SLOVENSKI STANDARD
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Cestna vozila - Dodatne naprave za oprijem pnevmatik na osebnih in lahkih tovornih vozilih - 1. del: Splošne varnostne in zahtevane lastnosti

Road vehicles - Supplementary grip devices for tyres of passenger cars and light duty vehicles - Part 1 : General safety and performance requirements

Straßenfahrzeuge - Zusätzliche Gleitschutzvorrichtungen für Reifen an Personenfahrzeugen und leichten Nutzfahrzeugen - Teil 1: Sicherheitstechnische Anforderungen und Prüfverfahren

Véhicules routiers - Dispositifs supplémentaires d'adhérence pour pneumatiques de véhicules particuliers et de véhicules utilitaires légers - Partie 1 : Exigences générales de sécurité et de performance

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83.160.10 Pnevmatike za cestna vozila Road vehicle tyres

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Véhicules routiers - Dispositifs supplémentaires d'adhérence pour pneumatiques de véhicules particuliers et de véhicules utilitaires légers - Partie 1 : Exigences générales de sécurité et de performance

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16662-1:2020) has been prepared by Technical Committee CEN/TC 301 “Road Vehicles”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2020, and conflicting national standards shall be withdrawn at the latest by November 2020.

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1 Scope

This document provides specifications for safety, quality and performance requirements for supplementary grip devices, commonly called “SGDs”, for type – approved tyres according to the current legislation, intended to be fitted on tyres on vehicles in categories M1, N1, O1, O_2 and relevant sub-categories (off road vehicles).

The requirements contained in this document apply to all SGDs, regardless of the material/technology used to build it.

In case there are available standards for the specific technology of the device, they are intended to be used in conjunction with this document.

In case no standard is available for the specific technology, this document applies.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4000-1, *Passenger car tyres and rims — Part 1: Tyres (metric series)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp/

3.1
Supplementary Grip Device
SGD
device for the increasing of force transmission, in particular on snow and ice

Note 1 to entry: If not differently specified, this term identifies the Sample SGD.

3.2
tyre tread
part of the tyre directly in contact with the road surface

3.3
SGD tread surface
elements of the SGD between the tyre tread and the road surface

3.4
product hazard
defects implying a not acceptable loss of safety

Note 1 to entry: These hazards may occur through e.g. holes, breakages, SGD falling off the tyre, etc.

Note 2 to entry: Safety risks need to be defined in the SGD manual.

3.5
SGD type
SGD group having common physical characteristics and structure

Note 1 to entry: Common characteristics mean i.e. geometry, material. Size of a SGD type may vary.

3.6
sample SGD
SGD to be tested

3.7
reference SGD
SGD used as a basis for evaluating all other types of sample SGDs during the comparison tests

Note 1 to entry: the reference SGD is defined in Annex A.

3.8
fabric material
material composed by textile fibers

3.9
fabric SGD
SGD whose tread surface is in majority composed by fabric material

3.10
non-metallic net SGD
SGD forming a net pattern, whose tread surface is in majority composed by non-metallic materials

3.11
metallic SGD
SGD whose tread surface is in majority composed by metallic components

3.12
hybrid SGD
SGD whose tread surface combines either several materials and/or several technologies

EXAMPLE Automatic snow chains are considered to be an alternative technology.

3.13
variation of geometry
visually recognizable modification of at least one of the elements of the SGD

3.14
efficiency
rate between the average values obtained with the sample SGD and the reference SGD

3.15
producer
manufacturer, entity or organization that has the legal responsibility for placing the product on the market

Note 1 to entry: Legal reference from the European Directive 2001/95/EC Art 2(e).

3.16
snow tyres
tyres corresponding to the category SEVERE SNOW according to UN R117, with 3PMSF logo on sidewall (Alpin logo)

3.17
normal tyres
tyres without M+S and 3PMSF logo on their sidewalls

4 Requirements

4.1 General provisions

4.1.1 Size

The size of the SGD shall correspond to the tyre size list supplied by the SGD producer.

4.1.2 Adaptability

The SGDs shall be adjustable to the shape and dimension of the tyres for which they are intended.

4.1.3 Design

After mounting and tensioning the SGD, no more than 1/8 of the wheel circumference may remain SGD-free in any part of the tyre tread.

4.1.4 Static envelope

With vehicle stopped, the additional envelope of the SGD fitted on the tyre shall not be greater than:

— 20 mm on the internal side;

— 20 mm on the tyre tread;

— 25 mm on the external side (restricted to the tyre zone);

— 30 mm (only in case of Envelope Class 30, on internal, external and tyre tread side).

Concerning the envelopes on both the tyre tread and the internal side, the producer shall indicate, for each SGD type, the appropriate envelope class among those defined in Annex B. In this case, for the affiliation class of the type, all the dimensions mentioned in Table B.1 shall not be exceeded.

4.1.5 Construction and materials

The SGDs shall be built:

— in order to resist to the usage requirements (e.g.: different road surfaces, different vehicles having different mass, etc);

— in a way that both snow and ice eventually caught inside the device will not affect its performance and safety requirements.

In addition, all the elements setting up a SGD:

— shall be articulated among one another in order to permit to the adaption of the SGD to the tyre deformation during the rolling process. The relative movement between the tyre and the SGD shall be guaranteed;

— shall not cause any damage to the tyre during normal use as a result of their conformation;

— those permitting, the fitting on the tyre tread shall be shaped in order to achieve the grip on snow and ice without impairing the behaviour of the vehicle;

— shall permit an increase of adherence both on the longitudinal axis (i.e: hill starting ability, braking) and on the lateral axis (i.e: road holding in a turn), so to guarantee the necessary safety level to the vehicle while driving on snowy or/and icy roads.

