INTERNATIONAL STANDARD

Rotary tools for threaded fasteners — Performance test method

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

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.

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.

International Standard ISO 5393 was prepared by Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*, Sub-Committee SC 3, *Pneumatic tools and machines*.

This second edition cancels and replaces the first edition (ISO 5393:1981), which has been technically revised.

Annexes A and B of this International Standard are for information only.

Introduction

The test method specified in this International Standard is designed to measure the capability of power assembly tools. It is not intended as a routine in-plant inspection test.

This International Standard is intended

a) to give users of threaded fasteners a method for evaluating and specifying the performance of power assembly tools, and

b) to enable the producers of power tools to offer their products under correlated technical specifications.

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Rotary tools for threaded fasteners — Performance test method

1 Scope

This International Standard specifies a laboratory performance test method for power assembly tools for installing threaded fasteners. It gives instructions on what to test for and how to evaluate and present the test data.

It is applicable to tools which apply torque continuously. It is, however, not applicable to impact wrenches, ratchet wrenches or wrenches with ratcheting clutches, or other tools which advance fasteners in discontinuous increments, overcoming static friction at each increment, in particular because the applied torque of these tools cannot be measured using conventional types of instrumentation.

The test method is not intended as a routine in-plant inspection test.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2787:1984, *Rotary and percussive pneumatic tools — Performance tests.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 torque: Product of the force turning the fastener and the perpendicular distance between the line of force and the centre of the fastener.

It is expressed in newton metres (N·m).

3.2 angle: Measure of the angular displacement through which a fastener is turned.

It is expressed in degrees (°).

3.3 torque rate: Increase in torque with angular displacement while advancing a fastener in a threaded joint.

It is expressed in newton metres per revolution (N·m/rev).

3.4 mean torque, $\bar{T}$: Arithmetic average of several torque readings on a specific joint under stated conditions, calculated by dividing the sum of the readings by the number of readings.

3.5 range: For a group of readings, the numerical difference between the highest reading and the lowest reading.

3.6 standard deviation, s: Measure of the dispersion (scatter) based on the mean-squared deviation from the arithmetic mean derived from a sample of a statistical population.

3.7 six sigma, $6s$: Range of probability, plus and minus three standard deviations from the mean, derived from a sample of a statistical population. For a normally distributed statistical population, 99,73 % of all members of that population are encompassed.

3.8 $6s$ torque scatter: Predictable range of torque over which a tool will perform using a single torque-rate joint under controlled conditions. For a normally distributed statistical population, 99,73 % of all members of that population are encompassed.

For the practical purposes of this International Standard, $6s$ torque scatter is the total probable range of torque of a tool run on a single joint at the same setting of the tool torque adjustment.