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Work Place Inspections

In Michigan, occupational disease surveillance plays an active role in the targeting of intervention and prevention efforts. When the state receives an occupational disease report from a physician that indicates work-related asthma, an inspection is initiated at the workplace where the patient became ill. The primary goal of such an inspection is to identify exposures and work practices that led to the development of the patient's work-related asthma in order to reduce the risk of additional illness among other workers who are similarly exposed. A secondary goal of these inspections is to identify workers similarly exposed who indicate breathing problems that merit medical follow-up.

In patients with suspected work-related asthma, an inspection can clarify the working conditions and specific exposures to help confirm or rule out a diagnosis of work-related asthma. Physicians who submit work-related asthma disease reports receive a copy of the patient's work place inspection report. Since the initiation of this program 12 years ago, no patient has lost their job because of a work place inspection. Both the patient's name and the doctor's name are kept confidential. Special procedures in small companies are followed to preserve anonymity.

This issue of the Project SENSOR newsletter contains an actual copy of a recent inspection that was initiated because of the following work-related asthma report:

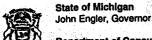
CASE REPORT

A woman in her late 50's had symptoms of shortness of breath and cough which were worse at work and began one year after she started to work at a facility that makes custom foam packaging. She had improvement in her symptoms on weekends and during vacations. She was begun on Flovent and Serevent. She continued to work at the facility for another four years. She left work on her doctor's advice shortly after two hospitalizations for severe asthma attacks.

After quitting work, her symptoms improved although they did not completely resolve. She continued to take Flovent and Serevent. Immediately after the hospitalizations, she had taken short courses of Prednisone.

The patient had never smoked cigarettes. Hyperresponsiveness of her airways was confirmed with an 18% improvement in her FEV, on spirometry.

Although the inspection did not find violations of any existing exposure standards, interviews with coworkers showed that 5 of the 10 employees at this facility had daily or weekly symptoms of shortness of breath, chest tightness or wheezing in relation to work. The inspector suggested several ways for improving working conditions at the facility. The company was cited for: inadequate training of their workers about the identification of hazards in their jobs; inadequate labeling on chemical containers; and inadequate record keeping for work-related injuries and illness. Although the company was cited for violations, no fines were issued. The company was required to correct the violations.



Department of Consumer & Industry Services Kathleen M. Wilbur, Director

On in response to an occupational disease report that indicated one of your current or past employees may have occupationally induced asthma, we conducted an investigation in your custom foam packaging company to evaluate employees' exposure to chemicals capable of causing occupational asthma.

The Occupational Health Division receives occupational disease report forms in accordance with the Michigan Public Health Code (i.e., Part 56 of the Public Act 368), which requires physicians, hospitals, clinics, or employers to report all known or suspected cases of occupational diseases. As a provision of Part 56, the Occupational Health Division upon receiving an occupational disease report form has authority to investigate the report to determine if the illness/diseases is related to workplace exposures. Enclosed are copies of Part 56, a letter from our Director explaining the occupational disease reporting form.

This investigation was also conducted in conjunction with our Occupational Health Division's Sentinel Event Notification System for Occupational Risks (SENSOR) program. The SENSOR program is an occupational disease surveillance system that specifically focuses upon noise-induced hearing loss and occupational asthma.

In an effort to assure a prompt response to all complaints and referrals our division receives, the primary scope of this investigation was limited to evaluating the referral items as well as determining your company's compliance with the MIOSHA Hazard Communication Standard, injury and illness record keeping, and workplace MIOSHA posting requirements.

During an opening conference held with you, we explained the purpose and procedure of our investigation. Subsequently, we were accompanied by you and Production Manager, during our investigation and discussed conditions of the work environment with employees on the worksite.

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REFERRAL ITEMS

During our investigation, we evaluated the possibility that the work environment might be contributing to the development of occupational asthma among employees. Our evaluation involved identifying chemicals used in or generated by your manufacturing process and comparing them to a list of agents associated with occupational asthma (copy enclosed). One agent appearing on this list is formaldehyde, which we thought might be generated through thermal degradation of the hot-melt plastic and polymeric hydrocarbon foams (i.e., polyurethane, polyethylene, and polystyrene). We considered styrene (i.e., monomer form of polystyrene), a known allergen, to be potentially present as well as isocyanates. We also identified dust particulate as a potential cause of asthma.

