INTERNATIONAL STANDARD

**ISO 16232-1**

First edition
2007-06-01

# Road vehicles — Cleanliness of components of fluid circuits —

## Part 1: Vocabulary

*Véhicules routiers — Propreté des composants des circuits de fluide —*

*Partie 1: Vocabulaire*

Reference number
ISO 16232-1:2007(E)



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Published in Switzerland

 

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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.

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 16232-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 5, *Engine tests*.

ISO 16232 consists of the following parts, under the general title *Road vehicles — Cleanliness of components of fluid circuits*:

— *Part 1: Vocabulary*

— *Part 2: Method of extraction of contaminants by agitation*

— *Part 3: Method of extraction of contaminants by pressure rinsing*

— *Part 4: Method of extraction of contaminants by ultrasonic techniques*

— *Part 5: Method of extraction of contaminants on functional test bench*

— *Part 6: Particle mass determination by gravimetric analysis*

— *Part 7: Particle sizing and counting by microscopic analysis*

— *Part 8: Particle nature determination by microscopic analysis*

— *Part 9: Particle sizing and counting by automatic light extinction particle counter*

— *Part 10: Expression of results*



 

# Introduction

The presence of particulate contamination in a fluid system is acknowledged to be a major factor governing the life and reliability of that system. The presence of particles residual from the manufacturing and assembly processes will cause a substantial increase in the wear rates of the system during the initial run-up and early life, and may even cause catastrophic failures.

In order to achieve reliable performance of components and systems, control over the amount of particles introduced during the build phase is necessary, and measurement of particulate contaminants is the basis of control.

The ISO 16232 series has been drafted to fulfil the requirements of the automotive industry, since the function and performance of modern automotive fluid components and systems are sensitive to the presence of a single or a few critically sized particles. Consequently, ISO 16232 requires the analysis of the total volume of extraction liquid and of all contaminants collected using an approved extraction method.

The ISO 16232 series has been based on existing ISO International Standards such as those developed by ISO/TC131/SC6. These International Standards have been extended, modified and new ones have been developed to produce a comprehensive suite of International Standards to measure and report the cleanliness levels of parts and components fitted to automotive fluid circuits.

# Road vehicles — Cleanliness of components of fluid circuits —

# Part 1: Vocabulary



## 1 Scope

This part of ISO 16232 defines the vocabulary used in the characterization and measurement of particulate contamination of parts, components, sub-assemblies and assemblies constituting the fluid circuits of internal combustion engines of road vehicles.

This applies to all components that may come into contact with a liquid (e.g. oil, fuel, air conditioning refrigerant, coolant), a solid lubricant or a gas (intake air).

Unless otherwise specified, this International Standard deals with particulate cleanliness only. It does not therefore cover appearance defects or contamination by liquid or gas materials.

It covers the amount and the nature of residual particulate contaminants resulting from the whole manufacturing processes and from the environment.

NOTE This part of ISO 16232 also covers vocabulary that will not be applied in parts 2 to 10 of ISO 16232. This is in order to complement unified usage of wording in the field of cleanliness of road vehicle components.

## 2 Normative references

The following referenced documents are indispensable for the application 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 14644-1:1999, *Cleanrooms and associated controlled environments — Part 1: Classification of air cleanliness*

ISO/TS 16949:2002, *Quality management systems — Particular requirements for the application of ISO 9001:2000 for automotive production and relevant service part organizations*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

**3.1**
**abrasive particle**
particle liable to change the surface finish

**3.2**
**active component**
component which may set the fluid in motion or be activated by the fluid during operation, for example pump, cylinder, distributor, injector, valve regulator