

**Economic and Social Council**Distr.: General
23 June 2020

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

Working Party on Noise and Tyres

Seventy-second session

Geneva, 7–9 September 2020

Item 5 (e) of the provisional agenda

Tyres: UN Regulation No. 117 (Tyre rolling resistance, rolling noise and wet grip)**Proposal for amendments to UN Regulation No. 117****Submitted by the experts from the European Tyre and Rim Technical Organisation***

The text reproduced below was prepared by the experts from the European Tyre and Rim Technical Organisation (ETRTO). The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

Paragraph 2.19.5., amend to read:

"2.19.5. ~~"Snow grip index ("SG")" means the ratio between the snow grip performance of the a candidate tyre relative to and the performance of the standard reference test tyre applicable SRTT."~~

Insert a new paragraph 4.3.1. to read:

"4.3.1. **In case the approval of a tyre pursuant to this Regulation has been granted by the same Type Approval Authority than that granting the approval pursuant to UN Regulation No. 30 or UN Regulation No. 54, the approval mark pursuant to UN Regulation No. 30 or UN Regulation No. 54 can be combined with an indication of the applicable series of amendments to which the tyre was approved pursuant to UN Regulation No. 117 on the form of 2 digits (example "02" indicating that the UN Regulation No.117 approval was granted following the 02 series of amendments) and the suffixes according to paragraph 5.2.2. using the addition sign "+", as described in Annex 2, Appendix 3 of this Regulation, for example "0236378 + 02S1WR2".**

Paragraph 4.4., amend to read:

"4.4. ~~The markings referred to in paragraph 4.2. and the approval mark prescribed in paragraph 5.4. of this Regulation shall be moulded into or onto the sidewall of the tyre, shall be clearly legible, indelible and raised above or sunk below the tyre surface. and shall be located in the lower area of the tyre on at least one of the sidewalls."~~

Paragraph 4.4.1., amend to read:

"4.4.1. **The markings shall be situated in the lower area of the tyre on at least one of its sidewalls.** However, in the case of tyres identified by the "tyre to rim fitment configuration" symbol "A" or "U", the markings may be located anywhere on the outside sidewall of the tyre."

Paragraph 5.4.4., amend to read:

"5.4.4. The marking on the tyre sidewalls of suffix(es) to the approval number removes the requirement for any additional marking on the tyre of the specific type approval number for conformity to the Regulation(s) to which the suffix refers as per paragraph ~~5.3.2.5.2.2.~~ above."

Paragraph 6.4.1.1., amend to read:

"6.4.1.1. Class C1, C2 and C3 tyres

The minimum snow grip index value, as calculated in the procedure described in Annex 7 and compared with the respective Standard Reference Test Tyre (SRTT) shall be as follows:

Class of tyre	Snow grip index (brake on snow method) ^(a)		Snow grip index (spin traction method) ^(b)	Snow grip index (acceleration method) ^(c)
	Ref. Ref.s = SRTT14, SRTT16	Ref. = SRTT16C	Ref. Ref.s = SRTT14, SRTT16	Ref.s = SRTT19.5, SRTT19.5, SRTT22.5
C1	1.07	No	1.10	No
C2	No	1.02	1.10	No
C3	No	No	No	1.25

^(a) See paragraph 3. of Annex 7 to this Regulation

^(b) See paragraph 2. of Annex 7 to this Regulation

^(c) See paragraph 4. of Annex 7 to this Regulation "

Paragraphs 7.1.3. and 7.1.4., renumber as 7.2. and 7.3.

Paragraph 9.1., amend to read:

"9.1. The approval granted in respect of a type of tyre pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8. above are not complied with, or if any tyre of the type of tyre exceeds the limits given in ~~paragraph~~ **paragraphs 8.3. or 8.4.8.4. or 8.5.** above."

Insert new paragraphs 12.10. to 12.12. to read:

"12.10. Until 3 months after the date of entry into force of Supplement XX to the 02 series of amendments to this Regulation, Contracting Parties applying this Regulation can continue to grant type approvals according to the 02 series of amendments to this Regulation, without taking into account the provisions of Supplement XX.

12.11. Until 1 September 2024, Contracting Parties applying this Regulation may continue to grant type approvals according to the 02 series of amendments to this Regulation, based on snow performance test described in Annex 7 to this Regulation using SRTT14 as reference tyre. ^(a)

12.12. Until 1 September 2024, Contracting Parties applying this Regulation may continue to grant type approvals according to the 02 series of amendments to this Regulation, based on the test procedures for measuring wet grip described in Annex 5 of this Regulation, without taking into account the provisions of Supplement XX."

