Eliminating Toxics in Carpet: Lessons for the Future of Recycling

BRIEF

An Optimizing Recycling Report by the Healthy Building Network
With Support from Changing Markets and the Global Alliance for Incinerator Alternatives

October 2017
This report explores the use of toxic chemicals in carpet and identifies pathways to remove them from recycled feedstocks. Following the established framework of our Optimizing Recycling series, it evaluates post-consumer carpet feedstock as delivered for incorporation into new products against a set of four criteria. The criteria gauge:

- Impacts on human health and the environment;
- Supply chain controls and transparency;
- The availability of “green jobs”; and
- Opportunities to expand use of the feedstock.

The review is focused on California, but the analysis of health and environmental impacts and supply chain controls is broadly applicable throughout the United States.

Post-consumer carpets collected for recycling contain substances of concern, including stain repellent treatments, antimicrobials, isocyanates, polyvinyl chloride, phthalates, flame retardants, fly ash, and toxic adhesives. Through our research, HBN identified 44 toxic chemicals commonly used in carpets and carpet adhesives. Neither manufacturers, nor third party organizations that certify carpet products, provide a full accounting of these substances. Many carpets, carpet pad, and carpet adhesives have obtained product certifications that assert certain attributes, like being free of “Red List” chemicals or VOCs; however, the standards upon which the certifications are based do not consider most of the 44 priority toxic substances we identified that are used in carpet.

Manufacturers are beginning to provide more robust information about their products through platforms like the Health Product Declaration and CRI’s new labeling program. These disclosures are important steps for many reasons:

- Processors need the information to efficiently sort and screen out unwanted materials, a prerequisite for increasing recycling rates in the future.
- Consumers need the information to select better carpets and reward manufacturers who improve.
- Regulators need better data to inform regulatory approaches that hold manufacturers accountable and incentivize toxic avoidance.
- Green chemistry innovators need the information to identify opportunities to provide improved chemistry and materials.

Key to dramatically accelerating recycling is an industrial transformation to real closed loop design. This can happen if toxics are designed out in favor of simple clean material streams for products designed for disassembly and recycling. Most of the toxic substances we’ve identified in this report can be replaced by other readily-available, less toxic chemicals. Dozens of carpet companies sell products in Europe that do not contain most of the priority substances. Leading carpet fiber manufacturers have eliminated fluorine-based treatments. Simple, hazard-free backings are also entering the market.

We urge the federal government and states to hasten this long-needed industrial transformation by acting to discourage or prohibit the use of certain highly toxic chemical classes that our research has identified as frequently or historically present in carpet as outlined in Table 1.

California is uniquely well positioned to lead this movement to a closed loop economy of safer carpet due to its leadership position in toxics legislation, hazard assessment across an increasing range of consumer products and the first ever extended producer responsibility mandate for carpet.
In the short term, additional action is needed for the industry to safely achieve California’s mandate to recycle 24 percent of post-consumer carpet waste by 2020. This is because manufacturers never disclosed the contents of most carpets that are being removed from buildings today. Doubling carpet recycling in two years will require a lot of diligence to ensure the feedstock is well-understood and does no harm as it is recycled. These measures should include testing for more than just fiber type in sorting operations, including improved occupational health practices to protect worker health.

The industry has much room to grow recycling through a combination of hazard avoidance, product redesign, and transparency. It is making tentative moves in this direction. Fully realized, this is a formula that works: it boosts recycling rates by creating clean material streams, protects human health and the environment, and saves energy and other resources.

A fundamental transformation of the carpet industry is needed if it is to become truly regenerative by design. HBN recommends that manufacturers, processors, consumers, product certifiers, retailers, and regulators and workers take the following actions, and those additionally outlined in the full report, to optimize carpet recycling.

**Recommendations include:**
- Banning the most toxic substances identified in this report and replacing them with other readily-available, less toxic chemicals;
- Incentivizing the design of fully recyclable carpets and removing substances that impede that process;
- Ensuring that toxic substances in carpet waste are identified and removed before they are recycled into

<table>
<thead>
<tr>
<th>Highly toxic chemical classes to eliminate from carpet design</th>
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<tr>
<td>PFAS stain repellants</td>
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<td>Certain antimicrobials (especially triclosan and formaldehyde-based)</td>
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<td>Isocyanates</td>
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<td>Phthalates</td>
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<td>Organotins</td>
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<td>Fly ash</td>
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<td>Halogenated and other toxic flame retardants (including carpet pad)</td>
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<td>Other endocrine disrupting chemicals such as bisphenols and nonylphenol ethoxylates (especially in adhesives)</td>
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*See Appendix 1 for a more detailed inventory of priority substances to eliminate from carpet and their hazards.*
new consumer products including carpet;

- Increasing and enforcing protections for workers in the recycling industry;
- Ensuring that product certifications more comprehensively protect human health;
- Holding manufacturers and certification schemes accountable, if they are misleading consumers;
- And, requiring that manufacturers and retailers fully and publicly disclose all material contents in new carpet.

For further information, and to see our full report on eliminating toxics from carpet, as well as reports on other recycled materials, visit http://www.healthybuilding.net/content/optimize-recycling.