



BSI Standards Publication

**Hydraulic fluid power  
— Method to relate the  
cleanliness of a hydraulic  
system to the cleanliness of the  
components and hydraulic fluid  
that make up the system**

**National foreword**

This Published Document is the UK implementation of ISO/TR 10686:2013.

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 secretary.

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ISBN 978 0 580 59008 5

ICS 23.100.01

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 July 2013.

**Amendments issued since publication**

Date	Text affected
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**Hydraulic fluid power — Method to relate the cleanliness of a hydraulic system to the cleanliness of the components and hydraulic fluid that make up the system**

*Transmissions hydrauliques — Méthode de relation entre propreté d'un système hydraulique et propreté des composants et du fluide hydraulique qui composent le système*



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Published in Switzerland

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## Foreword

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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. [www.iso.org/directives](http://www.iso.org/directives)

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The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 6, *Contamination control*.

## Introduction

The initial cleanliness level of a hydraulic system can affect its performance and useful life. Unless removed, particulate contaminants present after manufacture and assembly of a system can circulate through the system and cause damage to the system's components. To reduce the probability of such damage, the fluids and the internal surfaces of the hydraulic fluid power system and of its components should be cleaned to a specified level.

The final cleanliness level of the complete system can be theoretically predicted as the sum of the particulate contamination brought in by both the components that make up the system and the filling fluid.

As a reciprocal, the required cleanliness level of each individual component and of the filling fluid can be predicted from the required cleanliness level of the final system. This Technical Report explains the theoretical basis for such predictions.

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# Hydraulic fluid power — Method to relate the cleanliness of a hydraulic system to the cleanliness of the components and hydraulic fluid that make up the system

## 1 Scope

This Technical Report describes methods that can be used to:

- relate the cleanliness of a hydraulic system to the cleanliness of its components and the hydraulic fluid belonging to the system;
- estimate the final cleanliness level of an assembled hydraulic system filled with the hydraulic fluid, upon its release from the manufacturing area. The estimation of the final cleanliness level is based on the cleanliness level of each component in the system and on the cleanliness level of the filling fluid;
- calculate and manage cleanliness requirements of components and sub-assemblies that make up a system and of the fluid filling it so as to achieve a required cleanliness level (RCL) for the final system.

These methods can apply whatever the particle size considered and can also be used for other types than hydraulic fluid power.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

## 3 Terms and definitions

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

### 3.1

#### wetted surface area

*A*

surface area of the component or system that is exposed to the system liquid in normal operation, as agreed between parties

Note 1 to entry: Subscripts C or S are added to the symbol *A* when it refers to the wetted surface area of, respectively, a component or a system.

EXAMPLE Consider a hydraulic gear pump with two gears (see [Figure 1](#)). The wetted surface area can be calculated as the sum of the internal surfaces of the pump body (two plates and one flange with two ports) plus the external surface of the two gears.