ETRMA contribution to Call for Evidence for an Impact Assessment
Measures aiming to reduce the presence in the environment of unintentionally released microplastics from tyres

ETRMA welcomes the opportunity to provide our comments on the upcoming measures aimed at reducing the presence of unintentionally released microplastics. The tyre industry has been collaborating over the last 15 years through various research projects to developing a better understanding of the fate and possible effects of particles generated during normal tyre use and wear, through research projects performed under the umbrella of the World Business Council for Sustainable Development (WBCSD) Tyre Industry Project (TIP)\(^1\).

Tyre and road wear particles (TRWP) are a mixture of approximately 50% tyre tread fragments and 50% elements from the road surface (mainly minerals and road dust).

A 2010 publication by Kreider et al\(^2\) provides a characterization of the tyre and road wear particle as generated under controlled laboratory conditions. The study characterized the density and size of TRWP:

- **Density:** The density of TRWP, aggregated by tyre tread rubber and embedded minerals and other constituents of road dust, is estimated to be around 1.8 g/cm\(^3\).
- **Size:** TRWP has a size range from 1-350 microns (a micron is one-thousandth of a millimetre), the most common – the median value – being between approximately 80 and 100 microns.

These characteristics determine transportation and fate in the environment and differentiate TRWP from other particles covered by the Call for evidence.

**TRWP distribution in the environment**

The ETRMA-commissioned a study by Cardno ChemRisk and Deltares, “Characterising export of land-based microplastics to the estuary”\(^3\) (2018, 2019), analysed the distribution and retention of TRWP in freshwater to the estuary. The results demonstrate the potential for appreciable capture and retention of TRWP before the particles reach freshwater or the estuary. The study allows us to understand the most important parameters that are affecting the transportation of the TRWP to the estuary: the particles’ diameter and density.

Soil and freshwater sediments are recognized as being important compartments in the analysed watersheds in preventing the release of TRWP to marine waters. In particular, less than 10% of TRWP are not captured in soil sediments and storm water management, and this is supported by the comparison with the average concentration of TRWP measured in the Seine sediments. The results of the probabilistic model indicate that only 2% to 5% of TRWP released may reach the estuaries.

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\(^1\) Extensive literature on TRWP has been produced by the World Business Council for Sustainable Development (WBCSD) through the Tyre Industry Project (TIP) - [http://www.wbcsd.org/Projects/Tire-Industry-Project/Resources/Tire-Road-Wear-Particles-Papers](http://www.wbcsd.org/Projects/Tire-Industry-Project/Resources/Tire-Road-Wear-Particles-Papers)

\(^2\) [https://www.wbcsd.org/Sector-Projects/Tire-Industry-Project/Resources/Tire-Road-Wear-Particles-Papers](https://www.wbcsd.org/Sector-Projects/Tire-Industry-Project/Resources/Tire-Road-Wear-Particles-Papers)

The following picture summarises the distribution paths:

A balanced approach that considers the most relevant tyre performances, and a holistic approach considering factors with highest impact on TRWP generation measures with high potential for TRWP reduction/mitigation need to be applied to regulatory options.

During use, the friction between tyre and road generates TRWP. However, there are many different factors that affect the tyre tread abrasion rate (defined as the total amount of matter lost from the tyre tread due to interaction with the road per unit of distance). Intrinsic tyre design characteristics, like the tread rubber formulation and the distribution of the forces in the tyre-road contact area, are a few main examples, but a range of external factors also play an important role.

These factors can be divided into three categories:
- Vehicle characteristics (weight, distribution of load, location of driving wheels, suspension types);
- Road surface characteristics (material, roughness, age, wetness, pollutant, weather conditions) and road topology (hilly/windy vs plane/straight);
- Traffic and driving behaviour characteristics (sporty vs smooth driving, high vs moderate speed, respect of correct inflation pressure, braking, cornering).

It has been demonstrated that external factors, such as driving behaviour, road and vehicle characteristics, can cumulatively have a much bigger influence on the rate at which TRWP are formed than the tyre design. Nevertheless, working on tyre design is paramount, and the tyre industry is very active in that respect.

