U.S. Tire Manufacturers Association
Senate Environment and Public Works
Subcommittee on Chemical Safety, Waste Management,
Environmental Justice, and Regulatory Oversight

July 31, 2024

I. Introduction

Good afternoon, Chairman Merkley, Ranking Member Mullin and distinguished members of the Senate Environment and Public Works Subcommittee on Chemical Safety, Waste Management, Environmental Justice, and Regulatory Oversight. My name is Tracey Norberg, and I am testifying today on behalf of the U.S. Tire Manufacturers Association (USTMA).

II. USTMA overview

USTMA is the national trade association for tire manufacturers that produce tires in the United States. Our 12 member companies operate 57 tire-related manufacturing facilities across 17 states, making mobility possible. The U.S. tire manufacturing industry is responsible for more than 291,000 U.S. jobs in manufacturing, distribution, and retailing. The industry supports more than 510,000 additional U.S. jobs in supplier and induced activities, totaling more than 801,000 jobs nationwide. Tire manufacturing produces a direct economic impact of over $68 billion and generates over $21 billion in direct industry wages and nearly $19 billion annually in state and local tax revenue. In addition, the U.S. military depends on the tire manufacturing industry to supply tires to protect our military preparedness, national defense and homeland security. USTMA advances a sustainable tire manufacturing industry through thought leadership and a commitment to science-based public policy advocacy.

III. Overview and Context

A. What is 6PPD?

6PPD serves an essential safety function in tires as an antioxidant and antiozonant, protecting the components of the tire from attack by ozone, oxygen, and other factors. Without 6PPD, a tire's integrity would be severely and quickly compromised, jeopardizing driver and passenger safety. Any alternative identified to replace 6PPD must continue to ensure compliance with Federal Motor Vehicle Safety Standards (FMVSS) and other consumer, vehicle, and tire manufacturer requirements.

6PPD is currently used in all USTMA member passenger, light truck, truck and bus radial, and motorcycle tires. USTMA is not aware of any new motor vehicle tires available today that do not contain 6PPD.

6PPD-quinone, or 6PPDQ, is a recently discovered transformation product of 6PPD that may form when 6PPD reacts with oxygen or ozone under certain conditions. 6PPDQ is not used in U.S. tire manufacturing. Today there is no commercially available alternative to 6PPD that both provides comparable safety and performance in motor vehicle tires and minimizes potential environmental effects.

B. Efforts underway to identify an alternative

In December 2020, the same month that 6PPDQ was identified, USTMA requested the California Department of Toxic Substances Control (DTSC) to prioritize a review of 6PPD in tires under the California Safer Consumer Products Regulations (SCPR). To our knowledge, ours is the only industry that has ever asked to be part of the California program.

Once DTSC listed 6PPD in tires as a priority product, USTMA assembled a consortium of 32 tire manufacturers from across the world to prepare a Preliminary (Stage 1) Alternatives Analysis (AA) to identify and evaluate potential alternatives to 6PPD in tires. Individual Consortium members submitted the report to DTSC to meet the March 29, 2024 compliance date. On July 22, USTMA submitted an updated report in response to DTSC comments.

The Consortium is actively working to identify possible alternatives (appropriate reactivity with oxygen and ozone, proper migration rates through the rubber matrix etc.) that warrant further review of their potential impact to sensitive aquatic species. In support of this work, USTMA has initiated a joint research project with the U.S. Geological Survey to assess and refine methods of evaluating potential alternatives to 6PPD for use in tires.

In total, over 60 initial candidate alternatives were identified for screening and scoring for their suitability as possible alternatives to 6PPD in tires. In the Stage 1 AA Report, the Consortium considered different types of alternatives to 6PPD as an antidegradant in tires, including: (1) other phenylene diamines ("PPDs") that are the most logical and possibly most straight-forward alternatives to 6PPD, and (2) non-PPD possible alternatives that likely pose greater challenges in incorporating into tire chemistry.

40 of the over 60 initial candidates were subjected to an extensive review, which identified seven possible alternatives that warrant further evaluation in the Stage 2 AA. Of those seven possible alternatives, 4 are other PPD compounds, while 3 are non-PPD materials.

Below is a list of the possible alternatives identified:

Chemical Name	Acronym	CAS
N-(1,4-Dimethylpentyl)-N'-phenyl-p-phenylenediamine	7PPD	3081-01-4
N-Isopropyl-N'-phenyl-p-phenylenediamine	IPPD	101-72-4
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	77PD	3081-14-9
N,N'-Dicyclohexyl-p-phenylenediamine	CCPD	4175-38-6
Specialized graphene[1]	NA	1034343-98-0
Octyl gallate[2]	NA	1034-01-1
Nano calcium carbonate surface modified by gallic acid	NA	No CAS

[1]The materials referred to as graphene in the USTMA 6PPD Consortium Preliminary AA Report are graphene-based materials (sometimes referred to as a graphene nano-platelet) with a surface area not greater than 180 m2/g, and a carbon content greater than 99% and an oxygen content less than 1%. The lateral particle size of these materials is between 100 nm and 5 µm.

