

11 December 2023

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## **Agreement**

### **Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations\***

(Revision 3, including the amendments which entered into force on 14 September 2017)

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### **Addendum 163 – UN Regulation No. 164**

#### **Amendment 1**

Supplement 1 to the original version - Date of entry into force 24 September 2023

#### **Uniform provisions concerning the approval of studded tyres with regard to their snow performance**

This document is meant purely as documentation tool. The authentic and legal binding text is: ECE/TRANS/WP.29/2023/7.



**UNITED NATIONS**

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\* Former titles of the Agreement:

Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958 (original version); Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, done at Geneva on 5 October 1995 (Revision 2).



UN Regulation No. 164, amend to read:

**"UN Regulation No. 164 on uniform provisions concerning the approval of studded tyres with regard to their snow performance**

Contents

	<i>Page</i>
Regulation	
1. Scope .....	3
2. Definitions.....	3
3. Application for approval .....	4
4. Markings .....	5
5. Approval.....	6
6. Specifications .....	7
7. Modifications of the type of studded tyre and extension of approval .....	8
8. Conformity of production.....	9
9. Penalties for non-conformity of production .....	9
10. Production definitively discontinued.....	9
11. Names and addresses of Technical Services responsible for conducting approval tests of Type Approval Authorities .....	9
Annexes	
1 Communication .....	11
2 Arrangements of the approval mark.....	13
3 Procedures for ice performance testing relative to ice tyre of class C1.....	15
Appendix 1 - Test reports and test data for C1 tyres .....	16

## 1. Scope

- 1.1. This Regulation applies to new studded pneumatic tyres<sup>1</sup> of classes C1, C2 and C3 with regard to their snow performance.
- It does not, however, apply to:
- 1.1.1. Tyres of category of use "temporary use tyres" as declared in UN Regulation No. 30 for class C1 tyres;
- 1.1.2. Tyres having a nominal rim diameter code  $\leq 10$  (or  $\leq 254$  mm) or  $\geq 25$  (or  $\geq 635$  mm);
- 1.1.3. Tyres designed for competitions;
- 1.1.4. Tyres intended to be fitted to road vehicles of categories other than M, N and O;<sup>2</sup>
- 1.1.5. Tyres with a speed rating less than 80 km/h (speed symbol F);
- 1.1.6. Tyres designed only to be fitted to vehicles registered for the first time before 1 October 1990;
- 1.1.7. Tyres of category of use "Normal" as declared in UN Regulation No. 30 for class C1 tyres or in UN Regulation No. 54 for class C2 or C3 tyres;
- 1.1.8. Studdable tyres.
- 1.2. Notwithstanding the provisions of this Regulation a Contracting Party may permanently, temporarily or conditionally prohibit the use of, or impose additional requirements for, studded tyres.

## 2. Definitions

For the purpose of this Regulation, in addition to the definitions contained in UN Regulations Nos. 30, 54 and, with respect to the snow performance of tyres of classes C1, C2 and C3 and ice performance of tyres of class C1, in UN Regulation No. 117, the following definitions apply.

- 2.1. "*Type of studded tyre*" means tyres which do not differ in such essential characteristics as:
- (a) The manufacturer's name;
  - (b) The tyre class;
  - (c) The tyre structure;
  - (d) The category of use: snow or special use;
  - (e) For class C1 tyres, whether ice grip tyre or not;
  - (f) The tread pattern (see section 3.2.1. of this Regulation);
  - (g) The list of stud models.<sup>3</sup>
- 2.2. "*Tyre class*" means one of the following groupings:
- 2.2.1. *Class C1 tyres*: tyres approved according to UN Regulation No. 30;
- 2.2.2. *Class C2 tyres*: tyres approved according to UN Regulation No. 54 and identified by a load capacity index in single formation lower or equal to 121 and a speed category symbol higher or equal to "N";

<sup>1</sup> For the purpose of this Regulation "tyres" means "pneumatic tyres"

<sup>2</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3).

<sup>3</sup> Changing the list of stud models can be made as an extension of the type approval certificate.

