



BSI Standards Publication

Hydraulic fluid power — Fluid contamination — Determination of particulate contamination by the gravimetric method

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National foreword

This British Standard is the UK implementation of ISO 4405:2022.

The UK participation in its preparation was entrusted to Technical Committee MCE/18/-/6, Contamination control.

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

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Hydraulic fluid power — Fluid contamination — Determination of particulate contamination by the gravimetric method

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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.

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 6, *Contamination control*.

This second edition cancels and replaces the first edition (ISO 4405:1991), which has been technically revised.

The main changes are as follows.

- The calibration and test equipment have been updated and reduced to the most essential parts.
- The single steps of the calibration and test procedure have been updated and adapted to achieve the most reliable and verifiable test results.
- The double-membrane method has been eliminated as the test results have proven to be less reliable than those obtained by the single-membrane method.

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

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. The liquid is both a lubricant and a power-transmitting medium.

Reliable system performance requires control of the fluid medium. Qualitative and quantitative determination of particulate contamination in the fluid medium requires precision in obtaining the sample and in determining the nature and extent of contamination.

The gravimetric method of determination of fluid contamination involves weighing suspended solids per unit volume of fluid. The method employs membrane filters, which maintain fluid cleanliness by removing insoluble particles.

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Hydraulic fluid power — Fluid contamination — Determination of particulate contamination by the gravimetric method

1 Scope

This document defines the gravimetric method for determining the contamination level of fluids used in hydraulic fluid power systems.

The working instructions provided in this document serve for the gravimetric determination of dirt content of pressure fluids from mineral oil with additives. They are used in hydraulic systems with hydrostatic drive.

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 4021, *Hydraulic fluid power — Particulate contamination analysis — Extraction of fluid samples from lines of an operating system*

ISO 5598, *Fluid power systems and components — Vocabulary*

ISO 11158, *Lubricants, industrial oils and related products (class L) — Family H (hydraulic systems) — Specifications for categories HH, HL, HM, HV and HG*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 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

hydraulic oil HH

non-inhibited mineral oil

3.2

hydraulic oil HL

oil of HH type with improved anti-rust and anti-oxidation properties

3.3

hydraulic oil HM

oil of HL type with improved anti-wear and filterability properties

3.4

hydraulic oil HV

oil of HM type with improved viscosity/temperature properties