Add a new footnote (a) to read:

"^(a) SRTT14 will be available from the supplier until end of October 2021."

Annex 1,

Communication,

Item 8.4., amend to read:

"8.4. Snow grip level of the representative tyre size, see paragraph 2.7. of Regulation No. 117, as per item 7. of the test report in the ~~appendix³~~**appendix⁵** to Annex 7:..... (Snow grip index) using the brake on snow method², spin traction method² or acceleration method.²"

Former footnote 3, renumber as footnote 5:

"³⁵ Appendix 2 for C1 and C2 tyres.
Appendix 3 for C3 tyres."

Item 16.1., amend to read:

"16.1. A list of documents in the approval file deposited at the Type Approval Authorities having delivered the approval and which can be obtained upon request.⁴~~request.~~⁶"

Former footnote 4, renumber as footnote 6 and amend to read:

"⁴⁶ In the case of "snow tyre for use in severe snow conditions" a test report according to Appendix 2 **or Appendix 3, as applicable**, to Annex 7 shall be submitted."

Annex 2, Appendix 3, amend to read:

"Extensions to combine Combinations of markings of approvals issued in accordance with Regulations Nos. 117, 30 or 54[†]

Example 1

...

The above approval mark shows that the tyre concerned has been ~~initially~~ approved in the Netherlands (E 4) pursuant to Regulation No. 30 ~~and the~~ **according to its 02 series of amendments (indicated by the first two digits of the approval number, "02")** under approval number 0236378. It is also marked by "+ 02S1" (~~rolling sound at stage 1~~) which indicates that **the tyre was also approved pursuant to its approval is extended under Regulation No. 117 (02 series of amendments). ~~The first two digits of the approval number (02) indicate that the approval was granted according to Regulation No. 30 (02 series of amendments).~~ The addition (+) sign indicates that the first approval was granted in accordance with Regulation No. 30 and has been extended to include the approval(s) granted according to Regulation No. 117 (02 series of amendments) for rolling sound at stage 1.**

Example 2

[...]

The above approval mark shows that the tyre concerned has been ~~initially~~ approved in the Netherlands (E 4) pursuant to Regulation No. 30 ~~and the~~ **according to its 02 series of amendments (indicated by the first two digits of the approval number, "02")** under approval number 0236378. ~~This indicates that the approval is for S1 (rolling sound at stage 1) W (wet adhesion) and R2 (rolling resistance at stage 2).~~ ~~The~~ **It is also marked by "+ 02S1WR2"** ~~preceded by (02) which indicates that it has had its approval extended under the tyre was also approved pursuant to Regulation No. 117 which included the 02 series of amendments. The first two digits of the approval number (02) indicate that the approval was granted according to Regulation No. 30 (02 series of amendments).~~ The addition (+) sign indicates that the first approval was granted in accordance with Regulation No. 30 and has been extended to include Regulation No. 117 approval(s) (02 series of amendments) **for S1 (rolling sound at stage 1) W (wet adhesion) and R2 (rolling resistance at stage 2).**"

Footnote 1, delete.

~~[†] Approvals in accordance with Regulation No. 117 for tyres within the scope of Regulation No. 54 currently do not include wet adhesion requirements.~~

Annex 5,

Part (B),

Paragraph 1.1., amend to read:

"1.1. Track characteristics

The surface shall be a dense asphalt surface with a uniform gradient of not more than two per cent and shall not deviate more than 6 mm when tested with a 3 m straight edge.

The test surface shall have a pavement of uniform age, composition, and wear. The test surface shall be free of loose material or foreign deposits.

The maximum chipping size shall be from 8 mm to 13 mm.

The ~~sand~~**average macro texture** depth measured as specified in EN13036-1:2001 and ASTM E 965-96 (reapproved 2006) shall be ~~0.7 ± 0.3~~ **(0.7 ± 0.3)** mm.

The surface friction value for the wetted track shall be established by one or other of the following methods according to the discretion of the Contracting Party."

Paragraph 1.1.1., amend to read:

"1.1.1. Standard Reference Test Tyre (SRTT) method

This method uses the Standard Reference Test Tyre ~~SRTT14~~**SRTT16**.

