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Subject : Labelling road surfaces - benefits and necessity
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To : Stakeholders labelling road surfaces
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Labelling road surfaces - benefits and necessity

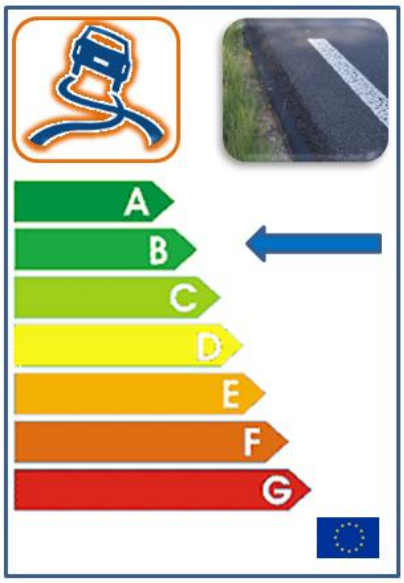
Road surface labels encourage the road construction industry to develop, build and manage safe, liveable, durable and economic roadways.

Labels are a categorisation of requirements and guidelines, often from A (good) to G (abysmal). Examples include energy labels for washing machines, buildings and cars, but the labels may also concern properties other than energy. For example, tyre labels on which the wet skid resistance and noise properties of tyres are displayed in addition to fuel consumption.

This note introduces the concept of labels for road surfaces and underpins their benefits and necessity (and elaborates on the opportunities and possibilities). The purpose of road surface labelling is easier, transparent communication between the client and contractor, between road authorities and road users, taxpayers and residents. Moreover, it promotes a recognition towards society and politics. The aim is to move forward step by step as a sector in the field of tyre-road surface: First, demand and achieve label D, then label C, then label B, etc. For example, see how the CO_2-ladder has stimulated the road construction industry in terms of sustainability.

The purpose of this note is to create support to actually implement road surface labels.

This initiative is limited to the road surface and tyres. For example, for the topic of safety the skid resistance is included, but the layout of the road (i.e. limiting visibility) is not.



Example of a *road surface label*

Accessibility, safety, liveability, durability and economy

Roads exist to facilitate the mobility of people and goods. Important political and social issues concerning roads include accessibility (and therefore availability), safety, liveability and durability. The ambition is to develop labels for road surfaces, to lift the road and tyre industry to the next level with regards to these themes.

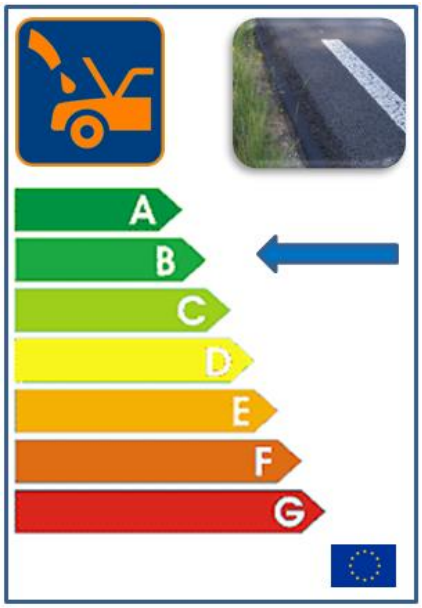
For the safety of a road (theme) the aspect of skid resistance is key, for the liveability (theme) the tyre-road surface noise (aspect) and for both durability and economy (and CO_2) the rolling resistance is very important. For accessibility and availability, the lifespan of the road, both mechanically and functionally, is an important parameter. This lifespan can be further worked out in, for example, resistance to crack formation, resistance to rutting and ravelling. Finally, durability can be expressed in an Environmental Cost indicator of a road surface. Below is a sample prepared for the theme of liveability and for the aspect of initial noise reduction of a road surface (immediately after construction).

