

# Advanced Materials & Chemicals



**Strengthening** Your Future

## Michigan Information

- ◆ More than one third of the state's R&D facilities are located in Oakland County
- ◆ Michigan ranks second in the nation in R&D spending
- ◆ Michigan companies file over 3,000 patents a year, placing Michigan in the top 10 states for total patents granted

## Organizations To Support You

- ◆ 21st Century Jobs Fund
- ◆ American Concrete Institute (ACI)
- ◆ Automation Alley - Southeast Michigan's Regional Technology Cluster
- ◆ Michigan Manufacturers Association
- ◆ MMTTC - Michigan Manufacturing Technology Center
- ◆ NextEnergy
- ◆ Society of Manufacturing Engineers world headquarters
- ◆ TARDEC's National Automotive Center (NAC)
- ◆ U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC)
- ◆ U.S. Tank-Automotive and Armaments Command (TACOM)

## Workforce: Educated, Innovative & Motivated

- ◆ Over 40% of Oakland County residents have college degrees (national average is about 26%)
- ◆ Oakland County has the third highest number of high-tech workers in the nation and twice the corporate R&D professionals compared to the national average
- ◆ Population of Michigan's workforce: 5.1 million
- ◆ 15 public universities, 50+ independent universities and colleges, 29 community colleges
- ◆ Over 96,000 college degrees are granted every year in Michigan - almost twice as many as the national average
  - ◆ 2 ½ times the number of master's degrees were issued in Michigan than the national average
  - ◆ Close to 1,500 Ph.D.s are granted in Michigan every year - almost twice the national average



Courtesy Lawrence Technological University



Courtesy DSM Engineering Plastics

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## Michigan Universities: Research Centers

### Central Michigan University

- ♦ Polymeric Materials Science and Technology Institute

### Eastern Michigan University

- ♦ Coatings Research Institute
- ♦ Surface Science Center
- ♦ NSF I/UCRC Center in Coatings Research
- ♦ Textile Research and Training Institute (TRTI)

### Ferris State University

- ♦ National Elastomer Center for Plastics and Rubber Technology

### Kettering University

- ♦ The Computational Plasma Dynamics Laboratory (CPDL)

### Lawrence Technological University

- ♦ Center for Innovative Materials Research
- ♦ Institute of Material Processing

### Michigan State University

- ♦ Composite Materials and Structures Center (CMSC)
- ♦ Fraunhofer Center for Coatings and Laser Applications
- ♦ Center for Fundamental Materials Research
- ♦ Midwest Hazardous Substance Research Center
- ♦ NSF Center for Sensor Materials

### Michigan Technological University

- ♦ Institute for Engineered Materials
- ♦ Carbon Technology Center
- ♦ Keweenaw Research Center
- ♦ Sustainable Future Institute

### Oakland Community College

- ♦ Customized Advanced Materials and Chemicals Programs

### Oakland University

- ♦ Fastening and Joining Research Institute

### University of Michigan

- ♦ Center for Lasers & Plasmas for Advanced Manufacturing
- ♦ Center for Sustainable Biobased Materials
- ♦ Biomaterials Laboratories Research Center
- ♦ Center for Advanced Electronic Materials
- ♦ Center for Nanomaterials Science
- ♦ The Michigan Computational Materials Center

### Wayne State University

- ♦ Chemistry Central Instrumentation Facility
- ♦ Institute for Manufacturing Research

### Western Michigan University

- ♦ Advanced Materials Testing and Evaluation Laboratory

**Green** - These universities are either located in or have campuses in Oakland County

## Access to Capital

*Oakland County's Economic Development Team will help your company find potential sources of capital and financing.*

**Michigan Venture Capital Association** - Established by venture capital and private equity investors in the state, the Michigan Venture Capital Association (MVCA) is the state's premier public policy advocate for the private equity/venture capital industry. MVCA works to promote entrepreneurship and private equity investment.

**Venture Capital** - In four years alone, over \$694 million in venture capital has been invested in 101 businesses in Michigan. For new emerging technology initiatives, Michigan has created the \$150 million Venture Michigan Fund to catalyze investment in early-stage firms operating in Michigan. With the matching requirement, this initiative will attract an additional \$450M in capital to Michigan for investment in promising new companies.

