

ADVANCED MANUFACTURING

"In deciding to locate our headquarters and service center in Metro Orlando, we found that the region can easily support corporate and manufacturing operations not only through solid infrastructure and transportation systems, but through a workforce that is young, literate and eager to hold a good job."

— Hector Ponce, EVP, Mitsubishi Power Systems, Inc.

From production of high performance components for medical equipment, computing, power generation systems, frequency control products, automotive systems and more, Metro Orlando is emerging as a significant locale for advanced manufacturing. Crossing over many traditional industry sectors, these companies share a reliance on research, engineering and intensive manufacturing.

Key businesses in the industry have established headquarters in Metro Orlando, which reinforces the region's position as a center for advanced manufacturing. In addition to production, advanced manufacturing companies in the region are involved in the design and prototyping of complex products.

The sector enjoys strong support from public and private organizations, benefits from a central location with infrastructure vital to distribution activity and possesses a highly skilled, diverse workforce. Additionally, local well-respected educational institutions attract research dollars and consistently produce an impressive number of graduates that adds to the quality of workforce availability in Metro Orlando.

Overview and History

Advanced manufacturing continues to evolve as a viable industry sector in Metro Orlando. Local companies are involved in different facets of the trade including manufacture of optical crystals for PET scanners, computer components and subsystems, crystal oscillators for frequency control and surface acoustic wave components. Their customers run the gamut from PC manufacturers to wireless terminal providers, network equipment suppliers and hard-disk drive providers.

The headquarters for Mitsubishi Power Systems, Inc. (MPS) is based in the region. MPS manufactures, repairs, and refurbishes parts for large turbines at its Orlando service center.

The University of Central Florida (UCF), one of the country's leading metropolitan research universities, consistently attracts research funding and consistently produces graduates in the popular fields of engineering and computer sciences. Adjacent to UCF is the Central Florida Research Park, which is home to over 80 companies involved in research and development activity through the combined resources of academia and private industry. Research park participants currently are pursuing activities in lasers, optical filters, simulation and training and diagnostic test equipment.

With easy access to seaports on both coasts of Florida, railways, interstate highways and two international airports, Metro Orlando is also a prime location for distribution activities. Industry leaders have cited the Orlando International Airport as being integral to worldwide sales efforts because of its convenient flight routes.

Advanced manufacturing businesses in the region can also take advantage of services offered by multiple agencies that have been created specifically to promote the growth of high tech industry in Metro Orlando. These organizations provide training seminars, networking opportunities, public advocacy and much more.

Marketplace

Metro Orlando is home to an emerging advanced manufacturing sector involved in the production of high performance components for a diverse range of leading edge electronic products. The sector benefits from a community intent on developing a diversified economy in which high tech industry plays a key role. Metro Orlando government agencies, private companies and academia have demonstrated a joint resolve to strengthen the sector through increased research collaboration, information sharing and educational program development.

Advanced manufacturing companies in the region provide high tech parts for a broad range of products and applications including:

- Power generators
- Computers
- Medical imaging
- Instruments and controls
- Video games
- Wireless LANs
- Automotive systems

Workforce

As Metro Orlando cultivates its reputation as a high tech hub, the employee base continues to grow with educated, technically trained workers. Collaboration between private industry and educational institutions has led to the development of valuable training programs and internships that further strengthen the employee pool available to advanced manufacturing businesses. The University of Central Florida's College of Engineering and Science (CECS) offers superior programs in areas related to advanced manufacturing, such as computer engineering, computer science and electrical engineering.

Approximately 80 percent of CECS students gain job-related experience before graduating, and more than 75 percent of graduates remain in Florida five years or more after completing their education. On average, CECS annually graduates nearly 1,000 engineers and computer scientists with a significant percentage taking jobs in the state.

The region's community colleges also add to the quality of the workforce. Notably, Valencia Community College maintains an associate of science degree program with an emphasis on micro-electronic manufacturing. This program is designed to produce highly-skilled technicians capable of assisting in the design, production, operation and servicing of electronic and microelectronic systems and equipment.

Students in the Electronics Engineering Technology program at Seminole State College of Florida apply electrical and electronic theory and related knowledge to design, build, test, assemble, install, repair and modify developmental, experimental, or production electrical equipment in a variety of industries.

Additionally, local high schools offer magnet programs with emphasis on microelectronics, as well as other disciplines related to advanced manufacturing. With job shadowing and internship opportunities, these programs provide young students with early exposure to careers in this dynamic field.

Education

The advanced manufacturing sector in Metro Orlando benefits from a wealth of well-rounded educational programs at secondary, post-secondary and graduate levels designed to prepare students for a range of careers in the industry. Advanced manufacturing companies can also take advantage of research partnerships available through the University of Central Florida (UCF), one of the nation's leading metropolitan research institutes.