Themes from politics and society	Aspect to address from a tyre-road surface perspective
Safety	Skid resistance
Liveability	Noise
Sustainability	Environmental Cost Indicator
Accessibility, availability	Lifespan
Economy	Rolling resistance

Noise level in dB(A)	
A	66.2 dB(A) or less
B	66.2 to 69.2 dB(A)
C	69.2 to 72.2 dB(A)
D	72.2 to 75.2 dB(A)
E	75.2 to 78.2 dB(A)
F	78.2 to 81.2 dB(A)
G	81.2 dB(A) or more

How does it benefit the society?

Road surface labels encourage the optimisation of road surfaces, e.g. for rolling resistance, skid resistance, noise, lifespan and help to make choices between different road surfaces. For example, an incentive to reduce rolling resistance by approximately 10-30% yields fuel savings of 2-6%, which leads to about 1,000 kton CO_2 reduction annually for society (for national roads + provincial roads in the Netherlands) and approximately €325 million social benefits (for national roads alone). Moreover, the risk of accidents at poor skid resistance is 2-5 times greater than with a proper skid resistance. It can also reduce the use of less visually appealing sound barriers, for there are already 400 km of noise barriers present today (worth approx. 400 million euros). The road surface label can easily be used in the management stage in order to more accurately determine the replacement time in advance and to be able to communicate with society. It encourages road builders to develop products with enhanced rolling resistance, optimum skid resistance, less noise, and an increasing lifespan.



Label example for rolling resistance

In addition, it facilitates the cooperation between the road industry and tyre industry and other relevant partners, resulting in faster innovation cycles (shorter turnaround of new products) and makes the optimisation of tyre-road interaction really possible. Indeed, a tyre can be optimised for a particular type of road surface, but might be less optimised for another type. Alternatively, a road surface can be optimised for a particular type of tyre, but might be less favourable for a different type of tyre. If these two sectors - the tyre industry and road construction industry - understand each other better, tyre-road interaction can be optimised as a whole. It makes the optimisation of the coherence of tyre-road surface really possible. Road surface labels are therefore a step forward towards professionalisation and industrialisation of the road industry and tyre industry. Road surface labelling should lead to the recognition of a road as a product that is industrially designed, built and maintained.

Development of road surface labels

The targeted approach to achieve road surface labels is focused on the procedure for noise reduction, or at least 5 measured representative road sections per label, measured by an independent certification body for the release of road surface labels. The proposal is to categorise the labels with validated in-situ measurement methods (product development and preliminary research, preferably in the laboratory). The main preconditions for road surface labels are:

- Compatibility with the existing tyre label;
- Suitable for current and future vehicle fleet;
- Includes (only) essential road surface features - for both new and existing roads;
- Must allow for (meaningful) innovation (product and process);
- Must cover about 5 to 10 families of road surfaces Europe-wide.

The ambition is to align first with the tyre labels and thus develop labels for wet pavement skid resistance, noise and rolling resistance. The advantage of aligning with these tyre labels is to create unambiguous standards and methods of measurement within both the tyre industry and road industry. From there it will be possible to optimise the tyre-road surface interaction. Subsequently, a durability label may be established, created on the basis of different mechanical and functional properties.

A first implementation of road surface labels has already been developed on the basis of practical experience and the latest scientific knowledge. This is presented at the Dutch Infra Days 2016. This is by no means a definitive proposal, but an impetus for strengthening the debate. The first next step will be to expand the paradigm and work it out in further detail. Afterwards, incremental agreements will be sought with road managers, contractors (suppliers) and measuring bodies on the interpretation of the various road surface labels.

Partners and planning

As the client, the Province of Gelderland encourages the use of road surface labels to better think about functional demands and clear communication with politicians and residents. Ooms Civiel (division of Strukton Civiel) innovates with the development of the interaction of tyre-road surface and optimisation (improvement) thereof to develop new knowledge, insights and products. The University of Twente (division Tribology and Building Infrastructure) provides input for the development of standards and methods of measurement and validation thereof. Together these parties will be able to put the Netherlands on the map (the next level) when it comes to tyre-road surfaces. The plan is to further develop the road surface labels in 2017 and to start the implementation of road surface labels in projects in mid-2017 (1st pilot in the province of Gelderland). By the end of 2017, a review will take place in Gelderland and a broader implementation in projects (in the Netherlands and in Europe) should take place.