**Angel Networks** - Aimed at helping companies with early stage seed financing, Michigan is fortunate to have three active Angel Networks: The Great Lakes Angels, The Grand Angels and The Ann Arbor Angels.

**Traditional and Non-Traditional Financing** - Oakland County's Business Finance and Economic Development Corporations help companies with the SBA 504 Loan and with Tax-Exempt Revenue Bond Programs. Through the Automation Alley Technology Center, emerging companies can be assisted with securing non-traditional and unique sources of financing and capital.

**State Incentives /Credits** - Michigan has a wide variety of incentive programs and credits for companies that qualify.

## Research Projects at Michigan Universities:

- ◆ Bendable concrete
- ◆ Mechanical fastening and adhesive bonding of composite and polymer joints
- ◆ Non-destructive testing and inspection of composite and metallic joints
- ◆ Finite element modeling and analysis of composite, polymer and metallic joints
- ◆ Composite drive shafts
- ◆ Carbon Fiber Reinforced Polymer (CFRP) material
- ◆ Engineered materials for medical devices
- ◆ Carbon-based coatings for the protection of medical implants from wear and corrosion
- ◆ Extending a drill bit's life tenfold by growing a diamond crystals on thin metal film making the film transparent
- ◆ Simulated ductile fracture in noncrystalline materials
- ◆ Embedding fibers like jute, flax, and sisal into bioplastics to create ecologically friendly biocomposites for structural applications ranging from automobiles to buildings
- ◆ Advanced materials that cool computer chips
- ◆ Hydrogel polymers with protein growth factors attached making stronger biodegradable ceramic scaffolding in bone growth
- ◆ Research on starches from agricultural feedstocks that produce environmentally benign materials
- ◆ Mechanical properties of polymers & elastomers
- ◆ Production of single wall nanotubes in reduced gravity environment
- ◆ Structural relaxation and properties of planar defects in amorphous and nanocrystalline metals
- ◆ Advanced corrosion resistant zinc alloys
- ◆ Novel methods to process carbon nanotubes
- ◆ Evaluation of chemically modified soybean oils as PVC plasticizers
- ◆ Effects of surface films on mechanical behavior of substrate materials by nanoindentation methods
- ◆ The mechanical properties of structural adhesives
- ◆ Intrinsic material properties
- ◆ Femtosecond laser-assisted health monitoring of critical structural components in advanced defense systems
- ◆ Quasicrystalline coatings
- ◆ High temperature shape memory alloy development for use above 500° C
- ◆ Reducing defects in manufactured titanium fasteners
- ◆ Thin film shape memory alloys on polymeric substrates for microactuators
- ◆ Liquid molding of polymer composites
- ◆ Durability characterization of POSS-based polyimides and carbon-fiber composites
- ◆ Utilization of renewable resources in materials
- ◆ Using artificial intelligence to design composites
- ◆ Technology used to recycle larger quantity of waste plastics
- ◆ Computer-aided testing (CAT) of metals and composites
- ◆ Life prediction and durability enhancement
- ◆ Carbon fiber road material (The Bridge Project)
- ◆ Anti-icing aggregates
- ◆ Aluminum metal-matrix composite
- ◆ Solid free-form fabrication process using plasma transfer Arc
- ◆ Coatings for control and prevention of corrosion
- ◆ Fouling release coatings
- ◆ Antimicrobial coatings
- ◆ Nanoparticle materials technology
- ◆ Microemulsion technology
- ◆ Automotive coatings technology/testing
- ◆ Polymers and coatings from renewable resources
- ◆ Coatings for plastics
- ◆ UV curable coatings
- ◆ Real-time in situ strength of thin films



Courtesy DSM  
Engineering  
Plastics

## Advanced Materials & Chemicals Companies

3d Polymers Inc.  
Acadia Polymers  
Acheson Industries Inc.  
ACT Laboratories  
ADCO Products Inc.  
Adept Plastic Finishing, Inc.  
Advanced Prototyping Inc.  
Akzo Nobel Coatings Inc.  
A-Line Products Corp.  
Amplas Compounding  
Anderson Development Co.  
ARRIS International  
Auburn Engineering  
Axchem  
Baron Industries  
BASF  
Bermar Associates Inc.  
BISSELL Homecare Inc.  
Bonaf Technologies  
BTU/AtmoPlas, Inc.  
Cass Polymers  
Celia Corp.  
Ceradyne Inc.  
Chemico  
Chemsol, Inc.  
Ciba Specialty Chemicals Corp.  
Clariant Corp.  
Coatings Specialist Group

