Transmitted by the experts of the European Tyre and Rim Technical Organisation

Informal document **GRBP-79-22**
(79th GRBP, 6–9 February 2024
agenda item 7 (d))

Proposal to replace document ECE/TRANS/WP.29/GRBP/2024/09

The changes are marked in **bold** for added text and strike through for deleted text, all in red font.

I. Proposal

Paragraph 2.18., amend to read:

"2.18. "*Standard Reference Test Tyre*" or "*SRTT*" means a tyre that is produced, controlled and stored in accordance with the standards of ASTM International:

(a) E1136 – ~~17~~**19** for the size P195/75R14 and referred to as "SRTT14",

(b) F2493 – ~~20~~**23** for the size P225/60R16 and referred to as "SRTT16",

(c) F3611 – 22**e1** for the size P225/60R16 in worn state and referred to as "moulded SRTT16 worn",

(d) F2872 – ~~16~~**19** for the size 225/75R16C and referred to as "SRTT16C",

(e) F2871 – ~~16~~**23** for the size 245/70R19.5 and referred to as "SRTT19.5",

(f) F2870 – ~~16~~**23** for the size 315/70R22.5 and referred to as "SRTT22.5"**,**

(g) F3678 – 23 for the size 245/70R19.5 and referred to as "SRTT19.5 siped",

(h) F3677 – 23 for the size 315/70R22.5 and referred to as "SRTT22.5 siped"."

Paragraph 6.5.1., amend to read:

"6.5.1. Snow performance requirements for classes 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.s = SRTT14, SRTT16	*Ref. = SRTT16C*	*Ref. = SRTT14, SRTT16*	*Ref.s = SRTT19.5, SRTT22.5,* ***SRTT19.5 siped, SRTT22.5 siped***
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 "

Add a new paragraph 8.3.2.1, to read:

"8.3.2.1. In the case of verification tests with regard to approvals of tyres of class C3 in accordance with paragraph 6.5.1. of this Regulation, these may be

carried out, upon request of the tyre manufacturer, using the same reference tyre (see Annex 7 to this Regulation) as that adopted for the original approval."

Add new paragraphs 12.15. to 12.20., to read:

"12.15. **As from 1 September 2028, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued according to Supplement ~~[~~2~~]~~ to the 03 series of amendments to this Regulation, based on the test procedures for measuring the wet adhesion of tyres in new state as described in Annex 5 to this Regulation using one of the two equivalent Standard Reference Test Tyres SRTT19.5 and SRTT22.5 as tyre reference, first issued after 31 August 2028.**

12.16. **As from 1 September 2028, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued according to Supplement ~~[~~2~~]~~ to the 03 series of amendments to this Regulation, based on snow performance tests as described in Annex 7 to this Regulation using one of the two equivalent Standard Reference Test Tyres SRTT19.5 and SRTT22.5 as tyre reference, first issued after 31 August 2028.**

12.17. **Notwithstanding paragraph 12.15., Contracting Parties applying this Regulation shall continue to grant extensions to existing type approvals of class C3 tyres according to the 03 series of amendments to this Regulation first granted before 01 September 2028, based on the test procedures for measuring the wet adhesion of tyres in new state as described in Annex 5 to this Regulation using one of the two equivalent Standard Reference Test Tyres SRTT19.5 and SRTT22.5 as reference tyre. In case a new test has to be performed on a different representative tyre size for an extension to be granted after 01 September 2028, the SRTT19.5 siped or SRTT22.5 siped will be used.**

12.18. **Notwithstanding paragraph 12.16., Contracting Parties applying this Regulation shall continue to grant extensions to existing type approvals of class C3 tyres according to the 03 series of amendments to this Regulation first granted before 1 September 2028, based on snow performance test described in Annex 7 to this Regulation using either SRTT19.5 or SRTT22.5 as reference tyre. In case a new test has to be performed on a different representative tyre size for an extension to be granted after 1 September 2028, the SRTT19.5 siped or SRTT22.5 siped will be used.**

