

MICHIGAN WORKFORCE, 2015:

**Potential Exposure to Acrylic
Acid, Chromium or Chromium
Compounds, Diethanolamine &
Ethylene Oxide**



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There are many resources available to help employers, employees, health care professionals and others understand more about work related asthma. Links to these resources can be found at:

www.oem.msu.edu

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Michigan companies using select chemicals capable of causing asthma were identified through the United States Environmental Protection Agency (EPA) Toxic Release Inventory (TRI) to characterize potential exposure among workers. 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 or chromium compounds, diethanolamine and ethylene oxide. These chemicals are part of the 650 substances whose usage requires reporting to the EPA. Similar information on exposures to isocyanates, maleic anhydride and methyl methacrylate can be found in the 2014 Annual Report: Tracking Work Related Asthma in Michigan, Tables 14 and 15 (www.oem.msu.edu).

In addition, the Michigan Department of Environmental Quality (DEQ) provided the names of companies that used the same select chemicals capable of causing asthma, listed in 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.

Data on the total number of employees working in the facilities identified were gathered from the 2015 Michigan Manufacturers' Directory and CareerOneStop.org business finder. The total number of workers in Michigan counties was obtained from the Michigan Labor Market Information, Data Explorer (<http://milmi.org>). Percentages of potentially exposed workers by county were calculated.

In 2015, there were four companies that reported use of acrylic acid with 1,413 potentially exposed workers (Table A). One hundred sixty-seven companies reported usage of chromium or chromium compounds with 49,049 employees potentially exposed (Table B). Twenty-two companies reported diethanolamine use with 5,691 potentially exposed workers (Table C). Five companies reported ethylene oxide use with 3,372 potentially exposed workers (Table D). Percentages of the workforce 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 except for ethylene oxide, which is capable of causing Reactive Airways Dysfunction Syndrome (RADSD). Company information from the DEQ did not exactly match the companies reported in the EPA TRI data. The DEQ, unlike EPA TRI data, lists all companies that meet threshold amounts regardless of employee size or facility type. However, a greater number of companies were reported through the EPA TRI database, likely related to the threshold amount for reporting, which is lower than that for the DEQ. Limitations of the data reported are: there was under-estimation of employees at risk because non-manufacturing companies are not required by law to report chemical use to the EPA, as well as companies using or manufacturing less than the specified amounts that trigger reporting. The DEQ data also share the potential for under-estimation of risk for companies that do not meet the threshold for reporting. In addition, over-estimates for both EPA and DEQ data 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:

- ◆ 2015 Michigan Manufacturing Directory. Manufacturer's News Inc. Evanston IL, 2015.
- ◆ Business Finder at: www.careeronestop.org, accessed 11-2-2016.
- ◆ Michigan Labor Market Information, Unemployment Statistics (LAUS): 2015 Data Explorer, accessed 11-1-2016 at: <http://milmi.org>.
- ◆ Toxic Release Inventory (TRI) Explorer, Releases: Facility Report, 2015 for select chemicals, accessed 11-1-2016 at: <http://iaspub.epa.gov/triexplorer>.
- ◆ SARA Title III-Toxic Chemical Release Inventory. Michigan Department of Environmental Quality, FOIA request for calendar year 2015 data obtained 9-15-2016.

**TABLE A. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE ACRYLIC ACID,
By County: 2015**

TRI	DEQ	County	Company Name	# Workers Employed in Acrylic -Acid Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Acrylic Acid
1		INGHAM	AURORA SPECIALTY CHEMISTRIES	30	139986	<0.1
1		JACKSON	ROYAL ADHESIVES & SEALANTS	200	69324	0.3
1	1	MIDLAND	TRINSEO/STYRON - MI OPERATIONS	183	39761	0.5
1	1	WAYNE	BASF CORP	1000	696033	0.1
TOTAL				1413	945104	0.1

**TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR
CHROMIUM COMPOUNDS, BY COUNTY: 2015**

TRI	DEQ	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		ALLEGAN	TRANS-MATIC MFG	250	58512	0.8
1			UNIFORM COLOR CO	200		
1		ALPENA	LAFARGE MIDWEST	200	12934	1.5
1		ANTRIM	ANCHOR LAMINA AMERICA	200	9332	2.1
1		BARRY	HASTINGS MFG CO	200	29390	0.7
1		BAY	BAY CAST INC	60	49668	0.1
1			STRAITS WOOD TREATING	6		
1		BERRIEN	DW NATIONAL STD - NILES	150	70456	1.0
1			GAST MFG	300		
1			NCP COATINGS	100		
1			NILES STEEL TANK	30		
1			PRIMETALS TECHNOLOGIES	50		
1			SANDVIK MATERIALS TECHNOLOGY	60		
1		BRANCH	ASAMA COLDWATER MFG	350	18315	2.8
1			HC STARCK	145		
1			IMPACT FORGE PRECISION PLANT	25		
1		CALHOUN	AUTOCAM CORP	85	61523	2.2
1			CLARIANT CORP-MASTERBATCHES DIV	100		
1			KNAUF INSULATION (GUARDIAN INSULATION)	200		
1			MUSASHI AUTO PARTS	500		
1			OMEGA CASTINGS	10		
1			STELMI AMERICA	18		
1			TENNECO	415		
1		CASS	MIDWEST TIMBER INC	47	23123	0.2
1		CHARLEVOIX	ST MARYS CEMENT	140	12453	1.1
1		CLINTON	MAHLE ENGINE COMPONENTS	300	38607	0.8
1		DICKINSON	BOSS PRODUCTS	300	12114	6.2
1			GREDE LLC	450		
1		EATON	LINN PRODUCTS	210	53934	0.4
1		GENESEE	SUPERIOR MATERIALS-PLANT 20	60	172233	<0.1
1		HILLSDALE	TENNECO	500	19857	2.5
1		HURON	BLUE DIAMOND STEEL CASTING	300	15748	8.6
1			HURON CASTING	450		
1			TOWER AUTOMOTIVE TOOL	600		

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2015

TRI	DEQ	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		INGHAM	BUILDERS REDI MIX-PLT 14	70	139986	0.3
1			DART CONTAINER	100		
1	1		SYMMETRY MEDICAL	300		
1		IONIA	THK RHYTHM AUTOMOTIVE	400	28251	4.1
1			VENTRA IONIA MAIN	750		
1		ISABELLA	MANITOWOC FOODSERVICE	600	34028	2.6
1			UNIFIED BRANDS	300		
1		JACKSON	CHEMETALL U.S.	80	69324	0.4
1			ELM PLATING	145		
1			GERDAU SPECIAL STEEL	80		
1			WOLVERINE SIDING SYSTEMS	4		
1		KALAMAZOO	FLOWSERVE CORP	400	124614	2.2
1			KAISER ALUMINUM FABRICATED PRODUCTS	120		
1			PHARMACIA & UPJOHN/PFIZER	2200		
1	1	KENT	ALLIED FINISHING-BROADMOOR SE	180	331429	1.2
1			AMERICAN SEATING CO	450		
1			AUTOCAM CORP	280		
1			BENTELER AUTOMOTIVE	600		
1			BETZ INDUSTRIES	125		
1			BOSCH EMISSION SYSTEMS	150		
1			ELECTRO CHEMICAL FINISHING	125		
1			GM COMPONENTS HOLDINGS	550		
1			KNAPE & VOGT MFG	700		
1			LACKS TRIM SYSTEMS-AIRLINE	300		
1			LACKS WHEEL TRIM SYSTEMS-BARDEN PLATER	150		
1			MIDWEST PLATING CO	25		
1			PLASTIC PLATE-KRAFT PLATER	150		
1			RAPID ENGINEERING	80		
1			RBT BOSCH FUEL SYSTEMS	150		
1			STEELTECH	50		
1		LAPEER	KAMAX	200	36355	2.0
1			LAPEER PLATING & PLASTICS	500		
1			SUPERIOR MATERIALS PLT 23	12		
1		LENAWEE	ERVIN TECHNOLOGIES	38	45643	0.1
1	1	LIVINGSTON	COR-MET	25	90101	0.3
1			DIAMOND CHROME PLATING	62		
1			PRECISION STAMPING	60		
1			PROGRESSIVE METAL FORMING	60		
1			SUPERIOR MATERIALS PLT 103	unknown		
1			WYMAN-GORDON	52		
1		MACOMB	AG SIMPSON USA	55	390572	0.4
1			GM POWERTRAIN WARREN TRANSMISSION	581		
1			HENKEL CORP	82		
1			HOWARD FINISHING	200		
1			INALFA -SSI ROOF SYSTEMS	100		
1			INTERNATIONAL CASTING CORP	20		
1			INVECAST CORP	40		
1			MACLEAN-FOGG COMPONENT SOLUTIONS	90		
1		SAS GLOBAL CORP	60			

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2015

TRI	DEQ	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		MACOMB, continued	SMS MODERN HARD CHROME	30		
1	SUPERIOR MATERIALS PLT 101		60			
1	SUPERIOR MATERIALS PLT 39		unknown			
1	TOWER AUTOMOTIVE-CLINTON		300			
1		MECOSTA	SIMONDS INTERNATIONAL	74	18173	0.4
1		MENOMINEE	LE JONES	350	11033	3.2
1		MIDLAND	DOW CHEMICAL CO	2000	39761	5.0
1		MISSAUKEE	HYDROLAKE	20	6635	0.3
1		MONROE	DTE ELECTRIC	50	73387	1.0
1	GERDAU MACSTEEL-MONROE		450			
1	SPARTAN STEEL COATING		65			
1	TAILOR WELDED BLANKS		170			
1		MONTCALM	AGA MARVEL (NORTHLAND CORP)	300	26513	1.1
1		MUSKEGON	CANNON-MUSKEGON	165	73444	4.6
1	CWC TEXTRON		325			
1	EAGLE ALLOY		400			
1	FLEET ENGINEERS		100			
1	HOWMET CORP-PLANT 10		250			
1	1		HOWMET CORP-PLANT 4	200		
1	1		HOWMET CORP-PLANT 5	16		
1			HOWMET CORP-PLANTS 1 & 3	1300		
1			JOHNSON TECHNOLOGY	600		
1		OAKLAND	ADEPT PLASTIC FINISHING	50	593961	1.0
1			AKZO NOBEL CASTINGS	175		
1			EMERALD STEEL PROCESSING	40		
1			FORMTECH	300		
1			GIFFIN	20		
1			MACDERMID	4550		
1			MACLEAN ROYAL OAK	150		
1			MICHIGAN SEAMLESS TUBE	290		
1			MSP INDUSTRIES	255		
1			OXFORD FORGE	4		
1			SHANNON PRECISION FASTENERS	120		
1			SPARTAN CONCRETE (SUPERIOR MATERIALS)	20		
1	1		SULZER METCO	46		
1			SUPERIOR MATERIALS-PLANT 36	20		
1		OGEMAW	SANDVIK HARD MATERIALS	152	7874	1.9
1		OTTAWA	CASTING TECHNOLOGIES	Unknown	147386	0.8
1			EVOQUA WATER TECH	180		
1			GRAND RIVER POLISHING	30		
1			ITW DRAWFORM	250		
1			JH CAMPBELL GENERATING PLANT	300		
1			METALFLOW CORP	200		
1			SUPREME MACHINED PRODUCTS	160		
1			VERTELLUS HEALTH & SPECIALTY PROD.	35		

