CENTER FOR MANUFACTURING INNOVATION

ADVANCED R&D AND ENGINEERING SOLUTIONS FOR A BROAD RANGE OF INDUSTRIES, INCLUDING BIOTECHNOLOGY, PHOTONICS, MANUFACTURING, AND RENEWABLE ENERGY

When the Fraunhofer Center for Manufacturing Innovation opened in 1994, it was one of Fraunhofer USA's first Centers in the U.S. and aimed at addressing the R&D needs of an increasingly global economy. CMI's synergy of life sciences and engineering provides efficient design and fabrication of instrumentation and devices. CMI was one of the early implementers of this new translational research paradigm; it is one of the few places in existence where biologists and engineers work side-by-side, and BioSafety Level 2 (BL2) laboratories are within arm's reach of big milling machines "making chips."

CENTER HIGHLIGHTS AND ACHIEVEMENTS

In 2000, Fraunhofer CMI established the highly successful spin-off kSARIA, a company that produces fiber optic and copper interconnect cables with proprietary automation assembly systems. Focusing on the glass fiber interfaces (an area where most of the processing steps need to be carried out manually), kSARIA developed solutions for fiber-to-fiber attachment and connections between fiber and periphery, as well as glass fiber handling, preparation and packaging. Its products can be found in numerous systems, including the Boeing 787, and the Airbus 380.

The company now employs over 100 people, contributing both to the performance and readiness of U.S. military hardware, as well as the local economy through jobs creation. Impressively, it has been profitable even through the recession. The company has won numerous awards from its customers, demonstrating that U.S. manufacturing can indeed be viable when incorporating the right advanced technologies to make up for the higher cost of labor. All of the

manufacturing takes place in the Commonwealth of Massachusetts. In 2010, only a few months after the outbreak of the H1N1 pandemic, the U.S. government's Defense Advanced Research Projects Agency (DARPA) awarded CMI and CMB researchers a grant to study ways of producing large quantities of vaccines. Drawing from research on tobacco plants, and the plants' genetically engineered mechanisms to produce proteins in their leaves and stalks, CMI and Fraunhofer Center for Molecular Biotechnology CMB developed a fully automated factory that uses tobacco plants to produce large quantities of vaccines and other therapeutic biologics within weeks.

The vaccines produced in the Delaware facility are currently undergoing clinical trials in the U.S. For their development of the fully-automated factory for plant-based pharmaceuticals, Fraunhofer CMI's Center Director, Professor Andre Sharon, and CMB's Center Director, Dr. Vidadi Yusibov, were awarded the 2013 Joseph von Fraunhofer Prize for Science and Innovation.

KEY TECHNOLOGIES

- Disruptive Automation for the Manufacture of Fiber Optic Gyroscopes Used in Airplanes, Satellites, and Ships
- Transformative Automation for the Production of Plant-Based Vaccines and Pharmaceuticals
- Rapid Identification of Antibiotic Susceptibility

STRATEGIC PARTNERSHIPS

The long-standing collaboration with Boston University has led to the creation of the Boston University-Fraunhofer Alliance for Medical Instrumentation, Devices, and Diagnostics. This Alliance has been accelerating the process of taking medical innovations from the laboratory to the patient point-of-care. It has led to several National Institutes of Health-funded activities in the areas of rapid identification of antibiotic susceptibility, rapid molecular diagnostics, and future cancer care technologies.

"Fraunhofer CMI has become our 'go-to' R&D partner when it comes to automating difficult-to-solve processes and unique manufacturing challenges. Their innovative solutions and commitment to getting problems solved are unparalleled. And, when a 'follow-up' is needed, they are back in a heartbeat to ensure sustainability of new and unique processes. They have been a strong, innovative partner to Avery Dennison's Fastening operations." – Craig Smith , Plant Manager - Retail Branding and Information Solutions, Avery Dennison.

PARENT INSTITUTE

Fraunhofer Institute for Production Technology IPT
Director: Prof. Fritz Klocke

CONTACT INFORMATION

www.fhcmi.org
Executive Director: Prof. Andre Sharon

Established in: **1994**

1ST Fraunhofer center in the U.S.

2013 AWARD RECIPIENT

JOSEPH VON FRAUNHOFER PRIZE FOR SCIENCE & INNOVATION
for Fraunhofer CMI's and Fraunhofer CMB's work on plant-based vaccine production.

Development of:

HIGH PRECISION AUTOMATION SYSTEMS

Development of Devices & Instruments for:

BIOTECH / BIOMEDICAL

PHOTONICS

ADVANCED MANUFACTURING

SUSTAINABLE ENERGY

"When we've had trouble finding a partner for some of our more unique and challenging machine design applications, we've found that Fraunhofer CMI tends to always be a good fit. Their breadth of expertise across numerous core competencies is unmatched.

DONNELL E. CREAR
GE GLOBAL RESEARCH