

MICHIGAN WORKFORCE, 2019:

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



April 14, 2021

Michigan State University
Department of Medicine
Division of Occupational & Environmental
Medicine

West Fee Hall

909 Wilson Rd, Room 117

East Lansing, MI 48824

517-353-1846

Hailey TenHarmsel, MS

Kenneth D. Rosenman, MD

Mary Jo Reilly, MS

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**.

Michigan Workforce, 2019: Potential Exposure to Acrylic Acid, Chromium or Chromium Compounds, Diethanolamine & Ethylene Oxide

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 usage exceeds 10,000 pounds per year and the company has a minimum of 10 employees. Chemical used 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 2019 Annual Report: Tracking Work Related Asthma in Michigan, Tables 22 and 23 (www.oem.msu.edu).

In addition, the Michigan Department of Environment, Great Lakes, and Energy (EGLE, formerly the 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 EGLE 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 online searches using Manta 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 2019, there were four companies that reported use of acrylic acid with 685 potentially exposed workers (Table A). One hundred sixty-nine companies reported usage of chromium or chromium compounds with 87,782 employees potentially exposed (Table B). Nineteen companies reported diethanolamine use with 2,559 potentially exposed workers (Table C). Seven companies reported ethylene oxide use with 2,595 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 (RADS). Company information from EGLE did not exactly match the companies reported in the EPA TRI data. The EGLE, 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 EGLE. Limitations of the data reported are: there was underestimation 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 EGLE 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 EGLE 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:

- Business Finder at: www.careeronestop.org, accessed 4-12-2021.
- Manta.com, accessed 4-12-2021.
- Michigan Labor Market Information, Unemployment Statistics (LAUS): 2019 Data Explorer, accessed 4-12-2021 at: <http://milmi.org>.
- Toxic Release Inventory (TRI) Explorer, Releases: Facility Report, 2019 for select chemicals, accessed 4-12-2021 at: <http://iaspub.epa.gov/triexplorer>.
- SARA Title III-Toxic Chemical Release Inventory. Michigan Department of Environment, Great Lakes, and Energy, FOIA request for calendar year 2019 data obtained 4-23-2020.

Table A—Michigan Workers Employed in Facilities that Use or Manufacture Acrylic Acid, by County: 2019

TRI	EGLE	County	Company Name	# Workers Employed in Acrylic Acid Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Acrylic Acid
1	1	INGHAM	AURORA SPECIALTY CHEMISTRIES	30	143138	<0.1
1		JACKSON	ROYAL ADHESIVES & SEALANTS/H.B. FULLER	300	71547	0.4
1	1	MIDLAND	TRINSEO – MI OPERATIONS	55	38588	0.1
1	1	WAYNE	BASF CORP	300	813306	<0.1
		TOTAL		685	1066579	<0.1

Table B—Michigan Workers Employed in Facilities that Use or Manufacture Chromium or Chromium Compounds, by County: 2019

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		ALLEGAN	L & W	300	60056	1.0
1			TRANS-MATIC MFG	300		
1		ALPENA	LAFARGE MIDWEST	300	13193	2.3
1		ANTRIM	ANCHOR LAMINA AMERICA	175	9860	1.8
1			EAST JORDAN FOUNDRY	2		
1		BARRY	HASTINGS MFG	300	30760	2.0
1			MIDDLEVILLE TOOL & DIE	300		
1		BAY	BAY CAST – CENTER ST & WEBSTER ST PLANTS	300	48319	0.7
1			STRAITS WOOD TREATING	55		
1		BERRIEN	GAST MFG	367	70407	0.7
1			NCP COATINGS	55		
1			NILES STEEL TANK	55		
1		BRANCH	ARCOSA SHORING – MENDON	75	19129	4.1
1			ASAMA COLDWATER MFG	340		
1			BLUEWATER THERMAL – COLDWATER	300		
1			HC STARCK	64		
1		CALHOUN	ARCOSA SHORING – M-60	75	59916	2.3
1			BREMBO HOMER FOUNDRY	300		
1			CLARIANT PLASTICS & COATINGS – ALBION FACILITY	300		
1			MUSASHI AUTO PARTS	330		