UCF's College of Engineering and Computer Science (CECS) offers bachelors, masters, and doctoral degrees in the areas of Computer Engineering, Electrical Engineering and Computer Science. The computer science doctoral program ranks among the top 10 in the nation, according to the National Association of Graduate and Professional Studies.

CECS is the top research-funded college at UCF, with awards exceeding \$14 million. The college is engaged in nearly 200 funded research projects sponsored by industrial groups and local, state and federal agencies. Notably, CECS received one of 14 awards from the National Science Foundation to fund student research in computer vision and semiconductors.

CECS professors are involved in active research that often involves collaboration among faculty members, graduate students and post-doctoral researchers and visitors. Current CECS research labs include:

- Software Engineering Research Laboratory — Current research projects include: specifying and testing software-intensive systems, automated model verification, and using mobile agents for network and system management.
- Solid State and Microelectronics Laboratory — Research projects include: development of improved methodology for measurements and SPICE simulation, statistical modeling of integrated circuits for digital and analog high-speed applications, and others.
- Chip Design and Reliability Laboratory — Research projects include: asynchronous digital design, CMOS Reliability and Adaptive Reed-Solomon decoder design for wireless communications.

Metro Orlando also boasts well-regarded community colleges that offer advanced manufacturing curricula. Valencia Community College offers an associate's degree in Electronics Engineering Technology with specialization in Electronics Engineering, Microelectronics Manufacturing and Applied Science.

Valencia's Electronics Engineering Technology program is designed to produce highly-skilled technicians capable of assisting in the design, production, operation and servicing of electronic and microelectronic systems and equipment. The college is a Center of Electronics Emphasis in the Florida system and is equipped with special test equipment and advanced laboratories, which provide the latest real-world experience.

Seminole State College of Florida offers an associate's degree in Electronics Engineering Technology. The two-year program is expected to prepare highly motivated students for entry into the electronics field. Emphasis is placed on the analytical and practical approaches to problem solving using the latest in electronic and microprocessor technology. Students in this program apply electrical and electronic theory and related knowledge to design, build, test, assemble, install, repair, and modify developmental, experimental, or production electrical equipment in a variety of industries.

Seeking to provide youth with an early stage high tech foundation, three local high schools have established magnet programs providing solid introductory vocational training in the areas of engineering, microelectronic engineering, science and technology. These valuable programs are largely supported by institutions such as UCF, along with private industry, which provides opportunities for job shadowing and internships.

Industry Organizations & Involvement

A variety of organizations have been formed to advance the interests of the emerging advanced manufacturing industry in Metro Orlando through networking events, information sharing and research and development endeavors. Following are brief overviews of a sampling of these organizations:

AeA

AeA is the nation's largest high tech trade association and is dedicated to advancing the business of technology. AeA represents more than 3,000 companies with 1.8 million employees. These 3000+ companies span the high-technology spectrum, from software, semiconductors, medical devices and computers to Internet technology, advanced electronics and telecommunications systems and services. With 17 regional U.S. councils, including one based in Orlando, and offices in Brussels and Beijing, AeA offers a unique global policy grassroots capability and a wide portfolio of valuable business services and products for the high tech industry. AeA has been the accepted voice of the U.S. technology community since 1943.

Advanced Materials Processing and Analysis Center (AMPAC)

In affiliation with the University of Central Florida (UCF), the goal of AMPAC is to excel in the development, processing and characterization of advanced materials. AMPAC aims to stimulate growth and in-depth research and education in advanced materials and works to make further developments in areas associated with energy technologies, lasers and microelectronics. The center is home to the UCF-Cirent Materials Characterization Facility (MCF), a \$10 million dollar facility with state-of-the-art surface and materials characterization equipment. This facility is located in the Central Florida Research Park, adjacent to the UCF campus.

AMPAC has established an Industrial Affiliates Program to improve communication between industry/government organizations, share expertise and build strong partnerships for research and education.

Institute of Electrical and Electronics Engineers (IEEE)

With a chapter based in Orlando, the IEEE is a non-profit professional association with members representing various fields in electrotechnologies and information technologies. It is a leading authority in numerous technical areas and offers its members educational opportunities, networking opportunities, public advocacy, and much more.

In addition to the numerous professional events attended and hosted by the Metro Orlando EDC, other trade organizations hold various local and nationally attended events related to advanced manufacturing such as:

IEEE Workshop on Applications of Computer Vision

This workshop consists of high quality double blind-reviewed papers and posters, invited talks, panels and demonstrations covering applications of Computer Vision and related technologies. Topics include industrial inspection/manufacturing, scientific imaging applications, robotics applications and underwater industrial applications.

