

# **MICHIGAN WORKFORCE, 2011:**

## **Potential Exposure to Acrylic Acid, Chromium, Diethanolamine, Ethylene Oxide, Maleic Anhydride, and Methyl Methacrylate**

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Chemicals identified as causing asthma were abstracted from data provided by The United States Environmental Protection Agency (EPA). Companies are required to report select chemicals, including some that cause asthma, if amounts exceed 10,000 pounds per year and the company has a minimum of 10 employees. Chemical usage among Michigan workers reviewed in this report include: acrylic acid, chromium, diethanolamine, ethylene oxide, maleic anhydride and methyl methacrylate. These chemicals are part of the 650 substances whose usage requires reporting to the EPA.

Michigan companies using these chemicals were sorted and collected from the EPA Toxic Release Inventory (TRI) to characterize potential exposure among workers. Data of total number of employees working in facilities using chemicals that cause asthma were gathered from the Michigan Manufacturers' Directory and CarrierOneStop (Acinet.org). The total number of workers in Michigan counties was obtained from Michigan Labor Market Information. In addition, the Michigan Department of Environmental Quality (DEQ) provided the names of companies that used chemicals listed on the Michigan Facilities' Guide to SARA Title III, Emergency Planning and Release Report. Companies reporting to DEQ must meet a threshold quantity of 25,000 pounds manufactured or 10,000 pounds otherwise used in company activities. Percentages of potentially exposed workers were calculated to provide an estimate by county of the risk of developing work-related asthma. North American Industry Classification System codes (NAICS codes) were used to classify companies according to industry type ranging from mining, utilities and manufacturing.

In 2011, there were eight companies that reported use of acrylic acid with 1,450 potentially exposed workers (Table A). Eighty six companies reported usage of chromium with 15,934 employees potentially exposed (Table B). Nineteen companies reported diethanolamine use with 5,901 potentially exposed workers (Table C). Three companies reported ethylene oxide use with 1,214 potentially exposed workers (Table D). Eight companies reported use of maleic anhydride with 949 potentially exposed workers (Table E). Finally, there were 9 companies that used methyl methacrylate and had 1,740 potentially exposed workers (Table F). Percentages of workers potentially exposed to these chemicals in each county were calculated and are listed in their respective tables.

All the chemicals analyzed in this report have been reported in the medical literature to cause asthma as respiratory sensitizers (RS) except for ethylene oxide, which is capable of causing Reactive Airways Dysfunction Syndrome (RADS). Company information from DEQ did not match EPA TRI data, since DEQ unlike EPA TRI lists all companies that meet threshold amounts regardless of employee size or facility type. This increased company data as it revealed companies not reported on EPA TRI and thus provided more data to accurately represent chemical usage. Limitations of the data reported are: 1) there was under-estimation of employees at risk because non-manufacturing companies are not required by law to report chemical use to EPA, as well as companies using or manufacturing less than the specified amounts that trigger reporting. In addition, over-estimates were generated because total employee counts included all individuals working for a company, even though it is likely that not all workers in a company would have jobs assignments that would cause them to have a potential exposure to the reported chemical.

### **Sources:**

*Michigan Manufacturers Directory 2010*. N.p.: Manufacturers News, 2010. Print

"Welcome to America's Career InfoNet." *CareerOneStop*. N.p., 13 Feb. 2013. Web. 05 Apr. 2013. <<http://www.acinet.org/>>.

"Unemployment Statistics (LAUS)." *Michigan Labor Market Information, Data Explorer*. N.p., 29 Mar. 2013. Web. 05 Apr. 2013

Toxic Release Inventory." *EPA*. Environmental Protection Agency, 20 Jan. 2013. Web. 05 Apr. 2013.

"SARA Title III -Toxic Chemical Release Inventory." *Michigan Department of Environmental Quality*. N.p., 18 Feb. 2013. Web. 05 Apr. 2013.