12.19. **As from the entry into force of that supplement until 31 August 2028, Contracting Parties applying this Regulation shall accept type approvals issued according to Supplement ~~[~~2~~]~~ of the 03 series of amendments to this Regulation, first issued before 1 September 2028, if the track characteristics for measuring wet adhesion of tyre in new state are established using the following reference tyres:**

Tyre class	*Reference tyres*
C2	**SRTT16 or SRTT 16C**
C3	**SRTT16 or SRTT19.5 or SRTT22.5 or SRTT19.5 siped or SRTT22.5 siped**

12.20. **As from the 1 September 2028, Contracting Parties applying this Regulation shall not be obliged to accept type approval issued according to Supplement ~~[~~2~~]~~ to the 03 series of amendments to this Regulation, if the track characteristics for measuring wet adhesion of tyre in new state are not established using the following reference tyres:**

Tyre class	*Reference tyres*

C2	**SRTT16C**
C3	**SRTT19.5 siped or SRTT22.5 siped**

"

Annex 5, Part (B),

Paragraph 1.1. and its subparagraphs, 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 average macro texture depth measured as specified in ASTM E 965-96 (reapproved 2006) shall be (0.7 ± 0.3) mm.

1.1.1. The surface friction value for the wetted track shall be established by one or other of the following methods according to **the class of the candidate tyre and the method (trailer or vehicle)** ~~the discretion of the Contracting Party~~.

Tyre class	*SRTT*	*Trailer method* μ_{peak} *range*	*Vehicle method BFC range*
C2, C3	**SRTT16**	**0.65 – 0.90**	**-**
C2	**SRTT16C**	**0.44 – 0.77**	**0.36 – 0.69**
C3	**SRTT19.5, SRTT22.5**	**0.51 – 0.67**	**0.35 – 0.61**
C3	**SRTT19.5 siped, SRTT22.5 siped**	~~**0.53 – 0.70**~~ **0.52 – 0.68**	~~**0.36 – 0.64**~~ **0.36 – 0.62**

1.1.1.**1.** Standard Reference Test Tyre method **using SRTT16**

~~This method uses the SRTT16.~~

Using the ~~procedure~~ **method** 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 at least six (6) valid test runs in the same direction.

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 arithmetic mean ($\overline{\mu_{peak}}$) of the measured peak braking force coefficients shall be corrected for the effects of temperature as follows:

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

where

ϑ is the wetted track surface temperature in degrees Celsius,

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

The temperature corrected average peak braking force coefficient ($\mu_{peak,corr}$) shall be 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 adhesion measurement.

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

1.1.1.2. Standard Reference Test Tyre method using SRTT16C, SRTT19.5, SRTT22.5, SRTT19.5 siped, SRTT22.5 siped;

1.1.1.2.1. Using the method described in paragraph 2.1. of Part (B) 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 at least eight (8) valid test runs in the same direction in the same test session.

Evaluate the braking test as described in paragraphs 2.1.2.12. and 2.1.2.13. of part (B) of this Annex. If the coefficient of variation CV_{μ} exceeds 5 per cent, dismiss the results and repeat the braking test.

No temperature correction is applied.

The average peak braking force coefficient ($\overline{\mu_{peak}}$) shall be within the range reported in the table in paragraph 1.1.1.

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

1.1.1.2.2. Using the method described in paragraph 2.2. of Part (B) 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 at least six (6) valid test runs in the same direction in the same test session.

Evaluate the braking test as described in paragraphs 2.2.2.7.1., 2.2.2.7.2. and 2.2.2.7.4. of part (B) of this Annex. If the coefficient of variation CV_{BFC} exceeds 3 per cent, dismiss the results and repeat the braking test.

No temperature correction is applied.

The braking force coefficient ($\overline{BFC}$) shall be within the range reported in the table in paragraph 1.1.1.

