



BSI Standards Publication

**Pneumatic fluid power — Assessment of
component reliability by accelerated life testing
— General guidelines and procedures**

National foreword

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**Pneumatic fluid power — Assessment
of component reliability by
accelerated life testing — General
guidelines and procedures**

*Transmissions pneumatiques — Évaluation de la fiabilité du
composant par essai de durée de vie accélérée — Lignes directrices
générales et modes opératoires*





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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.

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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ISO/TR 16194 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

Introduction

This document is being released to document progress that the working group has developed for accelerated testing. It is a new method with which the working group members have very little experience, but has been used by institutional laboratories and taught at academic levels.

Some experimentation on air cylinders has been done at the Korean Institute of Machinery and Materials (KIMM), but the application to pneumatic components in general has not been evaluated.

This document is offered to members as a reference and model procedure, so that they can develop experience with its use in their own laboratories.

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Pneumatic fluid power — Assessment of component reliability by accelerated life testing — General guidelines and procedures

1 Scope

This document provides general procedures for assessing the reliability of pneumatic fluid power components using accelerated life testing and the method for reporting the results. These procedures apply to directional control valves, cylinders with piston rods, pressure regulators, and accessory devices – the same components covered by the ISO 19973 series of standards.

This document does not provide specific procedures for accelerated life testing of components. Instead, it explains the variability among methods and provides guidelines for developing an accelerated test method.

The methods specified in this document apply to the first failure, without repairs.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598, ISO 19973-1 and the following apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

B_x life

life of a component or assembly that has not been altered since its production, where its reliability is $(100 - x) %$; or the time at which $(100 - x) %$ of the population has survived

Note 1 to entry: The cumulative failure fraction is $x %$. For example, if $x = 10$, the B₁₀ life has a cumulative failure probability of 10 %.

3.2

acceleration factor

AF

ratio between the life at the normal use stress level and the life at the accelerated stress level

3.3

accelerated life test

ALT

process in which a component is forced to fail more quickly than it would have under normal use conditions and which provides information about the component's life characteristics