


Real Life Example: Application of isocyanate product



A product containing **Methylene Bisphenyl Isocyanate** is spread out on a surface for 1 - 2 hours over the course of the day. There is no specific ventilation and the worker does not use any respiratory protection. What would the worker's exposure be?

The exposure calculator is used to predict the exposure. You answer questions about how long the task is performed, workers position, Vapour Hazard Ratio of product, etc. Each question comes with a guide and you simply select the best answer. The options for worker position are shown below.

How close a worker is to any fugitive emission is a significant metric of the magnitude of the worker's exposure.



Worker is Nearby Arm's length Directly in Emission

Select one of the choices below that best fits your scenario. *

- Intermittently nearby
- Worker is consistently nearby
- Worker at arm's length
- Worker is directly in emission

LIQUID EXPOSURE CALCULATOR

Process Name: Surface membrane fabrication
Description of Process: product is spread by hand over a period of 1 - 2 hours

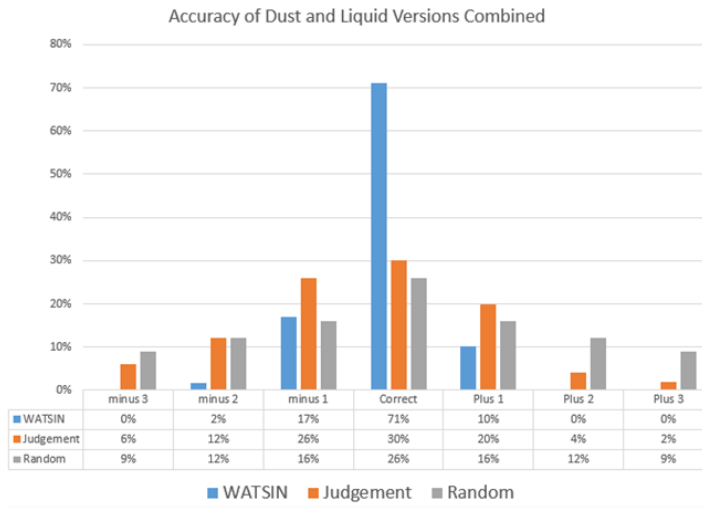
Name of Product: 4,4-methylene bisphenyl diisocyanate
Duration: Exposure occurs 1 - 2 hours / day
Proximity: Worker at arm's length
Vapour Hazard Ratio: < 5
Nature of Process: Default
Controls: Open system with no administrative or engineering controls in place (basically no controls in place)

Estimated exposure is	Action to take
<1 % of the OEL	No Action Recommended
1 - 10% of OEL	General WHMIS Training
10 - 20% of OEL	plus specific training on hazards of products
20 - 100% of OEL	plus periodic exposure monitoring
> 100% of OEL	plus respiratory, engineering or other controls
Multiples of OEL	greater respiratory protection, improved controls or process shutdown

The predicted exposure is shown as falling into an exposure band. A screenshot from the Exposure Calculator is shown below. It lists the assumptions entered into the calculator and the predicted band of exposure.

The laboratory results gave a concentration of 0.3 ug/m³ compared to an OEL of 51 ug/m³. This equates to about 0.5% of the OEL. This matches the predicted range of <1% of the OEL.

How Reliable is the Prediction?



No process is going to be correct every time. WATSIN is trying to be simple. Also, exposures move between bands on different days as durations of activities and other factors change from day to day. The results to date show that it is significantly better than professional judgement.

Answer six simple questions and you have a reasonable prediction of worker exposure. Again, we have compared (and to continue to compare) predicted exposures to actual lab results in a wide range of activities and settings and we believe that it provides a reasonable estimate of worker exposure.

Doug Wylie, CIH, ROH, CRSP, CRM
Occupational Hygienist