US EPA & Federal Partners Efforts to Understand & Promote the Safe Use of Polyurethane Products & EPA’s Proposed Regulatory Actions under the Toxic Substances Control Act (TSCA) for Diisocyanates

SPFA Convention & Expo
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Presented by:
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Presentation Outline

- EPA’s Concern for Isocyanates, SPF and other Polyurethane Products
- Partnerships & Stewardship Goals
- Challenges & Progress
- Background on TSCA Isocyanates Action Plans
- Other Activities
  - Information Gathering Approaches
  - Voluntary Information Request Letter on Curing Rates of PU Products
  - Test Method Development
  - Significant New Use Rule (SNUR)

- Summary
- Information Sources
EPA’s Concerns for Isocyanates and Polyurethane Products

- SPF and other polyurethane products can be mixed, applied, and/or manufactured on-site in a home, school, or other buildings.

- Diisocyanates in vapors, aerosols, and dust can cause:
  - Asthma, respiratory & breathing problems,
  - Skin, eye, and dermal irritation,
  - Sensitization, and
  - Can trigger severe asthma attacks in sensitized persons, even at very low levels.

- Amine catalysts, flame retardants, blowing agents and other ingredients or reaction products, such as aldehydes, may also cause health and environmental effects.
Partnerships

• Federal Partnership:
  • US Environmental Protection Agency
  • Occupational Safety and Health Administration
  • National Institute for Occupational Safety and Health
  • The Consumer Product Safety Commission (CPSC)
  • The Agency for Toxic Substances and Disease Registry (ATSDR)

• Engagement with Industry Representatives:
  • American Chemistry Council (ACC)
  • ACC’s Center For Polyurethanes Industry (CPI)
  • Spray Polyurethane Foam Alliance (SPFA), representing applicators
  • Individual Chemical and Polyurethane Product Manufacturers
Stewardship Goals

• Avoidance of misleading or deceptive marketing claims.
• Communication of hazards, as well as benefits of SPF.
• Develop & adopt practices to prevent harmful exposures:
  • Ensure workers are trained on hazards, processing and equipment, curing rates, performance, as well as communicating with others.
  • Ensure worksite isolated and restricted to workers wearing appropriate personal protective equipment (PPE).
  • Provide guidance on safe re-occupancy times and ventilation.
• Address research needs and data gaps.
Challenge – Misleading and/or Deceptive Marketing Claims

- “No off—gassing,” “non—toxic,” “green,” “environmentally friendly,” “plant-based,” “made from soy beans,” etc.
- Little may be revealed about chemical ingredients and potential hazards/risks.
- DIY programs showing improper protection.
- On-line videos showing untrained/unprotected application of products.
Progress in Addressing Misleading Marketing Claims

- US Federal Trade Commission (FTC) Green Guides
- Enhanced Energy Star Residential Insulation Partnership Requirements:
  - Clear and specific safe installation practices and PPE.
  - Documentation for performance and environmental claims.
  - Safety Data Sheets on chemical reactants with hazard information listed.
  - Safe re-entry times for other workers and home occupants after installation.

- Industry guidance -
  - http://www.spraypolyurethane.org/ GreenMarketingClaims
  - Guidance for Videos or Images Showing Spray Polyurethane Foam (SPF) Application
  - Hazard Information to Consider when Labeling of Diphenylmethane Diisocyanate (MDI), polymeric MDI and Isocyanate-terminated MDI prepolymerms Containing Products for the Consumer Marketplace.
Challenge – Hazard Communication

- Availability of Safety Data Sheets (SDSs).
- Hazard and exposure control information may vary.
- Recommendations on respiratory protection, including guidance on protection for “adjacent workers.”
- Although adequate ventilation described as needed, little guidance on what constitutes adequate ventilation and methods.
- Identification that skin contact may cause an allergic reaction and sensitization.
- Identification that dust can be generated during cutting or abrasive processes.
Progress in Addressing Hazard Communications

- Federal – US EPA Spray Polyurethane Foam website, OSHA’s Green Jobs site and National Emphasis Program, NIOSH ALERTS, numerous resources and information pages across federal Agency websites on isocyanates and other chemical hazards (see resources).

