

This is a preview of "ISO 16889:2008". [Click here to purchase the full version from the ANSI store.](#)

Second edition
2008-06-15

Hydraulic fluid power — Filters — Multi-pass method for evaluating filtration performance of a filter element

*Transmissions hydrauliques — Filtres — Évaluation des performances
par la méthode de filtration en circuit fermé*



Reference number
ISO 16889:2008(E)

© ISO 2008

This is a preview of "ISO 16889:2008". [Click here to purchase the full version from the ANSI store.](#)

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.



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

This is a preview of "ISO 16889:2008". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols	3
5 General procedures	5
6 Test equipment	5
7 Measuring instrument accuracy and test condition variations	6
8 Filter performance test circuit validation procedures	7
8.1 Filter test system validation	7
8.2 Validation of contaminant injection system	8
9 Summary of information required prior to testing	9
10 Preliminary preparation	9
10.1 Test filter assembly	9
10.2 Contaminant injection system.....	10
10.3 Filter test system	11
11 Filter performance test.....	12
12 Calculations.....	13
13 Data presentation.....	15
14 Identification statement (reference to this International Standard)	16
Annex A (normative) Base test-fluid properties	19
Annex B (informative) Test system design guide	21
Annex C (informative) Examples of report calculations and graphs	26
Annex D (informative) Summary of data from the round robin test programme conducted to verify the procedure in this International Standard.....	34
Bibliography	41

This is a preview of "ISO 16889:2008". [Click here to purchase the full version from the ANSI store.](#)

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 16889 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 16889:1999), 6.3 and Annex A of which have been technically revised, Annex A by the deletion of detailed round-robin data.

This is a preview of "ISO 16889:2008". [Click here to purchase the full version from the ANSI store.](#)

Introduction

In hydraulic fluid power systems, one of the functions of the hydraulic fluid is to separate and lubricate the moving parts of the components. The presence of solid particulate contamination produces wear, resulting in loss of efficiency, reduced component life and subsequent unreliability.

A hydraulic filter is provided to control the number of particles circulating within the system to a level that is commensurate with the degree of sensitivity of the components to the contaminant and the level of reliability required by the users.

To enable the comparison of the relative performance of filters so that the most appropriate filter can be selected, it is necessary that test procedures be available. The performance characteristics of a filter are a function of the element (its medium and geometry) and the housing (its general configuration and seal design).

In practice, a filter is subjected to a continuous flow of contaminant entrained in the hydraulic fluid until some specified terminal differential pressure (relief-valve cracking pressure or differential-pressure indicator setting) is reached.

Both the length of operating time (prior to reaching terminal pressure) and the contaminant level at any point in the system are functions of the rate of contaminant addition (ingression plus generation rates) and the performance characteristics of the filter.

Therefore, it is necessary that a realistic laboratory test to establish the relative performance of a filter provide the test filter with a continuous supply of ingressed contaminant and allow the periodic monitoring of the filtration performance characteristics of the filter.

It is also necessary that the test provide an acceptable level of repeatability and reproducibility, and a standard test contaminant, the ISO medium test dust (ISO MTD) in accordance with ISO 12103-1, be featured. This product has been shown to have a consistent particle-size distribution and is available worldwide. The filtration performance of the filter is determined by measurement of the upstream and downstream particle-size distributions using automatic particle counters validated to ISO standards.

This test is intended to differentiate filter elements according to their functional performance but is not intended to represent performance under actual field operating conditions. Test conditions are steady-state, and the dynamic characteristics of industrial hydraulic systems are not represented. Other test protocols exist or are in development to evaluate performance with cyclic flow, high viscosity, flow fatigue, etc.