Compound Technologies Inc.  
Creto International  
Crown Group  
Detrex Corp.  
Dhake Industries Inc.  
Diversified Chemical Technologies Inc.  
Douglas Corp.  
Dow Automotive  
Dow Chemical Co.  
Dow Corning Corp.  
DSM Engineering Plastics  
Dunnage Engineering Inc.  
DuPont Automotive  
EFTEC North America LLC.  
Electro Chemical Finishing Co.  
Electro Cote Chemicals Co.  
Energy Conversion Devices  
Fast4m Tooling  
Flint Ink Corp.  
Fraunhofer USA  
Freiborne Industries Inc.  
Genesee Polymers Corp.  
GMI Composites  
Gougeon Brothers Inc.  
Guardian Industries  
Henkel Surface Technology  
Hi-Tex Inc.

HMS Company  
Hot Melt Technologies Inc.  
Industrial Ceramic Technology Inc.  
Innovative Polymers Inc.  
Intertape Polymer Group  
ITECH  
Kish Sp Industries Inc.  
Lendell Manufacturing  
LG Chemical Ltd.  
Loctite  
Lyntal International Inc.  
Master Finish Co.  
McAllister Corp.  
NCP Coatings Inc.  
Noble Polymers  
Northern Coatings & Chemical Co. Inc.  
Polyply Composites  
Polytorx  
PPG Industries  
Prime Source Polymers  
Protomatic Inc.  
PVS Chemicals Inc.  
Red Spot Westland Inc.  
SENSITILE  
Solvay Engineered Polymers  
Statistical Processed Products Inc.  
Stork Climax Research Services  
Sun Chemical Corp.  
Technical Polymers Ticona  
Thermo Vac  
Toefco Engineered Coating Systems  
Toray Resins  
Troy Polymers Inc.  
United Paint and Chemical Corp.  
Wacker Chemical Corp.  
Wendt USA  
West System Inc.  
World Class Prototype  
Umicore Autocat USA Inc.



Courtesy BASF

Green - Oakland County companies

Blue - Southeast Michigan companies

Black - Michigan companies

Contact us with any additions or changes to this list.

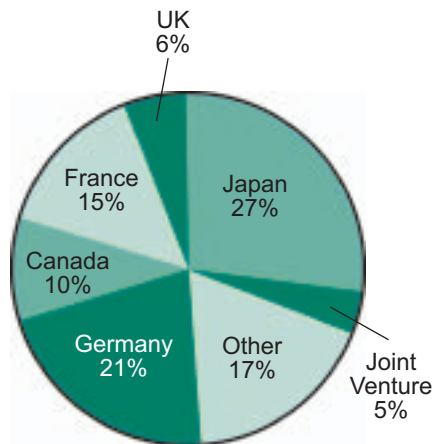
## Oakland County Can Help Your Business

The Economic Development Team offers assistance in:

- ◆ Site location
- ◆ Financing
- ◆ Tax incentive
- ◆ Liaison with state and local agencies
- ◆ Workforce development
- ◆ Business Assistance Center (business consulting)
- ◆ Information products - to ensure you make the right decision for your company's location

## Oakland County is an International Hub

Foreign firms make the strategic decision to locate in Oakland County because of the highly skilled workforce, strong educational systems and the international support services available to them.



- ◆ 653 foreign-owned firms from 24 countries are in Oakland County
- ◆ 259 of these firms came to Oakland County in the last 12 years-that's an average of two foreign companies a month opening up a location in Oakland County



**L. Brooks Patterson,**  
*Oakland County Executive*

*With the support of  
The Oakland County Board  
of Commissioners*

## Oakland County is Strategically Located



- ◆ Centrally located between Chicago, Toronto and Cleveland, Oakland County is strategically positioned to capture the entire Midwest market
- ◆ The Michigan-Ontario border is the busiest U.S.-Canada crossing in the country, making this area an ideal location to reach the United States and the Canadian markets. Ontario, less than an hour's drive from Oakland County, generates some 40% of Canada's total gross domestic product



**Contact us today for more information:**

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Planning & Economic Development Services**

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