

MICHIGAN WORKFORCE, 2017:

**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 2016 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 2017 Michigan Manufacturers' Directory. 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 2017, there were five companies that reported use of acrylic acid with 1,322 potentially exposed workers (Table A). One hundred seventy companies reported usage of chromium or chromium compounds with 52,010 employees potentially exposed (Table B). Twenty companies reported diethanolamine use with 6,715 potentially exposed workers (Table C). Five companies reported ethylene oxide use with 3,485 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 job assignments that would cause them to have a potential exposure to the reported chemical.

Sources:

- ◆ 2017 Michigan Manufacturing Directory, MNI, Evanston, IL.
- ◆ Michigan Labor Market Information, Data Explorer, calendar year 2017, accessed 10/29/2018 at: <http://milmi.org>.
- ◆ Toxic Release Inventory (TRI) Explorer, Releases: Facility Report, 2017 for select chemicals, accessed 11-27-2018 at: <http://iaspub.epa.gov/triexplorer>.
- ◆ SARA Title III-Toxic Chemical Release Inventory. Michigan Department of Environmental Quality, FOIA request for calendar year 2017 data obtained 11-26-2018.

**TABLE A. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE ACRYLIC ACID,
By County: 2017**

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	143970	0.1
	1		NEXEO SOLUTIONS	56		
1		JACKSON	ROYAL ADHESIVES & SEALANTS	200	70799	0.3
1	1	MIDLAND	TRINSEO LLC - MI OPERATIONS	36	38565	0.1
1	1	WAYNE	BASF CORP	1000	746415	0.1
TOTAL				1322	999749	0.1

**TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR
CHROMIUM COMPOUNDS, BY COUNTY: 2017**

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 CO INC	270	58958	0.8
1			UNIFORM COLOR CO	200		
1		ALPENA	LAFARGE MIDWEST INC	197	12781	1.5
1		ANTRIM	ANCHOR LAMINA AMERICA	200	9482	2.1
1		BARRY	HASTINGS MFG CO	275	29866	0.9
1		BAY	BAY CAST—CENTER ST & WEBSTER ST PLANTS	83	48120	0.2
1			STRAITS WOOD TREATING	12		
1		BERRIEN	DW NATIONAL STD - NILES LLC	150	70122	0.9
1			GAST MFG INC	300		
1			NCP COATINGS INC	100		
1			PRIMETALS TECHNOLOGIES USA LLC	50		
1		BRANCH	ASAMA COLDWATER MFG	350	18183	2.9
1			HC STARCK INC	145		
1			IMPACT FORGE GROUP - PRECISION PLANT	40		
1		CALHOUN	BREMBO HOMER FOUNDRY	125	60560	2.5
1			CLARIANT PLASTICS & COATINGS	100		
1			MUSASHI AUTO PARTS MI INC	649		
1			OMEGA CASTINGS INC	11		
1			STELMI AMERICA LLC	18		
1			TENNECO AUTOMOTIVE OPERATING CO INC	600		
1		CASS	MIDWEST TIMBER INC	47	23284	0.2
1		CHARLEVOIX	ST MARYS CEMENT US LLC	140	12324	1.1
1		CLINTON	MAHLE ENGINE COMPONENTS USA INC	300	39329	0.8
1		DICKINSON	BOSS PRODUCTS A DIVISION OF TORO CO	300	11940	6.3
1			GREDE LLC IRON MOUNTAIN	450		
1		EATON	LINN PRODUCTS INC	285	55093	0.5
1		GENESEE	RING SCREW LLC FENTON OPERATIONS	61	172577	0.1
1			SUPERIOR MATERIALS-PLANT 20	30		
1		GD TRAVERSE	CENTURY SPECIALTIES	125	47732	0.3
1		HILLSDALE	TENNECO AUTOMOTIVE OPERATING CO INC	500	20040	2.5
1		HURON	BLUE DIAMOND STEEL CASTING INC	200	14906	8.1
1			HURON CASTING INC	400		
1			TOWER AUTOMOTIVE TOOL LLC	600		

