

## Industrial Hygiene for I-BOND® MDI Resins

Composite Wood Products







## Our Wood Industry Commitment

Huntsman has established itself as a leading supplier to the global Composite Wood Products (CWP) industry, through continuous innovation, specialising in Methylene diphenyl diisocyanate (MDI) based technology. We are dedicated to giving our customers the finest quality products and services available. Through caring for our customers, suppliers, employees and the communities in which we work – as well as the environment in general – we believe we enhance our business performance.

Huntsman has a team of dedicated Industrial Hygiene specialists, who work alongside and support selected customers, to assist them with compliance with certain international, national and regional standards.

These Industrial Hygiene services are backed up by a team who can provide customers with basic information and assist them with design and inspection of bulk storage facilities.

### Bulk Audits

Huntsman provides its customers with the necessary advice and support, including requirements for bulk storage and dosing of I-BOND® MDI resins. Our team of experts will provide you with all the basic information to assist you with the design and inspection of your bulk storage facilities according to ISOPA guidelines (European Diisocyanate & Polyol Producers Association). The team will be present for your first delivery. A brochure "Bulk storage and dosing of I-BOND® MDI Resins for wood based panel production" is available on request from Huntsman.



### Walk the Talk Training

Did you know that 80% of accidents in the industry are behaviour related and could be avoided just by making a few simple adjustments to the way you work? That is why the member companies of ISOPA have launched an industry-wide program called 'Walk the Talk'. This program aims at promoting safer use of the chemicals used in making polyurethanes, including composite wood products. In a partnership between customers and suppliers, the initiative aims to develop your own and your employees' awareness of the risks involved in the use of chemicals, and offer you advice on managing spillages, first aid and fire. In practice, this means that for our composite wood products customers, we can provide training to management and staff to improve their safe use/behaviour when handling Huntsman products.

### Industrial Hygiene Service

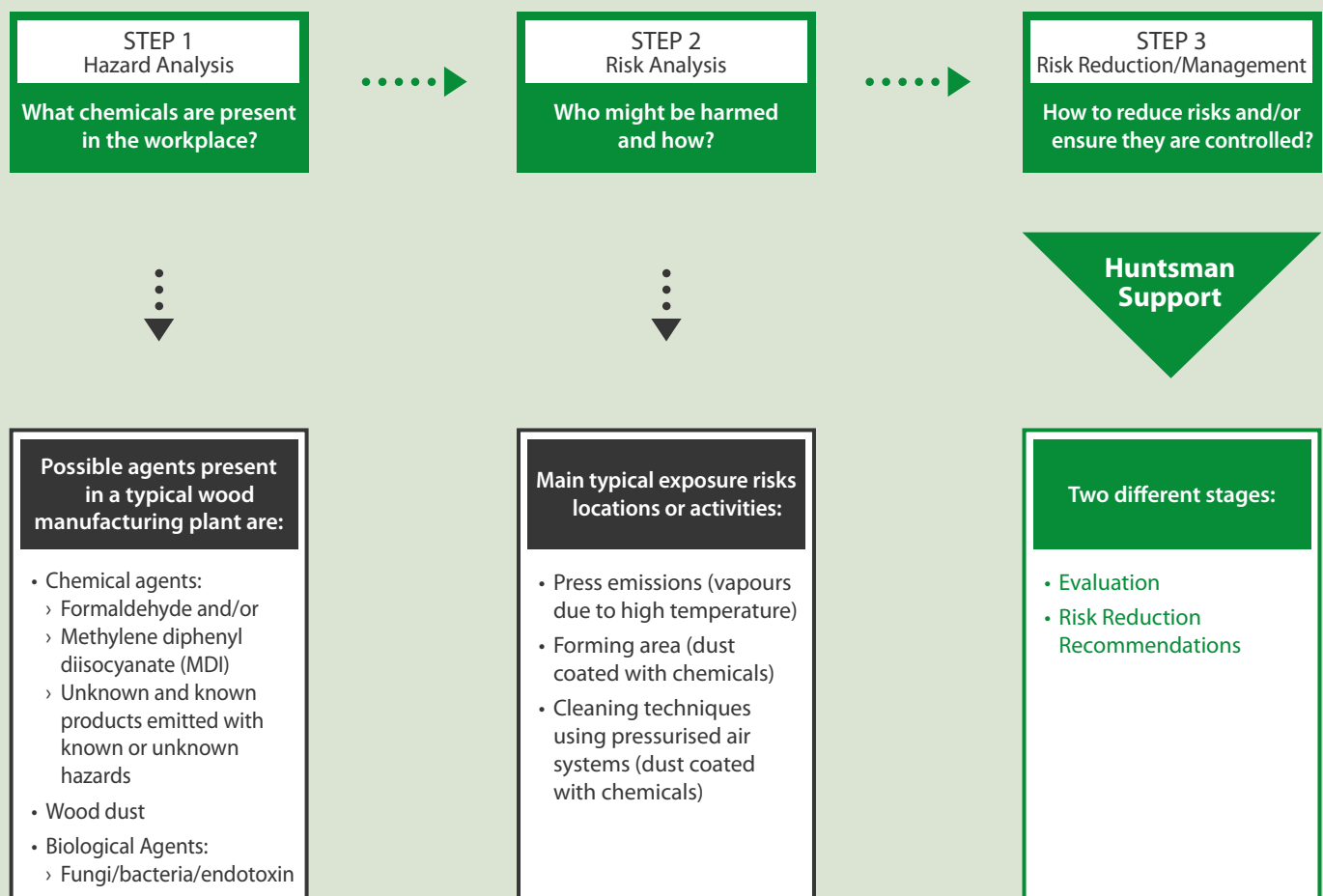
Huntsman promotes good working relationships with its customers, including the development of mutually acceptable product stewardship improvement goals so that any Environmental, Health and Safety concerns related to the use of I-BOND® MDI resins can be worked on jointly. We can provide the expertise of a fully dedicated team of Industrial Hygiene specialists to help resolve EHS concerns for customers.