- 2.2.3. *Class C3 tyres*: tyres approved according to UN Regulation No. 54 and identified by:
- (a) A load capacity index in single formation higher or equal to 122; or
  - (b) A load capacity index in single formation lower or equal to 121 and a speed category symbol lower or equal to "M".
- 2.3. "*Tyres designed for competition*" means tyres intended to be fitted to vehicles involved in motor sport competition and not intended for non-competitive on-road use.
- 2.4. "*Tyre for use in severe snow conditions*" means a tyre whose tread pattern, tread compound or structure is specifically designed to be used in severe snow conditions and that fulfils the requirements of paragraph 6.1. of this Regulation.
- 2.5. "*Ice grip tyre*" means a class C1 tyre for use in severe snow conditions that is specifically designed to be used on road surfaces covered with ice and that fulfils the requirements of paragraph 6.3. of this Regulation.
- 2.6. "*Studded tyre*" means a tyre that is designed to be equipped and always used with studs to improve traction properties on ice surfaces.
- 2.7. "*Studdable tyre*" means a tyre that is designed to be able to be equipped with studs and to be used with or without studs.
- 2.8. "*Stud*" means an additional device(s) inserted into or onto the tyre tread to improve traction properties on ice surfaces.
- 2.9. "*Stud model*" means studs that do not differ in their shape, main dimensions and mass.
- 2.10. "*Main dimensions of stud*" means the maximum height of the stud, maximum width of the stud body and maximum width of the stud bottom flange.
- 2.11. "*Snow grip index*" (*SG*) means the dimensionless unit for expressing the snow performance level of a candidate tyre relative to the performance of the applicable SRTT.
- 2.12. "*Ice grip index*" (*GI*) means the dimensionless unit for expressing the ice performance level of a candidate tyre relative to the performance of the applicable SRTT.

### **3. Application for approval**

- 3.1. The application for approval of a type of studded tyre with regard to this Regulation shall be submitted by the tyre manufacturer or by his duly accredited representative. It shall specify:
- 3.1.1. The performance characteristics to be assessed for the type of studded tyre; "snow performance level" and additionally "ice performance level" in case of ice grip tyre;
  - 3.1.2. Manufacturer's name and address;
  - 3.1.3. If applicable, name and address of manufacturer's representative;
  - 3.1.4. Tyre class (class C1, C2 or C3);
  - 3.1.5. Category of use (snow or special use);
  - 3.1.5.1. For class C1 tyres, whether ice grip tyre or not;
  - 3.1.6. Tyre structure;
  - 3.1.7. Brand name(s)/trademark(s), trade description(s)/commercial name(s);

- 3.1.8. A list of tyre size designations covered by this application and specifying for each brand name/trademark and/or each trade description/commercial name the applicable tyre size designations and service descriptions, adding in case of class C1 tyres whether "reinforced" (or "extra load") or not.
- 3.1.9. The list of stud models.
- 3.2. The application for approval shall be accompanied by:
- 3.2.1. Details of the major features, with respect to the effects on the snow performance, and, if applicable, on the ice performance, of the tyres, including the tread pattern, included in the designated range of tyre sizes. This may be by means of descriptions supplemented by technical data, drawings, photographs or Computer Tomography (CT) scans, and must be sufficient to allow the Type Approval Authority or Technical Service to determine whether any subsequent changes to the major features will adversely affect the tyre performance. The effects of changes to minor details of tyre construction on tyre performances will be evident and determined during checks on conformity of production;
- 3.2.1.1. Drawings of the stud models.
- 3.2.2. Drawings or photographs of the tyre side wall, showing the information given in paragraph 3.1.8. above and the approval mark referred to in paragraph 4., shall be submitted once the production has been established, but no later than one year after the date of granting of type approval.
- 3.2.3. In the case of applications relating to special use tyres, a copy of the mould drawing of the tread pattern shall be supplied in order to allow verification of the void-to-fill ratio.
- 3.3. At the request of the Type Approval Authority, the applicant shall submit samples of tyres for the test or copies of test reports from the Technical Services, communicated as given in paragraph 11. of this Regulation.
- 3.4. With regard to the application, testing may be confined to a representative tyre size of the type of studded tyre, at the discretion of the Type Approval Authority.