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

Paragraph 1.4., amend to read:

"1.4. In order to cover the range of the tyre sizes fitting the commercial vehicles, the Standard Reference Test Tyres (SRTT) shall be used to measure the relative wet index as shown in the following table:

For class C3 tyres ***SRTT19.5, SRTT22.5, SRTT19.5 siped or SRTT22.5 siped***	
~~Narrow family~~ ~~$S_{Nominal}$ < 285 mm~~	~~Wide family~~ ~~$S_{Nominal}$ ≥ 285 mm~~
~~SRTT19.5~~	~~SRTT22.5~~
For class C2 tyres SRTT16C	
~~$S_{Nominal}$ = Tyre nominal section width~~	

"

Paragraph 2.1.2.13, amend to read:

"2.1.2.13. Validation of results

For the reference tyre:

(a) If the coefficient of variation of the peak braking coefficient CV_{μ} of the reference tyre, which is calculated by the formula given in 4.2.8.2. of part (A) of this Annex, is higher than five per cent, discard all data and repeat the test for this reference tyre.

(b) **The average peak braking force coefficients ($\overline{\mu_{peak}}$, see paragraph 1.1.1.2.1. of this Annex) as calculated from the initial and from the final braking test of the reference tyre within a test cycle shall be within the range reported in the table in paragraph 1.1.1.**

If one or more of the above conditions is not met, the complete test cycle shall be performed again.

For the candidate tyres:

…"

Paragraph 2.1.2.14., amend to read:

"2.1.2.14. The wet grip index (G) shall be calculated as:

Wet grip index ~~(G) = μ peak,ave (T)/μ peak, ave (R)~~ $(\boldsymbol{G}) = \boldsymbol{f} \cdot \frac{\mu_{peak\ ave}(T)}{\mu_{peak\ ave}(R)}$

where

For class C2 tyres ***SRTT16C***	
***f* = 1**	
For class C3 tyres	
SRTT19.5, SRTT22.5	***SRTT19.5 siped, SRTT22.5 siped***
***f* = 1**	***f* = ~~1.04~~ 1.02**

***f*: correction factor depending on used SRTT**

It represents the relative wet grip index for braking performance of the candidate tyre (T) compared to the reference tyre (R)."

Paragraph 2.2.4., amend to read:

"2.2.2.4. Tyre load

The static load on each axle shall remain the same throughout the test procedure. The static load on each tyre**, expressed as a percent of the nominal static load and rounded to the nearest integer,** shall lie between 60 per cent and 100 per cent of **the SRTT and** the candidate tyre's load capacity. ~~This value shall not exceed 100 per cent of the load capacity of the reference tyre.~~

Tyre load on the same axle should not differ by more than 10 per cent.

The use of fitting as per Configurations 2 and 3 shall fulfil the following additional requirements:

Configuration 2: Front axle load > Rear axle load

The rear axle may be indifferently fitted with 2 or 4 tyres

Configuration 3: Rear axle load > Front axle load x 1.8"

Paragraph 2.2.2.7.2., amend to read:

"2.2.2.7.2. Validation of results

For the reference tyre:

(a) If the coefficient of variation of "AD" of any two consecutive groups of 3 runs of the reference tyre is higher than 3 per cent, discard all data and

repeat the test for all tyres (the candidate tyres and the reference tyre). The coefficient of variation is calculated by the following relation:

$$\frac{\text{standard deviation}}{\text{average}} \times 100$$

(b) The average braking force coefficients ($\overline{BFC}$, see paragraph 1.1.1.2.2. of this Annex) as calculated from the initial and from the final braking tests of the reference tyre within a test cycle shall be within the range reported in the table in paragraph 1.1.1.

If one or more of the above conditions is not met, the complete test cycle shall be performed again.

For the candidate tyres:

The coefficients of variation are calculated for all the candidate tyres.

$$\frac{\text{standard deviation}}{\text{average}} \times 100$$

If one coefficient of variation is greater than 3 per cent, discard the data for this candidate tyre and repeat the test."

Paragraph 2.2.2.7.5., amend to read:

"2.2.2.7.5. Calculation of the relative wet grip index of the tyre

The wet grip index represents the relative performance of the candidate tyre compared to the reference tyre. The way to obtain it depends on the test configuration as defined in paragraph 2.2.2.2. of this Annex. The wet grip index *G* of the tyre is calculated as reported into Table 7:

Table 7

Configuration C1: candidate tyres on both axles	$G = \boldsymbol{f} \cdot \frac{BFC(T)}{BFC(R)}$
Configuration C2: candidate tyres on front axle and reference tyres on rear axle	$G = \boldsymbol{f} \cdot \frac{BFC(T)\cdot[a+b+h\cdot BFC(R)]-a\cdot BFC(R)}{BFC(R)\cdot[b+h\cdot BFC(T)]}$
Configuration C3: reference tyres on front axle and candidate tyres on rear axle	$G = \boldsymbol{f} \cdot \frac{BFC(T)\cdot[-a-b+h\cdot BFC(R)]+b\cdot BFC(R)}{BFC(R)\cdot[-a+h\cdot BFC(T)]}$

where

For class C2 tyres	
SRTT16C	
$\boldsymbol{f}$ **= 1**	
For class C3 tyres	
SRTT19.5, SRTT22.5	***SRTT19.5 siped, SRTT22.5 siped***
$\boldsymbol{f}$ **= 1**	$\boldsymbol{f}$ **= ~~1.04~~ 1.02**

Where (see also Figure 1):

***f*: correction factor depending on used SRTT**

cog: centre of gravity of the loaded vehicle

m: mass (in kilograms) of the loaded vehicle

a: horizontal distance between front axle and centre of gravity of the loaded vehicle (m)

b: horizontal distance between rear axle and centre of gravity of the loaded vehicle

h: vertical distance between ground level and centre of gravity of the loaded vehicle (m).

N.B. When *h* is not precisely known, these worst case values shall apply: 1.2 for configuration C2, and 1.5 for configuration C3

γ: loaded vehicle acceleration [m·s^{-2}]

g: acceleration due to the gravity [m·s^{-2}]

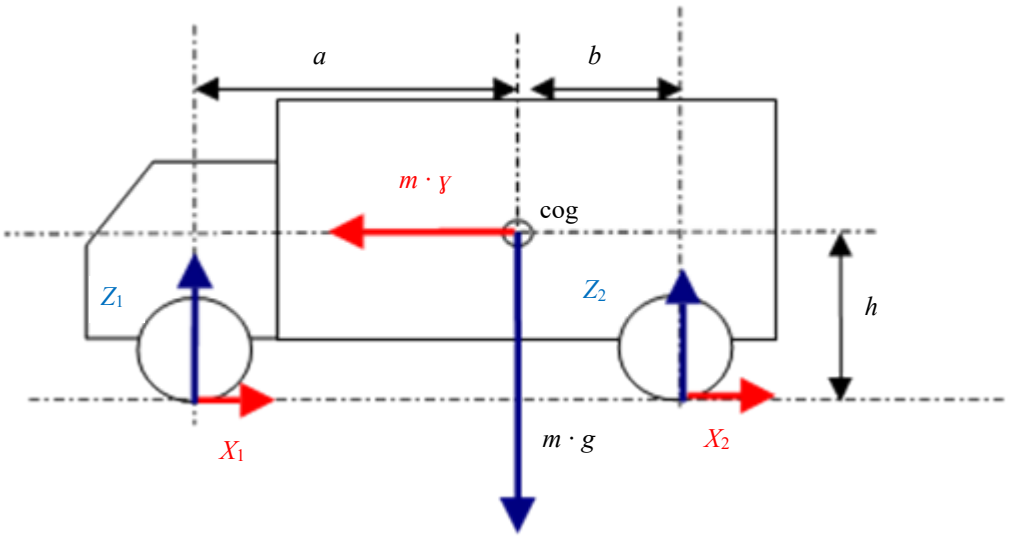
X_1: longitudinal (X-direction) reaction of the front tyre on the road

