
**Methods of test for full-flow lubricating oil
filters for internal combustion engines —**

Part 9:

Inlet and outlet anti-drain valve tests

*Méthodes d'essai des filtres à huile de lubrification à passage intégral
pour moteurs à combustion interne —*

Partie 9: Essais des clapets antiretours aval et amont

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4548-9:2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008)

[https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-
a462f0107f2a/iso-4548-9-2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008)



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4548-9:2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008)

<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Principle	1
4.1 Inlet and anti-drain valve.....	1
4.2 Outlet anti-drain valve	1
5 Test rigs	1
6 Test liquid	2
7 Test liquid	2
7.1 General.....	2
7.2 Inlet anti-drain valve — Test A: Basic performance test	2
7.3 Inlet anti-drain valve — Test B: Basic and supplementary performance test	3
7.4 Outlet anti-drain valve — Test A: Basic performance test	4
7.5 Outlet anti-drain valve — Test B: Basic and supplementary performance test	5
8 Test report	6
Bibliography	10

[ISO 4548-9:2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008)
<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4548-9 was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*, Subcommittee SC 7, *Tests for lubricating oil filters*.

This second edition cancels and replaces the first edition (ISO 4548-9:1995), of which it constitutes a minor revision.

ISO 4548 consists of the following parts, under the general title *Methods of test for full-flow lubricating oil filters for internal combustion engines*:

- Part 1: *Differential pressure/flow characteristics*
- Part 2: *Element by-pass valve characteristics*
- Part 3: *Resistance to high differential pressure and to elevated temperature*
- Part 4: *Initial particle retention efficiency, life and cumulative efficiency (gravimetric method)*
- Part 5: *Cold start simulation and hydraulic pulse durability test*
- Part 6: *Static burst pressure test*
- Part 7: *Vibration fatigue test*
- Part 9: *Inlet and outlet anti-drain valve tests*
- Part 11: *Self-cleaning filters*
- Part 12: *Filtration efficiency using particle counting, and contaminant retention capacity*

Introduction

The ISO 4548 series establishes standard test procedures for measuring and performance of full-flow lubricating oil filters for internal combustion engines. It has been prepared in separate parts, each part relating to a particular performance characteristic.

Together the tests provide the information necessary to assess the characteristics of a filter, but if agreed between the purchaser and the manufacturer, the tests can be conducted separately.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 4548-9:2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008)

<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 4548-9:2008

<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008>

Methods of test for full-flow lubricating oil filters for internal combustion engines —

Part 9: Inlet and outlet anti-drain valve tests

1 Scope

This part of ISO 4548 specifies methods of measuring the effectiveness of either inlet or outlet anti-drain valves if fitted to a full-flow lubricating oil filter of the “spin-on” or “easy change” type, for internal combustion engines.

2 Normative references

The following referenced documents are indispensable for the application 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 4548-1, *Methods of test for full-flow lubricating oil filters for internal combustion engines — Part 1: Differential pressure/flow characteristics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4548-1 apply.

4 Principle

4.1 Inlet and anti-drain valve

Assessment of the capability of the inlet anti-drain valve to prevent oil contained in the filter from draining out of the inlet when the engine is stopped.

4.2 Outlet anti-drain valve

Assessment of the capability of the outlet anti-drain valve to prevent oil contained in the filter from draining out of the outlet when the engine is stopped.

5 Test rigs

Suggested test rigs are shown diagrammatically in Figures 1 to 3. Figures 1 and 2 are simplified rigs for basic tests. Figure 3 is a more complicated rig involving the means to raise and lower the header tank at a fixed speed of 0,5 m/min between a 0 mm and a 1 500 mm head from the test block. This shall be used only if opening pressures and flow/pressure drop data are required.

NOTE Graphical symbols used in Figures 1 to 3 are in accordance with ISO 1219-1^[1].

The test rig shall comprise the following components together with necessary tubing, connectors and supports:

- a) oil reservoir;
- b) pump (vane type recommended);
- c) screen filter;
- d) stopcocks (see Figures 1 to 3);
- e) 3-way valves (see Figures 1 to 3);
- f) test mounting block;
- g) header tank (e.g. a separating funnel);
- h) measuring cylinders;
- i) stopwatch or clock (not shown).

