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Tubeless tyres — Valves and components —

Part 2:
Clamp-in tubeless tyre valve~~ test~~ — Test methods

Pneumatiques sans chambre — Valves et composants —

Partie 2: Méthodes d'essai pour les valves à visser

PROOF

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
E-mail: copyright@iso.org
Website: www.iso.org

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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~~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*.

This second edition cancels and replaces the first edition (ISO 14960-2:2014), which has been technically revised.

The main changes are as follows:

— ~~—~~all test methods have been revised;

— ~~—~~terms and definitions ~~chapter~~ have been added ~~(~~Clause 3~~(Clause 3);~~);

~~—~~test fixture and valve hole dimensions ~~clause have been added (~~Clause ~~4);~~

— ~~—~~ ~~general clause~~ has been added ~~(~~Clause 4~~(Clause 5.1);~~);

— ~~—~~leakage test method ~~clause~~ has been added ~~(~~5.2~~(Clause 5.2);~~);

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— ~~—~~radial force resistance test has been added (5.6.3);

— clauses and subclauses have been ~~added (Clause 5.6.3).~~ renumbered as necessary.

— A list of all parts in the ISO 14960 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.

Tubeless tyres — Valves and components —

Part 2:
Clamp-in tubeless tyre valve test method — Test methods

1 Scope

This document specifies test methods for clamp-in tubeless tyre valves.

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.

This document does not include TPMStyre pressure monitoring system (TPMS) valves.

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--2:1997, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3877-2, ISO 9413 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 valve
type of 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 ana hexagonal nut and eventuallypotentially a ring washer

3.2
valve assembly
clamp-in valve (3.1) (with a valve core, a cap, a nut, an O-ring or a rubber grommet and eventuallypotentially 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 ~~below~~ conditions in Table 1~~Table 1~~ shall be applied for the installation of the valve.

Table 1 — Test Fixtures

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

5 Test methods and performance requirements

5.1 General

5.1.1 Appearance

If not otherwise defined between customer and supplier, the appearance shall be as follows~~:~~.

— ~~valve~~Valve external aspect: no visible valve crack, spot or scratch is allowed~~, no~~. No visible defect of the anodizing layer~~, no~~ is allowed. No deep marks coming from shocks or machining are allowed. All these defects ~~might~~can be judged with naked eye at 1 m distance in final configuration (valve assembled on rim~~);~~).

— ~~sealing~~Sealing element aspect~~:~~ shall be uniform~~;~~: no bubble, no rubber lack, no crack visible or any other defect that ~~will~~can affect the performance~~;~~ is allowed.

— ~~— no~~No oil, grease, corrosion or other substance that ~~will~~can affect the performance is allowed.

Before performing any test, check the quality of the samples.

5.1.2 Operating pressure

All ~~pressure~~pressures mentioned in this document are gauge ~~pressure~~pressures.

Nominal operating pressure: 0 kPa to 830 kPa~~. (Refer~~ (refer to the valve manufacturer indication.)

By default, the maximum operating pressure is the maximum pressure as described in ISO 9413 for valves CQ07 and CQ08: ~~1400~~1 400 kPa. This maximum operating pressure can be replaced for each test by the real maximum operating pressure according to the valve's specification pressure.

5.1.3 Samples

It is recommended to test the minimum quantity to be representative of the design (for example 5 samples).

Each of the following tests shall be ~~considered~~performed on unused valve assembly.

5.2 Leakage test method

Perform the following for each required leakage test in this document.

a) ~~a)~~ Immerse the valve assembly vertically not more than 100 mm below the surface of the water. The valve mouth should be positioned down to test for valve core ~~leak testing~~leakage (see Figure 1~~Figure 1),~~, and the valve mouth should be positioned up to test for valve to rim ~~leak testing~~leakage (see Figure 2~~Figure 2).~~.

b) ~~b)~~ Use the liquid, temperature, pressure and time described in each test procedure.

c) ~~c)~~ Before checking for leakage, twist the test fixture several times in the water bath to remove bubbles stuck on valve and nut before starting the test (wait for surface stabilization).

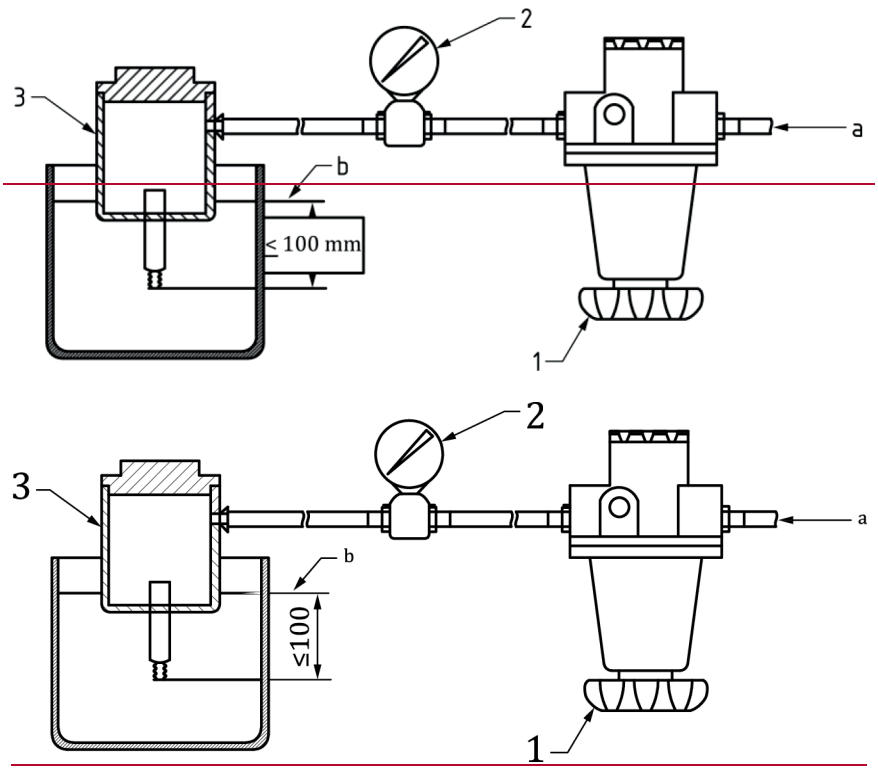
d) ~~d)~~ During the test, observe the bubbles in order to evaluate the leakage:

   — ~~— For information, the~~The leakage limit ~~of~~is 0,2 cm^3/min, which is equivalent to around 14 bubbles/min with a diameter of about 3 mm or to one bubble/min with a diameter of approximatively 7 mm.

   — ~~—~~No bubbles during 1 min is also considered as acceptable.

e) ~~e)~~ If the leakage exceeds the limit, perform ~~again~~ the test ~~24 h~~again to confirm the defect. Perform the test a minimum of 24 h after seal assembly onto the valve in order to take in account the seal relaxation effect ~~in order to confirm the defect~~.

Dimensions in millimetres



Key

1 ~~Regulator~~regulator

2 ~~Gauge~~gauge

3 ~~Clamp~~clamp-in ~~Valve~~valve

a Air supply.

b Liquid level.

Figure 1 — Valve core leakage test set-up