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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 37163-2018**

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**Hydraulic fluid power -- Determination of the particulate  
contamination level of a liquid sample by automatic particle  
counting using the light-extinction principle**

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## Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

### Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the redrafting method to modify the use of ISO 11500.2008 "hydraulic transmission using the principle of shading automatic particle counting method

Fixed liquid sample particle pollution degree.

The technical differences between this standard and ISO 11500.2008 and their reasons are as follows.

---About the normative reference documents, this standard has made technical adjustments to adapt to China's technical conditions, adjustments

The situation is reflected in Chapter 2, "Regulatory Citations", and the specific adjustments are as follows.

\* Replace ISO 4406 with GB/T 14039 modified to international standards (see Chapter 8);

\* Replace ISO 5598 with GB/T 17446, which is equivalent to the international standard (see Chapter 3);

\* Replace ISO 3722 with GB/T 17484 equivalent to the international standard (see 4.7, 6.2.1);

\* Replace ISO 11171 with GB/T 18854 modified to international standards (see 6.3);

\* Added reference to JJG196-2006 (see 4.12).

--- Revised the scope of application to meet the actual scope of application in China (see Chapter 1).

--- Modified the test powder used for automatic particle counter counting, and changed the ISO intermediate test powder to NIST (American National Standard)

Technical Research Institute) RM8632, to meet the test of the automatic particle counter

coincidence error limit calibration in GB/T 18854

Check the powder (see 3.3).

--- Added terminology and definition "dilution ratio" to comply with the idioms used in the dilution of liquid samples in our country (see 3.6).

--- Added terminology and definition "dilution factor" to comply with the idioms used in the dilution of liquid samples in our country (see 3.7).

--- Removed ISO 11500.2008 6.5.4.1b), because the provisions of this article do not meet the current situation of China's laboratories, do not have the ability to operate Work.

--- Combined 7.2.3.5 and 7.2.3.6 to meet the actual dilution of our liquid samples (see 7.2.3.5).

--- Combined 7.3.7 and 7.3.8 to meet the actual measurement of liquid samples in China (see 7.3.7).

--- Increased the liquid "YH-10, YH-12, No. 15 aviation hydraulic oil" that can be used in the dilution to meet the application status of China (see attached Record A).

This standard also made the following editorial changes.

--- Revised the description of the dilution method of Note 7.2.1.4 to comply with the idioms used in the dilution of liquid samples in China;

--- Revised the structure of 7.4 to adapt to the expression habits of our country;

--- Adjust the order of Appendix A~Appendix C according to the order mentioned in the appendix of the standard to comply with GB/T 1.1-2009

Claim;

--- Deleted the informative appendix of ISO 11500.2008 "The number of joint verification test procedures according to the ISO 11500 program description according to".

This standard was proposed by the China Machinery Industry Federation.

This standard is under the jurisdiction of the National Hydraulic and Pneumatic Standardization Technical Committee (SAC/TC3).

This standard was drafted. Aviation Industry (Xinxiang) Measurement Technology Co., Ltd., Tianjin Tianhe Analytical Instrument Co., Ltd., Beijing Coast Hongmeng

Standard Substance Technology Co., Ltd., Tianjin Luogen Technology Co., Ltd., Liming

Hydraulic Co., Ltd., Beijing University of Chemical Technology.

## Introduction

In hydraulic systems, power is transmitted and controlled by means of pressurized liquid in a closed circuit. The liquid is both a lubricant and a moving

Force transfer medium. Reliable system performance requires control of contaminants in the liquid. In order to quantitatively measure particles in a liquid

Contaminants need to be properly sampled and accurately measured for the size distribution and concentration of particulate contaminants. Automatic particle counter is a suitable

And widely used equipment for determining the size distribution and quantity concentration of particulate contaminants. The accuracy of the instrument is guaranteed by calibration.

Automatic transmission of hydraulic transmission using the principle of shading

Determination of particle particle contamination by counting method

## 1 Scope

This standard specifies the operating procedures for the determination of transparent, uniform, single-phase liquid-like particle contamination using an automatic particle counter using the shading principle.

The methods described in this standard are applicable to monitoring.

- a) the cleanliness of the hydraulic system;
- b) the rinsing process;
- c) Auxiliary equipment and test benches.

This standard also applies to the monitoring of other liquids (eg lubricants, fuels, treatment fluids).

Note 1. The surveyor needs to ensure that the original liquid sample or the particles in the liquid sample are uniformly suspended after dilution with a diluent in order to reduce the coincidence error.

Note 2. The fluid interface will produce a photoresist and give an error signal, which may cause the automatic particle counter to count down.

## 2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 14039 hydraulic transmission oil solid particle pollution level code (GB/T 14039-2002, ISO 4406.1999,

MOD)

GB/T 17446 fluid drive system and component vocabulary (GB/T 17446-2012, ISO 5598.2008, IDT)

GB/T 17484 Identification and control of purification methods for hydraulic oil sampling containers (GB/T 17484-1998, idtISO 3722.

1976)

GB/T 18854 Hydraulic Transmission Liquid Automatic Particle Counter Calibration (GB/T 18854-2015, ISO 11171.2010,

MOD)

JJG196-2006 Common Glass Measuring Instrument Verification Procedure

### 3 Terms and definitions

The following terms and definitions as defined in GB/T 17446 apply to this document.

#### 3.1

Condensed (caking) agglomerate

Two or more particles are tightly bonded together and will not separate under slight agitation and less shear.

#### 3.2

Coincidence error limit

When the sensor's sensing area has multiple particles at the same time, and the counting error is less than 5%, the automatic particle counter can count NIST

(National Institute of Standards and Technology) The highest particle number concentration of RM8632.

#### 3.3

Shading lightextinction

The phenomenon that the particle intensity is weakened by the particles passing through the sensing region.