PFAS – Demands for Safer Alternatives

December 4, 2018

Berkeley, CA
Per- & Polyfluoroalkyl Substances (PFAS)

- Entirely manmade – thousands of formulations in use
- Many are **extraordinarily persistent** in the environment, cannot be broken down by natural systems
- PFAS are detected in air, water, soil, sludge
- Many **bioaccumulate** at the top of the food chain – in birds, fish, livestock, and humans
- Environmental persistence leads to **global distribution** via air and water movement – releases here can be significant for communities on the other side of the world

Slide adapted from Andrew Lindstrom, US EPA
Some Uses & Sources of PFAS

Source: Green Science Policy Institute, reproduced with permission www.greensciencepolicy.org
PFAS Human Exposure Pathways

- Diet - Fish, seafood, garden produce
- Drinking water
- Incidental soil/dust ingestion
- Inhalation – may be significant

PFAS Health Effects

Animal toxicity
- Causes liver, immune system, developmental, endocrine, metabolic, and neurobehavioral toxicity.
- PFOA and PFOS caused tumors in chronic rat studies.

Human health effects associated with PFAS in the general population and/or communities
- Associated with kidney and testicular cancer, elevated total cholesterol, accelerated puberty, liver damage, obesity, immune system and thyroid disruption, and other health problems.
Northeastern Univ PFAS Contamination Site Tracker [https://pfasproject.com/pfas-contamination-site-tracker/](https://pfasproject.com/pfas-contamination-site-tracker/)
Alternatives to Carpets and Rugs with PFAS

Meredith Williams
BizNGO 2018 Annual Meeting
December 4, 2018
Alternatives already available for most uses

Inherently stain-resistant fibers such as:
- Wool
- Polypropylene
- Polyethylene terephthalate (PET)
- Polytrimethylene terephthalate (PTT)
- etc.

Chemical alternatives such as:
- Sulfonation
- Nanoparticle silicate clay-based repellent (Invista 2017)
- Non-fluorinated Duratech®
- Eco-Ensure
- Siloxane and silicone polymers
- Hydrocarbons
- Polyurethanes
- Dendrimers
Alternatives Analysis (Industry Step)

Alternatives Selection

- Manufacturer evaluation
- Public comment
- CBI protections
- Life Cycle Thinking

Life Cycle Thinking

Chemical Hazard Assessment

Exposure Analysis
Factors to be considered

- Public health impacts
- Environmental impacts
- Waste and end-of-life
- Environmental fate
- Materials and resource consumption
- Physical chemical hazards
- Physicochemical properties
- Exposure pathways and life cycle segments
- Product function and performance
- Economic impacts
Alternatives Analysis Guide Coverage

- AA framework
- Product requirements and alternatives
- Relevant factors
- Impact assessments
- Screening of alternatives
- Exposure
- Life cycle impacts
- Economic impacts
- Informational needs in AA
- Selection of alternatives
- Self-evaluation of AA
In California, 75% (257 million pounds) of the carpet discarded in 2016 was landfilled.
The challenge to manufacturers:
    What are the trade offs?
    What are the company’s values and criteria?
    What information is available?
    What are the data gaps?
    What will meet the performance criteria?
    Does this alternative have a downside?
Resources

Alternatives Analysis Guide – tools and resources for California’s AA process
https://dtsc.ca.gov/SCP/AlternativesAnalysisGuidance.cfm

Alternatives Assessment example review
https://dtsc.ca.gov/SCP/Alternatives_Analysis_Examples.cfm

Preliminary AA template
https://www.dtsc.ca.gov/SCP/Preliminary_AA_Report_Template.cfm
How a local government chooses safer alternatives: PFAS-free firefighting foam

Holly Davies, PhD, Research Scientist
• Multi-agency regional program
• 2 million residents
• 60,000 businesses
• Prevention and management
• Technical assistance and financial incentives
• Equity and Social Justice

Working Together to Reduce Hazardous Waste
www.HazwasteHelp.org
Safer Alternatives Strategy

• Leveraging TSCA
• Increase adoption and avoid regrettable substitutions
• Uniform system
• Regional partnerships
• Equity lens

• Examples
  • Dry cleaning (PERC)
  • Autobody paint
  • Methylene chloride
  • Residential cleaning
Washington State

- Drinking Water
  - Additional testing
  - Rulemaking for state levels
- Food contact paper ban (RCW 70.95G)
  - Entire class of PFAS
  - After Ecology alternatives assessment
- Class B firefighting foam (RCW 70.75A)
  - Entire class of PFAS
  - Use in training as of July 1, 2018
  - Sale as of July 1, 2020, with exceptions
  - Firefighting PPE notification to purchasers
Firefighting Foam Safer Alternatives

• Purchasers
  • Avoid regrettable substitutes
  • Focus on performance and cost
• Hazard and Exposure
• Lack of information

3. Composition/Information on Ingredients

[Blurred information due to privacy concerns]

[Image of a fire truck and a container]

does not contain PFOS or PFOA.
Lack of hazard information

SDS

3. Composition/information on Ingredients

3.1. Mixture

The following component(s) in this product are considered hazardous under applicable OSHA(USA)

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<thead>
<tr>
<th>Chemical name</th>
<th>CAS No</th>
<th>weight-%</th>
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<tbody>
<tr>
<td>2-Methyl-2,4-pentanediol</td>
<td>107-41-5</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Proprietary Hydrocarbon Surfactants</td>
<td>Proprietary</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Proprietary Hydrocarbon Surfactants</td>
<td>Proprietary</td>
<td>3 - 7</td>
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<td>1 - 5</td>
</tr>
<tr>
<td>Propan-2-ol</td>
<td>67-63-0</td>
<td>1 - 5</td>
</tr>
<tr>
<td>3-Butoxy-2-propanol</td>
<td>5131-66-8</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

Data Commons- GreenScreen
Safer Alternatives

- Third party certification
  - Disclosure and evaluation
  - GreenScreen hazard screen- Benchmark (1-4, U)
  - Lab analysis
- 24 manufacturers/100 F-free foams
All chemistry is green chemistry

Holly Davies, Ph.D.
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Adopting Safer Alternatives

Jen Jackson, Toxics Reduction & Healthy Ecosystems Program Manager
Precautionary Principle

Take anticipatory action to prevent harm, even if there is lack of full scientific certainty.
Drivers - Employee & Public Health
Drivers – Environmental Quality
Drivers – Zero Waste & Proper Disposal

No Bin
Our Priorities – Six Classes

- heavy metals
- solvents (VOCs)
- plasticizers
- flame retardants
- chlorinated antimicrobials
- fluorinated chemicals
First, always ask…

Is it necessary?
What we do...

• Seek strong third party certifications
• Assess performance
• Ensure enough products on the market
• Understand cost implications
• Develop compliant product lists
• Verify claims, when we can
Case Study: City Carpet Purchases

- Strong third-party certification?
- What are the performance needs/issues?
- If we eliminate the six classes, are there enough products on the market?
- What are the cost implications?
- Conducted survey of manufacturers to create product list
- Verified claims
Case Study: City Carpet Purchases

Cradle to Cradle Silver +
NO PFAS, PVC, Flame Retardants, Antimicrobials VOC limits
Case Study: PFAS in Foodware
Product Testing
Successful procurement contract

No PFAS
New Foodware Ordinance
Questions? Thank you!

Jen Jackson
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