- Industry - Product stewardship activities:
  - Fact sheets, technical bulletins, websites & portals, see http://spraypolyurethane.org/default.aspx
  - Other - Spray Foam Magazines, industry newsletters, blogs, Green Building webinars, technical panels at conferences, goals in product sustainability standards.
EPA’s Approach to Best Practices

- Identify established practices for engineering or process efficiencies & control technologies to reduce exposures and environmental releases,
- Review existing worker training materials & practices addressing the use of PPE and control technologies, and
- Solicit recommendations for innovative practices from industry and field experts, capturing the following:
  - Identify job related tasks.
  - Safe work practice(s).
  - Exposure reduction/prevention potential of the safe work practice.
  - Other relevant information (i.e., pros and cons) associated with the safe work practice.
EPA Guidance

- Checklists for installers and communicating with homeowners.
- Ventilation Guidance for SPF Applications/Automotive Shops.
- Self-evaluation tool for contractors of practices and strategies to protect workers and promote the safe use of polyurethane products.
  - Periodic assessment tool of their current practices and identify areas for improvement.
  - Includes the following:
    - Over 175 Activities (safer workplace practices).
    - Potential for exposure & impact on worker exposure.
    - Four key-operation phases: on-going, pre-application, application, and post-application.
**Challenge - Training**

- Ensure that **all workers** receive comprehensive training on hazards, curing rate, performance, equipment and processing, as well as communicating with others, including homeowners.

- Ensure premises are restricted to workers wearing appropriate personal protective equipment (PPE).

- Innovative solutions to prevent chemical migration should continue to be developed and shared to ensure industry-wide practice.

- Ensure homeowners, teachers and students, and the general public are not exposed to hazardous chemicals during and after polyurethane product applications.
Progress in Training

• Industry – ACC’s on-line H&S training & testing courses:
  • Low Pressure SPF Chemical Health and Safety Training
  • High Pressure SPF Chemical Health and Safety Training
    • See http://spraypolyurethane.org/SPF-Chemical-Health-and-Safety-Training

• SPFA certification and accreditation program:
  • SPF Professional Certification Program (PCP) for assistants, installers, master installers, program managers, and field examiner, see http://www.sprayfoam.org/index.php?page_id=4557

• Training courses at conferences/conventions
• Chemical or Product Manufacturer-Contractor training
MDI and TDI Action Plans

- **Diisocyanates:**
  - Recognized as dermal and inhalation sensitizers
  - May cause asthma, lung damage, and in severe cases, fatal reactions

- **EPA is concerned about potential exposures to consumers and/or those commercial workers not covered under OSHA regulations, and the general population that could result from the use of products containing unreacted MDI, TDI, and related compounds.**
  - e.g., application of spray-applied sealants and coatings when such products are used in or around buildings such as homes or schools
Summary of MDI & TDI Action Plans

- Based on EPA’s screening-level review of hazard and exposure information EPA will consider the following actions:
  - Initiate TSCA section 8(d) reporting for unpublished health and safety studies.
  - Consider initiating a TSCA section 4 test rule to require exposure monitoring studies.
  - Initiate rulemaking under TSCA section 5(a)(2) for a Significant New Use Rule (SNUR) designating certain uses of TDI in a consumer product as a new use requiring prior notice to the Agency.
Other Potential Regulatory Actions

