

SUPPORTING RESEARCH INTO 6PPD AND 6PPD-QUINONE

U.S. TIRE INDUSTRY COMMITTED TO SAFETY AND SUSTAINABILITY



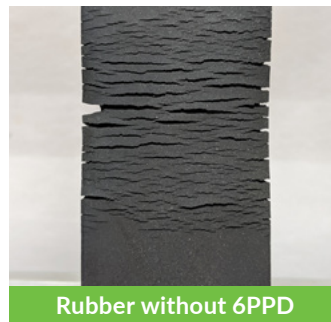
U.S. Tire Manufacturers Association (USTMA) members are committed to producing the safest, most durable and most efficient tires possible. As global leaders in manufacturing, our member companies embrace a shared responsibility of helping to achieve a more sustainable society. **It's this commitment that drives collaboration with researchers and regulators to better understand 6PPD and 6PPD-quinone, fill knowledge gaps in existing research and support the California Department of Toxic Substances Control (DTSC) alternatives analysis process.**

WHAT IS 6PPD?

6PPD is an antioxidant and antiozonant that **helps prevent the degradation and cracking of rubber compounds** caused by exposure to oxygen, ozone and temperature fluctuation.



Rubber with 6PPD



Rubber without 6PPD

WHAT IS 6PPD-QUINONE?

6PPD-quinone is **not used in U.S. tire manufacturing**. It is a **transformation product of 6PPD** that may form when 6PPD reacts with oxygen and/or ozone.

HOW DOES 6PPD SUPPORT TIRE SAFETY?

6PPD reacts with oxygen and ozone in the air to **minimize the opportunity for these agents to attack the tire surface** and degrade the rubber compound, causing it to crack. **Tire cracks can expose the underlying structures** within a tire. This **decreases the structural integrity of the tire** and increases the risk of catastrophic safety issues.

6PPD is the most effective protection-material commercially available today that enables tire manufacturers to produce safe and durable tires.

DOES 6PPD IN TIRES CONTRIBUTE TO COHO SALMON MORTALITY?

A **recent report** published by researchers at the University of Washington and the Washington Stormwater Center suggests a **possible connection between exposure to 6PPD-quinone and coho salmon mortality**.

Subsequent research has shown that 6PPD-quinone does not exhibit acute lethal toxicity to other **salmon** or **freshwater aquatic species** and has a comparatively low leaching potential from rubber particles in aqueous media. However, **USTMA supports further research to understand coho salmon mortality** and the environmental pathways of 6PPD-quinone.

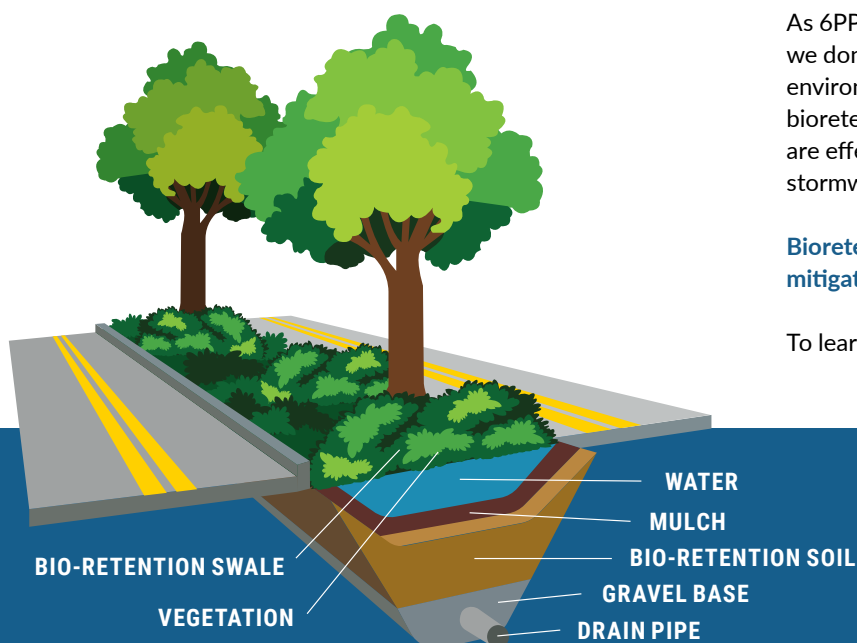
THE U.S. TIRE INDUSTRY IS ACTIVELY ENGAGED WITH RESEARCHERS AND REGULATORS TO BETTER UNDERSTAND 6PPD-QUINONE.

TAKING ACTION TO LEARN MORE ABOUT 6PPD AND 6PPD-QUINONE

- **More Research:** USTMA and its global partners continue to engage with Washington state researchers and regulators, chemical manufacturers, the [California DTSC](#) and other research institutions to **identify and support existing and future research related to 6PPD-quinone and ensure research utilizes the most robust methodologies.**
- **Global Cooperation:** The U.S. tire industry, through the [World Business Council for Sustainable Development Tire Industry Project \(TIP\)](#), is **supporting additional research to fill key data gaps related to 6PPD-quinone.** TIP is currently sponsoring research into 6PPD-quinone as part of its ongoing work to improve scientific understanding of the aging and ecotoxicology of tire and road wear particles. **TIP expects to publish peer-reviewed studies that detail the findings of this research in 2022** and will make relevant provisional findings available as the studies progress.
- **Seeking California Prioritization:** USTMA [requested the California DTSC add 6PPD in tires to the 2021-2023 Priority Products Work Plan](#) for the Safer Consumer Products Regulations. **DTSC accepted this request and included 6PPD in tires on the draft Work Plan.** The DTSC program will provide a rigorous, transparent and scientific regulatory framework **to analyze whether alternatives exist** that will enable tire manufacturers to meet vehicle safety and consumer product safety requirements.
- **Innovation to Find Alternatives:** USTMA participated in [UC Berkeley's Greener Solutions Program](#), a **project based class supported by DTSC and EPA Region 9**, where graduate students and advanced undergraduates partner with companies, non-profits or government agencies interested in promoting the adoption of more sustainable chemistry. Students were tasked with studying 6PPD and any greener alternatives that meet tire safety and performance standards.
- **Partnering on Solutions:** In November 2021, USTMA participated in the SETAC North America 42nd Annual Meeting to engage in sessions related to tire and road wear particles (TRWP) and 6PPD. Together, USTMA and TIP hosted a breakout session for 40+ leading tire materials researchers to share methodologies for studying TRWP. In addition, USTMA and TIP [announced](#) a commitment to [provide standardized, cryogenically milled tire tread \(CMTT\) samples](#) to researchers who study the potential human health and environmental impacts associated with TRWP.



WHAT CAN BE DONE NOW TO ADDRESS 6PPD-QUINONE IN THE ENVIRONMENT?



As 6PPD-quinone continues to receive the attention it deserves, we don't yet know all the ways the compound behaves in the environment. In the meantime, [recent research](#) has shown that bioretention technologies, such as raingardens and bioswales, are effective at reducing coho salmon mortality resulting from stormwater impacts generally.

Bioretention technologies can be installed today in hot spots to mitigate stormwater impacts on this species.

To learn more, visit www.ustires.org/6ppd-and-tire-manufacturing