The side panel/tensioning system of the SGD part shall be connected to each other when mounted, in such a way that loosening under the occurring loads and movements is prevented.

The tyre tread parts shall be delivered as pre-assembled elements.

Fine-adjustments of the elements is allowed. The adjustment procedure shall be indicated in the instruction manual.

4.1.6 Fitting

The SGDs shall be installable in such a way that they do not slip off during the use, and shall be installed on the tyre by following the indications contained in the use and maintenance booklet.

The functioning of the tensioning and/or fitting means shall be guaranteed in order to limit the dynamic lifting, and shall be effective in every condition of use.

In addition, the SGD shall not damage any part of the vehicle.

4.1.7 Driving speed

The maximum driving speed allowed while using a SGD is 50 km/h

4.2 Wear Resistance

The SGD shall be submitted to a wear resistance test as described in 5.2.5.5.

4.3 Protection against environmental agents

The materials used to build the SGD shall not decrease their mechanical properties as a reaction to environmental agents during the lifetime of the product defined by the SGD producer.

NOTE Environmental agents can include e.g. sand, salt, radiation, biological, chemicals, etc.

4.4 Dynamic liftting

The SGD shall be submitted to the dynamic lifting test described in 5.2.4.

4.5 General behaviour on the road

The SGD shall be submitted to the tests described in 5.2.

Both during the performance test as well as when used as intended, the SGD shall not:

— cause any visible damage to the tyre or the vehicle;

— slip off the wheel.

4.6 Effectiveness during the use

Considering the high variability of the SGD use conditions (i.e.: power, type, weights distribution and wheel dimensions of the car, as well as weather and road conditions), the efficiency of the SGD shall be measured comparing the results of tests carried out with a reference SGD.

The characteristics of the reference SGD are written in Annex A.

4.7 Comparison tests

The comparison tests shall be performed by mounting the SGD on the driven-axle.

A new SGD shall be submitted to the following comparison tests:

— test on ice-covered track (see 5.2.6);

— test on snow-covered track (see 5.2.7).

The new SGD shall be compared with the reference SGD.

The SGD shall be tested on both normal and snow tyres. The test should be run mounting the SGD on the normal tyres first.

The number of SGDs to be used for this test shall be as shown in Table 1.

Table 1 — Number of SGDs to be used for the comparison test

Laboratory test	1 pair
Performance circle track test emergency braking test high speed	1 pair
Wear resistance test	1 pair

One spare pair shall be available.

4.8 Validity of the test

For each one of the tests mentioned in 4.7, the standard deviation of the values measured for both the sample SGD and the reference SGD, should not be greater than 20 %.

In case this criterion is not fulfilled, the whole series of measurements shall be repeated completely.

The results shall be validated using a SGD mounted on both snow and normal tyres.

The SGD shall remain fitted onto the tyre in its working configuration (as stated by the producer in the use and maintenance booklet) during the road tests.

4.9 Acceptance criteria

For each one of the tests mentioned in 4.7, the efficiency shall not be lower than 80 % of the reference SGD.

In addition, the value of every single measurement obtained with the sample SGD shall not be lower than the 70 % of the average value obtained with the reference SGD. If the minimum value of 70 % is not reached while measuring, it is allowed to repeat the measurements twice.

If after the wear resistance test there are variations of geometry causing a product's hazard detected on the SGD, the following tests shall be performed:

— dynamic lifting test (see 5.2.3);

— test on ice-covered track (see 5.2.6, without performing the acceleration test as in 5.2.6.4);

— test on snow-covered track (see 5.2.7).

In this particular case, the comparison tests shall be performed using normal tyres only.

In case variations of geometry causing a product's hazard are not detected, no further test shall be performed.

5 Test methods

5.1 General

The SGD shall be submitted to all the tests under this clause, and no product hazards shall be verified on the SGD.

NOTE Different snow crystals are produced due to the different weather and pollution conditions in some EU or EFTA countries, particularly in European Alps. Additionally, local regulation asks the tests to be performed by test laboratories certified according to EN ISO/IEC 17025.

5.2 Test on a track

5.2.1 General

All tests included within this clause shall be performed with activated anti-lock braking systems (ABS) and Anti-slip Regulation System (ASR) unless specifically written otherwise.

5.2.2 Preparation of the test car

To perform the tests on a track, a car having the following characteristics shall be used:

— mass between 1100 kg and 3500 kg;

— maximum power not lower than 50 kW;

— equipped with Anti-lock Breaking System (i.e.: anti-lock braking systems (ABS));

— equipped with Anti-slip Regulation System (e.g.: TCS, ASR).

The use of four-wheel drive vehicles is not allowed.

While the car is in running condition, the load on the wheels shall be at least 50 % of the maximum tyre load index (load index according to ISO 4000-1).

NOTE The 50 % of the maximum tyre load can be caused e.g. by the driver and a passenger on the front seat.

The test car shall be equipped with snow tyres, with size corresponding to one of the measures reported on the approval certificate of the test car.

A set of normal tyres shall be available to perform the relative comparison test.

The type of tyres to be used to perform the test shall be chosen according to the test requirements and inflated according to the pressure level specified by the producer of the car.

The SGD shall be fitted on the tyres by using the instructions listed on the use and maintenance booklet mentioned in Clause 7.

5.2.3 General behaviour on different tracks

The test shall be performed with the SGD mounted on snow tyres on both ice-covered track and snow-covered track (before the comparison tests in 5.2.6 and 5.2.7).

The test is performed for at least 15 min driving the car with a speed up to 50 km/h, reproducing the following strains, obtainable while normally driving: