FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/FDIS
24163-2**

ISO/TC **31**/SC **9**

Secretariat: **AFNOR**

Voting begins on:
2023-10-09

Voting terminates on:
2023-12-04

Clamp-in tyre valves for tyre pressure monitoring systems —

Part 2:
Test methods and performance

Reference number
ISO/FDIS 24163-2:2023(E)

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Published in Switzerland

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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 documents 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*, Subcommittee SC 9, *Valves for tube and tubeless tyres*.

A list of all parts in the ISO 24163 series can be found on the ISO website.

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.

Clamp-in tyre valves for tyre pressure monitoring systems —

Part 2:
Test methods and performance

1 Scope

This document specifies test methods for clamp-in tyre valves for tyre pressure monitoring systems (TPMSs).

These methods are defined to determine the minimum level of performance requested.

This document applies to the tyre valve assembled on the rim hole with diameter of 11,3 mm for passenger cars or for light duty vehicles.

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 3877-2, *Tyres, valves and tubes — List of equivalent terms — Part 2: Tyre valves*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 9413, *Tyre valves — Dimensions and designation*

ISO 14960-2, *Tubeless tyres — Valves and components — Part 2: Clamp-in tubeless tyre valve-test method*

ISO 24163-1, *Tyre valves — Clamp-in tyre valves for tyre pressure monitoring systems — Part 1: Definition, types, dimensions and valve interface*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3877-2, ISO 9413, ISO 24163-1, ISO 14960-2 and the following 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
clamp-in tyre valve
valve for tubeless tyre, designed to be used with a valve core, a cap, an O-ring or a rubber grommet and to be fixed with a hex nut and potentially a ring washer

3.2
tyre pressure monitoring system
TPMS
system which directly monitors the tyre pressure and which alerts in case of under pressure

3.3
valve assembly
clamp-in *tyre pressure monitoring system (TPMS)* (3.2) valve (with a valve core, a cap, a nut, an O-ring or a rubber grommet and potentially a washer) fixed on the test fixture

4 Test fixture and valve hole dimensions

For each test, the material and the test fixture should be representative of the actual rim.

Break both edges on both sides of the valve hole either by a 45° chamfer or a radius from 0,3 mm to 0,4 mm. Emery cloth or suitable tooling is recommended. The material of rim or fixture shall be aluminium alloy or steel.

Unless otherwise stated, for all the tests, the conditions in Table 1 shall be applied for the installation of the valve.

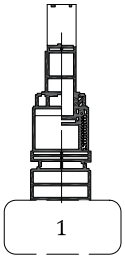
Table 1 — Test Fixture

Test	**Nominal hole diameter 11,3 mm**	
	Test hole diameter mm	Test plate thickness mm
Valve to rim seal leakage tests (see 5.5)	Specific fixture, see 5.5	
Over torque nut test (see 5.6.1)	$11{,}7^{+0}_{-0{,}05}$	3,5 ± 0,05
High pressure test (see 5.6.2)	$11{,}7^{+0}_{-0{,}05}$	3,5 ± 0,05
Radial force resistance (see 5.6.3)	$11{,}3^{+0{,}05}_{-0}$	3,5 ± 0,05
Ozone test (see 5.7.1)	Ozone test on seal alone: Specific fixture, see 5.7.1 Ozone test on complete valve assembly: $11{,}3^{+0{,}05}_{-0}$	Ozone test on seal alone: Specific fixture, see 5.7.1 Ozone test on complete valve assembly: 3,5 ± 0,05
Neutral salt spray test (see 5.7.2)	$11{,}3^{+0{,}05}_{-0}$	3,5 ± 0,05

As described in ISO 9413 and ISO 24163-1, several types of clamp-in valves exist.

Furthermore, several types of tyre pressure monitoring systems (TPMSs) exist and this document does not consider the attachment system between valve and sensor housing.

In this document a simplified illustration of a TPMS clamp-in valve is used (Figure 1).



Key
1 TPMS

Figure 1 — Simplified representation of a TPMS clamp-in valve