International Standard

ISO 18106

Passenger car, commercial vehicle, truck and bus tyres — Methods for measuring snow grip performance — Loaded new tyres

Pneumatiques pour voitures particulières, véhicules utilitaires, camions et autobus — Méthodes de mesurage de l´adhérence sur neige — Pneumatiques neufs en charge

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 31*, Tyres, rims and valves*.

This second edition cancels and replaces the first edition (ISO 18106:2016), which has been technically revised.

The main changes are as follows:

— addition of the reference tyre ASTM F2493-24, SRTT P225/60R16;

— addition of new reference tyres ASTM F3677-23, SRTT 315/70R22.5 SW and ASTM F3678-25, SRTT 245/70R19.5 SW.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The methods developed in this document are meant to reduce the variability of the tyre snow grip performance measurement. The proper reference tyres must be used in order to limit the variability of the testing method procedures.

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Passenger car, commercial vehicle, truck and bus tyres — Methods for measuring snow grip performance — Loaded new tyres

1 Scope

This document specifies the method for measuring the relative snow grip performance index of a candidate tyre compared to a reference, under loaded conditions for new tyres intended to be used on passenger car, commercial vehicle, truck and bus vehicles on a snow packed surface.

This document applies to all passenger car, commercial vehicle, truck and bus tyres.

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)*

ISO 4209-1, *Truck and bus tyres and rims (metric series) — Part 1: Tyres*

ASTM E1136-19, *Standard Specification for P195/75R14 Radial Standard Reference Test Tire*

ASTM F1805-20, *Standard Test Method for Single Wheel Driving Traction in a Straight Line on Snow- and Ice-Covered Surfaces*

ASTM F2872-25, *Standard Specification for 225/75R16C 116/114S M+S Radial Light Truck Standard Reference Test Tire*

ASTM F2493-24, *Standard Specification for P225/60R16 97S Radial Standard Reference Test Tire*

ASTM F3677-23, *Standard Specification for 315/70R22.5 154/150L Radial Truck Standard Reference Test Tire SW*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
passenger car tyre
tyres conforming to ISO 4000-1

3.2
commercial vehicle tyre
tyres conforming to ISO 4209-1 and identified by a load index in single configuration lower or equal to 121 and a speed symbol higher or equal to “N”

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3.3
truck and bus tyre
tyres conforming to ISO 4209-1 and identified by:

a) a load index in single configuration higher or equal to 122; or

b) a load index in single configuration lower or equal to 121 and a speed symbol lower or equal to “M”

3.4
test run
single pass of a loaded tyre over a given test surface

3.5
tyre set
group of two or four same tyres

3.6
candidate tyre
T
test *tyre set* (3.5) that is part of an evaluation program

3.7
reference tyre
R
special test *tyre set* (3.5), also known as a standard reference test tyre (SRTT), that is used as a benchmark in an evaluation program

Note 1 to entry: In order to minimize their variation, these tyres have carefully controlled design features and are produced, controlled and stored in accordance with the following ASTM standards:

— ASTM E1136-19, SRTT P195/75R14;

— ASTM F2870-23, SRTT 315/70 R 22.5 - 154/150 L;

— ASTM F2871-25, SRTT 245/70 R 19.5 - 136/134 M;

— ASTM F2872-25, SRTT 225/75 R 16 C - 116/114 S;

— ASTM F2493-24, SRTT P225/60R16 97 S;

— ASTM F3677-23, SRTT 315/70 R 22.5 SW - 154/150 L;

— ASTM F3678-25, SRTT 245/70 R 19.5 SW - 136/134 M.

3.8
control tyre
C
tyre set (3.5) that is part of an evaluation program

Note 1 to entry: It is an intermediate set of tyres which is used when the candidate tyre and the reference tyre cannot be directly compared on the same vehicle.

3.9
braking test
series of a specified number of anti-lock braking system (ABS) braking *test runs* (3.4) of the same tyre repeated within a short time frame

3.10
mean fully developed deceleration
MFDD
average deceleration calculated on the basis of the measured distance recorded when decelerating a vehicle between two specified speeds

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3.11
acceleration test
series of a specified number of traction-controlled acceleration *test runs* (3.4) of the same tyre repeated within a short time frame

3.12
acceleration force of a tyre
longitudinal force resulting from acceleration torque application

Note 1 to entry: It is expressed in newtons, N.

3.13
acceleration force coefficient of a tyre
AFC
ratio of acceleration force of a tyre to its vertical load

3.14
average acceleration
AA
average acceleration calculated on the basis of the measured distance recorded when accelerating a vehicle between two specified speeds

3.15
snow grip index
SG
ratio between the performance of the candidate tyre to the performance of the proper standard reference test tyre

3.16
loaded radius
distance from wheel axis of rotation to supporting surface (ground) at a given load and stated inflation pressure

4 Test methods

4.1 Braking on snow method for passenger car tyres

4.1.1 General

Snow performance is based on a test method by which the mean fully developed deceleration in a braking test, of a candidate tyre is compared to that of a standard reference test tyre.

The relative performance shall be indicated by a snow grip index (SG) in a test report format as shown in Annex A.

4.1.2 Test course

The braking tests shall be done on a flat test surface with a maximum 2 % gradient, covered with packed snow.

The snow surface shall be composed of a hard-packed snow base at least 3 cm thick and a surface layer of medium packed and prepared snow about 2 cm thick.

The air temperature, measured about one meter above the ground, shall be between −2 °C and −15 °C; the snow temperature, measured at a depth of about one centimetre, shall be between −4 °C and −15 °C.

It is recommended to avoid direct sunlight, large variations of sunlight or humidity, as well as wind.

The snow compaction index shall be measured according to ASTM F1805-20 by using a CTI penetrometer. The snow compaction index shall be between 75 and 85.

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