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2015

TRI	DEQ	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		SAGINAW	NEXTEER AUTOMOTIVE	3000	84159	3.6
1		SANILAC	NUMATICS SANDUSKY MAIN	110	18404	0.6
1		SHIAWASSEE	MACHINE TOOL & GEAR	60	31589	0.2
1		ST CLAIR	DTE ELECTRIC-BELLE RIVER POWER PLT	50	67169	0.2
1			DTE ELECTRIC-ST CLAIR POWER PLT	50		
1			MICHIGAN METAL COATINGS	40		
1			SUPERIOR MATERIALS PLT 25	15		
1		ST JOSEPH	AMERICAN AXLE & MFG	1900	28053	10.7
1			ARMSTRONG INTERNATIONAL	300		
1			IAC MENDON	800		
1		WASHTENAW	DEXTER FASTENER TECH	200	183151	0.1
1			SUPERIOR MATERIALS PLT 38	Unknown		
1		WAYNE	AJAX METAL PROCESSING	120	696033	1.3
1			AK STEEL WORKS-(SEVERSTAL)	1900		
1			DETROIT DIESEL CORP	2000		
1			DIPSOL OF AMERICA	20		
1			EES COKE BATTERY LLC	Unknown		
1			EQ DETROIT	300		
1			FAURECIA EMMISIONS CONTROL TECH	100		
1			FINTEX	50		
1			FMC WOODHAVEN FORGING PLT	950		
1			HOOVER TREATED WOOD PRODUCTS	40		
1			MAGNI INDUSTRIES	40		
1			MCGEAN-ROHCO INC	20		
1			NSS TECHNOLOGIES	125		
1			ST. MARY'S CEMENT	85		
1			STEEL INDUSTRIES-PLANT 4	60		
1			STEEL INDUSTRIES-PLANT 5	30		
1			STEEL INDUSTRIES PLT 1	150		
1			SUPERIOR MATERIALS PLT 2	60		
1			SUPERIOR MATERIALS PLT 32	Unknown		
1			SUPERIOR MATERIALS PLT 35	60		
1			TOWER AUTOMOTIVE-PLYMOUTH	180		
1			UNISTRUT INTERNATIONAL	65		
1			US ECOLOGY MICHIGAN (DYNECOL)	300		
1			US STEEL CORP-GREAT LAKES WORKS	2200		
1			WAYNE DISPOSAL	175		
1			WORTHINGTON SPECIALTY PROCESSING-CANTON	60		
		TOTAL		49049	4055227	1.2

**TABLE C. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE DIETHANOLAMINE,
By County: 2015**

TRI	DEQ	County	Company Name	# Workers Employed in Diethanolamine Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Diethanolamine
1	1	CLARE	RENOSOL SEATING (LEAR)	300	11016	2.7
	1	INGHAM	NEXEO SOLUTIONS	15	139986	<0.1
1		JACKSON	CHEMETALL US INC	80	69324	0.1
	1	KALKASKA	MAGNUM SOLVENT	11	7197	0.2
1		KENT	ACCESS BUSINESS GROUP	3600	331429	1.1
	1		BRILLCAST	125		
1	1	MUSKEGON	WEBB CHEMICAL SERVICE CORP	50	73444	0.1
	1	OAKLAND	CHEMICAL BLENDING/ND COMPOUND BLENDING	10	593961	<0.1
	1		HUNTSMAN INTERNATIONAL	40		
1	1		RECTICEL UREPP NORTH AMERICA	25		
1		OTTAWA	MAGNA ENGINEERED GLASS	350	147386	0.2
1	1	WAYNE	BASF CORP	60	696033	0.2
	1		BAY LOGISTICS	4		
	1		CADILLAC OIL	18		
1			EQ DETROIT	300		
	1		LABTECH	12		
1			MARATHON PETROLEUM CO	450		
	1		MATERIALS PROCESSING COATING	55		
	1		PVS NOLWOOD CHEMICALS	4		
	1		QUAKER CHEMICAL	40		
	1		UNIVAR USA	12		
1	1		WOODBRIDGE CORP	130		
		TOTAL		5691	2069776	0.3

**TABLE D. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE ETHYLENE OXIDE,
By County: 2015**

TRI	DEQ	County	Company Name	# Workers Employed in Ethylene Oxide Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Ethylene Oxide
1	1	KENT	VENTION STERILIZATION	265	331429	0.1
1	1	LIVINGSTON	CENTURION MEDICAL PRODUCTS	100	90101	0.1
	1	MIDLAND	MICHIGAN OPERATIONS-DOW	2000	39761	5.0
	1	SAGINAW	WIN FIELD SOLUTIONS	7	84159	<0.1
1	1	WAYNE	BASF CORP	1000	696033	0.1
		TOTAL		3372	1241483	0.3