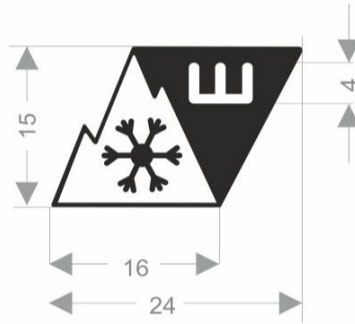
## **4. Markings**

- 4.1. All tyres constituting the type of studded tyre shall be marked as prescribed by either UN Regulation No. 30 or 54, as applicable.
- 4.2. Tyres type approved under this Regulation shall bear:<sup>4</sup>
- 4.2.1. the-word "STUDED" at least 4 mm in height.
- 4.2.2. The Snow Grip Symbol for Studded Tyres as defined in Figure 1 in case the tyre meets the requirements of paragraph 6.1.

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<sup>4</sup> Some of these requirements may be specified separately in UN Regulation No. 30 or 54.

Figure 1:  
Pictogram definition of "Snow Grip Symbol for Studded Tyres"

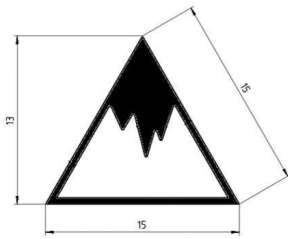


Minimum 16 mm base and 15 mm height.

Above drawing not to scale.

4.2.3. Additionally, the Ice Grip Symbol as defined in Figure 2 in the case the tyre meets the requirements of paragraph 6.3. below.

Figure 2:  
Pictogram definition of "Ice Grip Symbol"



Minimum 15 mm base and 13 mm height.

Above drawing not to scale.

4.3. Tyres shall provide adequate space for the approval mark as shown in Annex 2 to this Regulation.

4.3.1. In case the approval of a type of studded tyre pursuant to this Regulation has been granted by the same Type Approval Authority than that granting the approval pursuant to UN Regulations Nos. 30 or 54, the approval marks can be combined using sign "+" which indicates that its approval is complemented by an approval pursuant to this Regulation, as described in Annex 2 of this Regulation.

4.4. The marking referred to in paragraph 4.2. and the approval mark prescribed in paragraph 5.4 of this Regulation shall be clearly legible, indelible and raised above or sunk below the tyre surface.

4.4.1. The marking referred to in paragraph 4.2.1. and the approval mark shall be situated in the lower area of the tyre on at least one of its side walls. However, in the case of tyres identified by the tyre to rim fitment configuration symbol "A" or "U", the marking may be located anywhere on the outside side wall of the tyre.

## 5. Approval

5.1. If the representative tyre size of the type of studded tyre submitted for approval pursuant to this Regulation meets the requirements of paragraphs 6. and 7. below, approval of that type of studded tyre shall be granted.