Using the procedure described in paragraph 4.2. of part (A) of this Annex, perform in the same area where the average macro texture depth was measured one braking test of the reference tyre, consisting of ~~Perform at least six (6) valid test runs in the same direction~~ **measurements of the peak braking force coefficients with the Standard Reference Test Tyre SRTT14 using the trailer or special purpose tyre evaluation vehicle test procedure as specified in clause 2.1 (at 65 km/h and 180 kPa).**

Evaluate the braking test as described in paragraphs 4.2.8.1. and 4.2.8.2. of part (A) of this Annex. If the coefficient of variation CV_{μ} exceeds 4 per cent, dismiss the results and repeat the braking test.

The ~~average ($\mu_{\text{peak,ave}}$)~~ **arithmetic mean ($\overline{\mu_{\text{peak}}}$)** of the measured peak braking force coefficients shall be corrected for the effects of temperature as follows:

$$\mu_{\text{peak,corr}} = \mu_{\text{peak,ave}} + 0.0035 \cdot (t - 20)$$

$$\mu_{\text{peak,corr}} = \overline{\mu_{\text{peak}}} + a \cdot (\vartheta - \vartheta_0)$$

where

~~t~~ **ϑ** is the wetted track surface temperature in degrees Celsius,

$a = 0.002 \text{ } ^\circ\text{C}^{-1}$ and $\vartheta_0 = 20 \text{ } ^\circ\text{C}$.

The temperature corrected average peak braking force coefficient ($\mu_{\text{peak,corr}}$) shall be ~~0.7 ± 0.1~~ **not less than 0.65 and not greater than 0.90**.

The test shall be conducted using the lanes and length of the track to be used for the wet grip test.

For the trailer method, testing is run in such a way that braking occurs within 10 meters distance of where the surface was characterized."

Paragraph 1.1.2., delete.

Paragraph 1.1.3., renumber as 1.1.2.

Annex 7,

Paragraph 1.3., amend to read:

"1.3. "Traction test" means a series of a specified number of spin-traction test runs according to ASTM standard:

a. F1805-06 in case SRTT14 is used as reference tyre or

b. F1805-20 in case SRTT16 is used as reference tyre

of the same tyre repeated within a short time frame."

Paragraph 2., amend to read:

"2. Spin traction method for Class C1 and C2 tyres (traction ~~force~~ test per paragraph 6.4. (b) of this Regulation)

The test procedure of ASTM standard F1805-06 **or F1805-20, as applicable according to paragraph 1.3.,** shall be used to assess snow performance

through **the traction performance index (TPI)** ~~spin traction values~~ on medium **pack packed**-snow (The snow compaction index measured with a CTI penetrometer¹ shall be between 70 and 80)."

Paragraph 2.1., amend to read:

"2.1. The test course surface shall be composed of a medium **pack packed**-snow surface, as characterized in table A2.1 of ASTM standard F1805-06 **or ASTM F1805-20, as applicable.**"

Paragraph 2.2., amend to read:

"2.2. The tyre load for testing shall be as per option 2 in paragraph 11.9.2. of ASTM standard F1805-06 **or ASTM F1805-20, as applicable. When the SRTT16 is used as reference tyre, it shall be tested with a load of 531 kg at an inflation pressure of 240 kPa (cold).**"

Insert a new paragraph 2.3. to read:

"2.3. **The snow grip index (SG) of a candidate tyre T_n shall be computed as follows:**

$$SG(T_n) = f \cdot \frac{TPI}{100}$$

where

(a) **$f = 1.000$** when using SRTT14 as reference tyre per ASTM F1805-06, and

(b) **$f = 0.987$** when using SRTT16 as reference tyre per ASTM F1805-20,

and

TPI denotes the traction performance index as defined in ASTM F1805-06 or ASTM F1805-20, as applicable."