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**Eco-design requirements including new materials and the development of a standard on tyre abrasion:**

- Tyres are the sole point of contact between the vehicle and the road and thus play a crucial role in enhancing the safety of road users and of motor vehicles. Besides safety, tyres also have a key role in making driving more sustainable and comfortable, reducing a vehicle’s fuel consumption (Rolling Resistance accounts for up to 30% of a vehicle’s fuel consumption and CO2 emissions), and rolling noise emissions as well as ensure safe mobility in every weather situation. That is why tyre manufacturers have to work on all performances of the tyre at the same time.

- The design of tyres (and of the road surface) has an impact on the generation of TRWP. It is the role of the tyre industry to continuously innovate in order to find a good balance among the various – and often conflicting – environmental and safety tyre performances as in the case of TRWP which are caused by the friction between the tyre tread and the road surface. While friction generates wear, it is at same time needed to provide grip and thus deliver on the essential safety function in road traffic.

- Conscious of the need to be able to measure the abrasion level of tyres, the tyre sector - with ETRMA and ETRTO\(^5\) on the lead – has been running since 2018 an extensive test development program. This program aims to deliver an accurate, representative and reproducible abrasion test method for passenger car tyres to be used for regulatory purposes –within Q2-2023.

- Tyres are the sole contact with the road. It is key that any regulation on tyre abrasion performance is based on a robust test method, to guarantee the tests’ results are both accurate and representative of real-life driving. Therefore, any proposed reduction and/or mitigation measure addressing tyre design needs to be accompanied by a thorough assessment of the impact of such measure on all tyre performances (regulated and non-regulated), especially safety performances such as wet/dry grip and traction under winter/snow conditions as well as rolling resistance.

- Adapted regulatory tool, based on a thorough impact assessment.
  
  The Tyre Label Regulation\(^6\) contains provisions about the delegated power to the EC to assess the feasibility of adding information on tyre abrasion to the tyre label in a clear and unambiguous manner, on the condition that there is a reliable, accurate and reproducible method to test and measure tyre abrasion (and mileage). This regulation aims at providing tyre purchasers with relevant product information in order to enhance the safety, the protection of health, and the economic and environmental efficiency of road transport.

  In this respect, we reiterate the absolute need for the Commission to thoroughly assess the efficiency and feasibility of the policy options listed in the Call for Evidence in order to select the most appropriate instrument(s) for reduction/mitigation of TRWP. The availability of a representative, reliable, accurate and reproducible method to test and measure tyre abrasion would be pivotal for such an assessment. Other essential parts of the assessment shall include the (1) actual test dispersion, (2) the market assessment to establish the state of the art and, (3) a consumer attention study.

- Research on innovative materials contributing to mitigation of TRWP impact on the environment is highly encouraged by tyre industry.

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\(^5\) European Tyre and Rim Technical Organisation  
\(^6\) Regulation (EU) 2020/740
Maximizing the impact knowledge on TRWP emissions: Exploring links with vehicle type, vehicle maintenance, road characteristics and driver behavior including the influence of autonomous driving systems:

The generation of the TRWP relates to a more complex issue rather than just the design of the tyre alone. Tyre experts have calculated, and this knowledge has been shared by various stakeholders, that driving behaviour, speed, road surface cumulatively have a much bigger influence on tyre (and road) abrasion than tyre design.

![Fig. 2: Influencing factors on Tyre Abrasion Rate & factors weight](image)

Source: ETRTO, from the 20200330-FINAL-Way-Forward-Report.pdf (etma.org) (page6)

To this end, In July 2018, ETRMA took a proactive approach and launched the European TRWP Platform, facilitated by CSR Europe, to explore a balanced and holistic method in addressing and understanding TRWP. This multi-stakeholder platform brings together experts from governments, academia, non-governmental organizations and industries. Through an open and inclusive dialogue, the Platform aims to share scientific knowledge, achieve a common understanding of the possible effects of particles generated during normal tyre use and wear, and co-design mitigation options to reduce TRWP.

The stakeholders of the TRWP Platform have identified further challenges, which are considered to have a high influence in understanding the complexity of TRWP and finding the right mitigation and prevention solutions. Most of these challenges are related to gaps in the current body of scientific knowledge on the topic, which remains quite limited.

Some of the key knowledge gaps include:

- the lack of shared methodology to quantify TRWP and the lack of a method to identify and count TRWP in a complex sample;
- the lack of field work data;
- the lack of agreement on the definition of microplastics;
- the lack of a standard tests for quantitative assessment of tyre tread abrasion \( \Rightarrow \) Work in progress, the EU Tyre Industry is working towards a convoy test\(^7\);
- the lack of a standard tests for road abrasion
- the lack of knowledge on the impact of road pavements on the generation of TRWP, as well as lack of fully developed awareness about the potential of road drainage systems for retention and collection of TRWP;

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\(^7\) More details [here](#)
• the lack of indicators on microplastic, and of TRWP in particular, in the wastewater treatment plants.