Next, air monitoring was conducted for those agents which we have a monitoring capacity. On we collected air samples, including breathing zone and area samples, at the hotmelt glue, hot wire cutting, and band saw operations. The results of these samples are shown on the enclosed Air Contaminant Data Sheets. The results indicate that employees were not exposed to air contaminants above the permissible limits. See enclosed MIOSHA Air Contaminants Standard.

We requested your MIOSHA 200 logs for the previous five calendar years and employees' medical records to determine whether there have been any employees who have experienced respiratory illness indicative of asthma. However, you did not maintain the MIOSHA 200 log. See Injury and Illness Record keeping section of this report. You also indicated that you have not heard of any employee displaying respiratory problems in the past, with the exception of one, whose case is in dispute.

To further assess the presence of potential symptomatic individuals, employee interviews were conducted and a medical disease questionnaire for suspected occupational asthma was administered by Ms. Deb Chester, Industrial Hygienist-Michigan State University (MSU) Department of Medicine. The questionnaires were submitted to Kenneth D. Rosenman, M.D. of MSU Department of Medicine. Dr. Rosenman works under contract for the Occupational Health Division's SENSOR program. Ten questionnaires were completed. Five of the individuals had daily or weekly shortness of breath, chest tightness, or wheezing. Given this high percentage of symptomatic individuals, we recommend a medical program be implemented for the workers in your facility. A copy of a sample program entitled "Recommended Medical Screening Protocol For Workers Exposed to Occupational Allergens" is enclosed. This program was prepared by Dr. Rosenman and can be used as part of a medical surveillance program to screen employees which may have respiratory insufficiency.

We recommend that you keep employees who display respiratory insufficiency away from areas which cause them respiratory problems. We also recommend that you control processing temperatures at the hot melt glue and hot wire cutting operations to prevent thermal degradation products from being formed. When possible, you should substitute with materials that do not have a potential for causing asthma.

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Finally, we strongly recommend that you make improvements in isolating air contaminants at the hot wire cutting operations. You currently provide a mechanical exhaust canopy with minimal length plastic curtains. Fugitive smoke was observed escaping the operation. By providing a longer curtain length to enclose the operation more fully, you will increase the efficiency of the exhaust system. This will reduce the amount of smoke escaping.

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In conclusion, no violation was determined regarding the referral item.

ISOCYANATES -GENERAL RECOMMENDATIONS

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The measurement, control and development of safe working practices/conditions when using isocyanates (e.g. hexamethylene diisocyanate [HDI]; methylene bisphenyl isocyanate [MDI]; toluene diisocyanate [TDI]; polymeric isocyanate; methyl isocyanate [MIC]; and isophorone diisocyanate [IPDI]) is very challenging. Because of their reactive nature, current monitoring methods and the results they provide require careful scrutiny. Many factors can affect the results obtained, and it is common to have results that underestimate actual exposure. This is particularly true of polymeric isocyanates. Because of the wide variability in individual sensitivity to isocyanate exposure, and because of the nature of the health effects induced (i.e., sensitization and asthmatic response), current legal exposure limits as well as current recommended exposure guidelines may not be protective enough.

There are instances where employees experience health effects from levels below recommended exposure guidelines. In addition, isocyanates have odor thresholds that are higher than recommended guidelines, and for this reason, present additional challenges when using respirators as a means to control employee exposure. Conventional "cartridge" type airpurifying negative pressure respirators are not recommended, as contaminant breakthrough can occur well before an employee could detect it. In general, the following guidelines apply to situations where isocyanate exposure can occur:

- Maintain exposures as low as reasonably achievable by isolating operations, removing employees from the exposure, substituting process materials with those that do not have isocyanates, or providing local exhaust ventilation to completely capture and remove contaminants from the workplace.
- Provide supplied-air respirators for employees who work with or are exposed to isocyanates, where the above control measures are not technologically or economically feasible.

We recommend that you consider the above guidelines and examine the feasibility of both with regards to the operation involving the hot wire cutting of polyurethane even though the air tests showed isocyanate exposures were less than permissible limits. Though not recommended, a half-face negative pressure air-purifying respirator, equipped with organic vapor (black band) cartridges will reduce employee exposure to isocyanates. This may be an interim measure that would improve conditions for sensitive employees who may experience health effects from exposure below recommended guidelines. To assist you in providing information and training

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to your employees regarding the hazards of isocyanates, we have enclosed a copy of OH-941 "The Isocyanates."

MIOSHA JOB POSTER

The walkaround survey revealed the federal OSHA "Safety and Health Protection on the Job" poster was displayed in the lunch room. You must assure that the MIOSHA version of the "Safety and Health Protection on the Job" poster is adequately displayed in the workplace in accordance with R408.22311. A copy of this poster was provided to you while we were on site. Another copy is enclosed.