Our customer-focused support includes providing technical literature and services such as workplace monitoring as well as training and site audits. Huntsman Industrial Hygiene specialists make it their goal to work closely together with selected customers to improve your workplace to be compliant with international, national, regional or company standards.



## Industrial Hygiene Process

Industrial Hygiene is the science and art of identifying, evaluating and controlling health risks at the workplace. The following three steps describe the Industrial Hygiene process for managing health risk at the workplace.





## What Can Industrial Hygiene Service Offer You?

Industrial Hygiene surveys are carried out by the Industrial Hygiene Centre of Excellence, a dedicated team of specialists experienced with the Industrial Hygiene issues related to the production of I-BOND® MDI bonded wood panels. This team of experts can offer you assistance in reducing and managing the risks present at the workplace.

### STAGE 1 - Evaluation

The first step of an Industrial Hygiene survey consists of assessing the workplace for safe working with MDI by performing measurements, observing behaviour and evaluating applied control measures, e.g. ventilation.

At our dedicated in-house Industrial Hygiene laboratory the samples will be analysed using state-of-the-art analytical equipment. The Industrial Hygiene team works to the highest standard for analytical laboratories (ISO 17025). In addition, the laboratory has been tested and evaluated quarterly for more than 10 years and reaches the highest performance class for MDI in a worldwide program for proficiency testing for air monitoring methods. This evaluation is conducted by the UK Health & Safety Executive.

### STAGE 2 - Risk Reduction Recommendations

Based upon the results of the analysis and observations made during the field monitoring, a report will be written where after the IH specialists can provide their expertise to discuss further risk reduction measures.



## More Detailed Examples of the Industrial Hygiene Activities at Customers Are:

### Technical Support

#### a. Air Monitoring Evaluation

Samples are collected on the workers or along the production process, using internationally validated air monitoring methods for MDI (NCO) and wood dust or direct reading techniques.

##### » Personal Sampling:

- to assess compliance with local regulatory exposure limits
- to assess exposure during specific tasks.

##### » Background Area Sampling:

- to assess background levels along the production line at areas where workers may be present.

##### » Identification of Emission Sources:

Using screening air monitoring methods immediate indicative results are generated:

- to identify emission sources at the production line
- to identify efficiency of ventilation.

### General EHS Related Information

#### » Medical Surveillance

It is recommended that individuals who have higher risks to the effects of sensitisation should be identified prior to their first exposure to MDI, in order to avoid sensitisation.

#### » Technical and Individual Control Measures

- required design criteria for ventilation to minimise emissions of chemicals from raw materials and wood into the workplace
- good inspection and maintenance programs
- information on appropriate cleaning techniques
- adequate selection and use of personal protective equipment.

#### » Environmental Information

On MDI and its effects on air, water and soil.



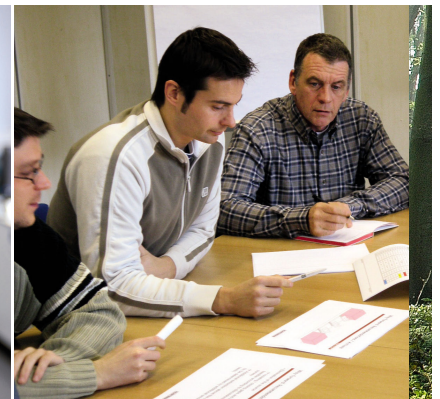
• Personal Monitoring



• Behaviour Monitoring



• Analysis



• Reporting

#### b. Dermal Exposure Evaluation

##### » Identification of Contaminated Equipment or Areas:

- to identify areas which are contaminated with MDI
- to verify efficiency of ventilation and/or the effect of cleaning with air pressurised equipment
- to identify areas where gloves need to be worn.