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		CALHOUN, continued	OMEGA CASTINGS	15		
1			STELMI AMERICA	55		
1			TENNECO AUTOMOTIVE	300		
1		CASS	MIDWEST TIMBER	55	23465	0.2
1		CHARLEVOIX	ST MARYS CEMENT	300	12202	2.5
1		CLINTON	MAHLE ENGINE COMPONENTS	300	38829	0.8
1		DICKINSON	BOSS PRODUCTS/TORO CO	300	11973	8.8
1			GREDE – IRON MOUNTAIN	750		
1		EATON	LINN PRODUCTS	175	54277	0.3
1		GENESEE	RING SCREW – FENTON OP	300	175355	0.2
1		GRAND TRAVERSE	CENTURY SPECIALTIES	175	47106	0.4
1		GRATIOT	AIRCRAFT PRECISION	55	17335	0.3
1		HILLSDALE	TENNECO AUTOMOTIVE	300	19567	1.5
1		HURON	BLUE DIAMOND STEEL CASTING	200	14749	8.5
1			HURON CASTING	300		
1			TOWER AUTOMOTIVE TOOL	750		
1		INGHAM	ARCOSA SHORING/ EFFICIENCY PRODUCTION	300	143138	1.2
1			ORCHID ORTHOPEDIC SOLUTIONS	750		
1	1		SYMMETRY MED/TECOMET – AURELIUS & ENTERPRISE	375		
1			TENNECO AUTOMOTIVE	300		
1		IONIA	THK RHYTHM AUTOMOTIVE	300	29815	3.0
1			VENTRA IONIA MAIN	585		
1		ISABELLA	THE DELFIELD CO	875	32694	3.8
1			UNIFIED BRANDS	375		
1		JACKSON	CERTAINTTEED	10	71547	1.8
1			CHEMETALL	35		
1			ELM PLATING	300		
1			GERDAU SPECIAL STEEL	300		
1			TAC MFG	600		
1			WORTHINGTON SPECIALTY PROCESSING	55		
1		KALAMAZOO	FLOWSERVE CORP	1100	127700	2.6
1			KAISER ALUMINUM FABRICATED PRODUCTS	200		
1			LANDSCAPE FORMS	375		
1			PHARMACIA & UPJOHN/PFIZER	1679		

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		KENT	ALLIED FINISHING – BROADMOOR SE	300	350351	1.1
	1		ARCANUM ALLOYS	7		
1			AUTOCAM CORP	175		
1			BENTELER AUTO – HAGEN	300		
1			BETZ INDUSTRIES	300		
1			ELECTRO CHEMICAL FINISHING	175		
1			GM COMPONENTS HOLDINGS	500		
1			HAVILAND ENTERPRISES	300		
1			KNAPE & VOGT MFG	640		
1			KNOLL	300		
1			LACKS ENTERPRISES – AIRLINE	175		
1			LACKS ENTERPRISES – BARDEN	175		
1			PHILLIPS & JOHNSTON ROCK RIVER FABRICATIONS	55		
1			PLASTIC PLATE – KRAFT	5		
1			RAPID ENGINEERING	75		
1			STEELTECH	70		
1			VI-CHEM CORP	300		
1		LAPEER	KAMAX	175	37569	1.3
1			LAPEER PLATING & PLASTICS	300		
1		LENAWEE	ERVIN TECHNOLOGIES	55	44104	0.1
1	1	LIVINGSTON	COR-MET	55	95631	0.3
1			DIAMOND CHROME PLATING	55		
1			PRECISION STAMPING	55		
1			PROGRESSIVE METAL FORMING	35		
1			WYMAN-GORDON	55		
1		MACOMB	AG SIMPSON	35	412021	0.3
1			BEACON PARK FINISHING	13		
1			FRASER MFG	75		
1			HENKEL CORP	300		
1			INALFA ROOF SYSTEMS	100		
1			INTERNATIONAL CASTING	55		
1			INVECAST CORP	4		
1			MB AEROSPACE WARREN	55		
1			SAS GLOBAL	250		
1			SMS GROUP TECHNICAL SERVICES – WARREN DIV	55		
1			TOWER AUTO – CLINTON	375		
1		WOLVERINE PLATING	55			
1		MANISTEE	PACKAGING CORP	55	9930	0.6

