AS 4002.1—2001
ISO 4406:1999

Australian Standard™

Hydraulic fluid power—Particulate contamination of systems

Part 1: Method for coding the level of contamination

[ISO title: Hydraulic fluid power—Fluids—Method for coding the level of contamination by solid particles]

Standards Australia

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Australian Chamber of Commerce and Industry

Australian Industry Group

Australian Institute of Petroleum

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Australian Standard™

Hydraulic fluid power—Particulate contamination of systems

Part 1: Method for coding the level of contamination

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-035, Fluid Power Systems and Components to supersede AS 4002.1—1992, *Fluid power systems and components—Cleanness levels in hydraulic systems,* Part 1: *Classification and determination of cleanness,* in part.

The objective of this Standard is to provide manufacturers and users of hydraulic fluid power systems with a code for defining the quantity of solid particles in the fluid in a given hydraulic fluid power system.

This edition introduces a three-part code for contamination levels measured with automatic particle counters calibrated in accordance with ISO 11171, *Hydraulic fluid power—Calibration of automatic particle counters for liquids*, and it also introduces equivalent particle sizes for such counters, based on calibration with NIST standard reference material SRM 2806.

The particle sizes to be reported for measurement by using a microscope, ≥5µm and ≥15µm, are unchanged from those specified in AS 4002.1—1992.

Defining the automatic particle counter code sizes in this way validates direct comparison of measurements made in accordance with this Standard using either measurement method, or between such measurements and data records based on AS 499.1:1992.

This Standard is identical with and has been reproduced from ISO 4406:1999, *Hydraulic fluid power—Fluids—Method for coding the level of contamination by solid particles.*

Statements expressed in mandatory terms in notes to text, tables and figures are deemed to be requirements of this Standard.

The term 'normative' has been used in this Standard to define the application of the annex to which it applies. A 'normative' annex is an integral part of a Standard.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

None of the documents referenced in this Standard has been adopted as an Australian Standard.

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AUSTRALIAN STANDARD

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Part 1:
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1 Scope

This International Standard specifies the code to be used in defining the quantity of solid particles in the fluid used in a given hydraulic fluid power system.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4407:1991, *Hydraulic fluid power — Fluid contamination — Determination of particulate contamination by the counting method using a microscope.*

ISO 11171:1999, *Hydraulic fluid power — Calibration of automatic particle counters for liquids.*

ISO 11500:1997, *Hydraulic fluid power — Determination of particulate contamination by automatic counting using the light extinction principle.*

3 Code definition

3.1 General

The purpose of this code is to simplify the reporting of particle count data by converting the numbers of particles into broad classes or codes, where an increase in one code is generally a doubling of the contamination level.

The original code in accordance with ISO 4406:1987 stated the reporting at two sizes, $\geqslant 5$ µm and $\geqslant 15$ µm, but the sizes in this revision have been changed to account for the use of a different calibration standard for optical automatic particle counters. The reported sizes are $\geqslant 4$ µm(c), $\geqslant 6$ µm(c) and $\geqslant 14$ µm(c), the last two of these being equivalent to the 5 µm and 15 µm particle sizes obtained using the ISO 4402:1991 method of calibrating automatic particle counters. ISO 4402:1991 has been replaced by ISO 11171:1999. Throughout this International Standard, the use of µm(c) means that particle size measurements are carried out using an automatic particle counter which has been calibrated in accordance with ISO 11171.

Measurement of particles using an optical microscope as specified in ISO 4407:1991 establishes the size of a particle as being equal to its longest dimension, whereas an automatic particle counter derives the size of an equivalent particle from its cross-sectional area, a value different in most cases from that determined using a microscope. The particle sizes to be reported for measurement by microscope, $\geqslant 5$ µm and $\geqslant 15$ µm, are unchanged from those specified in ISO 4406:1987.