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Neelektrična ročna orodja - Varnostne zahteve - 6. del: Električna orodja za pritrjevanje z navojem

Hand-held non-electric power tools - Safety requirements - Part 6: Assembly power tools for threaded fasteners

Handgehaltene nicht-elektrisch betriebene Maschinen - Sicherheitsanforderungen - Teil 6: Maschinen für Schraubverbindungen

Machines portatives à moteur non électrique - Prescriptions de sécurité - Partie 6: Machines portatives d'assemblage pour éléments de fixation filetés

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Hand-held non-electric power tools - Safety requirements - Part 6: Assembly power tools for threaded fasteners

Machines portatives à moteur non électrique - Prescriptions
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pour éléments de fixation filetés

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Sicherheitsanforderungen - Teil 6: Maschinen für
Schraubverbindungen

This European Standard was approved by CEN on 26 May 2000 and includes Amendment 1 approved by CEN on 23 July 2008.

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Foreword

This document (EN 792-6:2000+A1:2008) has been prepared by Technical Committee CEN/TC 255 "Hand-held, non-electric power tools - Safety", the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by March 2009 and conflicting national standards shall be withdrawn at the latest by December 2009.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

This document includes Amendment 1, approved by CEN on 2008-07-23.

This document supersedes EN 792-6:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

The standard has been created in close co-operation with CENELEC/TC 61F with the aim of achieving requirements for mechanical safety in the EN 50144 series, which are similar for hand-held electric and non-electric power tools.

The annexes to this part of the standard are:

Annex A (informative) Examples of power tools covered by this part

Annex B (informative) Labels, signs and tags

A1 Annexes ZA and ZB **A1** (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives.

This standard also contains a Bibliography.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EN 792-6:2000+A1:2008 (E)**Introduction**

This European standard is a type C standard as stated in EN 1070.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of other standards, for machines that have been designed and built according to the provisions of this type C standard.

The European Standard, EN 792, consists of a number of independent parts for individual types of hand-held non-electric power tools.

Other EN standards deal with safety rules for hand-held power tools used in e. g. the following fields:

- agriculture and forestry such as chain saws, hedge-trimmers, brush cutters, grass trimmers;
- construction and building such as cutting-off power tools, concrete vibrators;
- food industry, such as fowl secateurs, sheep shears.

Endeavours have been made to achieve co-ordination with the relevant Technical Committees so that the safety requirements are compatible.

This standard is divided in the following parts:

- Part 1 - Assembly power tools for non-threaded mechanical fasteners (former part 14)
- Part 2 - Cutting-off and crimping power tools (former part 15)
- Part 3 - Drills and tappers
- Part 4 - Non rotary percussive power tools
- Part 5 - Rotary, percussive power drills
- Part 6 - Assembly power tools for threaded fasteners
- Part 7 - Grinders
- Part 8 - Sanders and polishers
- Part 9 - Die grinders
- Part 10 - Compression power tools
- Part 11 - Nibblers and shears
- Part 12 - Small circular, small oscillating and reciprocating saws
- Part 13 - Fastener driving tools

Certain parts of EN 792 cover hand-held non-electric power tools, driven by internal combustion engines powered by gaseous or liquid fuel. In these parts, the safety aspects relating to internal combustion engines are found in a normative annex.

The parts are type C standards and refer to pertinent European Standards of type A and B where such standards are applicable.

1 Scope

The standard EN 792 applies to hand-held non-electric power tools driven by rotary or linear motors, powered by compressed air, hydraulic fluid and intended to be used by one operator and supported by:

- the operator's hand or hands
- a suspension, e.g. a balancer.

This part, EN 792-6, applies to hand-held, non-electric, power tools for tightening or installing of threaded fasteners. This part lists the significant hazards caused by such power tools and specifies safety requirements valid for different aspects of safety during their foreseeable lifetime.

Power tools covered by this part of the standard:

- air-hydraulic impulse wrenches,
- impact wrenches,
- fastener installation tools,
- nut runners,
- open-ended spanners,
- ratchet wrenches,
- screwdrivers.

Special requirements and modifications on a hand-held power tool for the purpose of mounting it in a fixture are not covered by this part.

NOTE At the date of publication no assembly power tools for threaded fasteners driven by internal combustion engines are known.