Incentives

Metro Orlando offers attractive incentives to qualified relocating and expanding companies. This assistance is provided based on each organization's particular needs, including, but not limited to:

- Job creation
- Wage levels
- Capital investments

For more information, please visit the "Relocate & Expand/Incentives" section of the Metro Orlando EDC's website at OrlandoEDC.com, which provides a general overview of incentives offered to companies within Metro Orlando.

Company Profiles

Advanced manufacturing businesses in Metro Orlando are involved in the design and production of high performance components used in various applications such as gas turbines, telecommunications devices, automotive systems, stereo electronics, wireless communications and computer hardware. Below are overviews of a sampling of advanced manufacturing companies operating in Metro Orlando:

Adaptec Inc.

Adaptec Inc. provides highly available storage access solutions that reliably move, manage and protect critical data and digital content. Adaptec's storage solutions are found in high-performance networks, servers, workstations and desktops from the world's leading manufacturers, and are sold through OEMs and distribution channels to ISPs, enterprises, medium and small businesses and consumers. Adaptec is an S&P SmallCap 600 Index member.

Chip Supply, Inc.

Chip Supply, Inc. supplies semiconductor products and services for use in aerospace, military and medical applications, as well as commercial and industrial systems. In addition to post-wafer fabrication semiconductor processing, the company provides an extensive range of interconnect, test and assembly services, and is the world's largest die distributor.

Crystal Photonics

Founded by two University of Central Florida professors, Crystal Photonics is a highly successful spinout of CREOL. The company produces crystals for use in medical imaging and semiconductor applications.

Lockheed Martin Missiles and Fire Control

Lockheed Martin Missiles and Fire Control designs, develops and builds advanced combat systems, including ground- and air-launched tactical missiles; ground-launched air and missile defense systems; airborne fire control and situation awareness systems; and air-launched strike weapon systems, including smart munitions and penetrators. The company is an industry leader in experience and technologies related to electro-optics, millimeter wave radar, image and signal processing, advanced materials, electronic packaging and large system integration. Lockheed Martin Corporation has designated the Orlando facility as a Center of Excellence for smart munitions.

Mitsubishi Power Systems, Inc.

Headquartered in Seminole County, Mitsubishi Power Systems, Inc. provides a broad range of products and services, including power systems, shipbuilding, steel structures, air-conditioners, machinery for industrial and general use, aerospace systems and more. In addition to the corporate headquarters, Mitsubishi Power Systems also operates a power systems service and manufacturing center in Metro Orlando. In 2002, the Metro Orlando EDC recognized the company with one of five Industry of the Year awards.

Ortheon Medical

Headquartered in Orange County, Ortheon is a development stage medical technology company. Ortheon created the proprietary Teno Fix™ technology, which is designed to replace the suture methods that orthopedic surgeons currently use in soft tissue repair. The intended benefits to patients include an earlier start for post-surgical physical therapy, a more rapid return to normal motion and a reduced need for repeat surgeries.

Piezo Technology, Inc. (PTI)

PTI is a worldwide supplier of customer frequency control products. PTI is ISO 9001:2001 certified and equipped to address a wide range of both low volume and high volume, high performance commercial and military requirements for crystal oscillators, crystal filters and LC filters.

Sawtek

Sawtek, a subsidiary of TriQuint Semiconductor, Inc., which is a leading supplier of high performance components and modules for communications applications, provides surface acoustic wave (SAW) solutions for various wireless applications.

After more than 20 years of dedication, Sawtek is now recognized as a global leader for high performance SAW components and subsystems. Sawtek is the dominant global high-volume SAW supplier to the CDMA handset market as well as the CDMA and GSM base station markets. While continuing to expand its high-volume consumer applications business, Sawtek retains its unique ability to offer custom designs for both military/space and emerging market applications.

Transpo Electronics

Headquartered in Orlando, Transpo manufactures premium quality automotive electronic components for charging, ignition and engine management systems, exclusively to the wholesale market. Transpo is the recognized innovator and supplier of the most comprehensive automotive electronic product line for worldwide applications. The company's *'First To Market'* philosophy, coupled with its design and manufacturing innovations, allow it to manufacture products on a faster schedule while adhering to the new worldwide Quality Systems Certification Program of ISO9001 and QS9000.

UroSolutions, Inc.

UroSolutions, Inc. specializes in the manufacturing and marketing of urological products for distribution throughout the world. The products are marketed to acute care hospitals, rehabilitation facilities and long-term nursing homes, as well as to individual patients.