Insert a new paragraph 3.1.6. to read:

"3.1.6. **In order to run this test, the Standard Reference Test Tyres (SRTT) as shown in the following table shall be used:**

<i>Class C1 tyres</i>	<i>Class C2 tyres</i>
SRTT14 or SRTT16	SRTT16C

"

Paragraph 3.4.1.3., amend to read:

"3.4.1.3. The snow grip index (SG) of a candidate tyre T_n shall be computed ~~as the~~ ~~quotient of~~ ~~from~~ the arithmetic mean $\overline{a_{Tn}}$ of the mfdd of the tyre T_n and the applicable weighted average w_{SRTT} of the SRTT **as shown in the table:**

$$SG(T_n) = \frac{\overline{a_{Tn}}}{w_{SRTT}}$$

$$SG(T_n) = f \cdot \frac{\overline{a_{Tn}}}{w_{SRTT}}$$

where **f** is given in the following table

<i>Tyre class</i>	<i>Reference tyre</i>	<i>Factor</i>
C1	SRTT14	$f = 1.000$
	SRTT16	$f = 0.980$
C2	SRTT16C	$f = 1.000$

"

Paragraph 3.4.3.1., amend to read:

"3.4.3.1 The snow grip index of the control tyre **C** relative to the SRTT (SG1) is given by

$$SG1 = SG(C) = f \cdot \frac{\bar{a}_C}{wa_{SRTT}}$$

where **f** is given in paragraph 3.4.1.3., and snow grip index of the candidate tyre **Tn** relative to the control tyre (SG2) is given by

$$SG2 = \frac{\bar{a}_{Tn}}{wa_C}$$

where **wa_C** is the applicable weighted average of the control tyre, shall be established using the procedure in paragraphs 3.1. to 3.4.2. above.

The snow grip index of the candidate tyre relative to the SRTT **SG(Tn)** shall be the product of the two resulting snow grip indices that is given by ~~SG1 × SG2~~

$$SG(Tn) = SG1 \cdot SG2."$$

Annex 7 – Appendix 2, Part 1, Report, amend to read:

- " ...
5. Tyre class:
 6. Category of use:
 7. Snow grip index ~~SG~~ relative to SRTT according to paragraph 6.4.1.1.
 - 7.1. Test procedure and SRTT used
 8. Comments (if any):
- ... "

Annex 7 – Appendix 2, Part 2, Test data, amend to read:

- " ...
5. Test results: mean fully developed decelerations (m · s⁻²) / traction coefficient⁽³⁾

Run number	Specification	SRTT (1st test)	Candidate 1	Candidate 2	SRTT (2nd test)
1					
2					
3					
4					
5					
6					
Mean					
Standard deviation					
Coefficient of variation	CV _a ≤ 6 %				
Coefficient of Validation	CVal _a (SRTT) ≤ 5 %	X	X	X	
SRTT weighted average		X	X	X	

<i>Run number</i>	<i>Specification</i>	<i>SRTT (1st test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (2nd test)</i>
Factor <i>f</i>			X	X	X
Snow grip index		1.00	X	X	X

- (1) for C2 tyres, corresponding to the indication of the inflation pressure marked on the sidewall as required by paragraph 4.1. of this Regulation

..."

II. Justification

1. As presented in Informal document GRBP-71-08, the use of wording "moulded" is a technical limitation linked to the technology available at the time of the first issue of the regulations, but now is only one of the various technical solutions.
2. The removal of this technical limitation would be advisable following the principle of not stopping the technical innovations.
3. ETRTO proposes to amend the UN Regulations on tyres in order to allow tyre marking methods other than moulding by keeping the following criteria:
 - (a) Any technical solution alternative to the "moulding" shall guarantee that the markings on the tyre sidewall is clearly legible and indelible.
 - (b) Once amending the UN Regulations on tyres, it will be then possible and advisable to propose the same requirements at global level to other major countries not applying them (i.e. the United States of America, China and India) by amending UN Global Technical Regulation (GTR) No. 16.
4. As presented in Informal document GRBP-71-06, SRTT14 will be phased out end of October 2021 and the proposal is in line with the amendments for the snow performance test described in Annex 7 to this Regulation as described in the informal document.
5. The requested transitional provisions in paragraph 12.11. are necessary to allow technical services a smooth transition to SRTT16 without premature disposal of SRTT14.
6. References are updated following previous paragraph renumbering.
7. New paragraphs are added and examples 1 and 2 are amended in Annex 2 to better explain authorized markings of approval.
8. Due to the phase out of SRTT14 (see item 4.), the track characterization for the wet grip performance test method needs to be amended, too. It is proposed to align the track friction requirements for track characterization for the Class C2 and C3 tyre test method with the requirements for track characterization for the Class C1 tyre test method (as separately proposed by ETRTO for this September 2020 session of the Working Party on Noise and Tyres) to ensure that both can be tested on the same surfaces.
9. The transitional provisions 12.12. are introduced to ensure that technical services may adapt the test tracks to the new requirements.