- 5.2. An approval number according to Schedule 4 to the Revision 3 of the 1958 Agreement shall be assigned to the type of studded tyre approved. The same Contracting Party may not assign the same number to another type of studded tyre.
- 5.2.1. Instead of granting the original type approval number pursuant to UN Regulation No. 164, upon the request of the manufacturer, the Type Approval Authority may grant the type approval number, which had been granted before to that type of studded tyre pursuant to UN Regulations Nos. 30 or 54 with the subsequent extension number.
- 5.3. Notice of approval or extension of approval or refusal of approval of a type of studded tyre pursuant to this Regulation shall be communicated to the Parties to the Agreement, which apply this Regulation by means of a form conforming to the model in Annex 1 to the Regulation.
- 5.3.1. With reference to paragraph 5.2.1. above, tyre manufacturers are entitled to submit an application for extension of type approval to the requirements of other Regulations relevant to the tyre type. In that case, a copy of the relevant type approval communication(s), as issued by the relevant Type Approval Authority, shall be attached to the application for extension of approval. All applications for extension of approval(s) shall only be granted by the Type Approval Authority which issued the original approval for the tyre.
- 5.3.1.1. When extension of approval is granted to incorporate into the communication form (see Annex 1 to this Regulation) certification(s) of conformity to other Regulations, (all) the specific type approval number(s) and the Regulation itself shall be added to item 9. of Annex 1 "Communication form".
- 5.4. In the space referred to in paragraph 4.3. and in accordance with the requirements of paragraph 4.4. above there shall be affixed to every tyre size, conforming to the type of studded tyre approved under this Regulation, an international approval mark consisting of:
- 5.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval;<sup>5</sup> and
- 5.4.2. The part of the approval number specified in paragraph 3, Section 3 of Schedule 4 to the Revision 3 of the 1958 Agreement, which shall be placed close to the circle prescribed in paragraph 5.4.1. above either above or below the "E" or to the left or right of that letter.
- 5.5. If the tyre conforms to type approvals under one or more other Regulations annexed to the Agreement in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 5.4.1. above need not be repeated. In such a case the additional numbers and symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed adjacent to the symbol prescribed in paragraph 5.4.1. above.
- 5.6. Annex 2 to this Regulation gives examples of arrangements of approval marks.

## **6. Specifications**

- 6.1. Snow performance of studded tyres, when tested according to Annex 7 to UN Regulation No. 117 and paragraph 6.2. to this Regulation.

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<sup>5</sup> The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (ECE/TRANS/WP.29/78/Rev.6)

The studded tyre shall meet the minimum snow grip index value compared with the respective Standard Reference Test Tyre (SRTT) as follows:

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

<sup>(a)</sup> See paragraph 3. of Annex 7 to UN Regulation No. 117

<sup>(b)</sup> See paragraph 2. of Annex 7 to UN Regulation No. 117

<sup>(c)</sup> See paragraph 4. of Annex 7 to UN Regulation No. 117

- 6.2. The snow performance of studded tyres approved according to this Regulation shall be tested in studded form.
- 6.3. Ice performance of studded tyres of class C1 when tested according to Annex 8 to UN Regulation No. 117 and paragraph 6.4. to this Regulation.

The studded tyre of class C1 in category of snow tyre for use in severe snow conditions shall meet the minimum ice grip index value compared with the respective Standard Reference Test Tyre (SRTT) as follows:

Class of tyre	Ice grip index
C1	Ref. = SRTT16 1.18

- 6.4. The ice performance of studded tyres approved according to this Regulation shall be tested in studded form and following the additional prescriptions for testing as defined in Annex 3 to this Regulation.

## 7. Modifications of the type of studded tyre and extension of approval

- 7.1. Every modification of the type of studded tyre, which may influence the performance characteristics approved in accordance with this Regulation, shall be notified to the Type Approval Authority which approved the type of studded tyre. That Authority may either:
- 7.1.1. Consider that the modifications are unlikely to have any appreciable adverse effect on the performance characteristics approved and that the tyre will comply with the requirements of this Regulation; or
- 7.1.2. Require further samples to be submitted for test or further test reports from the designated Technical Service.
- 7.2. Confirmation or refusal of approval, specifying the modifications, shall be communicated by the procedure given in paragraph 5.3. of this Regulation to the Parties to the Agreement which apply this Regulation.
- 7.3. The Type Approval Authority granting the extension of approval shall assign a series number for such an extension which shall be shown on the communication form.