X_2: longitudinal (X-direction) reaction of the rear tyre on the road

Z_1: normal (Z-direction) reaction of the front tyre on the road

Z_2: normal (Z-direction) reaction of the rear tyre on the road

Figure 1
Nomenclature explanation related to grip index of the tyre



"

Paragraph 2.2.2.8.4., amend to read:

"2.2.2.8.4. The wet grip index of the candidate tyre compared to the reference tyre is deduced by multiplying the relative efficiencies calculated above:

(Wet Grip Index 1 · Wet Grip Index 2)

~~*Note*: When the test expert decides to use an SRTT tyre as a control tyre (i.e. in the test procedure two SRTTs are compared directly instead of an SRTT with a control tyre) the result of the comparison between the SRTTs is called the "local shift factor".~~

~~It is permitted to use a previous SRTTs comparison.~~

~~The comparison results shall be checked periodically.~~"

Annex 5, Appendix, amend to read:

"Test reports examples of wet grip index for tyres in new state

Example 1: Test report of wet grip index for tyres in new state using trailer or tyre test vehicle method

Test report number:		Test date:	

Track:			Minimum:	Maximum:
Texture depth (mm):		Wetted surface temp. (°C):		
$\mu_{peak,corr}$[4]:		Ambient temp (°C):		
Water depth (mm):				

Speed (km/h):	

No.		*1*	*2*	*3*	*4*	*5*
Brand						
Pattern/trade description		SRTT…				SRTT…
Size						
Service description						
Reference (test) inflation pressure[1] (kPa)						
Tyre identification						
M+S marking (Y/N)						
3PMSF marking (Y/N)						
Rim						
Load (kg)						
Pressure (kPa)						
μ_{peak}	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
$\overline{\mu_{peak}}$						
Standard deviation, σ_μ						
$CV_\mu \leq 4$ % [2]						
$CVal(\mu_{peak}) \leq 5$ % [3]						
$\mu_{peak,corr}$(R)						
$\mu_{peak,adj}$(R)						
f						
Wet grip index						
Wetted surface temp. (°C)						
Ambient temp. (°C)						
Remarks						

(1) for classes C2 and C3 tyres, corresponding to the indication of the inflation pressure marked on the sidewall as required by paragraph 4.1. of this Regulation

(2) For classes C2 and C3 tyres, the limit is 5 %.

(3) For classes C2 and C3 tyres, $CVal(\mu_{peak})$ is not defined nor applied.

(4) For classes C2 and C3 tyres, no temperature correction is applied when paragraph 1.1.1.2. is applied.

Example 2: Test report of wet grip index for tyres in new state using vehicle method

Test report number:	

Test date:	

Track:	
Texture depth (mm):	
$BFC_{ave,corr,1}$ (5): **or BFC_{ave} or $\mu_{peak,corr}$** (4):	
$BFC_{ave,corr,2}$ (5):	
$CVal(BFC_{ave,corr})$:	
Water depth (mm):	

	Minimum:	Maximum:
Wetted surface temp. (°C):		
Ambient temp (°C):		

Vehicle		
Brand:		
Model:		
Type:		
Year of registration:		
Maximum axle load:	Front	Rear

Initial speed (km/h):	

Final speed (km/h):	

