing technologies to small and medium-sized manufacturers (SMMs)

## Advanced Robotics and Automation

Advanced Robotics and Automation (ARA) has become a priority for manufacturers as tighter labor markets and competitive pressures drive change. SMMs who previously couldn't afford robotics and automation are finding positive ROI as the cost of automation falls and the ease of use rises. Teaming human workers with robots on the assembly line fundamentally changes how products are manufactured.

Today's robots are more intelligent, versatile, flexible, and steadily falling in cost. Collaborative robots (cobots) enable workers to safely interact with machines that are tasked to do repetitive, hazardous and ergonomically challenging tasks.

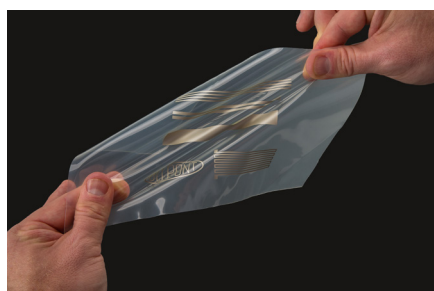
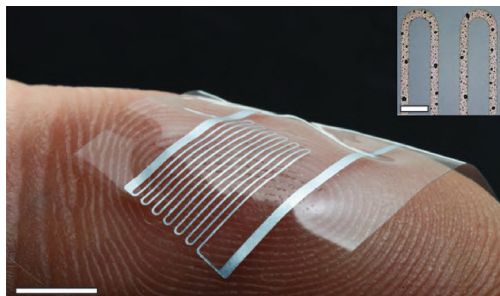


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## Flexible Hybrid Electronics

Flexible Hybrid Electronics (FHE) combines the flexibility and low cost of printed plastic film substrates with the performance of semiconductor devices to create a new category of electronics. By adding electronics to new and unique materials combined with the power of thin silicon integrated circuits, FHE creates conformable and stretchable products for a wide array of product categories including: medical devices, wearable products, Department of Defense applications and consumer products.



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Through the Manufacturing USA Institutes, the Federal government has committed over \$850 million, which has been matched by more than \$1.8 billion in non-Federal investment to move technologies from research to commercialization.

## CMTC's Role in Supporting the Manufacturing USA Institutes

1. Increase SMM awareness of Manufacturing USA Institute focus areas and resources
2. Ensure the involvement of SMMs in the processes and activities associated with informing and developing the research agendas of the Manufacturing USA Institutes
3. Increase SMMs participation in Manufacturing USA Institute research
4. Ensure the transition of Manufacturing USA Institute research results to SMMs for implementation



**NextFlex (Flexible Hybrid Electronics)** - San Jose, CA  
NextFlex takes key steps toward futhering U.S. development and adoption of the flexible hybrid electronics that will revolutionize the way we live, work and play.



**CESMII (Clean Energy Smart Manufacturing Innovation Institute)** - Los Angeles, CA  
Smart Manufacturing works to spur advances in smart sensors and digital process controls that can radically improve the efficiency of U.S. manufacturing.



**ARM (Advanced Robotics Manufacturing)** - Pittsburgh, PA  
ARM supports the implementation of robotic technologies to improve U.S. global manufacturing competitiveness.



**DMDII (The Digital Manufacturing and Design Innovation Institute)** - Chicago, IL  
Encourages factories across the United States to deploy digital manufacturing and design technologies, so those factories can become more efficient and cost-competitive.



**America Makes** - Youngstown, OH  
America Makes is a national accelerator for technology research, discovery, creation, and innovation in additive manufacturing and 3D printing.



California's Manufacturing Network

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