## **8. Conformity of production**

The conformity of production procedures shall comply with those set out in the Agreement, Schedule 1 (E/ECE/324-E/ECE/TRANS/505/Rev.3) with the following requirements:

- 8.1. Any studded tyre approved under this Regulation shall be so manufactured as to conform to the performance characteristics of the type of studded tyre approved and satisfy the requirements of paragraph 6. above;
- 8.2. The authority which has granted type approval may at any time verify the conformity control methods applied by the manufacturer. In general, the conformity control methods should take into consideration the production volumes of the type of studded tyre at each manufacturing facility. The normal frequency of these verifications shall be at least once every two years.
- 8.3. Verification tests shall be carried out on random samples of tyres bearing the approval mark required by this Regulation taken from the series production. The Type Approval Authority shall satisfy itself that all tyres falling within an approved type comply with the approval requirement.
  - 8.3.1. In the case of verification tests with regard to approvals in accordance with paragraph 6. of this Regulation, these shall be carried out using the same testing method as that adopted for original approval as declared in item 8 of the communication form.
- 8.4. Production shall be deemed to conform to the requirements of this Regulation if the levels measured comply with the limits prescribed in paragraph 6. of this Regulation.

## **9. Penalties for non-conformity of production**

- 9.1. The approval granted in respect of a type of studded tyre pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8. above are not complied with, or if any studded tyre of the type of studded tyre does not meet the limits given in paragraph 8.4. above.
- 9.2. If a Party to the Agreement, which applies this Regulation, withdraws an approval, it has previously granted, it shall forthwith notify the other Contracting Parties applying this Regulation by means of a copy of the approval form conforming to the model in Annex 1 to this Regulation.

## **10. Production definitively discontinued**

If the holder of an approval completely ceases to manufacture a type of studded tyre approved in accordance with this Regulation, he shall so inform the Type Approval Authority, which granted the approval. Upon receiving the relevant communication that Authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

## **11. Names and addresses of Technical Services responsible for conducting approval tests of Type Approval Authorities**

- 11.1. The Contracting Parties to the 1958 Agreement which apply this Regulation shall communicate to the United Nations Secretariat, the names and addresses of the Technical Services responsible for conducting approval tests and, where applicable, of the approved test laboratories and of the Type Approval

Authorities which grant approval and to which forms certifying approval or extension of approval or refusal of approval or withdrawal of approval, or production definitively discontinued, issued in other countries, are to be sent.

- 11.2. The Contracting Parties to the 1958 Agreement which apply this Regulation may designate laboratories of tyre manufacturers as approved test laboratories.
- 11.3. Where a Contracting Party to the 1958 Agreement applies paragraph 11.2. above, it may, if it so desires, be represented at the tests by one or more persons of its choice.

# Annex 1

## Communication

(Maximum format: A4 (210 x 297 mm))



Issued by:                      Name of administration:

.....  
 .....  
 .....

- Concerning:<sup>2</sup> Approval granted  
                   Approval extended  
                   Approval refused  
                   Approval withdrawn  
                   Production definitively discontinued

of a type of studded tyre pursuant to UN Regulation No. 164

Approval No.<sup>3</sup>.....

1.     Manufacturer's name and address: .....
2.     If applicable, name and address of manufacturer's representative: .....
3.     "Tyre class" of the type of studded tyre: .....
4.     "Category of use" of the type of studded tyre:
- 4.1    Ice grip tyre (Yes/No)<sup>2</sup>.....
5.     Tyre structure: .....
6.     Type of studded tyre designation:
- 6.1.   Brand name(s)/trademark(s) of the type of studded tyre
- 6.2.   Trade description(s)/commercial name(s) of the type of studded tyre:
7.     Technical Service and, where applicable, test laboratory approved for purposes of approval or of verification of conformity tests: .....
8.     Snow performance level of the representative tyre size, as per item 7. of the test report in the appendix 2 or 3, as applicable, to Annex 7 of the UN Regulation No. 117:..... (snow grip index) using the brake on snow method<sup>2</sup>, spin traction method<sup>2</sup> or acceleration method<sup>2</sup>.
- 8.1.   Ice performance level of the representative tyre size, see paragraph 2.7. of Regulation No. 117, as per item 8. of the test report in the appendix 1 to Annex 3 of UN Regulation No. 164: ..... (ice grip index) using the brake on ice method to confirm the classification as ice grip tyre.
9.     Number of report issued by the Technical Service: .....
10.    Date of report issued by that Service: .....
11.    Reason(s) of extension (if applicable): .....

<sup>1</sup> Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

<sup>2</sup> Strike out what does not apply.

