



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

Introduction

Based on the available toxicity data in animals and epidemiologic studies of humans, aromatic diisocyanates such as toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (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).

TDI and MDI are commonly used to make various polymers including 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 American Chemistry Council - Frequently Asked Questions (<https://dii.americanchemistry.com/Frequently-Asked-Questions/>)

Principle of Operation

The SafeAir TDI/MDI badge is a monitoring system designed to indicate the presence of TDI and/or MDI at concentrations below the permissible exposure limit. The SafeAir TDI/MDI 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.

Physical Specifications:

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

Sampling Parameters:

Sensitivity (exposure dose):	
Badge	5 ppb-hr
Badge with MDI color comparator	5 – 140 ppb-hr
Badge with TDI color comparator	5 – 140 ppb-hr
Minimum detectable limit (8 hours)	0.6 ppb
Maximum recommended sampling time	24 hours
Minimum recommended sampling time	15 minutes
Relative humidity range	11% - 87%
Face velocity range	10 – 100 cm/sec
Temperature range	15°C - 32°C (60°F - 91°F)
Light effect – UV (direct sunlight)	not recommended >4hrs
Light effect – visible	no effect
Color stability	two weeks

Known Interferences: Other aromatic diisocyanates and high concentrations of hydrazine

Operating Instructions

- 1) Prior to removing the badge from its protective pouch, allow the badge to warm to room temperature.
- 2) 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.
- 3) For area monitoring, attach the badge to a stand and mount in a centralized area with the front side exposed to the surrounding atmosphere.
- 4) The exclamation mark begins to appear within the triangle on the front of the badge when TDI and/or MDI are present at the sensitivity level.
- 5) To determine exposure dose, a SafeAir TDI color comparator (PN: 383005) and SafeAir MDI color comparator (PN: 383006) are available for use with this badge. To obtain the average concentration, divide the exposure dose (ppb-hr) by the exposure time in hours (hr).
- 6) **When using a comparator, read badge within one hour of the end of the sampling period or return badge to its original pouch for reading within 24 hours of the end of the sampling period.**

WARRANTY EXCLUSIONS AND LIMITATION OF LIABILITY

IF THE USER DOES NOT ACCEPT THE FOLLOWING TERMS, THE USER SHOULD NOT USE THE SAFEAIR BADGES AND COLOR COMPARATORS.

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



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