INJURY AND ILLNESS RECORD KEEPING

During our investigation, it was determined that the company did not maintain the MIOSHA 200 form (i.e., Log and Summary of Occupational Injuries and Illnesses) (copy enclosed) or its equivalent for the establishment for the calendar year 1999. You also failed to maintain a supplemental record (i.e., MIOSHA No. 101 or equivalent) (copy enclosed) of each recordable occupational injury and illness at the workplace. These conditions represent violations of R408.22111(1), Rule 1111(1) and Rule 408.22113, Rule 1113(1) (copy enclosed) and constitute Item Nos. 2a and 2b of the enclosed Citation. To verify that these items have been abated, please submit a copy of the completed forms to the Department for review.

HAZARD COMMUNICATION

During our investigation, we reviewed the company's responsibilities under the MIOSHA Hazard Communication Standard (copy enclosed). Statements by management and our observations confirmed that the company failed to develop and implement a written hazard communication program, to properly label all containers of hazardous chemicals, to provide employees with information and training on hazardous chemicals in their workplace, to obtain and maintain copies of material safety data sheets (MSDSs) for all hazardous chemicals in the plant, to post the specified signs in the workplace advising employees of the required information on hazardous chemicals, and to identify pipes or piping systems containing a hazardous chemical. These violations of Michigan's Occupational Health Standards for General Industry constitute Item No. 1 of the enclosed Citation.

Major parts of this law that must be complied with are listed below:

Develop and implement a written hazard communication program which
describes how the requirements of the standard will be met. Prepare a list of
hazardous chemicals known to be present in the work area. Develop a method
to inform employees of the hazards of non-routine tasks and methods to inform
contractor employees of hazards of your workplace. A sample program is
enclosed for your guidance.

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- 2. Ensure that labels or other forms of warning are legible and prominently displayed on the containers of hazardous chemicals present in the workplace and that pipes or piping systems that contain a hazardous chemical are identified.
- 3. Maintain copies of the required MSDSs for each hazardous chemical in the workplace and make them readily accessible to all employees during their work shift. Also, post a notice indicating where to find MSDSs and who is responsible for maintaining them.
- 4. Provide information and training to employees regarding the hazardous chemicals in their work area.

We have enclosed a copy of a "Suggested Format for a Written Hazard Communication Program" to assist you in developing a written program for your workplace.

SUMMARY

As a result of our investigation, we are issuing the enclosed citations for violations of MIOSHA's regulations. The enclosed citations must be posted at or near the location of the violations for a minimum of three (3) days or until the items have been corrected, whichever is later. If abatement cannot be achieved by the dates specified, you may request an extension in writing prior to the abatement date. When compliance is achieved, you must sign, date, and return the Abatement Copies of the citation, as well as evidence of abatement, to the Department in Lansing. For more detailed information concerning citation procedures, refer to pages 1-3 of the citation.

Should you have any questions regarding this report or other occupational health-related matters, please do not hesitate to contact us.

If you would like to obtain a copy of one of the Public Health Codes, Air Contaminant Standards, Recommended Medical Screening Protocol for Workers Exposed to Occupational Allergens, or any other document referenced in the MIOSHA inspection report, please call us toll-free at 1-800-446-7805 to request a copy.

AIR CONTAMINANT DATA SHEET.

Employer:

Date:

Location:

Michigan Department of Consumer & Industry Services Bureau of Safety and Regulation Occupational Health Division

IH:

Contaminant	TWA	STEL	С	AL	Equipment	
Dust, Total Particulate	15 mg/m³	-	-	•	Low-ash PVC filter connected to a personal sampling pump.	
Formaldehyde	0.75 ppm	2 ppm	. *. *. *. *. *. *. *. *. *. *. *. *. *.	0.5 ppm	Silica gel tube connected to a personal sampling pump.	
Acetone ·	1800 mg/m³	2400 mg/m³		•	Carbosieve tube connected to a personal sampling pump.	
2-Butanone	590 mg/m³	885 mg/m³		•	Carbosieve tube connected to a personal sampling pump.	
Styrene	215 mg/m³	425 mg/m³			Charcoal tube connected to a personal sampling pump.	
Vinyl Acetate	30 mg/m³	60 mg/m³	ay nagarata	saga • sijasa	Charcoal tube connected to a personal sampling pump.	
Volatile Organic Chemicals (VOC's)	Varies with each chemical		eta ning satu. Pana arang satu	i en egal, en i Lighter graen	Charcoal tube connected to a personal sampling pump.	
Methylene Bisphenyl Isocyanate (MDI)		•	0.2 mg/m³	•	Glass fiber filter connected to a personal sampling pump.	
Toluene - 2, 4 - Diisocyanate (2, 4 - TDI)	0.04 mg/m³	0.15 mg/m³	nere or a transfer La State Tollowski	esima kentan	Glass fiber filter connected to a personal sampling pump.	
Toluene - 2, 6 - Diisocyanate (2, 6 - TDI)		ti ya yasinti	e jaro, a nkaanji£	mugike, dawi	Glass fiber filter connected to a personal sampling pump.	
Hexamethylene Diisocyanate (HDI)	81.	•		Mir nga tibik.	Glass fiber filter connected to a personal sampling pump.	
Isophorone Diisocyanate (IPDI)	0.005 ppm	0.02 ppm	÷		Glass fiber filter connected to a personal sampling pump.	

Identification/Description	Time	Contaminant	Results	Туре	Exposure	Note
Breathing zone of whot wire cutting polyurethane foam.	hile 11:15 am to 1:10 pm	2, 4 - TDI 2, 6 - TDI HDI IPDI	ND 0.0029 mg/m³ 0.0028 mg/m³ ND ND	TWA TWA TWA TWA	<0.003 mg/m³ 0.0029 mg/m³ 0.0028 mg/m³ <0.003 mg/m³ <0.0001 ppm	2 1 2 2 1
		Formaldehyde Acetone 2-Butanone VOC's	ND ND ND ND	TWA TWA TWA TWA	< 0.05 ppm < 3 mg/m³ < 3 mg/m³ < 3 mg/m³	1 1 1
Identification/Description	Time	Contaminant	Results	Туре	Exposure	Note
Area sample collected by placing samp pump on table next to employees performing hot melt adhes and glue stick gun operations.		Formaldehyde Acetone 2-Butanone Vinyl Acetate VOC's	ND ND ND Not Present ND	TWA TWA TWA TWA	< 0.04 ppm < 3 mg/m³ < 3 mg/m³ NA < 3 mg/m³	1 1 1 1 1
Breathing zone of while h wire cutting polystyrene foam.	ot 1:20 pm to 2:45 pm	Formaldehyde Acetone 2-Butanone Styrene VOC's	ND ND ND Not Present ND	TWA TWA TWA TWA	<0.06 ppm <3 mg/m³ <3 mg/m³ NA <3 mg/m³	1 1 1 1
Breathing zone of while h	ot 1:25 pm to 2:55 pm	Formaldehyde Acetone 2-Butanone VOC's	ND ND ND ND	TWA TWA TWA TWA	< 0.05 ppm < 3 mg/m³ < 3 mg/m³ < 3 mg/m³	1 1 1
Breathing zone of while operating ba	1:35 pm to 3:00 pm	Dust, Total Particulate	0.32 mg/m³	TWA	0.32 mg/m³	1

Note 1: Employee exposure does not exceed the limit.

Note 2: There is no MIOSHA TWA limit for MDI, HDI and 2, 6 - TDI. The ACGIH recommends TWA limits of 0.05 mg/m² (MDI) and 0.03 mg/m² (HDI). There is no ACGIH recommended limit for 2.6 - TDI.

TWA (Time-Weighted Average) = exposure limit averaged over an 8-hour period STEL (Short-Term Exposure Limit) = averaged over a 15-minute period C (Ceiling) = exposure limit not to be exceeded during any part of the workday AL (Action Level) = exposure limit averaged over an 8-hour period Results = average exposure concentration during the sample period Exposure = employee's exposure; compare it to the limit

Em = exposure for mixture: see R325.51104

Em shall not exceed 1
> = greater than

<= less than

NA = not applicable ND = none detected

ppm = parts per million ppb = parts per billion μ g/m³ = micrograms per cubic meter mg/m³ = milligrams per cubic meter f/cc = fibers per cubic centimeter

OCCUPATIONAL SAFETY AND HEALTH RESOURCE GUIDE FOR MICHIGAN PRACTITIONERS

date last revised: 11-9-99

AGENCIES

MICHIGAN DEPARTMENT OF CONSUMER AND INDUSTRY SERVICES

MDCIS covers regulation, consultation and education on occupational health and safety. They are also responsible for collecting reports of "known or suspected occupational disease" by health professionals (see box below). Several offices may be of help:

Asbestos Program	(517) 322-1320
Bureau of Safety & Regulation	(517) 322-1814
Chemical Compliance	(517) 322-5208
Employee Discrimination	(517) 256-3620
Occupational Health	(517) 322-1608
Radiological Health	(313) 422-7661
Statistical Information	(517) 322-1851
web site: www.cis.state.mi.us/bsr	

There are six district offices of the Michigan Occupational Safety and Health Administration (MIOSHA):

Escanaba (Upper Penin)	(906) 786-7784
Farmington (Detroit area)	(248) 888-8880
Farmington (Mid-East area)	(248) 888-8877
Grand Rapids (West MI)	(616) 447-2650
Lansing (Mid-South MI)	(517) 322-5208
Saginaw (North East MI)	(517) 758-1726

Other government, university and community organizations that can also provide assistance are:

Academic Occupational Health Programs:

Michigan State University, Occupational and Environmental Health, College of Human Medicine (800) 446-7805 web site: www.chm.msu.edu/oem/index.htm

The University of Michigan, Occupational Health Program, School of Public Health (734) 764-2594

Wayne State University, University Health Center,
Department of Family Medicine (313) 577-5074

Cancer Information Service-National Cancer Institute (800) 422-6237

Consumer Products Safety Commission

To report an injury or illness associated with a consumer product (800) 638-2772

To request a database search for injuries or illnesses associated with a consumer product. (301) 504-0424

Department of Environmental Quality, Waste

Management Covers enforcement of chemical disposal.

(313) 953-1448

Duke University Maintains a web site that includes a list of occupational and environmental web sites. web site: http://gilligan.mc.duke.edu/oem/index2.htm

Federal Equal Employment Opportunity Commission
Handles cases of employment discrimination based on race, sex, age, religion or <u>disability</u>. Administers the Americans with Disabilities Act (ADA). (313) 226-7636

Michigan Department of Agriculture, Pesticide and Plant Pest Management Division Covers enforcement of pesticide complaints in Michigan. (517) 373-1087

Michigan Migrant Legal Assistance Advocates for migrant labor safety and health. (616) 454-5055

Michigan State Bar Provides workers' compensation lawyer referrals. (800) 968-0738

Michigan Workers' Compensation Bureau: Health Care Services Division (517) 322-5433

National Pesticide Telecommunications Network Provides information on pesticide products, poisonings, toxicology, referrals for laboratory analyses, investigations, and emergency treatment information. (800) 858-PEST

National Toxicology Program (NTP) of the DHHS Provides background information on the program, MSDS information, information on carcinogenic/toxicology studies and more: web site: http://ntp-server.niehs.nih.gov

NIOSH National Institute for Occupational Safety and Health Conducts research on occupational hazards, including:

Health Hazard Evaluations: (513) 841-4382 **Information & Publications**: (800) 35-NIOSH

OSHA Occupational Safety and Health Administration Covers federal employees in Michigan. (517) 377-1892

Poison Control Center in Michigan (800) 764-7661

Pregnancy and Environmental Hotline of the National Birth Defects Center Free consultation and information on potential risks to pregnancy from environmental or workplace exposures.

(800) 322-5014

SEMCOSH Southeast Michigan Coalition on Occupational Safety and Health An organization of workers, unions, attorneys, medical and health and safety professionals concerned with improving occupational safety and health.(313) 961-3345

A physician, hospital, clinic of employer <u>must report known or suspected cases</u> of <u>occupational diseases</u> or workplace aggravated <u>health conditions</u> to the Michigan Department of Consumer and Industry Services. Under Part 56 of P.A. 368 of 1978, the report is to be filed <u>within 10 days after</u> the <u>discovery</u> of the disease or condition on a form furnished by the MDCIS. These forms can be obtained from the Michigan Department of Consumer and Industry Services, Division of Occupational Health Services (517) 322-1608.

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Michigan Law Requires the Reporting of Known or Suspected Occupational Diseases

Reporting can be done by:

*FAX (517) 432-3606

*Telephone 1-800-446-7805

*E-Mail Rosenman@msu.edu

*Mail Michigan Department of Consumer and Industry Services
Division of Occupational Health
P.O. Box 30649

Lansing, MI 48909-8149

Reporting forms can be obtained by calling (517) 322-5208 or 1-800-446-7805.

Printed on recycled paper.

Remember to report all cases of occupational disease!

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In this issue: Work Place Inspections

Address service requested.

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