The Platform participants have identified at that time a combination of mitigation options, starting with the ones having the highest impact on TRWP generation.

A few, not exhaustive, examples of these measures include:

1. Education on driving behaviour (part of driving license)
2. Adjustment of road surface parameters
3. Review of traffic regulation (preceded by analysis of traffic conditions causing increased TRWP generation)
4. Adjustment of vehicle characteristics
5. Vehicle maintenance (control of toe and camber angles)
6. Road maintenance (renewal and cleaning)
7. Tyre maintenance (inflation pressure)

**Increasing capture of microplastics including via green infrastructure**

TRWP are chemically complex with a higher density than water, leading them to sink and settle in freshwater sediments. The formed TRWP mass is distributed between the road-side soil, the air and freshwater. The transportation of these particles is influenced by rain, wind, run-off and sewage discharges, which spread the particles in the environment, including rivers and then the sea via the estuary.

As mentioned earlier, a recent study (Unice et al. (2019). *Characterising export of land-based microplastics to the estuary, Part I* and *Part II*) shows that, due to their density, no more than 2-5% of all formed TRWP reaches the estuaries.

The results demonstrate the potential for appreciable capture and retention of TRWPs prior to reaching the freshwater or even the estuary. The study also provides the quantification of TRWP in a number of environmental compartments showing that TRWPs end up in soils and river sediments.

Despite the intensive research programmes, there are still many uncertainties on the fate and transportation of TRWP and their impact on the environment.

Capture systems for TRWP on the road, in the run-off and in wastewater appear to be suitable for reducing the outfall into rivers. However, feasible options to capture TRWP are still a major knowledge gap.

Some examples of mitigation measures have been identified that could qualify for a cost/benefit analysis; like for example:

- **Application of filters for road run-off water at verified hot spots.** Greater use and better maintenance of existing filtering techniques (such as: Disc sieve filter system, Drum cloth filtering system, Retention soil filter, etc.) is needed. The greater application of filters should focus on hotspots, such as locations with high potential of generation/transportation of TRWP in the environment. This action should be led by public authorities, supported by research institutes, the automotive industry and the wastewater sector.

- **Improve cleaning of roads** (e.g. intelligent network). The development of intelligent networks to connect water management systems and road maintenance activities with weather forecasts should be considered (e.g. to clean streets before rain). This action should be led by the road sector and supported by public authorities.

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• Use professional street cleaning machines in wet mode to reduce the particulate matter (city of Stuttgart best practice). Street sweeping and washing are important activities to reduce the transportation of TRWP and other road dust particles in the environment. Several types of sweeping vehicles exist (e.g. mechanical broom sweepers, regenerative-air sweepers, vacuum sweeper, etc.). Tests from the city of Stuttgart have shown that using street cleaning machines in wet mode (combining sweeping and water flushing) can provide a higher level of TRWP removal than the other systems. In addition, tests in both Norway and Sweden indicate that high pressure washing directly followed by high power vacuuming seems to be the best method for removing road dust, especially when cemented in the texture. At dry conditions with loose material dry strong vacuum sweeping might be the best method, since water tends to make fine dust stick to the surface and be hard to remove. This action should be led by the road sector, with the support of cleaners and public authorities.

**Proportionality of the measures, robust science and effective enforcement**

ETRMA invites the policy makers to give particular attention to operational feasibility and to facilitate implementation and enforcement.

Continue supporting research and understanding of TRWP presence and effect on the environment to find the most targeted solutions.

**Conclusion**

Tyres keep the world moving.

The tyre sector and its value chain have a vital role to play in creating a future with environmentally friendly, safe, efficient and accessible mobility for all.

In the particular case of abrasion, ETRMA and its members

• Committed to actively pursue the work towards a reliable & representative test method, filling knowledge gaps through robust science and supporting the TRWP Platform;
• Calls on the legislator for ex ante and in-depth assessment of most effective measures for prevention and mitigation of TRWP;
• Remains available to cooperate and dialogue with the EU Institutions and relevant stakeholders.

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