February 1, 2012

EPA Chemical Action Plans on MDI and TDI

Lee Salamone
Senior Director
ACC Center for the Polyurethanes Industry

American Chemistry Council
EPA Approach for Comprehensive Chemical Management

• September 29, 2009 announcement

• Enhance chemical management under existing authority under TSCA

• Identify chemicals that pose a concern to the public

• Move quickly to address them and determine how to manage risk

• Initiate appropriate action
Principle Provisions of TSCA

- Section 4 - testing of existing chemicals
- Section 5 - screening of new chemicals or new uses of existing chemicals
- Section 6 - risk management
- Section 8 - information collection and reporting
- Section 7 – imminent hazard
- Section 9 - relationship of TSCA to other federal laws
- Section 11 – inspections
- Section 12 - chemical export
- Section 13 - chemical import
- Section 14 – CBI
- Sections 15, 16 and 17 - prohibited acts, penalties & EPA's enforcement powers.
- Section 20 and 21 - citizen actions
- Section 26 – use of categories versus specific substances
Existing Chemicals - Reporting & Testing

TSCA Inventory

- Section 8(a): EPA can collect info on exposure, use, production.
- Section 8(d): EPA can collect info on ongoing or existing studies.
- Section 8(c): Companies retain allegations of adverse effects and submit it to EPA upon request.
- Section 8(e): Companies immediately report substantial risk info to EPA.
- Section 8(b): Inventory Update - Companies report production & use info for substance above threshold.

Section 4 test rules - manufacturers can be required to conduct tests on specified chemicals.

Section 6 - EPA addresses unreasonable risks through restrictions, warning labels, recordkeeping, product bans.
What is in a Chemical Action Plan?

- Summary of available hazard, exposure, and use information
- Outline of the risks EPA believes each chemical may present
- Identification of the specific steps the Agency plans to take to address those concerns (initiate appropriate action)
Effect of a Chemical Action Plan

- CAPs are pronouncements by EPA that a particular chemical may pose a concern to the public

- There may be media and public attention, including attention to where the chemical is used and how members of the public might be exposed

- A CAP can invite discussion of product reformulation or de-selection even if it is not warranted
<table>
<thead>
<tr>
<th>Date</th>
<th>CAPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/30/09</td>
<td>PBDEs (penta, octa, deca)</td>
</tr>
<tr>
<td>12/30/09</td>
<td>Phthalate esters (8)</td>
</tr>
<tr>
<td>12/30/09</td>
<td>Short-Chain chlorinated paraffins</td>
</tr>
<tr>
<td>12/30/09</td>
<td>Perfluorinated chemicals</td>
</tr>
<tr>
<td>3/29/2010</td>
<td>Bisphenol A</td>
</tr>
<tr>
<td>8/18/2010</td>
<td>Benzidine Dyes</td>
</tr>
<tr>
<td>8/18/2010</td>
<td>Hexabromocyclododecane (HBCD)</td>
</tr>
<tr>
<td>8/18/2010</td>
<td>Nonylphenol and Nonylphenol Ethoxylates</td>
</tr>
<tr>
<td>4/13/2011</td>
<td>MDI</td>
</tr>
<tr>
<td>4/13/2011</td>
<td>TDI</td>
</tr>
</tbody>
</table>
TDI/MDI Chemical Action Plans

- Both plans were released on April 13, 2011
- EPA chose not to propose TDI or MDI as a “chemical of concern” for regulation under TSCA Section 5(b)(4)
- Focus is on potential consumer exposures to uncured (unreacted) products that may contain diisocyanates (e.g., coatings, adhesives, sealants, elastomers) and “bystander exposure” to other products
- Both plans state that products made out of cured polyurethane are generally considered to be inert and non-toxic
- No imminent deadlines are associated with documents that were released (comment period until 5/1/2012)
TDI/MDI Chemical Action Plans

- EPA has not indicated that it is thinking about any broad restrictions on the use of diisocyanates

- **EXCEPT:** A proposed SNUR on the presence of unreacted TDI in consumer products

- Their stated position is that more information is needed to develop better guidance and to inform any next steps, and it is focusing FIRST on developing that additional information
Potential Agency Actions

EPA considering requesting/requiring (via regulatory authority):

- Significant New Use Rule (SNUR) or industry voluntary phase-out of TDI in uncured consumer products
- Via TSCA 8(c), reports of significant adverse effects from uncured TDI/MDI
- Via TSCA 8(d), reports of relevant unpublished health and safety studies for uncured TDI/MDI
- Via TSCA Section 5, conduct of exposure monitoring studies in representative locations where commercial products with uncured TDI/MDI would be used. Also considering requiring exposure monitoring studies on uncured MDI in consumer products
Potential Agency Actions (Cont’d)

- EPA considering a rulemaking for commercial uses of uncured TDI/MDI products in locations where the general population could be exposed. EPA also considering a rulemaking for uncured MDI in consumer products.