##### » Behaviour inspection

#### c. Control Measures Evaluation

##### » Ventilation Testing:

- to identify the efficiency of ventilation system by using smoke generating techniques.

#### d. Management and Operator Training

##### » Basic Training:

To raise the awareness about the hazards and risks involved with working with chemicals in general and MDI specifically (Walk the Talk).

##### » Specific Training:

Individuals will be confronted with the effect of poor behaviour and good behaviour, e.g. the effect of using air pressurised techniques for cleaning, by using video exposure monitoring techniques.

## Frequently Asked Questions

### Will the emissions to air increase when I use I-BOND® MDI as a binder?

Emissions to air of I-BOND® MDI are generally within regulatory emission limits. In addition, due to the fact that I-BOND® MDI also chemically bonds with amines, alcohols and other functional groups, the total volatile organic emissions tend to decrease when I-BOND® MDI is used as a resin.

### Is I-BOND® MDI emitted from wood panels, which could lead to indoor air issues?

Several studies carried out by independent organisations demonstrated that emissions of I-BOND® MDI bonded wood panels are negligible and in most cases not detectable. I-BOND® MDI resin from Huntsman is not an additional source contributing to indoor air formaldehyde emissions from composite wood panels.



### Do panels bonded with I-BOND® MDI resin cause an increase in emissions of hazardous products when combusted?

An independent study has demonstrated that panels bonded with I-BOND® MDI resin do not emit significant levels of hazardous compounds compared to conventionally bonded panels.

### Will my employees get sensitised when I start working with I-BOND® MDI?

Hazards are present in our daily lives – it is just a matter of managing the risks. Huntsman can support you with the implementation of risk reduction measures prior to the introduction and during the use of I-BOND® MDI resin.

### Will I need to invest significantly so I can produce panels bonded with I-BOND® MDI resin in a safe way?

If your current control measures, e.g. ventilation and risk measurement systems, are efficient using conventional resins there should be no need to alter your existing process.

### Environmental Health & Safety Information Available from Huntsman

- Material Safety Data Sheets
- I-BOND® EHS Communication Package
- Further information on these topics can be provided, on request
- Working Safely With I-BOND® MDI Resins
- Some Facts About I-BOND® MDI Resins



# HUNTSMAN

Enriching lives through innovation

## European headquarters

Huntsman  
Everslaan 45  
B-3078 Everberg  
Belgium  
Telephone +32 2 758 9952

## American headquarters

Huntsman  
10003 Woodloch Forest Drive  
The Woodlands  
Texas 77380  
USA  
Telephone +1 281 719 4916

## Asian headquarters

Huntsman  
No. 452 Wen Jing Road  
Minhang Development Zone  
Shanghai 200245  
Telephone +86 21 6462 6868

[www.ibondwood.com](http://www.ibondwood.com)

[ibondwood@huntsman.com](mailto:ibondwood@huntsman.com)

Huntsman Polyurethanes warrants only that its products meet the specifications agreed with the buyer. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications. While all the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NO GUARANTY, WARRANTY OR REPRESENTATION IS MADE, INTENDED OR IMPLIED AS TO THE CORRECTNESS OR SUFFICIENCY OF ANY INFORMATION OR RECOMMENDATION OR AS TO THE MERCHANTABILITY, SUITABILITY OR FITNESS OF ANY PRODUCTS FOR ANY PARTICULAR USE OR PURPOSE. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE. NOTHING IN THIS PUBLICATION IS TO BE CONSTRUED AS RECOMMENDING THE INFRINGEMENT OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT AND NO LIABILITY ARISING FROM ANY SUCH INFRINGEMENT IS ASSUMED. NOTHING IN THIS PUBLICATION IS TO BE VIEWED AS A LICENCE UNDER ANY INTELLECTUAL PROPERTY RIGHT. Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Polyurethanes containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards. Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users. Huntsman Polyurethanes is an international business unit of Huntsman International LLC. Huntsman Polyurethanes trades through Huntsman affiliated companies in different countries such as Huntsman International LLC in the USA and Huntsman Holland BV in Western Europe. Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman International LLC or of its affiliated companies. I-BOND® and I-RELEASE® are registered trademarks of Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2009 Huntsman Corporation or an affiliate thereof. All rights reserved.

Editor: Iain Stanton.