

World Business Council for Sustainable Development

# TIP: MATERIAL RESEARCH

The primary goal of the WBCSD Tire Industry Project (TIP)—a voluntary, CEO-led initiative, undertaken by 11 leading tire companies—is to anticipate, identify, analyze, and address the potential human health and environmental impacts associated with tire development, use and management through end of life. TIP has developed an understanding of the sustainability challenges facing the tire industry, many of which relate to the existing and potential replacement materials used in tire manufacturing.

TIP employs rigorous scientific analysis to key material considerations, such as tire and road wear particles (TRWP), nanomaterials, and tire granulates. By evaluating existing literature, supporting research and experiments, and undergoing a system of peer review, TIP has enhanced its understanding of the potential health and environmental impacts posed by tire materials.

## OBJECTIVES:

- Research the effects of tire-related materials and communicate the results via a three-pronged method: landscape analysis, experimentation and evaluation, and peer review
- Identify and fill existing gaps in data through research and analysis
- Share research and conclusions with key stakeholders, including regional trade organizations, NGOs, customers and third-parties interested in tire-related materials and the potential impacts

## FOCUS:

**Tire and Road Wear Particles (TRWP):** TIP's work regarding TRWP evaluates the potential impacts on human health and environmental conditions. Prior to TIP's work, no method existed to identify TRWP in the environment. The research led by TIP has enabled future studies which have assessed the potential hazards and exposure risks associated with TRWP.

- The key takeaway from TIP's research so far has been that **the presence of TRWP presents no significant risk to humans and the environment.**
  - TIP found that TRWP presented a low toxicity in freshwater environments. This result shows that TRWP are of low risk to species in these environments.
  - To assess the effects of TRWP on humans through inhalation, TIP sponsored research simulations on rats which indicated a low level of toxicity.
- TIP research also evaluated the composition, presence, and the ability to detect TRWP in various environments. TIP analysis showed that TRWP is comprised of a significant amount of material from the road and surrounding environment, as opposed to just rubber.

- TIP developed a chemical marker that enables identification of TRWP in soil, air and water, and which tests the presence of TRWP in air particulate matter (PM10 and PM2.5).
- TIP took a significant number of air samples from high traffic locations in Europe, Japan and the United States to evaluate the relation to the presence of TRWP.
- Across all samples collected, TRWP contribute on average less than 1% for PM10 and 0.3% for PM2.5. The highest levels detected in studies conducted by TIP found that TRWP contributed less than 3% to PM10 and 1% to PM2.5.

**Nanomaterials:** In 2008, TIP began researching nanomaterials, focusing on nanomaterial composition and human health risk and impact. This research served as the basis to publish scientific, peer-reviewed reports.

Some of these studies include:

- TIP created a methodology and enabled measurement for quantitative assessment of worker exposure to nanomaterials in a manufacturing environment.
  - *Evaluation of Quantitative Exposure Assessment Method for Nanomaterials in Mixed Dust Environments: Application in Tire Manufacturing Facilities* (2015)
- TIP verified that the nanomaterials amorphous silica and carbon black demonstrate no significant human health risk and may improve tire performance.
  - *Reinforcing Fillers in the Rubber Industry: Assessment as Potential Nanomaterials with a Focus on Tires* (2011)
- To expand research on nanomaterials, TIP collaborated with the Organization for Economic Co-operation and Development (OECD) to research and publish *Nanotechnology and Tyres: Greening Industry and Transport* (2014).
- TIP identified data gaps in the development and use of nanomaterials including a lack of guidance on specific nanomaterials used in the tire industry.

**Tire Granulates:** Prior to TIP's research on tire granulates, the existing data was conducted by disparate groups.

- TIP monitors government research such as studies by the U.S. Environmental Protection Agency (EPA), National Toxicology Program (NTP), California's Office of Environmental Health Hazard Assessment (OEHHA) and the European Union regarding the potential impacts of tire granulates.
- TIP actively supports the results of trade association studies on tire granulates—such as ETRMA, and JATMA—as they become available.
- TIP's aim is to close the remaining data gaps on toxicity and exposure.

## THE ROAD AHEAD:

- TIP will continue to work with regional trade organizations, NGOs, customers and third parties to identify potential environmental and human health impacts of tire materials.
- TIP will support ongoing research on the potential environmental and health impacts of TRWP.
- TIP will continue efforts to develop a framework for companies when introducing new nanomaterials.
- TIP will continue to monitor regional and government research on tire granulates' toxicity and exposure.

## FACTS AND FIGURES

- TIP has developed ways to **collect and identify TRWP** in the environment.
- TRWP are comprised of both **tire tread and particles from the road**.
- TRWP present a **low risk** to humans and the environment.
- TRWP contribute **less than 3%** of PM10 and **less than 1%** of PM2.5.
- TIP **continues to investigate** the impacts of tire materials to fill data gaps.



## ABOUT THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than US\$8.5 trillion and with 19 million employees. Our Global Network of almost 70 national business councils gives our members unparalleled reach across the globe. WBCSD is uniquely positioned to work with member companies along and across value chains to deliver high-impact business solutions to the most challenging sustainability issues.