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NSAI Standards

Irish Standard
I.S. EN ISO 6789-2:2017

# Assembly tools for screws and nuts - Hand torque tools - Part 2: Requirements for calibration and determination of measurement uncertainly (ISO 6789-2:2017)

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## National Foreword

I.S. EN ISO 6789-2:2017 is the adopted Irish version of the European Document EN ISO 6789-2:2017, Assembly tools for screws and nuts - Hand torque tools - Part 2: Requirements for calibration and determination of measurement uncertainly (ISO 6789-2:2017)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 6789-2

March 2017

ICS 25.140.30

Supersedes EN ISO 6789:2003

English Version

# Assembly tools for screws and nuts - Hand torque tools - Part 2: Requirements for calibration and determination of measurement uncertainly (ISO 6789-2:2017)

Outils de manoeuvre pour vis et écrous - Outils dynamométriques à commande manuelle - Partie 2: Exigences d'étalonnage et détermination de l'incertitude de mesure (ISO 6789-2:2017)

Schraubwerkzeuge - Handbetätigte Drehmomentwerkzeuge - Teil 2: Anforderungen an die Kalibrierung und die Bestimmung der Messunsicherheit (ISO 6789-2:2017)

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# Contents

Page

**European foreword** ..... **3**

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# European foreword

This document (EN ISO 6789-2:2017) has been prepared by Technical Committee ISO/TC 29 "Small tools".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2017, and conflicting national standards shall be withdrawn at the latest by March 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

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INTERNATIONAL STANDARD

# ISO 6789-2

First edition
2017-02

# Assembly tools for screws and nuts — Hand torque tools —

## Part 2: Requirements for calibration and determination of measurement uncertainty

*Outils de manoeuvre pour vis et écrous — Outils dynamométriques à commande manuelle —*

*Partie 2: Exigences d'étalonnage et détermination de l'incertitude de mesure*

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# Contents

Page

**Foreword** ..... **iv**

**Introduction** ..... **v**

**1 Scope** ..... **1**

**2 Normative references** ..... **1**

**3 Terms, definitions and symbols** ..... **1**
3.1 Terms and definitions ..... 2
3.2 Symbols, designations and units ..... 2

**4 Requirements for calibration** ..... **4**
4.1 Calibration during use ..... 4
4.2 Calibration method ..... 4
4.3 Calibration system ..... 4

**5 Measurement error** ..... **5**
5.1 Calculation of the relative measurement error ..... 5
5.2 Exemplary calculations of the relative measurement error ..... 5
5.2.1 Example 1 ..... 5
5.2.2 Example 2 ..... 6

**6 Sources of uncertainty** ..... **7**
6.1 General ..... 7
6.2 Evaluation of Type B uncertainties due to the torque tool ..... 8
6.2.1 Scale, dial or display resolution, $r$ ..... *8*
6.2.2 Variation due to the reproducibility of the torque tool, $b_{rep}$ ..... 10
6.2.3 Variation due to the interface between the torque tool and the calibration system ..... 11
6.2.4 Variation due to the variation of the force loading point, $b_l$ ..... 12
6.3 Evaluation of Type A uncertainty due to the torque tool ..... 13
6.3.1 General ..... 13
6.3.2 Variation due to the repeatability of the torque tool, $b_{re}$ ..... 13

**7 Determination of the calibration result** ..... **13**
7.1 Determination of the relative standard measurement uncertainty, $w$ ..... *13*
7.2 Determination of the relative expanded measurement uncertainty, $W$ ..... *14*
7.3 Determination of the relative measurement uncertainty interval, $W'$ ..... *14*

**8 Calibration certificate** ..... **15**

**Annex A** (informative) **Calculation example for an indicating torque tool (Type I)** ..... **16**

**Annex B** (informative) **Calculation example for a setting torque tool (Type II)** ..... **25**

**Annex C** (normative) **Minimum requirements for the calibration of the torque measurement device and the estimation of its measurement uncertainty** ..... **34**

**Bibliography** ..... **41**

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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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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.

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This first edition of ISO 6789-2, together with ISO 6789-1, cancels and replaces ISO 6789:2003 which has been technically revised with changes as follows.

a) ISO 6789:2003 has been divided into two parts. ISO 6789:2003 has become ISO 6789-1 which specifies the requirements for design and manufacture including the content of a declaration of conformance. This document specifies the requirements for traceable certificates of calibration. It includes a method for calculation of uncertainties and provides a method for calibration of the torque measurement device used for calibrating hand torque tools.

b) This document includes detailed methods for calculation of the uncertainty budget which shall be performed for each individual tool.

c) This document includes example calculations that are provided for different types of torque tool.

d) Annex C provides requirements for calibrating the torque measurement device where the calibration laboratory does not utilize a national standard giving such requirements.

A list of all parts in the ISO 6789 series can be found on the ISO website.


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# Introduction

The revision of ISO 6789:2003 has been designed to achieve the following improvements.

ISO 6789 has been split to provide two levels of documentation. It recognizes the different needs of different users of the standard.

ISO 6789-1 continues to provide designers and manufacturers with relevant minimum requirements for the development, production and documentation of hand torque tools.

This document provides detailed methods for calculation of uncertainties and requirements for calibrations. This will allow users of calibration services to more easily compare the calibrations from different laboratories. Additionally, minimum requirements for the calibration of torque measurement devices are described in Annex C.

The purpose of this document is to define the requirements for a calibration in which the sources of uncertainty are evaluated and used to define the range of values within which the readings probably fall. Additional uncertainties may exist in the use of the torque tool. The evaluation of uncertainties for each individual tool is time-consuming and where there are sufficient data to estimate the Type B uncertainty components by statistical means, it is acceptable to use these values for a given model of torque tool, providing that the uncertainty components are subject to periodic review.

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# Assembly tools for screws and nuts — Hand torque tools —

## Part 2: Requirements for calibration and determination of measurement uncertainty

## 1 Scope

This document specifies the method for the calibration of hand torque tools and describes the method of calculation of measurement uncertainties for the calibration.

This document specifies the minimum requirements for the calibration of the torque measurement device where the relative measurement uncertainty interval, $W'_{\mathrm{md}}$, is not already provided by a traceable calibration certificate.

ISO 6789 is applicable for the step by step (static) and continuous (quasi-static) calibration of torque measurement devices, the torque of which is defined by measuring of the elastic form change of a deformable body or a measured variable which is in proportion to the torque.

This document applies to hand torque tools which are classified as indicating torque tools (Type I) and setting torque tools (Type II).

NOTE Hand torque tools covered by this document are the ones identified in ISO 1703:2005 by reference numbers 6 1 00 11 0, 6 1 00 11 1 and 6 1 00 12 0, 6 1 00 12 1 and 6 1 00 14 0, 6 1 00 15 0. ISO 1703 is currently under revision. In the next edition, torque tools will be moved to an own clause, and with this change the reference numbers will also change and additional reference numbers will be added.

## 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.

ISO 6789-1:2017, *Assembly tools for screws and nut — Hand torque tools — Part 1: Requirements and methods for design conformance testing and quality conformance testing: minimum requirements for declaration of conformance*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

## 3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in ISO 6789-1 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

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