- Consider issuing a data call-in under TSCA section 8(c) Allegations of Adverse Effects
- Consider TSCA section 6 action that gives EPA the authority to protect against unreasonable risk of injury to health or the environment -
  - If EPA finds that there is a reasonable basis to conclude that the chemical's manufacture, processing, distribution, use or disposal presents an unreasonable risk.
  - Actions could include but are not limited to: prohibiting or limiting manufacture, processing, or distribution in commerce of a chemical; requiring warnings and instructions with respect to use, distribution, or disposal; and/or, recordkeeping requirements.
For the purposes of carrying out TSCA, EPA requested companies voluntarily provide certain information

- EPA specifically requested information in their possession on the curing time required to chemically react all diisocyanate functional groups, and
- The amount of time required to safely re-occupy or use an area where diisocyanates have been reacted

The Agency is reviewing the information to determine what it tells us about consumer and worker exposure to polyurethane products.

EPA received the following types of data as a result of our request including:

- Formulation Data
- Safety Data Sheets
- Industrial Hygiene Studies
- Curing information
Test Methods to Measure Emissions

- Need methods and data that paint the picture of “source-to-exposure,” over the product life-cycle capturing “normal” cure phase emissions as a benchmark for evaluating emissions and off-spec conditions, wherein –
  - A methodology is a tool that industry uniformly uses to evaluate product formulations, providing reliable data to better assess the potential for exposures.
- EPA’s Office of Research and Development is developing test methods and protocols to generate reliable data to fill knowledge gaps, including
  - What is emitted and for how long and factors that may impact emissions?
  - This work supports the ASTM Committee D 22.05 SPFI emissions test method development task.
Significant New Use Rules (SNURs)

- TSCA section 5(a) authorizes EPA to determine that a use of a chemical substance is a “significant new use.” EPA must make this determination by rule after considering all relevant factors, including:
  - The projected volume of manufacturing and processing of a chemical substance.
  - The extent to which a use changes the type or form of exposure of human beings or the environment to a chemical substance.
  - The extent to which a use increases the magnitude and duration of exposure of human beings or the environment to a chemical substance.
  - The reasonably anticipated manner and methods of manufacturing, processing, distribution in commerce, and disposal of a chemical substance.

- A SNUR requires that manufacturers and processors of the chemical subject to the SNUR notify EPA at least 90 days before beginning any activity that EPA has designated as a "significant new use.”

- EPA will designate certain uses of TDI and TDI related compounds in consumer products as a new use requiring prior notice to the Agency.
Summary

• The SPF industry needs to ensure:
  • There is comprehensive and clear hazard communication for all SPF users – applicators, assistance, other trades, do-it-yourselfers, consumers, and other decision-makers (i.e., building managers, etc.).
  • Consumers need clear hazard and use warnings, such as through product labeling and communications with commercial contractors.
  • The work site is restricted to only those wearing appropriate personal protective equipment.
  • Quality control - avoid installation of off-spec, poor performance polyurethane materials. (see saferproducts.gov for complaints of off-gas persistence).
  • Guidance is provided on re-occupancy time & long-term ventilation (H-VAC) needs.
  • Marketing claims are accurate and balanced.
Where to Get More Information?

- FTC Green Guides: [http://www.ftc.gov/os/2012/10/greenguides.pdf](http://www.ftc.gov/os/2012/10/greenguides.pdf)
- International Research Conference (Isocyanates & Health: Past, Present, & Future, April 2013, Bolger Center in Potomac, MD), [http://www.isocyanates2012.org/content/home.cfm](http://www.isocyanates2012.org/content/home.cfm)
- ASTM Methods (D22.05) for measuring chemical emissions from Spray Polyurethane Foam.
- Project Coordinators: Carol Hetfield; 202-564-8792; hetfield.carol@epa.gov
  & Katherine Sleasman; 202-564-7716; sleasman.katherine@epa.gov
Isocyanates National Emphasis Program
CPL 03-00-017

Sven J. Rundman III
OSHA
Directorate of Enforcement Programs
Office of Health Enforcement
Background & Objectives

- OSHA resources focus on the workplace serious health effects associated with occupational exposure to isocyanates.