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2 Normative references [cb26c374ba64/sist-en-792-6-2000a1-2008](https://standards.iteh.ai/catalog/standards/sist/d865b3f2-133a-456d-ab83-cb26c374ba64/sist-en-792-6-2000a1-2008)

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of the publications referred to in this European Standard are valid only when they are incorporated in this standard by amendment or revision. For undated references the latest edition of the publication referred to, applies (including amendments).

EN 292-1:1991, *Safety of machinery - Basic concepts, general principles for design – Part 1: Basic terminology, methodology*

EN 292-2:1991, *Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles and specifications*

EN 563, *Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit values for hot surfaces*

EN 614-1, *Safety of machinery - Ergonomic design principles – Part 1: Terminology and general principles*

EN 1070, *Safety of machinery - Terminology*

EN 12096, *Mechanical vibration - Declaration and verification of vibration emission values*

EN ISO 4871, *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

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EN ISO 15744:2008, *Hand-held non-electric power tools – Noise measurement code – Engineering method (grade 2) (ISO 15744:2002)*

EN 28662-1, *Hand-held portable power tools - Measurement of vibrations at the handle – Part 1: General (ISO 8662-1:1988)*

EN ISO 8662-7, *Hand-held portable power tools - Measurement of vibrations at the handle – Part 7: Wrenches, screwdrivers and nut runners with impact, impulse or ratchet action (ISO 8662-7:1997)*

ISO 3857-1, *Compressors, pneumatic tools and machines - Vocabulary – Part 1: General*

ISO 5391, *Pneumatic tools and machines - Vocabulary*

ISO 9158, *Road vehicles - Nozzles spouts for unleaded fuel*

ISO 9159, *Road vehicles - Nozzles spouts for leaded gasoline and diesel fuel*

3 Terms and definitions

For the purposes of this part of the standard, the following terms and definitions apply:

3.1 General terms and definitions**3.1.1 hand-held power tool**

machine driven by rotary or linear motors powered by compressed air, hydraulic fluid, gaseous or liquid fuel, electricity or stored energy (e.g. by a spring) to do mechanical work and so designed that the motor and the mechanism form an assembly that can easily be brought to its place of operation. The hand-held power tool is operated by one or two hands

NOTE Hand-held power tools driven by compressed air or gas are called pneumatic tools. Hand-held power tools driven by hydraulic liquid are called hydraulic tools.

3.1.2 rotary power tool

hand-held power tool the machine spindle of which rotates

3.1.3 inserted tool

tool inserted in the hand-held power tool to perform the intended work

3.1.4 service tool

tool intended for performing maintenance or service on the hand-held power tool

3.1.5 control device

device to start and stop the hand-held power tool or to change the direction of the rotation or to control the functional characteristics such as speed and power

3.1.6 maximum operating pressure

maximum pressure that a hand-held power tool may be operated at, as specified by the manufacturer

3.2 Terms and definitions related to assembly power tools for threaded fasteners

3.2.1

screwdriver

rotary power tool, with a reversible or non-reversible spindle fitted with a screwdriver bit, for the purpose of tightening or loosening threaded fasteners, usually screws.

Screw drivers can be straight, pistol-grip or angle types, and may or may not have a clutch; these terms are defined by ISO 5391

3.2.2

nutrunner

rotary power tool, with a reversible or non-reversible spindle fitted with a drive adapter for the purpose of tightening or loosening nuts and bolts.

Nutrunners can be pistol-grip or angle drive types, and may or may not have a clutch. This category includes two-speed and crow-foot nut runners; these terms are defined by ISO 5391

3.2.3

impact wrench

rotary power tool, with a reversible spindle driving a hammer which periodically strikes an anvil which includes a drive adapter for the purpose of tightening or loosening nuts and bolts without producing any major torque reaction on the power tool.

Impact wrenches can be straight, pistol or angle drive types and may or may not be torque controlled; these terms are defined by ISO 5391

3.2.4

air-hydraulic impulse wrench

nutrunner where the torque for tightening or loosening threaded fasteners is obtained by a hydraulic impulse mechanism.

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Air-hydraulic impulse wrenches have the same types as impact wrenches

3.2.5

fastener installation tool

screwdriver with a reverse mechanism and a threaded drive spindle for installing threaded captive fasteners; may be straight, pistol-grip or angle drive type

3.2.6

open-ended spanner

nutrunner or a ratched wrench with an open end socket

NOTE In US the term "Tube wrench" is used.