No.		*1*		*2*		*3*		*4*		*5*	
Brand											
Pattern/trade description		SRTT…								SRTT…	
Size											
Service description											
Reference (test) inflation pressure(1) (kPa)											
Tyre identification											
M+S marking (Y/N)											
3PMSF marking (Y/N)											
Rim											
Front axle pressure (kPa)		left:	right:	left:	right:	left:	right:	left:	right:	left:	right:
Rear axle pressure (kPa)		left:	right:	left:	right:	left:	right:	left:	right:	left:	right:
Front axle load (kg)		left:	right:	left:	right:	left:	right:	left:	right:	left:	right:
Rear axle load (kg)		left:	right:	left:	right:	left:	right:	left:	right:	left:	right:
		Braking distance (m)	*BFC_i*	*Braking distance (m)*	*BFC_i*	*Braking distance (m)*	*BFC_i*	*Braking distance (m)*	*BFC_i*	*Braking distance (m)*	*BFC_i*
Measurement	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
$\overline{BFC_{ave}}$											
Standard deviation, σ_{BFC}											
$CV_{BFC} \leq 4$ % (2)											
$CVal(BFC_{ave}) \leq 5$ % (3)											

$BFC_{ave,corr}$(R)					
BFC_{adj}(R)					
f					
Wet grip index					
Wetted surface temp. (°C)					
Ambient temp. (°C)					
Remarks					

(1) for classes C2 and C3 tyres, corresponding to the indication of the inflation pressure marked on the sidewall as required by paragraph 4.1. of this Regulation.

(2) For classes C2 and C3 tyres, the limit is 3 %.

(3) For classes C2 and C3 tyres, $CVal(BFC_{ave})$ is not defined nor applied.

(4) For classes C2 and C3 tyres, depending on whether paragraph 1.1.1.1 or 1.1.1.2. applies

(5) For classes C2 and C3 tyres, $BFC_{ave,corr}$ is not defined nor applied

"

Annex 7,

Paragraph 4.8.4., amend to read:

"4.8.4. Calculation of the relative snow grip index of the tyre

The snow grip index represents the relative performance of the candidate tyre compared to the reference tyre.

$$SG(\mathrm{Tn}) = \boldsymbol{f} \cdot \frac{\overline{AA_{\mathrm{Tn}}}}{wa_{\mathrm{SRTT}}}$$

where $\overline{AA_{Tn}}$ is the arithmetic mean of the average accelerations of the n-th candidate tyre

and *f* is given in the following table

Reference tyre	*Factor*
SRTT19.5, SRTT22.5	$\boldsymbol{f = 1.000}$
SRTT19.5 siped~~, SRTT22.5 siped~~	$\boldsymbol{f = 1.670}$**1.570**
SRTT22.5 siped	$\boldsymbol{f = 1.680}$

"

Paragraph 4.9.2., amend to read:

"4.9.2. Principle of the approach

The principle lies upon the use of a control tyre and 2 different vehicles for the assessment of a candidate tyre in comparison with a reference tyre.

One vehicle can fit the reference tyre and the control tyre, the other the control tyre and the candidate tyre. All conditions are in conformity with paragraph 4.7. above.

The first assessment is a comparison between the control tyre **C** and the reference tyre. The result (snow grip index SG1) is the relative efficiency of the control tyre compared to the reference tyre.

$$\boldsymbol{SG1 = f \cdot \frac{\overline{AA_C}}{wa_{\mathrm{SRTT}}}}$$

The second assessment is a comparison between the candidate tyre **Tn** and the control tyre **C**. The result (snow grip index SG2) is the relative efficiency of the candidate tyre compared to the control tyre.

$$\boldsymbol{SG2 = \frac{\overline{AA_{Tn}}}{\overline{AA_{C}}}}$$

The second assessment is done on the same track as the first one. The air temperature must be in the range of ±5 °C of the temperature of the first assessment. The control tyre set is the same set as the set used for the first assessment.

