



# Spray Polyurethane Foam Systems Containing Unreacted Diisocyanates

Safer Consumer Products Branch



California  
Environmental  
Protection Agency



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Department of  
Toxic Substances  
Control



# Topics for Discussion

- Priority Product: Description
- Why are they listed?
  - Chemicals of Concern
  - Hazards
  - Exposure Considerations
- Alternatives
- Market Information



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# Priority Product

- Spray polyurethane foam (SPF) systems containing unreacted diisocyanates
- Used for insulation, roofing, and filling and sealing
- GPC Brick 10002456 & 10002692



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# Priority Product



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# What is not included?

- Polyurethane products that don't involve spraying
- Other polyurethane products involving spraying, but not included in the profile
- Cured, rigid polyurethane foam



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# Why are these products selected?

- Vapors, aerosols, and particulates released during spraying may contain unreacted diisocyanates, which are considered chemicals of concern (COCs) by DTSC
- Exposure to diisocyanates may harm sensitive people



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# Chemicals of Concern

- Methylene diphenyl diisocyanate (MDI)
  - Mixed MDI isomers (CAS #: 26447-40-5)
  - 4,4'-Methylenediphenyl diisocyanate (CAS #: 101-68-8)
- ~~Toluene diisocyanates (TDI)~~
  - ~~Mixed (CAS #: 26471-62-5)~~
  - ~~2,4-Toluene diisocyanate (CAS #: 584-84-9)~~
  - ~~2,6-Toluene diisocyanate (CAS #: 91-08-7)~~
- ~~Hexamethylene-1,6-diisocyanate (CAS #: 822-06-0)~~



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# Why TDI and HDI no longer included

- TDI and HDI urethane coatings may be used in SPF roof systems.
- Urethane-based coatings are one of several options for SPF roof systems
- Polyurethane roof coatings and TDI and HDI need to be addressed separately



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# Hazard Considerations

Exposure to MDI through respiratory system, eyes, and skin could sensitize people, which can lead to occupational asthma and allergic contact dermatitis.



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# Hazard Considerations

Once sensitized, continued exposure may lead to:

- Severe asthma attacks
- Permanent lung damage
- Possible deaths



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# Demand Considerations

- Quantity / volume
- Popularity
- Recognition: energy savings



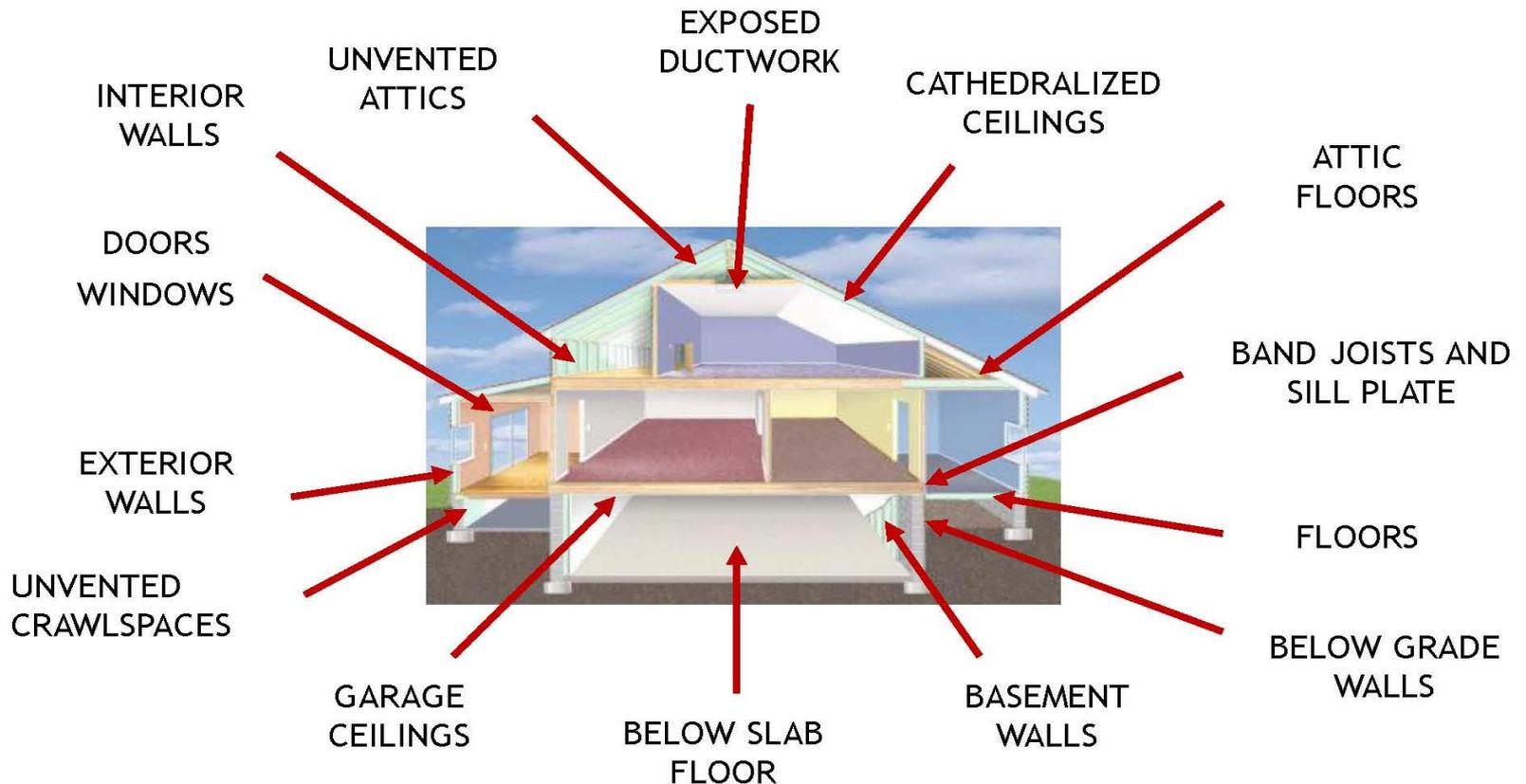
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# Demand Considerations

## SPF Uses (Rick Duncan, PHD, SPFA, 2014)



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# Exposure Considerations

- **Vapors**
- **Aerosols**
- **Particulates**



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# Exposure Considerations

Populations of particular concern:

- Contractors:  
small/independent
- Do-it-yourselfers (DIYers)





# Exposure Considerations

Some independent contractors and DIYers:

- Not fully aware of the risks
- Insufficient training
- Little or no PPE
- Lack of engineering controls



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# Are there alternatives?

- Alternative insulation materials
- Non-polyurethane foam technologies are emerging
- DTSC neither evaluated nor compared them.



# Market Information

- A few large companies supply SPF chemicals and formulations
- System houses make and distribute SPF systems
- Number of California-based system houses, product types, and production are unknown to the Department



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# How to comment?

We encourage written comments to be submitted by June 30, 2014.

- [SaferConsumerProducts@dtsc.ca.gov](mailto:SaferConsumerProducts@dtsc.ca.gov)

Thank you!



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# Topic 1: Priority Product Description

1. Are the definition and terms clear and unambiguous as to which related products are included or excluded?
2. Are there GPC GS1 brick codes that would be helpful in characterizing this product?
3. Are there other considerations for this Priority Product description that DTSC should know about?



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## Topic 2: Chemical(s) of Concern and Alternatives

1. Are there other Candidate Chemicals in this product that you suggest be considered?
2. Are there functionally acceptable alternatives to this Priority Product?
  - a. Are they commercially available?
  - b. Do they require the use of a replacement chemical?
  - c. Are there known hazards associated with these alternatives?
  - d. Are any potential replacement chemicals listed as Candidate Chemicals?



# Topic 3: Market Information

1. What is the market presence of the Priority Product?
2. How is the Priority Product marketed and/or sold?
3. What types of businesses are involved in the supply chain for manufacturing the Priority Product?



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