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2017

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	143970	1.4
1			DART CONTAINER OF MICHIGAN LLC	1600		
1			SYMMETRY MEDICAL INC LANSING (TECOMET)	360		
1			TRINITY EPI LLC	20		
1		IONIA	THK RHYTHM AUTOMOTIVE	400	28689	4.9
1			VENTRA IONIA MAIN LLC	1000		
1		ISABELLA	DELFIELD CO	600	33858	2.7
1			UNIFIED BRANDS, RANDELL	300		
1		JACKSON	CHEMETALL U.S.	80	70799	1.7
1			ELM PLATING CO	210		
1			GERDAU SPECIAL STEEL	80		
1			TAC MANUFACTURING INC	700		
1			WORTHINGTON SPECIALTY PROCESSING	106		
1		KALAMA-ZOO	FLOWSERVE CORP	400	126982	2.2
1			KAISER ALUMINUM FABRICATED PRODUCTS LLC	180		
1			PHARMACIA & UPJOHN CO (SUB OF PFIZER)	2200		
1		KENT	ALLIED FINISHING INC	200	342568	1.3
1			AUTOCAM PRECISION COMPONENTS	280		
1			BENTELEER AUTOMOTIVE, HAGEN FACILITY	600		
1			BETZ INDUSTRIES	125		
1			BOSCH EMISSION SYSTEMS US	150		
1			GM COMPONENTS HOLDINGS LLC	600		
1			HAVILAND ENTERPRISES INC	220		
1			KNAPE & VOGT MFG CO	700		
1			KNOLL INC	250		
1			LACKS ENTERPRISES PATTERSON AVENUE	1000		
1			LACKS ENTERPRISES CASCADE ROAD	75		
1			MIDWEST PLATING CO INC	25		
1			PLASTIC PLATE INC-KRAFT PLATER	150		
1			RAPID ENGINEERING	80		
1			STEELTECH LTD	50		
1		LAPEER	KAMAX	200	38906	1.8
1			LAPEER PLATING & PLASTICS INC	500		
1			SUPERIOR MATERIALS PLT 23	10		
1		LENAWEE	ERVIN TECHNOLOGIES	38	45089	0.1
1	1	LIVINGSTON	COR-MET INC	25	98038	0.2
1			DIAMOND CHROME PLATING INC	62		
1			PRECISION STAMPING CO INC	60		
1			PROGRESSIVE METAL FORMING INC	40		
1			SUPERIOR MATERIALS PLT 103	unknown		
1			WYMAN-GORDON CO	52		
1		MACOMB	AG SIMPSON USA	365	422560	0.4
1			BEACON PARK FINISHING LLC	20		
1			GM POWERTRAIN WARREN TRANSMISSION	400		
1			HENKEL CORP	82		
1			INALFA -SSI ROOF SYSTEMS	100		

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2017

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	INTERNATIONAL CASTING CORP	20		
1			INVECAST CORP	40		
1			MB AEROSPACE WARREN LLC	206		
1			SAS GLOBAL CORP	72		
1			SMS GROUP WARREN WORKSHOP	30		
1			SUPERIOR MATERIALS PLTS 39 & 101	60		
1			TOWER AUTOMOTIVE-CLINTON	425		
1			MANISTEE	PACKAGING CORP OF AMERICA		
1		MECOSTA	SIMONDS INTERNATIONAL CORP	74	17808	0.4
1		MENOMINEE	LE JONES CO LLC	350	10464	3.3
1		MIDLAND	DOW CHEMICAL CO	2000	38565	5.2
1		MISSAUKEE	HYDROLAKE INC	20	6613	2.3
1			LC MANUFACTURING LLC	135		
1		MONROE	DTE ELECTRIC CO MONROE POWER PLANT	50	72736	1.7
1			GERDAU MACSTEEL-MONROE	450		
1			GUARDIAN INDUSTRIES, CARLETON	450		
1			TAILOR WELDED BLANKS	300		
1		MONTCALM	AGA MARVEL	227	26753	0.8
1		MUSKEGON	CANNON-MUSKEGON	165	73961	6.3
1			CWC TEXTRON	325		
1			EAGLE ALLOY	400		
1			FLEET ENGINEERS	130		
1			HOWMET CORP-PLANTS 1 & 3 (ARCONIC)	1300		
1	1		HOWMET CORP-PLANT 4 (ARCONIC)	200		
	1		HOWMET CORP-PLANT 5 (ARCONIC)	16		
1			HOWMET CORP-PLANT 10 (ARCONIC)	2100		
1		OAKLAND	ADEPT PLASTIC FINISHING PLANTS 4 & 5	340	639968	0.4
1			COSMA BODY ASSEMBLY, MICHIGAN	300		
1			EMERALD STEEL PROCESSING LLC, MADISON HTS	40		
1			FORMTECH LLC	175		
1			GIFFIN INC	20		
1			MACDERMID INC	65		
1			MACLEAN ROYAL OAK LLC	150		
1			MICHIGAN SEAMLESS TUBE LLC	290		
1			MOELLER MFG CO INC	500		
1			MSP INDUSTRIES	300		
1			OERLIKON METCO (US) TROY	46		
1			OXFORD FORGE INC	5		
1			SHANNON PRECISION FASTENER	180		
1			SPARTAN CONCRETE	20		
	1		SULZER METCO US INC	75		
1			SUPERIOR MATERIALS-PLANT 36	20		
1			OGEMAW	SANDVIK HARD MATERIALS		
1		OTTAWA	EVOQUA WATER TECH	180	152022	0.4
1			JH CAMPBELL GENERATING PLANT	12		
1			LEGGETT & PLATT INC	31		
1			METALFLOW CORP	200		
1			SUPREME MACHINED PRODUCTS	160		