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		MECOSTA	SIMONDS INTERNATIONAL	75	17696	0.4
1		MENOMINEE	LE JONES	390	10556	3.7
1		MIDLAND	DDP SPECIALTY ELECTRONIC MATERIALS	46	38588	5.8
1			DOW CHEMICAL	2155		
1		MISSAUKEE	HYDROLAKE	15	6724	1.0
1			LC MFG	55		
1		MONROE	DTE ELECTRIC – MONROE	400	71717	1.5
1			GERDAU MACSTEEL – MONROE	375		
1			JAYTEC	15		
1			TAILOR WELDED BLANKS	300		
1		MONTCALM	MARVEL REFRIGERATION	175	27343	0.6
1		MUSKEGON	CANNON – MUSKEGON	175	74424	5.4
1			CWC TEXTRON	300		
1			EAGLE ALLOY	300		
1			HOWMET CORP – PLANT 1 & 3	300		
1	1		HOWMET CORP – PLANT 4	57		
1			HOWMET CORP – PLANT 5	175		
1			HOWMET CORP – PLANT 10	2091		
1			JOHNSON TECHNOLOGY	300		
1			TRAMEC SLOAN – FLEET ENGINEERS	300		
1		OAKLAND	ADEPT PLASTIC FINISHING – PLANT 4	150	621502	0.5
1			ADEPT PLASTIC FINISHING – PLANT 5	55		
1			COSMA BODY ASSEMBLY/MAGNA	750		
1			EMERALD STEEL PROCESSING	35		
1			GIFFIN	750		
1			HHI-FORMTECH – ROYAL OAK	500		
1			MACDERMID	38		
1			MACLEAN-FOGG	300		
1			MICHIGAN SEAMLESS TUBE	375		
1			MSP INDUSTRIES	250		
1	1		OERLIKON/SULZER METCO	50		
1			SHANNON PRECISION FASTENER	55		
1		OGEMAW	HYPERION MATERIALS & TECH	202	7849	2.6

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
1		OTTAWA	BUSCHE ALUMINUM TECH	385	156700	0.5
1			FOGG FILLER	75		
1			JH CAMPBELL GENERATING PLANT	5		
1			LEGGETT & PLATT	23		
1			METAL FLOW CORP	230		
1			SUPREME MACHINED PRODUCTS	40		
1		SAGINAW	NEXTEER AUTOMOTIVE	7500	82500	9.3
1			ORCHID ORTHOPEDIC SOLUTIONS	175		
1		SANILAC	ASCO NUMATICS	300	18600	1.6
1		SHIAWASSEE	CIE NEWCOR MTG – OWOSSO	7	32100	<0.1
1		ST CLAIR	DTE ELECTRIC – BELLE RIVER POWER PLANT	35	69350	0.1
1			MICHIGAN METAL COATINGS	55		
1		ST JOSEPH	AMERICAN AXLE & MFG	3000	27846	28.8
1			ARMSTRONG INTERNATIONAL	3000		
1			IAC MENDON	907		
1			MORGAN OLSON	1100		
1		WASHTENAW	DEXTER FASTENER TECH	300	189856	0.2
1		WAYNE	AJAX METAL PROCESSING	300	742803	2.6
1			AK STEEL WORKS (SEVERSTAL)	1120		
1			DETROIT DIESEL – REDFORD	10000		
1			DIPSOL OF AMERICA	15		
1			EDW C LEVY CO – PLANT 3	2		
1			EDW C LEVY CO – PLANT 6	371		
1			EES COKE BATTERY	7		
1			EQ DETROIT/US ECOLOGY	45		
1			EUCLID MFG CO	12		
1			FINTEX	28		
1			FMC LIVONIA TRANSMISSION PLANT	2845		
1			FMC WOODHAVEN FORGING PLANT	100		
1			HOOVER TREATED WOOD PRODUCTS	55		
1			L & W – 6771 & 6201 HAGGERTY	350		
1			MAGNI INDUSTRIES	55		
1			MCGEAN-ROHCO	35		
1			NSS TECHNOLOGIES	140		
1			OAKLAND STAMPING	8		

