BRITISH STANDARD

BS ISO
2943:1998

Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids

ICS 23.100.60

National foreword

This British Standard reproduces verbatim ISO 2943:1998 and implements it as the UK national standard. It partially replaces BS 6275-2:1984.

The UK participation in its preparation was entrusted to Technical Committee MCE/18, Fluid power systems and components, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 5 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 February 1999

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INTERNATIONAL STANDARD

ISO 2943

Second edition
1998-11-15

Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids

Transmissions hydrauliques — Éléments filtrants — Vérification de la compatibilité des matériaux avec les fluides

Reference number
ISO 2943:1998(E)

Contents

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.
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.

International Standard ISO 2943 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 6, *Contamination control and hydraulic fluids*.

This second edition cancels and replaces the first edition (ISO 2943:1987), which has been technically revised. It now includes, provisions for verifying material compatibility at low temperatures and a method for reporting test data.

Annex A forms an integral part of this International Standard.

Descriptors: Hydraulic fluid power, hydraulic transmission, filters, fluid filters, components, tests, determination, compatibility.

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Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Filters maintain fluid cleanliness by removing insoluble contaminants.

The filter element is the porous device which performs the actual process of filtration.

1 Scope

This International Standard specifies a method of verifying the compatibility of materials comprising a hydraulic fluid power filter element with a designated fluid, by verifying the ability of the filter element to maintain its collapse burst rating after being subjected to the designated system fluid at a high and/or low temperature.

The filter element mounting seal is not included as part of the element.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2941:1974, *Hydraulic fluid power — Filter elements — Verification of collapse/burst resistance.*

ISO 2942:1994, *Hydraulic fluid power — Filter elements — Verification of fabrication integrity and determination of the first bubble point.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Equipment

4.1 Temperature bath or **oven** and **cold chamber**, capable of maintaining the fluid temperature to within 5 °C.

4.2 Vessel suitable for containing the fluid and test elements, closed but vented with adequate safety considerations.

4.3 Test fluid, appropriate to the system.

4.4 Temperature instrumentation, accurate to within 1 °C.

5 Procedure

5.1 Subject the filter element to the fabrication integrity test in accordance with ISO 2942.

5.2 Failure of the filter element to exhibit a minimum bubble pressure as designated by the filter manufacturer shall disqualify the element from further testing.

5.3 Rinse the test element in the test fluid. The element shall be deemed to be clean if any test fluid previously used has been removed from the test element. Discard the rinsing fluid.

5.4 Immerse the filter element in the designated system fluid for at least 72 h; the fluid shall be maintained for 72 h continuously, at a temperature 15 °C above the manufacturer's recommended maximum operating temperature. Use new fluid for this operation.

NOTE The 72 h soak at 15 °C above the hydraulic system manufacturer's recommended operating temperature is a practical compromise to achieve an accelerated test rather than a long test at rated temperature.

CAUTION — Do not exceed the safe temperature of the fluid for this high temperature test. This International Standard does not apply in such cases.

5.5 If there is an additional demand for verification of material compatibility with cold fluids, rinse the element as specified in **5.3** and then immerse the filter element in the designated system fluid for at least 72 h. The fluid shall be maintained for 72 h continuously, at a temperature 5 °C below the stated minimum temperature of use.

Use new fluid for this operation. Use a covered container to prevent condensation.

NOTE In case of running tests on both temperature levels it might be convenient to start with the low temperature test in order to use the same test fluid for both tests. Where the high temperature test immediately follows the low temperature test, it is not necessary to renew the test fluid in between tests.

5.6 Subject the filter element to the collapse or burst resistance test in accordance with ISO 2941.

5.7 Report the test information and results as specified in Annex A.

6 Criteria for acceptance

6.1 There shall be no visual evidence of structural failure or damage or functional deterioration.

6.2 The collapse/burst test shall be successfully completed as specified in ISO 2941.

7 Designated information

Include the following designated information in documents referring to this International Standard:

a) maximum operating temperature of the filter element;

b) minimum operating temperature of the filter element;

c) system fluid.

8 Identification statement (Reference to this International Standard)

The use of the following statement in catalogues and sales literature prepared by those electing to comply with this International Standard is strongly recommended.

"Filter element material compatibility with fluids determined in accordance with ISO 2943:1998, *Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids."*

Annex A (normative)
Reporting method

A.1 Test identification

Date: .....

Operator: .....

A.2 Test element identification

Designation: .....

Manufacturer: .....

Type: .....

Production no.: .....

Batch no: .....

Date of test: .....

A.3 Verification of fabrication integrity in accordance with ISO 2942

Manufacturers designated (rated) minimum value[1)]: ..... Pa (..... mbar)

Fill in the test conditions and results in Table A.1 at the appropriate places in the ISO 2943 procedure:

Table A.1

Test parameter/result	Initial (see **5.1**)	After soaking (see **5.4**, and **5.5** if required)	After burst test (see **5.6**)
Fluid			
Temperature,°C			
Measured bubble point pressure[a], Pa (mbar)			
Bubble location[b]			
Has rated value been exceeded? (yes/no)			

[a] Actually observed value: additional information, not required in ISO 2941.
[b] i.e. filter element media, side seam, end cap, etc.

A.4 Immersion in accordance with ISO 2943:1998, 5.4

A.4.1 *Test conditions*

Test fluid: .....

A.4.2 *Immersion in hot fluid condition*

Test temperature: .....°C

Total soak period: .....h; 72 h at test temperature

[1)] As specified by the manufacturer.

A.4.3 *Immersion in cold fluid condition*

Test temperature: .....°C

Total soak period: .....h; 72 h at test temperature

A.4.4 *Determination of element condition (in accordance with ISO 2942:1994, 6.1.2 to 6.1.3)*

Fill in the test conditions and results in Table A.1

A.5 Determination of collapse/burst pressure in accordance with ISO 2941

A.5.1 *Collapse/burst pressure*

Rated value[2)]:.....kPa (.....bar)

A.5.2 *Test conditions*

Test fluid: .....

Test temperature: ..... °C

Test flow rate: ..... l/min

Nominal flow rate: ..... l/min

Pressure drop (Δp) of empty filter housing at test flow rate: ..... kPa (..... bar)

Test contaminant: .....

Mass of contaminant added per unit time: ..... g/min ( ) continuously

( ) intermittently

NOTE A continuous recording of $\Delta p = f$ (mass of contaminant added) is recommended for better evaluation.

A.5.3 *Test result*

Collapse/burst pressure:

Measured value : .....kPa (.....bar)

( ) Rated value reached ( ) Rated value not reached

[2)] As specified by the manufacturer.

A.5.4 ***Determination of element condition (in accordance with ISO 2942:1994, 6.1.2 to 6.1.3)***
Fill in the test conditions and results in Table A.1.

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