The snow grip index SG of the candidate tyre compared to the reference tyre is deduced by multiplying the relative efficiencies calculated above:

$$\mathrm{SG} = \mathrm{SG1} \cdot \mathrm{SG2}$$

"

Annex 7, Appendix 3, Part 5, amend to read:

"5. Test results: average accelerations ($m \cdot s^{-2}$)

Run number	*Specification*	*SRTT (1st test)*	*Candidate 1*	*Candidate 2*	*Candidate 3*	*SRTT (2nd test)*
1						
2						
3						
4						
5						
6						
Mean						
Standard deviation						
Slip ratio (per cent)						
Coefficient of variation	$CV_{AA} \leq 6$ %					
Coefficient of Validation	$CVal_{AA}$(SRTT) ≤ 6 %					
SRTT weighted average						
f						
Snow grip index		1.00				

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

(2) refer to single load"

II. Justification

1. As presented in informal document GRBP-78-28-Rev.1, the main goal of this supplement is to improve the reproducibility of the snow grip test method by replacing the current reference tyres C3 SRTTs 19.5 and 22.5 with the new reference tyres C3 SRTTs 19.5 and 22.5 siped.

2. As these new reference tyres will be also used to assess the wet adhesion performance, adaptations are needed for the C2 and C3 class tyres wet grip index procedure in Annex 5 - Part (B). Additional improvements for this procedure are also proposed in the document. In the *Table of Contents*, item 7 is now aligned to the title of paragraph 7.

3. Differently from the snow grip test procedure, SRTTs 19.5 and 22.5 are currently not interchangeable for the wet grip index test, being their choice linked to the section width of the candidate tyre. This provision generates uncertainty in testing and logistic difficulties, being not always possible to fit SRTT and the candidate tyre under the same vehicle. As anticipated in informal document GRBP-78-28-Rev.1, the analysis of the wet grip test campaign results confirmed the statistical equivalence of both the two new C3 SRTTs 19.5 and 22.5 siped and the two current SRTTs 19.5 and 22.5. It is then proposed to eliminate the existing unnecessary constrain. The tighter provision for load in paragraph 2.2.2.4. assures consistency of this supplement with the version of the UN Regulation currently in force: no change of reference tyre will be, in practice, applicable for most of the candidate tyres, while - for the candidate tyres sizes which, as of today, are difficult to be tested - a direct comparison with the proper reference tyre will be possible.

4. As of today, the method to measure and validate the wetted frictional properties of the C2 and C3 track surface is based on the C1 SRTT16 μ-peak. This provision is complex and not really effective, not allowing a contextual check of the friction property of the track during the test session. As anticipated in informal document GRBP-78-28-Rev.1, in analogy with the prescriptions of C1 tyres wet grip index procedures (new and worn), it is proposed to validate both the C2 and C3 track surface and the tests results of each test session using the same method and the same reference tyres used in the evaluation program itself. The analysis of the results of the wet grip index test campaign (different conditions and tracks) leads to the proposed values of the wetted frictional properties (for each reference tyre and method).

5. The standard ISO 15222 is in the process of being revised in the same way as proposed in this document in order to ensure global standardization and to promote harmonization worldwide.

6. The test report examples have been amended to consider the introduced new possibilities to characterize the wetted frictional properties.

7. Transitional provisions are introduced to ensure that technical services may adapt, if needed, the test tracks to the new requirements and to assure a smooth transition to the new SRTTs 19.5 and 22.5 siped without premature disposal of current SRTTs 19.5 and 22.5. The current SRTTs 19.5 and 22.5 will be phased out at the end of 2028.

8. The test report templates are aligned to the revised test procedure.

9. References are updated following the previous paragraph renumbering.

10. Paragraph 8.3.2.1. is introduced to consider the availability of the C3 SRTTs when the conformity of production (COP) occurs. This proposal will give each manufacturer the opportunity to use the same reference tyre used for the type approval.

11. Brackets are removed in the proposed transitional provisions to address Supplement 2 to the 04 series of amendments to this Regulation. The wording is also aligned to the guidelines.

12. Regarding the snow grip test procedure, as requested by GRBP Chairman during the 78th session, ETRTO contacted JAPAN.

The proposal presented in this amendment is based on the following considerations:

(a) The equivalence of the performance of the new siped SRTTs was assessed by comparing the Average Acceleration Distance of the two SRTTs (see slide 7 of document GRBP-78-28e-Rev.), each one tested on the suitable truck and conditions for the given tyre size.