- EPA may consider identifying additional diisocyanates and their related polyisocyanates that may be present in an uncured form in consumer products that should be evaluated for regulatory and/or voluntary action.
EPA’s Next Steps

• EPA plans to draft a request for submission of TSCA 8(c) records, and rule requiring submission of 8(d) studies in Spring 2012

• EPA plans to issue a TSCA Section 8(c) request followed by a Section 8(d) Rule

• Information obtained from the 8(c) and/or 8(d) will be used to determine whether any Section 4 or Section 6 actions are warranted

• EPA is working on a SNUR for consumer uses of uncured TDI—could be a year in development
TSCA 8(c)

- Requires companies to keep records on allegations of harmful effects caused by chemicals
- No rulemaking needed by EPA
- Applies to allegations concerning any chemical substance or mixture regulated under TSCA
- Also covers allegations of adverse health or environmental effects from a particular facility, process, or activity, an article containing a chemical substance or mixture, or a facility discharge
TSCA 8(d)

• Gives EPA authority to require companies that manufacture, process, or distribute in commerce chemical substances or mixtures to submit to EPA lists and copies of health and safety studies
  • “conducted or initiated by or for such company with respect to such substance or mixture and any time; known to that company, or reasonably ascertainable by that company”

• Rulemaking by EPA need to identify chemicals subject to submittal and initiate process
ACC Path Forward

- ACC Action Plan Team formed
- Value chain outreach and partnerships with related ACC members and trade associations representing user groups
- Identifying uses of MDI/TDI in products likely to be used by consumers focusing on likely sources of unreacted isocyanates
- Focusing on enhanced product stewardship of such products
- Continuing research largely focused on potential exposure to products containing uncured MDI
ACC Path Forward

• Respond in some form to Action Plans (provide up-to-date information and correct some inaccuracies during comment period until 5/1/2012)

• Maintaining an open dialogue with EPA to discuss the Agency’s plans for implementing the Action Plans

• We continue to update EPA on the progress of our spray foam product stewardship activities

• Discussing among the many interested parties inside and outside ACC next steps

• Fact sheets

• Webinars
How You Can Respond

• Understand your products (which products are available to consumers, which products have potential to expose consumers, especially children, to “uncured” MDI or TDI)

• Consider measuring exposure potential during product use

• Evaluate your product stewardship efforts

• Consider your response to what EPA may suggest (voluntary phase out, request for additional information, etc.)

• Participate in ACC activities related to the CAP and invite additional interested associations or groups
Contact

Lee Salamone
Senior Director
ACC Center for the Polyurethanes Industry
(202) 249-6604
Lee_Salamone@americanchemistry.com
Questions?
February 1, 2012

CPI SPF Research Workgroup Update

Scott Ecoff, Bayer MaterialScience
CPI SPF Research Projects

- Evaluate Potential Worker Exposure During SPF Spraying
  - SPF Ventilation Study
- Evaluate SPF Chemical Emissions After SPF Application
  - Indoor Air Quality Study
SPF Ventilation Research Project
SPF Ventilation Research Project

Purpose

- Determine the effectiveness of ventilation on airborne concentrations of SPF chemicals during application

Research consists of 3 Phases

- Phase 1 - Develop SPF Generic Formulations and Perform Spray Test to Verify Acceptability
- Phase 2 - Monitor chemical emissions during SPF application under controlled environmental conditions
- Phase 3 - Conduct field testing to verify Phase 2 results
Phase 1

Developed Generic Spray Foam Formulations

- Committee investigated and agreed to three (3) formulations
  - A low density ½ lb or open cell foam
  - A medium density 2 lb or closed cell formulation
  - A low pressure 2-component kit
- Formulations are similar to what is used in industry
Phase 1

Generic SPF Formulations applied using standard spray equipment

- 5 member companies tested the $\frac{1}{2}$ lb and 2 lb formulations using manufacturer recommended spray parameters (i.e. pressure and temperature)
- 2 member companies tested the low pressure spray kit
- The amount of foam used (lbs) and the densities plus other physical characteristics were recorded
- SPF applied to a substrate of approximate area of 3 ft x 7 ft (substrate constructed with 2 inch x 6 inch studs, 16 inches on center to create two wall cavities)
- SPF applied to achieve normal thickness
Phase 2