<sup>3</sup> According to Schedule 4 to Revision 3 of the 1958 Agreement.

- 12. Any remarks:.....
- 13. Place: .....
- 14. Date: .....
- 15. Signature: .....
- 16. Annexed to this communication are: .....
- 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.
- 16.2. A list of tyre size designations: Specify for each brand name/trademark and/or each trade description/Commercial name the list of tyre size designations and service descriptions, adding in case of class C1 tyres whether "reinforced" (or "extra load") or not.
- 16.3. A list of stud models.

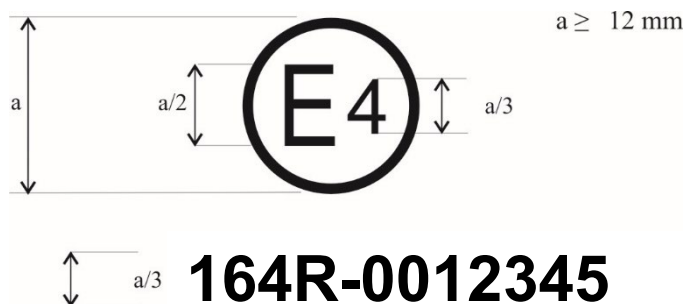
## Annex 2

### Arrangements of the approval mark

(See paragraphs 5.4. and 5.5. of this Regulation)

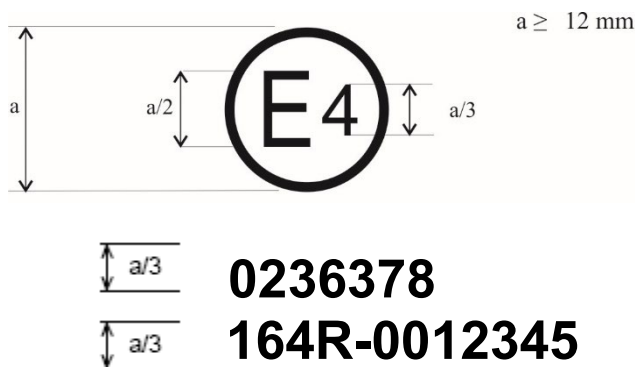
Approval pursuant to UN Regulation No. 164

Example 1



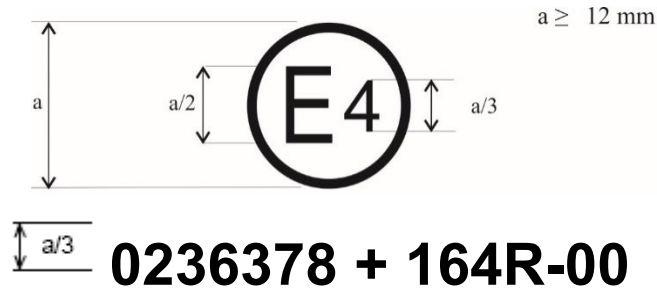
The above approval mark, affixed to a tyre shows that a tyre concerned has been approved in the Netherlands (E 4) pursuant to UN Regulation No. 164, under approval number 0012345. The first two digits of the approval number (00) indicate that the approval was granted according to the requirements 00 series of amendments to this Regulation.

Example 2

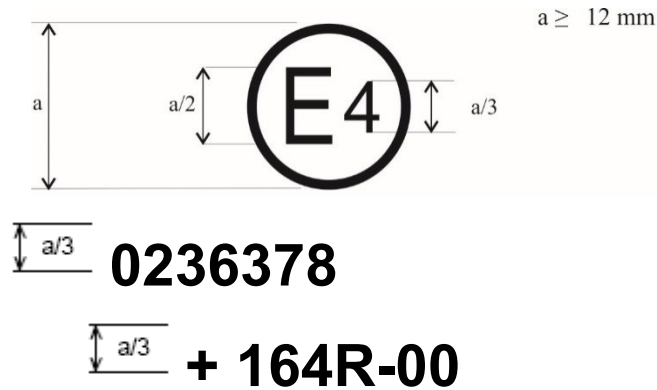


The above approval mark (according to paragraph 5.5. of this Regulation) shows that the tyre concerned has been approved in the Netherlands (E 4) pursuant to UN Regulations Nos. 30 and 164. The first two digits of the approval numbers indicate that, at the dates when the respective approvals were granted, UN Regulation No. 30 included the 02 series of amendments while UN Regulation No. 164 was in its original form.

