

MASSACHUSETTS

INDUSTRIES OF THE FUTURE

AGRICULTURE, ALUMINUM, CHEMICALS, FOREST PRODUCTS, AND METAL CASTING



OIT PARTNERS IN MASSACHUSETTS

Altus Biologics, Inc.
(Cambridge)

Apogee Technology, Inc.
(Norwood)

Arthur D. Little
(Cambridge)

Bost Nitride Technologies
(Canton)

Brittany Printing and Dyeing
Corporation (New Bedford)

CeraMem Corporation
(Waltham)

Charles River Associates
(Boston)

Gensym Corporation
(Cambridge)

GL & V / Impco-Jones, Inc.
(Pittsfield)

Hyperion Catalysis International
(Cambridge)

Innovative Membrane Systems,
Inc. (Norwood)

Koch Membrane Systems, Inc.
(Wilmington)

Massachusetts Institute of
Technology (Cambridge)

Massachusetts Office of
Technical Assistance (Boston)

MC Research and Innovation
Center (Cambridge)

Metabolix, Inc.
(Cambridge)

Osram Sylvania
(Salem)

Physical Sciences, Inc.
(Andover)

THE OFFICE OF INDUSTRIAL TECHNOLOGIES IS WORKING TO IMPROVE ENERGY EFFICIENCY IN MASSACHUSETTS

The State of Massachusetts ranks 27th in the nation in industrial energy consumption (391.4 trillion Btu). Large energy-consuming industries in the state are chemicals, forest products, and mining. In 1999, these Industries of the Future employed over 40,000 people and shipped goods valued at more than \$12 billion.

The Office of Industrial Technologies (OIT) is working with industry and university partners from Massachusetts on cost-shared research that is critical to the energy efficiency of state industry. The Office is also expanding the national IOF program to the state level in Massachusetts. In 2001, the Office of Industrial Technologies awarded Massachusetts a State Energy Program (SEP) grant for \$199,575 to expand the program to include metal casting and build on existing partnerships with the forest products and chemicals industries. In addition, the National Environmental Technology Center and the Center for Energy Efficiency and Renewable Energy received a State IOF Broad-Based award for \$62,500 in 2001 to expand its industry stakeholder group to key industry leaders, DOE, state government, universities, and consultants.

INDUSTRIES OF THE FUTURE IN MASSACHUSETTS

INDUSTRIES	EMPLOYEES	WAGES (\$1,000)	VALUE OF SHIPMENTS (\$1,000)
AGRICULTURE	42,381	644,842	461,474
ALUMINUM	N/A	N/A	N/A
CHEMICALS	17,800	1,331,511	6,811,000
FOREST PRODUCTS	21,127	778,468	4,375,912
GLASS	1,244	44,607	178,455
METAL CASTING	2,051	68,459	216,255
MINING	1,741	71,338	941,627
PETROLEUM	1,026	58,312	498,775
STEEL	N/A	N/A	N/A

N/A: Data not available or withheld due to industry size
Annual Survey of Manufacturers 1999, U.S. Dept. of Commerce: Aluminum, Forest Products, Glass, Metal Casting, Petroleum, Steel
American Chemistry Council 2001: Chemicals
Bureau of Economic Analysis 1999, U.S. Dept. of Commerce: Agriculture Employee and Wages
Economic Research Service 1999, U.S. Dept. of Agriculture: Agriculture Value of Shipments
Economic Census 1997, U.S. Dept. of Commerce: Mining



State Energy Program Project Description

Goal: To build on existing partnerships with the forest products and chemicals industries and expand the IOF program to include metal casting.

IOF Broad-Based Award Description

Goal: To aid the National Environmental Technology Center and the Center for Energy Efficiency and Renewable Energy to expand its industry stakeholder group to include key industry leaders, DOE, state government, universities, and consultants.

IOF Activities in Massachusetts

Agriculture

- Biodegradable Polyhydroxyalkanoate Polymer from Switchgrass
- Industrial Membrane Filtration and Fractal Separation Systems
- New Enzymes for Corn Syrup Processing

Aluminum

- Evaluation & Characterization of In-Line Annealed Continuous Cast Aluminum Sheet
- Intelligent Potroom Operation: Improved Control of the Aluminum Refining
- Semi-Solid Aluminum Alloys

Chemicals

- Ceramic Membrane Process for Upgrading Vacuum Residual Oil
- Computational Chemistry and Reaction Engineering Workbench
- Development of Data Processing Scheme for Plastic Identification Instruments
- Development of Non-Aqueous Enzymes
- Harsh Fluorochemical Separations
- Membranes for Reverse-Organic Air Separations
- Nanoscale Catalysts
- Novel Catalyst for CH₄-CO Conversion
- Novel Membrane Reactor for Fischer-Tropsch Synthesis
- Zeolite Membrane

Forest Products

- Increasing Yield and Quality of Low-Temperature, Low-Alkali Kraft Cooks with Microwave Pretreatment
- Polyoxometalate Bleaching: An Efficient, Oxygen-Based, Closed Mill Technology

Metal Casting

- Semi-Solid Metals Processing Consortium

OIT Crosscut Activities in Massachusetts

Sensors and Controls

- Diode Laser Sensor for Combustion Control

OIT BestPractices and Financial Assistance Activities in Massachusetts

BestPractices

- Industrial Assessment Center/University of Massachusetts

Inventions and Innovation

- Energy Efficient Isothermal Melting (ITM) of Aluminum
- Evaluation & Characterization of In-Line Annealed Continuous Cast Aluminum Sheet
- Novel LED for Illumination Applications

NICE3

- Commercialization of Cleaner Technologies for the Continuous Dyeing of Textiles

For more information, see OIT's fact sheets on the Web at www.oit.doe.gov/factsheets.



OIT PARTNERS IN MASSACHUSETTS CONTINUED

University of Massachusetts
(Amherst, Lowell)

Worcester Polytechnic Institute
(Worcester)

FOR ADDITIONAL INFORMATION,
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