- Personal and area monitoring to be conducted while generic SPF formulations are applied under controlled air exchange rates and environmental conditions
- ½ lb and 2 lb formulations to be sprayed using typical industry high pressure equipment
- Low pressure kit formulations to be sprayed using manufacturer supplied equipment
1. **Spray room**
   - 8 ft x 8 ft x 8 ft ventilated enclosure
   - Make-up air at 75°F/50% humidity
   - Testing to be conducted at 0.3, 2, 5, and 10 Air Changes per Hour (ACH)

2. **Spray structure**
   - 3 ft x 7 ft spray substrate (same as Phase 1)
   - 2 cavities for SPF application

3. **Air monitoring conducted by Industrial Hygiene contractor during foam application**
   - For each generic formulation
   - At each air exchange rate (0.3, 2, 5, 10 ACH)
Phase 2 - Ventilated Enclosure

Spray Area

Airlock

7'9”

8’2” High

7’9”

Spray Room Area

22’

25’

Breathing Air

Polyol

Spray Machine

Iso drum
1. Test Protocol
   - Components to be evaluated:
     - MDI/PMDI
     - Amine catalysts
     - Blowing Agents
     - Fire Retardant
   - Sample locations = 1 personal + 2 area
   - Sampling sessions at each ventilation rate = 3 to 4
   - Air sample time per test = 10 to 15 min

2. Time to complete Phase 2 = 8 weeks (estimated)
Phase 3

- Monitoring conducted in a medium-sized residential building during the application of the 3 generic formulations
- Work area to be equipped with ventilation units capable of providing air exchange rates of 0.3, 2, 5, and 10 ACH
- Purpose - Determine if air exchange rates used in Phase 2 provide similar results in the Phase 3 field study
- Total Phase 3 project time = 8 weeks
Current Project Status

- CPI will prepare a written report summarizing the Phase 1 findings
- Industrial hygiene contractor will prepare reports summarizing Phase 2 monitoring results
- Next steps include completing Phase 3 and complying data
- Final report will be shared with participants and federal agencies
Product Emission Testing
Develop a testing protocol for use by SPF manufacturers to evaluate potential chemical emissions released from SPF samples

CPI joins ASTM sub-committee on Indoor Air Quality to assist in development of SPF product emission test standards
ASTM Subcommittee D22.05 on Indoor Air Task Group on SPF Emissions

Work Item WK30960

- New standard determination of volatile organic compounds, diisocyanates, oligomeric isocyanates, amine catalysts, fire retardants and other potential constituents emitted from spray polyurethane foam insulation (SPFI) products designed for on-site application in buildings

Proposed work item at ASTM D22 Air Quality Meeting held in October 2010

Technical Contact / Task Group Chair

- John Sebroski, Bayer MaterialScience

Subcommittee Chair

- Alfred Hodgson, Berkeley Analytical Assoc.

Several Task Group Members

- Industry / CPI, Regulatory, Instrument Vendors (micro chamber, thermal desorption), Consultants, Testing Labs, Certification Programs, Other Stakeholders
ASTM Work Item WK30960

Work item covers the development of several possible standard practices or test methods including:

- Standard Practice for Development of Generic SPF Formulations
- Standard Practice for Spraying, Sampling, and Packaging SPF Samples for Chamber Testing
- Standard Test Method for Use of Thermal Desorption Tubes for SPF Chemical Emission Testing
- Standard Test Method for Measuring MDI using LC MS/MS During Chamber Testing/IAQ Studies
- Standard Practice or Method for Estimating SPF Emissions using Micro-scale Test Chambers
Recent Task Group Meetings

ASTM Spray Foam Workshop held October 31, 2011

- Over 50 stakeholders attended workshop (regulatory agencies, industry, instrument manufacturers, labs, consultants)
- Presented preliminary findings of initial emission research on SPF generic formulations; analytical test method development, holding time and packaging, evaluation of micro-scale chambers for MDI recovery and potential wall effects.

IAQ Committee D22.05 meeting held November 1, 2011

- Discussed findings from Workshop on SPF Insulation
- Discussed the development of needed Standards related to SPF emissions (i.e. Preparing SPF generic formulations; Spraying, Sampling, and Packaging SPF samples, Analytical Test Methods for SPF Emissions, Use of Test Chambers)
- D22.05 meets two times/year; and holds periodic conference calls to discuss project progress/new developments
Evaluating Chambers including micro-scale chambers for testing of SPF insulation compared to conventional test chambers

- Minimize wall effects for semi-volatile compounds

Evaluating sampling and analytical techniques for capturing and measuring MDI, amine catalysts, flame retardants, and other potential constituents of SPF insulation

- Evaluate existing industry analytical methods
- Thermal desorption GC/MS (relatively new approach for spray foam work)

Investigating other innovative approaches for answering important questions related to assessing chemical emissions from SPF insulation and the establishment of building re-occupancy times after installation of SPF products
Questions?