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Warning: Keep out of reach of children, if ingested seek medical attention immediately.



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Operating Instructions for Aromatic Isocyanates Badge For the detection of Toluene Diisocyanate (TDI) and Methylene Diphenyl Diisocyanate (MDI) (Part Number: 382001)

Technical Summary

Physical Specifications:

Dimensions	(74 ± 1 mm) x (41 ± 1 mm) x (1 mm)
Weight	1.5 g
Refrigerated shelf life	1 year
Color change	off-white to red

Sampling Parameters:

	TDI	MDI
Exposure dose:		
Badge	5 ppb-hr	3.5 ppb-hr
Badge with color comparator	5 – 140 ppb-hr	
Minimum detectable limit (8 hours)	0.6 ppb	0.4 ppb
Maximum recommended sampling time	24 hours	24 hours
Minimum recommended sampling time	15 minutes	15 minutes
Relative humidity range	11% - 87%	11% - 87%
Face velocity range	10 – 100 cm/sec	10 – 100 cm/sec
Temperature range	60°F - 91°F	60°F - 91°F
Light effect – UV (direct sunlight)		not recommended above 4 hr
Light effect – visible	no effect	no effect
Color stability	two weeks	two weeks

Applications:

The SafeAir aromatic isocyanates badge may be used for personnel or area monitoring for exposure times ranging from 15 minutes to 24 hours. For higher resolution when monitoring for TDI, the SafeAir aromatic isocyanates badge may be used in conjunction with the SafeAir TDI color comparator (part number: 383005). **For exposure times less than 30 minutes, it is recommended to allow the exposed badge to stand for at least 30 minutes before reading the exposure dose with the color comparator.**

The SafeAir aromatic isocyanates badge is designed to monitor TDI and/or MDI vapors in the air. **It is not recommended to use the badge to monitor TDI or MDI aerosols.**

Cross Interferences:

Other aromatic diisocyanates and high concentrations of hydrazines are known interferences. No other interferences are known.

Introduction

Based on the available toxicity data in animals and epidemiologic studies of humans, aromatic diisocyanates such as TDI and MDI are strong respiratory sensitizers.¹ Repeated exposures or a single large dose may cause sensitization. Chronic overexposure has also been reported to cause lung damage including fibrosis. OSHA and NIOSH exposure limit for TDI is 0.02 ppm (TWA), the OSHA exposure limit for MDI is 0.02 ppm (ceiling) and the NIOSH exposure limit for MDI is 0.005 ppm (TWA).

Aromatic diisocyanates, such as toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI), are commonly used to make various polymers such as polyurethanes. Polyurethanes have significant application in the manufacture of rigid and flexible foams. They are also used in the production of adhesives, elastomers and coatings. Polyurethane coatings are preferred in the automotive refinishing industry where high performance coatings are required.

¹ www.epa.gov/dfe/pubs/auto/profile/toxicology1a.pdf

Principle of Operation

The SafeAir aromatic isocyanates badge is a monitoring system designed to indicate the presence of TDI and/or MDI at concentrations below the permissible exposure limit. The SafeAir aromatic isocyanates badge detects the presence of TDI and/or MDI by forming a color change in the shape of an exclamation mark inside the triangle. This indication is produced by a color-forming reaction, which occurs when TDI and/or MDI react with a flat indicator layer.

Operating Instructions

1. Remove the pouch from the refrigerator and allow it to warm to room temperature.
2. Remove the badge from its protective pouch.
3. For personnel monitoring, attach the badge near the user's breathing zone (i.e. the collar) with the front side exposed to the surrounding atmosphere.
4. For area monitoring, attach the badge to a stand and mount in a centralized area with the front side exposed to the surrounding atmosphere.
5. The exclamation mark appears within the triangle when TDI and/or MDI are present. Please note that the exclamation mark will appear on the front of the badge.
6. To obtain the average concentration, divide the exposure dose (ppb-hr) by the exposure time in hours (hr).

Storage

The SafeAir aromatic isocyanates badge should be refrigerated in its sealed bag at all times.

Benefits

1. Accurate Detection: The SafeAir aromatic isocyanates badge is designed to react selectively with TDI and/or MDI with minimum interference from other substances.
2. Applications: The SafeAir badge may be used for personnel screening and for area monitoring or area mapping.
3. Ease of Use: The SafeAir badge is a direct-read device that gives immediate, on-site results.

Other Available Monitors

1. SafeAir Badges:

Ammonia	Hydrazine	Phosgene
Carbon Monoxide	Hydrogen Chloride	Phosgene Dura
Chlorine	Hydrogen Sulfide	Phosgene Medi
Chlorine/Chlorine Dioxide	Mercury	Sulfur Dioxide
Formaldehyde	Ozone	
2. SafeAir Color Comparators:

Chlorine	Hydrogen Chloride	Phosgene Dura
Chloroformates ¹	Phosgene	Phosgene Medi
Hydrazine	Phosgene ext. range	

If you require SafeAir monitors for a chemical hazard not listed, please contact Morphix Technologies® for a free compound consultation at (800) 808-2234.

¹ To be used with the SafeAir phosgene badges