If it is required to carry out all tests specified in this part of ISO 4548, then a single test rig incorporating the features of Figures 1 to 3 may be used.

iTech STANDARD PREVIEW
(standards.iteh.ai)

6 Test liquid

The test liquid shall be mineral oil that has a kinematic viscosity¹⁾ of $8 \text{ mm}^2/\text{s} \pm 2 \text{ mm}^2/\text{s}$ at $20 \text{ }^\circ\text{C}$ (viscosity class ISO VG 5^[2]).

<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-a462f0107f2a/iso-4548-9-2008>

7 Test liquid

7.1 General

Two test procedures for both inlet and outlet anti-drain valves are described. Test A covers the essential basic performance of the valve in terms of its function as an anti-drain feature. Test B covers the basic performance test and additional procedures suggested to ascertain supplementary performance data which may be required.

7.2 Inlet anti-drain valve — Test A: Basic performance test

7.2.1 An example of the apparatus required for this test is shown in Figure 1. The individual elements of Figure 1, where referenced in 7.2.2 to 7.2.13 by number, are given in bold typeface inside parentheses.

7.2.2 If the filter incorporates an outlet anti-drain valve then, prior to testing, this valve should be locked open by a suitable means, to permit entry of oil on the outlet side of the filter.

7.2.3 Carry out the test at an ambient temperature of $25 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$.

7.2.4 Fit the test mounting block **(6)** into the test rig in an inverted position (i.e. 180° from the position shown in Figure 1).

1) $1 \text{ mm}^2/\text{s} = 1 \text{ cSt}$.

7.2.5 Assemble the filter to be tested on the mounting block using a suitable gasket to prevent leakage through the thread.

If the object of this test is to assess the performance of the valve only and not the integrity of the filter assembly as a whole, the potential leak path between the threaded mounting plate and the gasket retainer should also be sealed off.

7.2.6 Open the inlet cock (4) to the filter and the outlet cock (8) in the base of the header tank (9).

7.2.7 Pump test liquid into the system until all air is expelled and a $600 \text{ mm} \pm 10 \text{ mm}$ head is obtained above the base of the filter, then close the inlet cock (4) and the outlet cock (8) in the base of the header tank (9).

NOTE The filter is installed in the position described in order to achieve a more complete expulsion of air.

7.2.8 Disconnect the inlet pipe at the base of the filter and turn the filter through 180° , into the position shown in Figure 1.

7.2.9 Open the outlet cock (8) at the base of the header tank (9) and remove the bleed screw (5) from the test mounting block. Leave for 5 min to drain surplus test liquid from the test mounting block.

7.2.10 Replace the bleed screw and place a suitable measuring cylinder (10) beneath the outlet pipe (11), and start the stopwatch.

7.2.11 Leave for a test time of 1 h, then measure the amount of test liquid that leaked from the filter during this period.

7.2.12 Maintain the level of test liquid contained in the header tank (9) at $600 \text{ mm} \pm 10 \text{ mm}$.

7.2.13 Record the results (see Clause 8). [ISO 4548-9:2008](https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706-)

<https://standards.iteh.ai/catalog/standards/sist/8aab32bc-50a9-493e-8706->

7.3 Inlet anti-drain valve — Test B: Basic and supplementary performance test

7.3.1 An example of the apparatus required for Test B is shown in Figure 3. The individual elements of Figure 3, where referenced in 7.3.2 to 7.3.20 by number, are given in bold typeface inside parentheses.

7.3.2 This test may be used if flow/pressure drop and opening pressure are required.

If necessary, repeat the test for the following conditions:

- a) with the filter in a position other than vertical (at an angle agreed between the purchaser and the manufacturer);
- b) after submitting the filter to an ageing test in accordance with ISO 4548-3^[3] in vertical and inclined positions.

7.3.3 Carry out the test at a temperature of $25 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$.

7.3.4 Fit the test mounting block (8) into the test rig in an inverted position i.e. 180° from the test position shown in Figure 3.

7.3.5 Assemble the filter to be tested on the mounting block using a suitable gasket to prevent leakage through the thread.

7.3.6 Open the inlet cock (4) and the outlet cock (11). Set 3-way valves (5), (6) and (10) to permit oil flow through the filter and return via the header tank (12).

7.3.7 Start the pump (2) and adjust the inlet cock (4) to allow oil through the filter at sufficient flow rate to open the anti-drain valve and flow until oil is free from air bubbles.