

The Department of Toxic Substance Control (DTSC) recently adopted a rule that requires manufacturers of motor vehicle tires for sale in California to evaluate alternatives to N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine (6PPD), a chemical that helps reduce tire degradation and cracking which is vital for driver and passenger safety. When 6PPD reacts with oxygen and/or ozone, a new compound, 6PPD-quinone (6PPDq), is produced. Every time a vehicle drives on roadways, small bits of tire treads break off and accumulate on road surfaces. When it rains, these bits of tire are washed into storm-water drains and eventually reach rivers and streams, posing a risk to aquatic organisms like salmon, steelhead, and other [fish and marine organisms](#).



Researchers from Northeastern University and the University of Washington found that even small doses of such chemical were lethal for salmon. Shortly after the 6PPDq research was released, lab testing producer Eurofins along with Phenomenex's sister-company, SCIEX,

started to work on testing and detection methodologies to identify 6PPDq contamination at multiple levels and from multiple sources. Taking a nontarget and suspect screening approach and using high resolution LC-MS/MS workflows and advanced software tools for characterization, 18 compounds were discovered in tire-derived samples, including 6PPD-quinone. In addition to 6PPDq, multiple other compounds known to be used during tire production were discovered. [Download Study \(Version 1\)](#) | [Download Study \(Version 2\)](#)

The DTSC regulation will take effect on October 1, 2023. Domestic and foreign manufacturers will have until November 30, 2023, to notify the entity if they manufacture 6PPD-containing tires being commercialized in California.

Currently, there are no known alternatives to 6PPD that provide the same safety and performance characteristics. The DTSC is working with tire manufacturers during this process.

Sources:

Department of Toxic Substances Control - www.dtsc.co.gov

Nontarget and suspect screening analysis of samples containing compounds derived from tire rubber, Karl A Oetjen, SCIEX, USA www.sciex.com

Acute Toxicity of the Tire Rubber-Derived Chemical 6PPD-quinone to Four Fishes of Commercial, Cultural, and Ecological Importance. Environ. Sci. Technol. Lett. 2022, 9, 4, 333–338. Publication Date: March 2, 2022. <https://doi.org/10.1021/acs.estlett.2c00050>.
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