**Table A: Michigan Workers Employed in Manufacturing Facilities That Use Acrylic Acid, by County**

<b>County</b>	<b>Company Name<sup>d</sup></b>	<b>Total Employees Working in Acrylic -Using Facilities<sup>a,b</sup></b>	<b>Total Number of Workers in the County<sup>c</sup></b>	<b>% Workers Potentially Exposed to Acrylic Acid</b>
<b>INGHAM</b>	AURORA SPECIALTY CHEMISTRIES	30	130735	<b>&lt;0.1</b>
<b>JACKSON</b>	ADCO PRODUCTS INC	100	64075	<b>0.2</b>
<b>MACOMB</b>	DUPONT MOUNT CLEMENS PLANT	500	356457	<b>0.1</b>
<b>MIDLAND</b>	STYRON LLC - MI OPERATIONS	20	38281	<b>0.1</b>
<b>WAYNE</b>	BASF CORP	800	719175	<b>0.1</b>
<b>Total</b>		<b>1450</b>	<b>1308723</b>	<b>0.1</b>

<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies Using Acrylic Acid in 2011 (report January 20, 2013)

**Table B: Michigan Workers Employed in Manufacturing Facilities That Use Chromium, by County**

<b>County</b>	<b>Company Name<sup>d</sup></b>	<b>Total Employees Working in Chromium - Using Facilities<sup>a,b</sup></b>	<b>Total Number of Workers in the County<sup>c</sup></b>	<b>% Workers Potentially Exposed to Chromium</b>
<b>ALLEGAN</b>	TRANS-MATIC MANUFACTURING CO INC	250	48269	0.5
<b>BERRIEN</b>	SANDVIK MATERIALS TECHNOLOGY DW NATIONAL STANDARD - NILES LLC	53	65673	0.1
<b>BRANCH</b>	H C STARCK INC	100	17727	0.6
<b>CALHOUN</b>	OMEGA CASTINGS INC JOHNSON CONTROLS BATTLE CREEK FACILITY MUSASHI AUTO PARTS-MI INC SPX (Listed as Clyde Union Pump, INC a division of SPX) TENNECO	1235	58781	2.1
<b>CHARLEVOLX</b>	ST MARYS CEMENT INC (US)	125	11162	1.1
<b>DICKINSON</b>	GREDE LLC - IRON MOUNTAIN	500	12204	4.1
<b>EATON</b>	LINN PRODUCTS INC	100	50623	0.2
<b>HILLSDALE</b>	TENNECO	204	16987	1.2
<b>HURON</b>	BLUE DIAMOND STEEL CASTING,INC HURON CASTING INC TOWER AUTOMOTIVE TOOL LLC	880	13870	6.3

<b>INGHAM</b>	BHARAT FORGE AMERICA INC DEMMEER CORPORATION-NORTH SYMMETRY MEDICAL INC LANSING	990	130735	0.8
<b>IRON</b>	OLDENBURG GROUP INC	145	4856	3.0
<b>ISABELLA</b>	DELFIELD CO UNIFIED BRANDS	900	33723	2.7
<b>KALAMAZOO</b>	PARKER HANNIFIN PNEUMATIC DIV	350	114013	0.3
<b>KENT</b>	AMERICAN SEATING CO BENTELER AUTOMOTIVE CORP BETZ INDUSTRIES FEDERAL-MOGUL POWERTRAIN SYSTEMS GR SPRING & STAMPING INC RAPID ENGINEERING ROBERT BOSCH FUEL SYSTEMS LLC STEELTECH LTD	1580	278213	0.6
<b>LAPEER</b>	KAMAX	100	35225	0.3
<b>LENAWEE</b>	ERVIN TECHNOLOGIES POWERS METAL <sup>e</sup>	20	39535	0.1
<b>LIVINGSTON</b>	FLEXIBLE METAL INC PROGRESSIVE METAL FORMING INC WYMAN-GORDON CO	73	79924	0.1
<b>MACOMB</b>	GLOBAL ROLLFORMING SYSTEMS	1125	356457	0.3

	GM POWERTRAIN WARREN TRANSMISSION INALFA/SSI ROOF SYSTEMS INVECAST CORP SAS GLOBAL CORP TOWER AUTOMOTIVE CLINTON			
<b>MENOMINEE</b>	LE JONES CO	250	11147	2.2
<b>MISSAUKEE</b>	HYDROLAKE INC	20	5057	0.4
<b>MONROE</b>	SPARTAN STEEL COATING TAILOR WELDED BLANKS	300	62032	0.5
<b>MUSKEGON</b>	CANNON-MUSKEGON CWC TEXTRON EAGLE ALLOY INC FLEET ENGINEERS INC HOWMET CORP - PLANT 10 HOWMET CORP - PLANT 4 HOWMET CORP - PLANT 5 HOWMET CORP - PLANTS 1& 3 JOHNSON TECHNOLOGY INC MICHIGAN SPRING & STAMPING OF MUSKEGON LLC MICHIGAN STEEL INC	1892	73756	2.6
<b>OAKLAND</b>	EMERALD STEEL PROCESSING LLC - MADISON HEIGHTS FACILITY FORMTECH LLC GIFFIN INC MACLEAN ROYAL OAK LLC	955	528805	0.2