- Isocyanates NEP effective on June 20, 2013.
  - Covers ALL isocyanates.
  - Includes field guidance on site selection, inspection procedures, & exposure assessments.

- Combines enforcement and outreach efforts to raise awareness to employers, workers, and safety and health professionals.
Background (con’t)

- Used in the formulation of many products.
  - Insulation
  - Packaging material
  - Blown foam
  - Paint

- OSHA Permissible Exposure Limits (PEL) – MIC, MDI, TDI
- Other Occupational Exposure Limits (OEL) – NIOSH, ACGIH

- Health Effects from workplace exposure.
  - Occupational Asthma
  - Dermatitis
    - Studies indicate that dermal exposure is a significant cause of respiratory sensitization.

NIOSH = National Institute for Occupational Safety and Health
ACGIH = American Conference of Governmental Industrial Hygienists
Appendix A –

Primary targeting list compiled using 1) NIOSH Health Hazard Evaluations; 2) inspection sampling data (SLTC) – known overexposures; and 3) available workers’ compensation data.

<table>
<thead>
<tr>
<th>SIC</th>
<th>SIC Title</th>
<th>NAICS</th>
<th>NAICS Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2599</td>
<td>Furniture and Fixtures</td>
<td>339950</td>
<td>Sign Manufacturing</td>
</tr>
<tr>
<td>3442</td>
<td>Millwork/Metal Window and Door Manufacturing</td>
<td>332321</td>
<td>Wood or Metal Framed Windows &amp; Door Mfg.</td>
</tr>
<tr>
<td>3792</td>
<td>Travel Trailers and Campers</td>
<td>336214</td>
<td>Travel Trailer &amp; Camper Mfg.</td>
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</tbody>
</table>

Secondary targeting list similar but for settings with no known overexposures.

SLTC = Salt Lake Technical Center (OSHA)
Inspections are made whenever a complaint/referral is received; or a CSHO observes an activity where potential worker exposure to isocyanates are suspected.

<table>
<thead>
<tr>
<th>SIC</th>
<th>SIC TITLE</th>
<th>NAICS 2007</th>
<th>NAICS TITLE</th>
</tr>
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<tbody>
<tr>
<td>1721</td>
<td>Painting and Paper Hanging</td>
<td>238230</td>
<td>Painting and Wall Covering Contractors</td>
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<tr>
<td>1742</td>
<td>Plastering, Drywall, Acoustical, and Insulation Work</td>
<td>238310</td>
<td>Drywall and Insulation Contractors</td>
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<tr>
<td>1752</td>
<td>Floor Laying and Other Floor Work, NEC</td>
<td>238330</td>
<td>Flooring Contractors</td>
</tr>
<tr>
<td>1793</td>
<td>Glass and Glazing Work</td>
<td>238150</td>
<td>Glass and Glazing Contractors</td>
</tr>
<tr>
<td>1799</td>
<td>Special Trade Contractors, NEC</td>
<td>238150</td>
<td>Glass and Glazing Contractors</td>
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</tbody>
</table>

CSHO = Compliance Safety and Health Officer
Site Selection

- NEP maintains flexibility for an OSHA area office to use their judgment in adding sites based on local knowledge where exposure would be anticipated.
  - For example – SIC 7500/NAICS 811121 – “Auto repair”

- If an establishment is not one of the targeted but the CSHO has verified that the establishment is using isocyanates, an inspection following the NEP can be initiated.
CSHOs will review:

- OSHA 300 Injury and Illness logs (if applicable).
- Hazard Communication program (written program, labeling, safety data sheets (SDSs), training).
- Personal Protective Equipment (PPE) hazard assessment.
  - Evaluate the effectiveness of PPE.
  - Check for effective respiratory protection program including medical evaluation, fit–testing, training, and respirator cleaning.

Health Surveillance Form (non–mandatory) available to CSHOs when interviewing workers.
Exposure Assessments

- CSHOs will be prepared to collect personal air samples on day of the inspection.

