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**Hydraulic fluid power — Fatigue pressure  
testing of metal pressure-containing  
envelopes —**

**Part 1:  
Test method**

*Transmissions hydrauliques — Essais de fatigue des enveloppes  
métalliques sous pression —*

*Partie 1: Méthode d'essai*



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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 3.

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 part of ISO 10771 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10771-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 8, *Product testing*.

ISO 10771 consists of the following parts, under the general title *Hydraulic fluid power — Fatigue pressure testing of metal pressure-containing envelopes*:

- *Part 1: Test method*
- *Part 2: Test rating* (in preparation)

Annexes A to D form a normative part of this part of ISO 10771.

## Introduction

In hydraulic fluid power systems, power is transmitted and controlled under pressure within an enclosed circuit. It is important for the manufacturer and user of hydraulic components to have information on their global reliability because of the importance of the fatigue failure mode and the relationship this has with the functional safety and service life of such components. This part of ISO 10771 provides a method for fatigue testing the pressure-containing envelope provided by hydraulic components.

During operation, components in a system may be subjected to loads that arise from:

- internal pressure;
- external forces;
- inertia and gravitational effects;
- impact or shock;
- temperature changes or gradients.

The nature of these loads can vary from a single static application to continuously varying amplitudes, repetitive loadings and even shocks. It is important to know how a component can withstand these loads, but this part of ISO 10771 addresses only the loading due to internal pressure.

There are many ways in which internal pressure loads are imposed upon a component. This part of ISO 10771 considers a broad range of waveforms within prescribed time limits, temperatures and environmental conditions, and only upon metals. It is expected that these limitations could still provide sufficient common ground for a method of fatigue pressure testing metal pressure-containing envelopes in hydraulic fluid power components. This method, therefore, provides the system designer with certain information to assist in a selection of components for an application. The system designer still has the responsibility of considering the other loading characteristics described above and determining how they could affect the component's pressure-retaining capability.

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# Hydraulic fluid power — Fatigue pressure testing of metal pressure-containing envelopes —

## Part 1: Test method

### 1 Scope

This part of ISO 10771 specifies a method of fatigue testing the pressure-containing envelopes of components used in hydraulic fluid power systems under sustained steady cyclic internal pressure loads.

This part of ISO 10771 is only applicable to component pressure-containing envelopes that:

- are manufactured from metals;
- are operated at temperatures that exclude creep and low-temperature embrittlement;
- are only subjected to pressure-induced stresses;
- are not subjected to loss of strength due to corrosion or other chemical action;
- may include gaskets, seals and other non-metallic components; however, these are not considered part of the pressure-containing envelope being tested, (see note 3 in 5.5).

This part of ISO 10771 does not apply to piping as defined in ISO 4413 (i.e. connectors, hose, tubing, pipe). See ISO 8434-5, ISO 6803 and ISO 6605 for methods of fatigue testing of piping devices.

This part of ISO 10771 establishes a general test method that is applicable for many hydraulic fluid power components, but additional requirements or more specific methods that may be required for particular components are contained in the annexes or other standards.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitutes provisions of this part of ISO 10771. For dated reference, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 10771 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For an undated reference, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4413:1998, *Hydraulic fluid power — General rules relating to systems*

ISO 5598:1985, *Fluid power systems and components — Vocabulary*

ISO 9110-1:1990, *Hydraulic fluid power — Measurement techniques — Part 1: General measurement principles*

ISO 9110-2:1990, *Hydraulic fluid power — Measurement techniques — Part 2: Measurement of average steady-state pressure in a closed conduit*