

ISOCYANATES IN AUTOBODY REPAIR



TABLE OF CONTENTS

Isocyanates	1
Autobody repair shops	1
Controlling Isocyanate Exposure	1
Shop layout and equipment design	1
Work procedures	1
Occupational Asthma	2
Signs & Symptoms of Asthma	2
Regulation Requirements	2

ISOCYANATES

Isocyanates are highly reactive compounds that have a variety of industrial applications, such as: polyurethane foam manufacturing, elastomers, paints, adhesives, coatings, varnishes and others. Some examples are:

TDI – toluene diisocyanate

MDI – methylene diphenyl diisocyanate

HDI – hexamethylene diisocyanate

IPDI – isophorone diisocyanate

NDI – naphthalene diisocyanate

Isocyanates are severe irritants to the upper and lower respiratory tract. Inhalation exposure may cause coughs, sore throat, chest pain and/or shortness of breath. Repeated exposure can cause a decline in lung function even without showing any symptoms – in some people it can cause respiratory sensitization and this can lead to asthmatic attacks.

Isocyanates are also skin and eye irritants – repeated skin exposure can cause skin rashes and sensitization; and exposure to mist can result in damage to the cornea.

AUTOBODY REPAIR SHOPS

It is important for workers and employers to know that isocyanates can be found in some products. They are usually found in the hardener of two-part coating material. The information can be found on the material safety data sheet (MSDS) for each product.

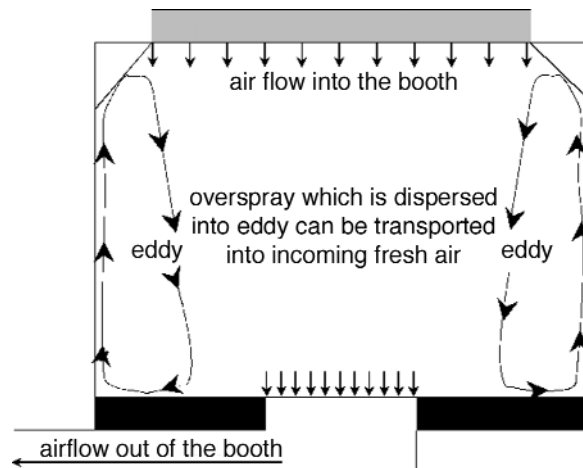
In autobody repair shops spray painting is a process by which exposure to isocyanates can be high. Spray painting creates fine mists or droplets of paint that may stay suspended in the air for a short period of time, thereby increasing the risk of inhalation and eye exposure.

CONTROLLING ISOCYANATE EXPOSURE

Ideally, eliminating the source of exposure provides the greatest results; however, it is not always practical. Usually engineering controls and job modification can be incorporated to reduce worker exposure.

SHOP LAYOUT AND EQUIPMENT DESIGN

Mixing of the hardener and paint should be done in a separate, well ventilated area or in a paint booth. This will reduce the number of workers exposed. A proper paint booth design will operate at negative pressure and have a minimum airflow of 100 feet/minute (*0.5 meters/second*) past the painter. Ideally, design for a down-draft booth should be used. Provision for adequate make-up air should be provided. As well, exhaust from the paint booth should be discharged so that it cannot be re-circulated into the shop.



Schematic diagram of a down-draft hood.

WORK PROCEDURES

Spray painting should be performed by using a high volume, low pressure gun. Workers who are either painting or mixing should have, if not better, a full-face piece, air-purifying respirator with prefilters mounted on cartridges for organic solvents (*approved National Institute for Safety and Health*)

Gloves or barrier creams should be used when handling products containing isocyanates. Splash goggles should also be worn to protect the eye.

OCCUPATIONAL ASTHMA

Occupational asthma (OA) is caused by workers breathing in substances at work that produce an immune or irritant response in the airways of the lung.

The identification of OA in workers is important because early detection may lead to reversal of the worker's symptoms and control of the chemical in the workplace which caused the asthma. This will also prevent additional workers from being at risk of getting OA.

Without early detection, workers will be needlessly put at risk of developing a morbid lung disease possibly preventing them from enjoying leisure sport activities and continuing work in the same profession.

It is also important to know that pre-existing asthma may be aggravated by some workplace exposures.

SIGNS & SYMPTOMS OF ASTHMA

- Wheezing
- Coughing
- Chest tightness
- Shortness of breath

(note: if you have any concerns contact your family physician)



Human lung

The following section has been adapted from the Ontario Occupational Health & Safety (OH&S) Act and Regulation 2002 under designated substances. Copies of the Regulations can be purchased from the Ontario Ministry of Labour or from the Windsor Occupational Health Information Services (WOHIS).

REGULATION REQUIREMENTS

Employers must inform their workers of the hazards of isocyanates, how to protect themselves and how to react in an emergency.

Every employer shall take all necessary measures: engineering controls, work practices and hygiene practices to ensure that the time-weighted average exposure of a worker is in any case not exceeding 5 parts per billion.

The isocyanate regulation requires a control program which includes medical surveillance. Components of a medical surveillance program are: pre-employment, pre-placement and periodic medical examination, clinical tests, health education, record keeping and a questionnaire about the worker's exposure profile. Clinical tests such as pulmonary function tests are required minimally every 2 years or more often if the physician deems it necessary. Chest x-rays may be requested if questions and pulmonary function test indicate the need for further testing. The physician then notifies the employer that the worker is either fit, fit with restrictions or unfit for isocyanate exposure.

FOR MORE INFORMATION

OHCOW has trained medical professionals that can provide medical surveillance for companies who require it. In addition, occupational hygiene and ergonomic services can be provided to workers and employers.

OHCOW OFFICES

If you need further assistance, call the Occupational Health Clinic for Ontario Workers Inc. Closest to you.

HAMILTON

848 Main Street East
Hamilton, ON
L8M 1L9
(905)-549-2552
Toll Free: 1-800-263-2129
Fax: (905)-549-7993
E-mail: hamilton@ohcow.on.ca

SARNIA-LAMBTON CLINIC

171 Kendall Street
Point Edward, ON
N7V 4G6
(519)-337-4627
Fax: (519)-337-9442
E-mail: sarnia@ohcow.on.ca

SUDBURY

1300 Paris St.
Suite 4
Sudbury, ON
P3E 3A3
(705)-523-2330
Toll Free: 1-800-461-7120
Fax: (705)-523-2606
E-mail: sudbury@ohcow.on.ca

TORONTO

970 Lawrence Ave. West
Main Floor
Toronto, ON
M6A 3B6
(416)-449-0009
Toll Free: 1-888-596-3800
Fax: (416) 449-7772
E-mail: toronto@ohcow.on.ca

WINDSOR

3129 Marentette Avenue
Unit #1
Windsor, ON
N9A 4N1
(519)-973-4800
Toll Free: 1-800-565-3185
Fax: (519)-973-1906
E-mail: windsor@ohcow.on.ca

PROVINCIAL OFFICE

15 Gervais Drive
Suite 601
Don Mills, ON
M3C 1Y8
(416)-443-6320
Fax: (416)-443-6323
Toll Free : 1-877-817-0336
E-mail: info@ohcow.on.ca

Every effort has been made to ensure the accuracy of the information in this workbook.
OHCOW assumes no responsibility for how this information is used.

Revised 2005