- Wipe samples may be collected to determine surface, dermal, and/or PPE contamination.
  - Wipe samples collected from expected (e.g., tools, work benches) and unexpected (e.g., drinking fountains, lockers, inside PPE) areas.
## OSHA Enforcement

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Issue Citation</th>
<th>Consider 5(a)(1) violation</th>
<th>Consider HAL</th>
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</thead>
<tbody>
<tr>
<td>&gt; PEL</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No PEL, but &gt; OEL,</td>
<td></td>
<td>✓</td>
<td>If 5(a)(1) not issued or elements not met</td>
</tr>
<tr>
<td>&lt; PEL, but &gt; OEL,</td>
<td>see FOM, Chapter 4, Section XIII.B.1.e</td>
<td>✓ If serious illnesses/or health effects present and employer recognizes the hazard</td>
<td>If 5(a)(1) not issued or elements not met</td>
</tr>
<tr>
<td>Reported illnesses/health effects (even if no overexposures have been documented)</td>
<td>✓ If serious illnesses/or health effects present and employer recognizes the hazard</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**5(a)(1) elements:**
(1) The employer failed to keep the workplace free of a hazard to which employees of that employer were exposed;
(2) The hazard was recognized;
(3) The hazard was causing or was likely to cause death or serious physical harm; and
(4) There was a feasible and useful method to correct the hazard.

FOM = (OSHA) Field Operations Manual
HAL = Hazard Alert Letter
Enforcement Data

- Inspections (June 2013 – Jan 2014)
  - 110 inspections
    - Roofing
    - Drywall & Insulation
    - Bldg Finishers
    - Chemical Mfg.
    - Paint/Coating Mfg.
    - Shipbuilding & Repair
    - Automotive Body & Paint

- Top Violations Cited
  - 1910.134 – Respiratory protection
  - 1910.1200 – Hazard communication
  - 1910.107 – Spray finishing using flammable and combustible materials
  - 1910.106 – Flammable liquids
  - 1910.132 – Personal protective equipment
## Enforcement Data

<table>
<thead>
<tr>
<th>Data Criteria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Inspections</td>
<td>110</td>
</tr>
<tr>
<td>% Programmed</td>
<td></td>
</tr>
<tr>
<td>% Unprogrammed</td>
<td></td>
</tr>
<tr>
<td>Number Inspections with Violations Cited</td>
<td>43</td>
</tr>
<tr>
<td>Total Violations Cited</td>
<td>181</td>
</tr>
<tr>
<td>% Cited as Serious</td>
<td></td>
</tr>
<tr>
<td>% Cited as S, W, R, FTA, Unclassified</td>
<td></td>
</tr>
<tr>
<td>Avg. Number Violations Cited per Initial Inspection</td>
<td>4.3</td>
</tr>
<tr>
<td>Avg. Current Penalty per Serious Violation</td>
<td>$2,028</td>
</tr>
</tbody>
</table>
Compliance Assistance/Outreach

- Appendices
- Isocyanates Safety & Health Topics page
- Letters to stakeholders
- Speeches
- CPI/OSHA Alliance

OSHA On–Site Consultation Program

- Free and confidential advice to small and medium-sized businesses in all states.

- On–site Consultation services are separate from enforcement and do not result in penalties or citations.

- Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing injury and illness prevention programs.

https://www.osha.gov/dcsp/smallbusiness/consult.html
NEP applies to General Industry, Maritime, and Construction.

Isocyanates cause many health effects including occupational asthma.

Targeting list built on NIOSH HHE evaluations, inspection sampling data (SLTC), and available workers’ compensation data.

Worker exposures can occur in expected and unexpected areas.

Employer may be subject to citation if workers exposed above PEL or OEL.

Compliance assistance available.

Stop by OSHA Booth #109
Questions?

Stop by OSHA Booth #109

www.osha.gov

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