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Hydraulic fluid power — Method for determining the required cleanliness level (RCL) of a system

Transmissions hydrauliques — Méthode de détermination du niveau de propreté requis (NPR) d'un système



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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle of the method	2
5 Selection of the RCL	3
5.1 General	3
5.2 Procedure	3
5.3 Weightings for working pressure and duty cycle	4
5.4 Weightings for component contaminant sensitivity	4
5.5 Weightings for system life expectancy	5
5.6 Weightings for total cost of component replacement	5
5.7 Weightings for cost of downtime	5
5.8 Weightings for risk	6
6 Identification statement (reference to this document)	6
Annex A (informative) Options for selecting the RCL for a hydraulic system	7
Annex B (informative) Example of a pro forma worksheet	10
Annex C (informative) Worked example of the determination of the RCL for a hydraulic system	12
Annex D (informative) Effect of extraneous contamination on cleanliness data	13
Bibliography	15

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.

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 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/131, *Fluid power systems*, Subcommittee SC 6, *Contamination control*.

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Introduction

In hydraulic fluid power systems, power is transmitted through a liquid under pressure within a closed circuit. The liquid is both a lubricant and power-transmitting medium. The presence of solid particulate contamination interferes with the ability of the hydraulic liquid to lubricate and causes wear to the components. The extent of this form of contamination has a direct bearing on the performance and reliability of the system and needs to be controlled to levels that are considered appropriate for the system concerned. This level is called the required cleanliness level (RCL) and the level for an individual system depends upon the contaminant sensitivity of the system and the level of reliability required by the user. It therefore varies from application to application and within common system types.

In the past, the selection of the RCL was arbitrary and based on either the system designer's past experience or on third-party recommendations that were based upon their experience. Rarely did the selection reflect current fluid cleanliness requirements. Furthermore, as the selection was subjective, there was not any consistency in the RCL recommended by the various parties involved in the selection. The end result was that the user of the RCL would be confused and select an incorrect RCL. This fact was recognised by the British Fluid Power Association (BFPA) in 1999^[1], and it developed a method for selecting an RCL which was based upon the requirements of an individual system and user (see the Bibliography). The rationale behind the development of this method is given in [Annex A](#). This has since been adopted as Norwegian national standard NS 2085^[2].

The emphasis on fluid cleanliness has made the RCL an important parameter in the management of cleanliness in hydraulic systems. The RCL sets the standard for cleanliness throughout the manufacturing process, through the assembly and commissioning stages, and in service. It also is instrumental in ensuring that the correct filtration level is achieved in the operating system. The RCL calculated by this method is used in ISO/TR 15640^[3] to assist in the selection of filters.

This document has been developed to provide a uniform and consistent procedure for selecting the RCL for a particular system. It takes the user of this procedure through a series of conditions that best describe the system for which the RCL is required and the RCL is selected on this basis.