TABLE B. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE CHROMIUM OR CHROMIUM COMPOUNDS, BY COUNTY: 2017

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 CORP	6000	82820	7.6
1			ORCHID ORTHOPEDIC SOLUTIONS	315		
1		SANILAC	NUMATICS SANDUSKY MAIN	200	18287	1.1
1		SHIAWASSEE	NEWCOR MFG, CHESTNUT & SHIAWASSEE	325	31762	1.0
1		ST CLAIR	DTE ELECTRIC-BELLE RIVER POWER PLT	50	71672	0.1
1			MICHIGAN METAL COATINGS	50		
1		ST JOSEPH	AMERICAN AXLE & MFG INC	60	27615	6.4
1			ARMSTRONG INTERNATIONAL INC	300		
1			IAC MENDON	600		
1			MORGAN OLSON LLC	800		
1		WASHTENAW	DEXTER FASTENER TECH INC	285	186598	0.2
1			ELECTRONICS FOR IMAGING INC	100		
1			SUPERIOR MATERIALS PLT 38	Unknown		
1		WAYNE	AJAX METAL PROCESSING INC	125	746415	1.1
1			AK STEEL DEARBORN WORKS	1900		
1			DETROIT DIESEL CORP, REFORD FACILITY	2000		
1			DIPSOL OF AMERICA INC	20		
1			EES COKE BATTERY LLC	Unknown		
1			EQ DETROIT INC	80		
1			FAURECIA EMMISIONS CONTROL TECH	100		
1			FINTEX LLC	40		
1			FMC WOODHAVEN FORGING PLT	472		
1			HOOVER TREATED WOOD PRODUCTS INC	40		
1			MAGNI INDUSTRIES INC	40		
1			MCGEAN-ROHCO INC	20		
1			NSS TECHNOLOGIES INC	136		
1			ST. MARY'S CEMENT INC	85		
1			STEEL INDUSTRIES-PLANT 1	150		
1			STEEL INDUSTRIES-PLANT 4	60		
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 CORP	111		
1			US ECOLOGY MICHIGAN (DBA DYNECOL)	80		
1			US STEEL CORP-GREAT LAKES WORKS	2200		
1			WAYNE DISPOSAL INC	25		
1			WORTHINGTON SPECIALTY PROCESSING-CANTON	96		
			TOTAL			

**TABLE C. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE DIETHANOLAMINE,
By County: 2017**

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	LEAR CORP, FARWELL PLANT	300	11240	2.7
	1	INGHAM	NEXEO SOLUTIONS	56	143970	<0.1
1		JACKSON	CHEMETALL US INC	80	70799	0.1
	1	KALKASKA	MAGNUM SOLVENT	14	7238	0.2
1		KENT	ACCESS BUSINESS GROUP LLC (AMWAY)	4000	342568	1.2
1		MACOMB	AXALTA COATING SYSTEMS USA LLC	600	422560	0.1
1	1	MUSKEGON	WEBB CHEMICAL SERVICE CORP INC	80	73961	0.1
	1	OAKLAND	CHEMICAL BLENDING	10	639968	<0.1
	1		HUNTSMAN INTERNATIONAL LLC	40		
1	1		RECTICEL UREPP NORTH AMERICA INC	25		
1		OTTAWA	MAGNA ENGINEERED GLASS	350	152022	0.2
1	1	WAYNE	BASF CORP	60	746415	0.2
	1		BAY LOGISTICS	175		
1	1		CADILLAC OIL CO	18		
	1		LABTECH	12		
1			MARATHON PETROLEUM CO	500		
1	1		PVS NOLWOOD CHEMICALS INC	225		
1	1		QUAKER CHEMICAL CORP	40		
	1		RIVERVIEW PLANT	unknown		
	1		WOODBIDGE CORP	130		
		TOTAL		6715	2610741	0.3

**TABLE D. MICHIGAN WORKERS EMPLOYED IN FACILITIES THAT USE OR MANUFACTURE ETHYLENE OXIDE,
By County: 2017**

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 SERVICES	350	342568	0.1
1	1	LIVINGSTON	CENTURION MEDICAL PRODUCTS	130	98038	0.1
	1	MIDLAND	MICHIGAN OPERATIONS-DOW	2000	38565	5.2
	1	SAGINAW	WINFIELD UNITED	5	82820	<0.1
1	1	WAYNE	BASF CORP	1000	746415	0.1
		TOTAL		3485	1308406	0.3