(b) On the other hand, the assumed (and mentioned in R117) equivalence of the current SRTT could not be proved and was probably due to the high variability of current SRTTs and the limited data available when the snow grip method was developed.

Because of the above, in the case of a candidate tyre tested against the four available C3 SRTTs and provided that all the ambient conditions remain unchanged, we may assume that:

(a) test against *SRTT19.5 siped* and *SRTT22.5 siped* would provide the same snow grip index ($SGC_{19.5\ siped} = SGC_{22.5\ siped}$)

(b) the tested against *SRTT19.5* and *SRTT22.5* would provide different snow grip indices ($SGC_{19.5} < SGC_{22.5}$, because $SGC_{19.5}$ perform better than $SGC_{22.5}$)

As the passage between the results obtained with the new siped SRTTs and the current SRTTs is provided by the correlation factor, four different scenarios can be considered. For each one the result of an **ideal test of a candidate tyre vs each of the 4 SRTTs is provided:**

Sc.1	$f_{19.5} = f_{22.5} = 1.68$	$SGC_{19.5\ siped} = SGC_{22.5\ siped}$ **$SGC_{19.5\ siped} > SGC_{19.5}$** $SGC_{22.5\ siped} = SGC_{22.5}$	This scenario would cover already type approved tyres on the market, including those tested against current SRTT22.5.
Sc.2	$f_{19.5} = f_{22.5} = 1.57$	$SGC_{19.5\ siped} = SGC_{22.5\ siped}$ $SGC_{19.5\ siped} = SGC_{19.5}$ **$SGC_{22.5\ siped} < SGC_{22.5}$**	$SGC_{22.5\ siped} < SGC_{22.5}$ would result in a **hidden tightening of the limits** for candidate tyres tested against $SGC_{22.5\ siped}$
Sc.3	$1.57 < f_{19.5} = f_{22.5} < 1.68$	$SGC_{19.5\ siped} = SGC_{22.5\ siped}$ **$SGC_{19.5\ siped} \neq SGC_{19.5}$** **$SGC_{22.5\ siped} \neq SGC_{22.5}$**	In this case testing a candidate tyre against the 4 SRTTs would likely end up in **3 different snow grip indices**
Sc.4	$f_{19.5} = 1.57$ and $f_{22.5} = 1.68$	$SGC_{19.5\ siped} < SGC_{22.5\ siped}$ **$SGC_{19.5\ siped} = SGC_{19.5}$** **$SGC_{22.5\ siped} = SGC_{22.5}$**	Although this scenario would imply **different correlation factors despite the claimed equivalence** of the new siped SRTTs, it **would maintain the alignment of the snow grip indices** within the same SRTT tyre size, i.e., $SGC_{19.5\ siped}$ vs $SGC_{19.5}$ and $SGC_{22.5\ siped}$ vs $SGC_{22.5}$

Where $f_{19.5}$ is the correlation factor when using *SRTT19.5 siped* and $f_{22.5}$ the one when using *SRTT22.5 siped*.

Although none of the illustrated scenarios is self-consistent, scenario 4 at least keeps unchanged the current situation for the measured snow grip index.

Regarding the correlation factors for C3 tyres' snow grip testing, and considering Japan objections to initial ETRTO proposal, we propose to consider in this amendment the scenario 4, i.e., to introduce two different correlation factors for the snow grip testing of C3 tyres in the case the new C3 siped SRTT's are used:

$f = 1.57$ for *SRTT19.5 siped*

$f = 1.68$ for *SRTT22.5 siped*

This proposal differs from document GRBP-79-07e because it is based on additional data, missing in previous analysis presented with document GRBP-78-28-Rev.1.

The affected paragraphs are amended accordingly.

It is presented as a compromise intermediate solution aimed primarily to improve the reproducibility of the snow grip test method.

13. Regarding the correlation factor for the wet grip, ETRTO agrees with Japan proposal expressed in document GRBP-79-07e.

The affected paragraphs are amended accordingly.