

TYRES / ROAD SURFACES

*Consider in parallel all the PART 3. sheets
Driver, Enforcement, Vehicle, Immission, Tyres/roads*

DESCRIPTION / DEFINITION:

- **TYRES & ROAD SURFACES** have a recognized influence on vehicle sound emissions. Different aspects have to be considered as the road surface itself, the tyre rolling sound, the interaction between the tyre and the road, but also the different tools available to classify them (e.g. the tyre labelling) taking into account the performances and impacts of tyres/roads on health, safety and environment.
- **Keywords:** tyre labelling, tyre particle emission, tyre road noise, road surface, safety.

GENERAL FINDINGS/STATEMENTS FROM THE PRESENTATIONS/REPORTS

- All the studies are in phase to say/affirm/conclude that the most important source of noise for road traffic is caused by the rolling sound.
- This phenomenon will be even more true for Electric vehicles due to the higher weight of these vehicles with wider or extra load tyres needed.
- The knowledge of the different performances of the tyres (rolling sound, abrasion, ...), their interaction/interdependency and their effect on the safety and public health has to be improved. Then a further improvement in tire performance can only be possible within a reasonable time.
- The current outdoor test method related to the tyre rolling sound has important measurement uncertainties, up to 2,8 dB mainly due to parameters such as tracks, weather conditions, test vehicle etc. and a high cost.
- The tyre rolling sound is highly influenced by the excitation given by road roughness and road irregularities.
- Several studies show that the work on the road surface itself brings a win-win deal with the community with an immediate effect on sound emissions abatement and that for any vehicles (type, age, tyres, ...). The road maintenance has also to be considered to maintain its beneficial effect on traffic noise over time.

NEEDS & QUESTIONS FOR FURTHER CONSIDERATION FROM THE ORIGINAL PRESENTATIONS/REPORTS:

- Future improvements of traffic noise require the assessment of methodologies necessary to evaluate the whole ecosystem, e.g., road surface, peak noise, traffic regulations, tyres, vehicles, etc. and stimulate its improvement regarding noise.
- All studies say/affirm/conclude that additional research is needed regarding low-noise road surfaces with a focus on their acoustic behaviour, maintenance costs and safety performance. A cost-efficient process for the renewal of low noise surfaces by exchanging the top layer has been presented.
- Regarding vehicle limit value adaptations beyond phase 3 of (EU)540/1024 or UN-R51-03, it was proposed to wait for phase 3 vehicles to enter the market and observe the impact on sound level in combination with additional tasks that could help to get a better understanding on real

traffic noise issues. For instance, more campaigns are expected, similar to recent studies (Brussels Env., Bruitparif, G+P Switzerland and FEDRO) while gathering N3 vehicle data with realistic configuration especially on street types with higher driving speed.

- For electric vehicles with dedicated designed AVAS, extra-load tyres and/or wider tyres the noise source ranking analysis showed that the overall noise level is primarily influenced by the tyre/road noise.
- Existing noise mapping models should be revised to be better aligned with the real-life situation, considering recent studies and technical innovations as well as the application of reference scenarios to establish a comparability of simulations in different studies. A process to ensure a regular update of the sound emissions models (vehicles and tyres) should be implemented to avoid simulations based on traffic noise data that was gathered more than a decade ago and no longer represents the current vehicle fleet.
- The current outdoor test method related to the tyre rolling noise can be improved by developing an indoor drum test method, consisting in a unique & standardized drum surface replicating a reference test track to reduce measurement uncertainties with a better operational efficiency and improve correlation between sites.

REFERENCES:

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 - o [TFVS-04-09](#) (Switzerland/FEDRO) : Low-noise road surfaces in SwitzerlandReports are available in German language (except EP1 in French) under the following link: [RESEARCH+DATA-Shop - Mobilityplatform](#), or [TFVS-04-17](#): Research package – Low noise pavements in urban areas – Report analysis
- [04 – \(STEER\) CEDR Belgium Noise & Nuisance](#)
 - o [TFVS-11-04 / IWGMU-20-04](#): STEER-Project overview
- [05 – \(ISO\) COAST-BY DRUM INDOOR METHOD ISO TC31 WG11, ISO 20908](#)
 - o TFVS-05-05 (ISO): 20211026 -- WG11 indoor method concept for GRBP TFVS
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- [13 – \(OICA\) Mngt. Noise R51-03 at low speeds vs. AVAS R138](#)
 - o [TFVS-04-12](#) (OICA): Management of Noise emissions according to UN-R51-03 at low speeds vs. AVAS compliant to UN-R138
- [14 – \(ETRTO\) Tyres road traffic noise-where potential](#)

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 - Website LEON-T: <https://www.leont-project.eu/>
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 - [TFSL-02-08](#) (EC): M- and N- sound limit study – intermediate report,
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 - [TFVS-10-06](#) (Japan): Questions to Study on sound level limits of M-and N-category vehicles on TFVS-09-06 and TFVS-07-11
 - [TFVS-10-07](#) (Japan): Comment for the N2 category threshold
 - [TFVS-11-03](#) (EC Consortium): Answer to TFVS-10-06
 - [TFVS-04-10](#) (OICA/ACEA/ATEEL): Study on future sound limits values for type-approval for vehicles of category M & N
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