Example 3



Example 4



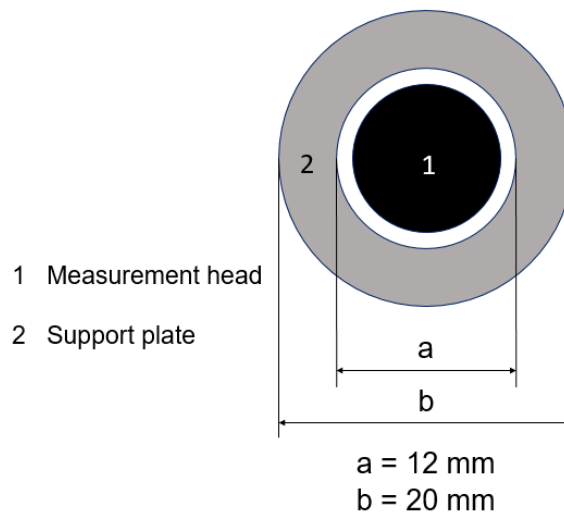
The above examples of the approval mark show that the tyre concerned has been initially approved in the Netherlands (E 4) pursuant to UN Regulation No. 30 under approval number 0236378. It is also marked by "+ 164R-00", which indicates that its approval is complemented by an approval pursuant to UN Regulation No. 164 in its original form. The first two digits (02) of the approval number pursuant to UN Regulation No. 30 indicate that the approval was granted pursuant to the 02 series of amendments of this Regulation. The addition (+) sign indicates that the approval granted pursuant to UN Regulation No. 30 has been complemented by an approval granted pursuant to UN Regulation No. 164.

## Annex 3

### Procedures for ice performance testing relative to ice grip tyre of class C1

1. The test procedure shall be carried out as described in Annex 8 to Regulation No. 117, taking into account the provisions of paragraph 3. below, using studded tyres with studs whose protrusion is measured before each braking test cycle pursuant to the procedure described in paragraph 2. below. The studded tyres should be "broken-in" prior to testing (at least 100 km on roads or with an equivalent method) to ensure correct fit of the studs and stable performance.
2. Stud protrusion measurement procedure  
 The stud protrusion measurement shall be done under the inflation pressure conditions required by the ice grip test. Figure 1 illustrates the stud protrusion device. It shall be equipped with a support plate (2) of 20 mm diameter and a 12-mm diameter hole for the measurement head (1). The measurement head shall be pressed perpendicular to the tread surface with a force of 15 N to 20 N to trigger the measurement. The stud protrusion shall be measured from every test tyre, from 20 consecutive studs over the whole width of the tread and in circumferential direction, and at the same stud positions each time.

Figure 1  
**Stud protrusion device sketch**



3. Notwithstanding the provisions of paragraph 2.1.1.2. of Annex 8 to Regulation No. 117, the braking lines must not overlap. The reference tyre shall be tested on its own braking line and each candidate studded tyre next to it on its own individual braking lines. The line for the reference tyre shall be kept clean from ice and snow dust. The candidate studded tyres shall be driven on new clean braking lines.

# Appendix 1

## Test reports and test data for C1 tyres

### Part 1 - Report

1. Type Approval Authority or Technical Service: .....
2. Name and address of manufacturer: .....
3. Test report No.: .....
4. Brand name and trade description: .....
5. Tyre class: .....
6. Category of use: .....
7. Stud model: .....
8. Ice grip index relative to SRTT
  - 8.1. Test procedure and SRTT used .....
9. Comments (if any): .....
10. Date: .....
11. Signature: .....