[2]Octyl gallate was investigated instead of propyl, butyl or pentyl gallates. Propyl gallate has been tested as an antiozonant for non-rubber applications. Propyl gallate, however, is expected to be less suitable for rubber than other gallate esters with longer carbon chains. Propyl gallate melts at 150°C, which is the temperature at which rubber is mixed. Natural rubber compounds are sometimes mixed at a lower temperature. Unless propyl gallate completely melts and is dispersed in the compound, it will not have an opportunity to function as an antiozonant. Octyl gallate is a much better choice because it melts at approximately 100° C and is sure to melt during mixing. Butyl gallate melts at 144°C so it may be acceptable, but octyl gallate has been used as a food additive, is more readily available and has more hazard information.

At the end of the Stage 2 AA, we are optimistic that we will have identified one or more possible alternatives that hold promise to replace or materially reduce 6PPD in motor vehicle tires, subject to future performance testing to ensure comparable tire safety and performance. Additional toxicity testing may need to be performed to satisfy regulatory requirements and to fill important data gaps. Simultaneously, USTMA is coordinating with the Washington State Department of Ecology as it progresses through its own, separate alternatives analysis process. USTMA is working closely with Ecology to ensure that any possible alternatives identified through our work with DTSC also meet Washington's criteria as their evaluation moves forward.

Outside our work with state regulators, USTMA has established a 6PPD Platform to facilitate the development as quickly and efficiently as possible of one or more candidate alternatives to 6PPD that ensures the safety of motorists and considers potential environmental and societal effects of the possible alternatives. Consistent with U.S. competition laws, the USTMA 6PPD Platform recognizes the benefits of collaborating in the pre-competitive space to save time, money, and resources, thus promoting competition while enabling USTMA, in partnership with chemical manufacturers, to facilitate the development of one or more viable alternative(s) to 6PPD quickly, effectively, and economically.

C. Supporting research and filling data gaps

USTMA's collaboration with Washington State Department of Ecology extends back to 2019, predating the identification of 6PPDQ and includes providing information on tire materials that may be found in stormwater discharge, providing technical expertise on identifying and researching tire and road wear particles (TRWP), and providing samples of cryogenically milled tire tread (CMTT) to support research on TRWP.

USTMA also plans to work with the U.S. Environmental Protection Agency (EPA) officials as they continue their evaluations of 6PPD under the Toxic Substances Control Act (TSCA), and as appropriate in the other areas of focus for the Agency, including research and stormwater management.

USTMA has been working closely with the Interstate Technology and Regulatory Council ("ITRC") which includes many of the same officials we are working with at the state and federal levels, tribes, NGOs, and other stakeholders as part of the ITRC's project on tire anti-degradants.

In addition, part of the Alternatives Analysis, USTMA signed a Cooperative Research and Development Agreement ("CRADA") with the U.S. Geological Survey ("USGS") to test potential alternatives against coho salmon cell lines.

Similarly, a chemical manufacturer of 6PPD, Flexsys, has a CRADA with the U.S. Department of Agriculture's Agricultural Research Service to develop a biobased potential alternative to 6PPD.

USTMA is also working with our global partners to assess relevant data gaps.

IV. Comprehensive Approach: Research and Mitigation

USTMA is committed to working collaboratively with regulators, affected partners, and interested stakeholders to expeditiously identify an alternative that is protective of motorist safety and the environment.

While efforts to find and implement a potential alternative to 6PPD (while still complying with safety standards) will take time, there are things that can be done now to reduce 6PPD and 6PPDQ in the environment. Those measures include street sweeping in urban areas, choosing pavement surfaces (such as rubber modified asphalt and permeable pavement) that reduce tire abrasion and mitigate stormwater impacts, installing bioretention technologies to treat stormwater, and maintaining proper tire inflation to reduce tire abrasion.

Research done in Washington State has demonstrated the effectiveness of bioretention technologies such as rain gardens and bioswales, which can be installed to improve the quality

of stormwater. Additionally, research conducted in Oregon has shown the effectiveness of permeable pavements in improving stormwater quality.

USTMA is currently engaging with potential partners to advance the practical knowledge around promising stormwater solutions, and we are eager to share more about that work as those projects are formalized.

USTMA would welcome the opportunity to collaborate with Congress – as well as regulators, affected partners and interested stakeholders – to develop policies that take advantage of bioretention technologies, permeable pavements and other technologies to help mitigate stormwater impacts associated with roadways

V. **Conclusion**

The tire industry is working actively, transparently, and collaboratively with regulators, partners and interested stakeholders to identify an alternative to 6PPD that is protective of motorist safety and the environment.

We appreciate your time, and we welcome the opportunity to continue to be part of this discussion moving forward.

I am happy to answer any questions you might have.