TRI	EGLE	County	Company Name	# Workers Employed in Chromium Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Chromium
	1	WAYNE, continued	OERLIKON METCO	1		
1			ST MARYS CEMENT	55		
1			STEEL INDUSTRIES – PLANT 1	175		
1			STEEL INDUSTRIES – PLANT 4	2		
1			UNISTRUT INTERNATIONAL	75		
1			US ECOLOGY MICHIGAN (DYNECOL)	55		
1			US STEEL – GREAT LAKES WORKS	3000		
1			WAYNE DISPOSAL	50		
1			WORTHINGTON SPECIALTY PROCESSING – CANTON	91		
			TOTAL			

Table C—Michigan Workers Employed in Facilities that Use or Manufacture Diethanolamine, by County: 2019

TRI	EGLE	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) – FARWELL PLANT	375	11445	3.3
1		GENESEE	RING SCREW – FENTON OP	300	175355	0.2
	1	INGHAM	UNIVAR SOLUTIONS	15	143138	<0.1
1	1	JACKSON	CHEMETALL	35	71547	<0.1
	1	KALKASKA	MAGNUM SOLVENT	16	7582	0.2
1	1	LIVINGSTON	AMERICAN CHEMICAL TECH	55	95631	<0.1
1		MACOMB	AXALTA COATING SYSTEMS – MT CLEMENS PLANT	500	412021	0.1
1	1	MUSKEGON	WEBB CHEMICAL SERVICE	55	74424	<0.1
	1	OAKLAND	HUNTSMAN	55	621502	<0.1
	1		RECTICEL NORTH AMERICA	130		
1	1	WAYNE	BASF CORP	300	813306	0.1
	1		BAY LOGISTICS	4		
1			CADILLAC OIL	55		
1			EQ DETROIT/US ECOLOGY	45		
	1		LABTECH	55		
1			MARATHON PETROLEUM – MI REFINING DIV	375		

TRI	EGLE	County	Company Name	# Workers Employed in Diethanola-mine Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Diethanola-mine
	1	WAYNE, continued	PROGRESSIVE DISTRIBUTION	10		
1	1		QUAKER CHEMICAL	4		
1			WOODBIDGE CORP	175		
		TOTAL		2559	2425951	1.0

Table D—Michigan Workers Employed in Facilities that Use or Manufacture Ethylene Oxide, by County: 2019

TRI	EGLE	County	Company Name	# Workers Employed in Ethylene Oxide Using Facilities	Total # Workers in the County	% of County Workforce Potentially Exposed to Ethylene Oxide
	1	BERRIEN	WILBUR-ELLIS – WATERVLIET	55	70407	<0.1
	1	IONIA	WILBUR-ELLIS – PEWAMO	10	29815	<0.1
1		KENT	VIANT MEDICAL	55	350351	<0.1
1	1	LIVINGSTON	CENTURION MEDICAL PRODUCTS	10	95631	<0.1
	1	MIDLAND	DOW AGROSCIENCES	10	38588	5.6
	1		DUPONT – MI OPERATIONS	2155		
1	1	WAYNE	BASF CORP	300	813306	<0.1
		TOTAL		2595	1398098	0.2