	MICHIGAN SEAMLESS TUBE LLC			
	MOELLER MANUFACTURING CO INC			
	OXFORD FORGE INC			
	SULZER METCO (US) INC <sup>e</sup>			
	ITW DRAWFORM			
	METALFLOW CORP			
<b>OTTAWA</b>	SAF-HOLLAND USA INC OAC	975	117606	0.8
	SIEMENS INDUSTRY INC			
	SUPREME MACHINED PRODUCTS			
<b>SAGINAW</b>	NEXTEER AUTOMOTIVE CORP	1000	81393	1.2
<b>SANILAC</b>	NUMATICS SANDUSKY MAIN	100	16843	0.6
	ARMSTRONG INTERNATIONAL INC			
<b>ST JOSEPH</b>	METAL TECHNOLOGIES INC	105	24768	0.4
	THREE RIVERS GRAY IRON			
<b>TUSCOLA</b>	META VATION LLC	60	22790	0.3
<b>WASHTENAW</b>	DEXTER FASTENER TECHNOLOGIES INC	200	168067	0.1
	DETROIT DIESEL CORP REDFORD FACILITY			
	FORD MOTOR CO WOODHAVEN FORGING PLANT			
<b>WAYNE</b>	FRITZ PRODUCTS	1347	719175	0.2
	MACK AVENUE ENGINE PLANT COMPLEX			
	NSS TECHNOLOGIES INC			
	STEEL INDUSTRIES PLANT 1			



STEEL INDUSTRIES PLANT 4  
 STEEL INDUSTRIES PLANT 5  
 STEEL TECHNOLOGIES INC

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<b>Total</b>	<b>15934</b>	<b>3199416</b>	<b>0.5</b>
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<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed on March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies Using Chromium in 2011 (report January 20, 2013)

<sup>e</sup> Source: Michigan Department of Environmental Quality, FOIA Request for SARA Title III Emergency Planning and Release Reporting of Select Chemicals (Chromium), received February 18, 2013

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**Table C: Michigan Workers Employed in Manufacturing Facilities That Use Diethanolamine, by County**

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<b>County</b>	<b>Company Name<sup>d</sup></b>	<b>Total Employees Working in Diethanolamine - Using Facilities<sup>a,b</sup></b>	<b>Total Number of Workers in the County<sup>c</sup></b>	<b>% Workers Potentially Exposed to Diethanolamine</b>
<b>CLARE</b>	FARWELL PLANT RENOSOL SEATING LLC	20	10598	<b>0.2</b>
<b>INGHAM</b>	NEXEO SOLUTIONS <sup>e</sup>	10	130735	<b>&lt;0.1</b>
<b>KALKASKA</b>	MAGNUM SOLVENT <sup>e</sup>	10	7100	<b>0.1</b>
<b>KENT</b>	BRILLCAST INC <sup>e</sup> ACCESS BUSINESS GROUP LLC	5100	278213	<b>1.8</b>
<b>MUSKEGON</b>	WEBB CHEMICAL SERVICE CORP 50INC. <sup>e</sup>	70	73756	<b>0.1</b>

<b>OAKLAND</b>	2 V INDUSTRIES INC. <sup>e</sup> RECTICEL UREPP NORTH AMERICA INC	316	528805	<b>0.1</b>
<b>WAYNE</b>	LABTECH <sup>e</sup> BASF CORP BAY LOGISTICS <sup>e</sup> CADILLAC OIL CO CHEMETALL US INC EQ DETROIT INC MARATHON PETROLEUM CO LP - MICHIGAN REFINING DIV PVS NOLWOOD CHEMICALS INC QUAKER CHEMICAL CORPORATION <sup>e</sup> UNIVAR USA/ROMULUS <sup>e</sup> WOODBIDGE CORP	375	719175	<b>0.1</b>
<b>Total</b>		<b>5901</b>	<b>1748382</b>	<b>0.3</b>

<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed on March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies Using Diethanolamine in 2011 (report January 20, 2013)

<sup>e</sup> Source: Michigan Department of Environmental Quality, FOIA Request for SARA Title III Emergency Planning and Release Reporting of Select Chemicals (Diethanolamine), received February 18, 2013