3.2.7

reaction bar

mechanical device for absorption of the reaction torque

3.2.8

ratchet wrench

angle drive wrench which progressively rotates a socket by means of ratchet and pawl coupling

3.2.9

rated speed, r/min

maximum rotational speed of the machine spindle, in revolutions per minute under operating conditions with the inserted tool mounted and at the upper limit of the energy supply, e.g. pressure or flow, as specified by the manufacturer.

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For other terms, see EN 1070 and also ISO 3857-3 and ISO 5391. For examples of assembly power tools for threaded fasteners see annex A

4 List of hazards

The following hazards can occur in the use of assembly power tools for threaded fasteners.

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Hazard type	Reference to safety requirement	
	By design or guarding	Information for use
4.1 Mechanical hazards <ul style="list-style-type: none"> - crushing - cutting - drawing in or trapping (caused by hair, clothing etc. getting entangled in a rotating power tool) - friction or abrasion hazard - loss of stability - whipping hose - ejection from high pressure hydraulic systems - ejection of parts - hose and hose coupling specifications 	5.7.1. 5.1.1 5.1.1 5.1.2 5.1.3	6.2.2 6.2.2 6.2.2 6.2.2 6.2.2
4.2 Electrical hazards		6.2.2
4.3 Thermal hazards <ul style="list-style-type: none"> - explosions - health damage due to hot or cold surfaces 	5.2 5.2	
4.4 Hazards caused by noise	5.3	6.2.2
4.5 Hazards generated by vibration <ul style="list-style-type: none"> - hazards caused by the operator putting hands on the nut-running socket 	5.4	6.2.2 6.2.2
4.6 Hazards generated by materials and substances processed, used or exhausted <ul style="list-style-type: none"> - exhaust air - lubricants - hydraulic fluid 	5.5.1 5.5.2	6.2.2
4.7 Hazards caused by neglecting ergonomic principles <ul style="list-style-type: none"> - repetitive strain injuries - unsuitable postures - inadequate grip design and tool balance - effects of reaction forces upon operator - neglected use of personal protection equipment 	5.6.1, 5.6.3, 5.6.4 5.6.1 5.6.2	6.2.2 6.2.2 6.2.2
4.8 Hazards caused by failure of energy supply <ul style="list-style-type: none"> - unexpected return of energy supply after a breakdown - incorrect hydraulic fluid flow and outlet pressure 		6.2.2 6.2.2
4.9 Hazards caused by missing and/or incorrectly positioned safety related means <ul style="list-style-type: none"> - start and stop device - unintentional start - unintentional locking - start in unexpected direction 	5.7.1 5.7.2 5.7.3 5.7.4	6.2.2

EN 792-6:2000+A1:2008 (E)**5 Safety requirements and measures****5.1 Mechanical safety****5.1.1 Surfaces, edges and corners**

Accessible parts of assembly power tools for threaded fasteners, except the inserted tool, shall not have sharp edges or angles or rough or abrasive surfaces, see 3.1 of EN 292-2:1991.

5.1.2 Supporting surface and stability

Assembly power tools for threaded fasteners shall be so designed that they can be laid aside and remain in stable position on a plane surface.

5.1.3 High pressure ejection

Hydraulic systems of the power tools shall be enclosed so as to give protection against high pressure fluid ejection.

5.1.4 Guards

Guards covering the inserted tool are not required.

5.2 Thermal safety

Surface temperatures of parts of the power tools which are held during use or could be inadvertently touched shall follow the provisions of EN 563.

NOTE The limit values for low temperatures are studied by CEN/TC 122.

Power tools for use in potentially explosive atmospheres should comply with EN 1127-1. However because the suitability of a power tool for use in potentially explosive atmospheres will depend not only on the power tool but the inserted tool and the workpiece, it is not possible to give any detailed advice in this standard.

5.3 Noise**5.3.1 General**

The emission of noise from a hand-held power tool shall be kept as low as possible.

The noise emission from using hand-held power tools emanates from three main sources:

- the hand-held power tool itself,
- the inserted tool,
- the workpiece.

NOTE Generally, the manufacturer has no possibility of influencing the noise emitted by the processed workpiece.

5.3.2 Noise emitted by the hand-held power tool

The noise emitted by the hand-held power tool itself can be divided into:

- noise from the motor,