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BSI Standards Publication

## Rotary tools for threaded fasteners — Performance test method

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## National foreword

This British Standard is the UK implementation of ISO 5393:2017.

The UK participation in its preparation was entrusted to Technical Committee MCE/8/-/2, Hand-held, non-electric power tools - Safety.

A list of organizations represented on this committee can be obtained on request to its secretary.

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## Rotary tools for threaded fasteners — Performance test method

*Outils rotatifs pour éléments de fixation filetés — Méthode d'essai des caractéristiques de fonctionnement*



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

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 3, *Pneumatic tools and machines*.

This third edition cancels and replaces the second edition (ISO 5393:1994), which has been technically revised.

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## Introduction

The test method specified in this document is designed to measure the performance of power assembly tools in a laboratory environment. It is not intended as a routine in-plant inspection test.

This document is intended

- to enable the producers of power tools to offer their products under standardized technical specifications, and
- to give users of threaded fasteners a method for evaluating and specifying the performance of power assembly tools.

As with the previously published versions, this 2017 version of the document remains a fundamental test procedure, with no attempt to set acceptance criteria. Any minimum performance requirements are the responsibility of the user to meet the demands of the particular application for which the tool is intended for use.

Additional elements have been introduced with this version to address preferred test torque levels, tool performance over a defined number of operating cycles and a method to determine the precision of any torque measurement system which may be included as part of the assembly tool.

As with the previously published versions, this document is applicable to tightening tools of any power source within its scope. This version more clearly addresses electric powered tools which have become more commonly used in the workplace.

This version includes some changes to the specifications for the test joints and for the test method. These changes reflect the practical experience gained through the use of the document and are intended to improve the reproducibility of the test method. Results obtained using this version is not expected to be significantly different than results obtained using the previous version.

Information regarding rated torque, test torque and torque adjustment range: The scope (see last paragraph) allows a test to be performed at any test torque level (see [3.18](#)). A manufacturer defines a tool's rated torque (see [3.11](#)) and its torque adjustment range (see [3.21](#)). [Clause 6](#) describes a method to identify torque scatter over a defined range of torque adjustment. In theory, a manufacturer could offer a tool with a defined rated torque of 100 Nm, and may choose to identify the performance over a defined torque adjustment range of 60 Nm to 80 Nm (perhaps to satisfy a customer or market requirement). In that case, as specified in [Clause 6](#), performance tests will be carried out at 60 Nm and 80 Nm, and should the manufacturer want to identify the tool's performance over a defined number of operating cycles, the operating cycle test would be performed at 80 Nm (the upper limit of the defined range of torque adjustment, as specified in [7.2.2](#)). Results of the performance tests would then be valid only for that defined range of torque adjustment.

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# Rotary tools for threaded fasteners — Performance test method

## 1 Scope

This document specifies a laboratory performance test method for power assembly tools (referred throughout the document as “tool”) for installing threaded fasteners.

It provides a method for the measurement of torque repeatability (scatter)

- over a range of torque rates as specified in this document,
- over a range of torque adjustment as defined by the manufacturer, and
- over a number of operating cycles as defined by the manufacturer.

It provides a method for the measurement of the precision of the built-in torque measurement system for tools incorporating such a feature. See [Annex E](#).

It gives instructions on equipment parameters, what to test for and how to evaluate and present the test data.

It is applicable to tools

- of any power source, e.g. pneumatic, hydraulic, and electric, including battery-powered,
- which apply torque in a generally continuous manner, and
- within the torque range 0,5 Nm to 2 000 Nm. Outside this range, it is acceptable to modify the test method providing that the modification is documented in the test report.

It is not applicable to

- impact or impulse wrenches,
- ratchet wrenches or wrenches with ratcheting clutches, and
- other tools which advance fasteners in discontinuous increments, overcoming static friction at each increment.

It allows a test to be performed at any test torque level; however, in order to minimize the number of test joints necessary for a wide range of test torque levels, a list of preferred test torque levels is provided in [Annex A](#).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EURAMET/cg-14/v.2.0: March–2011, *Guidelines on the Calibration of Static Torque Measuring Devices*

## 3 Terms and definitions

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