**Table D: Michigan Workers Employed in Manufacturing Facilities That Use Ethylene Oxide, by County**

County	Company Name <sup>d</sup>	Total Employees Working in Ethylene Oxide -Using Facilities <sup>a,b</sup>	Total Number of Workers in the County <sup>c</sup>	% Workers Potentially Exposed to Ethylene Oxide
<b>KENT</b>	MEDTRONIC BIOMEDICUS INC STERILE SYSTEMS OPERATION	10	278213	<b>&lt;0.1</b>
<b>LIVINGSTON</b>	CENTURION MEDICAL PRODUCTS	4	79924	<b>&lt;0.1</b>
<b>WAYNE</b>	BASF CORP	1200	719175	<b>0.2</b>
<b>Total</b>		<b>1214</b>	<b>1077312</b>	<b>0.1</b>

<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed on March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies Using Ethylene Oxide in 2011 (report January 20, 2013)

**Table E: Michigan Workers Employed in Manufacturing Facilities That Use Maleic Anhydride, by County**

<b>County</b>	<b>Company Name<sup>d</sup></b>	<b>Total Employees Working in Maleic Anhydride -Using Facilities<sup>a,b</sup></b>	<b>Total Number of Workers in the County<sup>c</sup></b>	<b>% Workers Potentially Exposed to Maleic Anhydride</b>
<b>LENAWEE</b>	ADC MAIN PLANT <sup>c</sup> ANDERSON DEVELOPMENT CO	200	39535	<b>0.5</b>
<b>LIVINGSTON</b>	ASAHI KASEI PLASTICS NORTH AMERICA <sup>c</sup>	100	79924	<b>0.1</b>
<b>MACOMB</b>	DUPONT MOUNT CLEMENS PLANT	600	356457	<b>0.2</b>
<b>OTTAWA</b>	PFIZER GLOBAL MANUFACTURING - Douglas Street Warehouse <sup>e</sup> VERTELLUS SPECIALTIES - Zeeland facility <sup>e</sup> VERTELLUS SPECIALTIES INC	40	117606	<b>&lt;0.1</b>
<b>WAYNE</b>	UNIVAR USA	9	719175	<b>&lt;0.1</b>
<b>Total</b>		<b>949</b>	<b>1312697</b>	<b>0.1</b>

<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed on March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies Using Maleic Anhydride in 2011 (report January 20, 2013)

<sup>e</sup> Source: Michigan Department of Environmental Quality, FOIA Request for SARA Title III Emergency Planning and Release Reporting of Select Chemicals (Maleic Anhydride), received February 18, 2013

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**Table F: Michigan Workers Employed in Manufacturing Facilities That Use Methyl Methacrylate, by County**

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<b>County</b>	<b>Company Name<sup>d</sup></b>	<b>Total Employees Working in Methyl Methacrylate - Using Facilities<sup>a,b</sup></b>	<b>Total Number of Workers in the County<sup>c</sup></b>	<b>% Workers Potentially Exposed to Methyl Methacrylate</b>
<b>HOUGHTON</b>	WARM RAIN CORP	45	15158	<b>0.3</b>
<b>KENT</b>	SUPERIOR STONE PRODUCTS INC <sup>e</sup>	10	278213	<b>&lt;0.1</b>
<b>LENAWEE</b>	ADC MAIN PLANT <sup>e</sup>	200	39535	<b>0.5</b>

ANDERSON DEVELOPMENT CO				
<b>MACOMB</b>	DU PONT PERFORMANCE COATINGS- MT CLEMENS PLANT	600	356457	<b>0.2</b>
<b>MASON</b>	NORON COMPOSITE TECHNOLOGIES INC	45	12673	<b>0.4</b>
<b>OAKLAND</b>	MARBELITE CORP	20	528805	<b>&lt;0.1</b>
<b>ST CLAIR</b>	SUNSATON PRODUCTS INC	20	66164	<b>&lt;0.1</b>
<b>WAYNE</b>	BASF CORP	800	719175	<b>0.1</b>
<b>Total</b>		<b>1740</b>	<b>2016180</b>	<b>0.1</b>

<sup>a</sup> Source: Michigan Manufacturers' Directory, 2010

<sup>b</sup> Source: Acinet on <http://www.acinet.org> accessed on March 17, 2013

<sup>c</sup> Source: Michigan Labor Market Information. Data Explorer, [www.milmi.org](http://www.milmi.org). Accessed on March 29, 2013

<sup>d</sup> Source: U.S Environmental Protection Agency (EPA). Toxics Release Inventory. Michigan Companies using Methyl Methacrylate in 2011 (report January 20, 2013)

<sup>e</sup> Source: Michigan Department of Environmental Quality, FOIA Request for SARA Title III Emergency Planning and Release Reporting of Select Chemicals (Methyl Methacrylate), received February 18, 2013