### Part 2 - Test data: 1st braking test cycle

1. Date of test: .....
2. Location of test track: .....
- 2.1. Test track characteristics:

	<i>At start of test</i>	<i>At end of test</i>	<i>Specification</i>
Weather			
Ambient temperature			-15 °C to +4 °C
Ice temperature			-15 °C to -5 °C
Other			

3. Test vehicle (make, model and type, year): .....
4. Test tyre details and data .....

	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
Brand name				
Trade description/ commercial name				
Tyre size designation				
Service description				
Test rim width code				
Tyre load FL/FR/RL/RR (kg)				



Load-on-tyre rate (FL/FR/RL/RR) (%)				
Tyre pressure (kPa)				

## 5. Measured stud protrusions before braking test (mm)

	<i>Min</i>	<i>Max</i>	<i>Average</i>
Left front			
Left rear			
Right front			
Right rear			

6. Test results: mean fully developed decelerations ( $m \cdot s^{-2}$ )

<i>Run number</i>	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
1				
2				
3				
4				
5				
6				
7				
8				
9				
$d_{m,ave}$				
$\sigma_d$				
$CV_d (\leq 6 \%)$				
$CV_d(d_m) (\leq 5 \%)$				
$d_{m,adj}(R)$				
Ice grip index	1.00			

**Part 2 - Test data: 2nd braking test cycle**

1. Date of test: .....
2. Location of test track: .....
- 2.1. Test track characteristics:

	<i>At start of test</i>	<i>At end of test</i>	<i>Specification</i>
Weather			
Ambient temperature			-15 °C to +4 °C
Ice temperature			-15 °C to -5 °C
Other			

3. Test vehicle (make, model and type, year): .....
4. Test tyre details and data .....

	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
Brand name				
Trade description/ commercial name				
Tyre size designation				
Service description				
Test rim width code				
Tyre load FL/FR/RL/RR (kg)				
Load-on-tyre rate (FL/FR/RL/RR) (%)				
Tyre pressure (kPa)				

5. Measured stud protrusions before braking test (mm)

	<i>Min</i>	<i>Max</i>	<i>Average</i>
Left front			
Left rear			
Right front			
Right rear			

6. Test results: mean fully developed decelerations ( $m \cdot s^{-2}$ )

<i>Run number</i>	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
1				
2				
3				
4				
5				
6				
7				
8				
9				
$d_{m,ave}$				
$\sigma_d$				
$CV_d (\leq 6\%)$				
$CV_d(d_m) (\leq 5\%)$				
$d_{m,adj}(R)$				
Ice grip index	1.00			

**Part 2 - Test data: 3<sup>rd</sup> braking test cycle**

1. Date of test: .....
2. Location of test track: .....

## 2.1. Test track characteristics:

	<i>At start of test</i>	<i>At end of test</i>	<i>Specification</i>
Weather			
Ambient temperature			-15 °C to +4 °C
Ice temperature			-15 °C to -5 °C
Other			

3. Test vehicle (make, model and type, year): .....

4. Test tyre details and data .....

	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
Brand name				
Trade description/ commercial name				
Tyre size designation				
Service description				
Test rim width code				
Tyre load FL/FR/RL/RR (kg)				
Load-on-tyre rate (FL/FR/RL/RR) (%)				
Tyre pressure (kPa)				

5. Measured stud protrusions before braking test (mm)

	<i>Min</i>	<i>Max</i>	<i>Average</i>
Left front			
Left rear			
Right front			
Right rear			

6. Test results: mean fully developed decelerations ( $m \cdot s^{-2}$ )

<i>Run number</i>	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
1				
2				
3				
4				
5				
6				
7				
8				
9				

<i>Run number</i>	<i>SRTT (Initial braking test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>SRTT (final braking test)</i>
$d_{m,ave}$				
$\sigma_d$				
$CV_d (\leq 6 \%)$				
$CVal(d_m) (\leq 5\%)$	<del></del>	<del></del>	<del></del>	<del></del>
$d_{m,adj}(R)$	<del></del>	<del></del>	<del></del>	<del></del>
Ice grip index	1.00			<del></del>

11

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