Submitted by the expert from France

Informal document GRBP-74-04
(74th GRBP, 15 - 17 September 2021,
agenda item 7 (e))

Proposal for amendments to the 02 series of amendments to UN Regulation No. 117 (Approval of Tyres with regard to Rolling Sound Emissions and/or to Adhesion on Wet Surfaces and/or to Rolling Resistance)

The text reproduced below was prepared by the expert from the France to amend UN Regulation No. 117-02 Supplement 13, in order to add requirement on the monitoring of the machine deviation for rolling resistance measurement. The modifications are marked in bold for new or strikethrough for deleted characters.

2. Definitions

2.20.9. Measurement reproducibility σ_m

Capability of a machine to measure rolling resistance**:**[1]

Measurement reproducibility σm shall be estimated by measuring n times (where n ≥ 3), on a single tyre, the whole procedure described in paragraph 4. of Annex 6 as follows:

$$\sigma_m = \sqrt{\frac{1}{n-1} \cdot \sum_{j=1}^{n} \left(Cr_j - \frac{1}{n} \cdot \sum_{j=1}^{n} Cr_j \right)^2}$$

Where:

j = is the counter from 1 to n for the number of repetitions of each measurement for a given tyre,

n = number of repetitions of tyre measurements (n ≥ 3).

1 Some of these requirements may be specified separately in Reg

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Annex 6

Test procedure for measuring rolling resistance

[…]

2.2. Measuring rim

The tyre shall be mounted on a steel or light alloy measuring rim, as follows:

(a) For Class C1 tyres, the width of the rim shall be as defined in ISO 4000-1:2015,

(b) For Class C2 and C3 tyres, the width of the rim shall be as defined in ISO 4209 1:2020~~01~~.

In cases where the width is not defined in the above mentioned ISO Standards, the rim width as defined by one of the standards organizations as specified in Appendix 4 may be used.

[…]

6.4. Measurement result

~~Where n measurements are greater than 1, if required by paragraph 4.6. above, the measurement result shall be the average of the C_r values obtained for the n measurements, after the corrections described in paragraphs 6.2. and 6.3. above have been made. Following this method, f~~**F**inal Cr results shall be expressed in N/kN and rounded to the first decimal place according to ISO 80000-1:2009, B.3, rule B.

[…]

6.6. **Monitoring of the laboratory.**

Monitoring of the laboratory control tyre shall be carried out at intervals no greater than one month. Monitoring shall include a minimum of 3 separate measurements taken during this one month period. The average of the 3 measurements taken during a given one-month period shall be evaluated for drift from one monthly evaluation to another.

6.6.1. **Machine drift evaluation**

The monitoring is assessed according to paragraph 6.6.1.1 and 6.6.1.2., depending on the number of machine(s) per laboratory.

If the monitoring indicates that there is machine drift, then the machine shall be considered noncompliant and the laboratory shall:

- **Stop the machine and perform maintenance, then**
- **Re-measure the control tyre, re-check compliance, and**
- **Treat the non-conforming measured values according to the internal quality procedures.**

6.6.1.1. Laboratory with two or more machines

The values from the control tyre used for monitoring as described in paragraph 6.6. of this annex shall be used. The same control tyre will be measured on more than one machine.

The moving average of the 3 measurements of the Cr for the control tyre is calculated over the past month and is monitored every week.

If the moving average has the same evolution on multiple machines, it may be attributed to tyre evolution, or a parameter that affects the multiple machines and is not attributed to a singular machine drift.

If the moving average does not have the same evolution on multiple machines, then the issue cannot be attributed to tyre evolution and a machine drift may have occurred on at least one of them.

6.6.1.2. Laboratory with only one machine or a single physical reference machine

The laboratory shall assess machine drift by the following method: measure at least 2 control tyres on a weekly basis, or at least 3 times a month. The moving average of 3 measurements is monitored every week. Machine drift shall be distinguished from tyre evolution by comparing the behaviour on multiple control tyres.

Annex 6 - Appendix 1

[…]

2.1. Width

For passenger car tyre rims (C1 tyres), the test rim width shall be the same as the measuring rim determined in ISO 4000-1: 2015~~0~~, clause 6.2.2.

For truck and bus tyres (C2 and C3), the rim width shall be the same as the measuring rim determined in ISO 4209-1:20**20**~~01~~, clause 5.1.3.

In cases where the width is not defined in the above mentioned ISO Standards, the rim width as defined by one of the standards organizations as specified in Appendix 4 to Annex 6 may be used.