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Neelektrična ročna orodja - Varnostne zahteve - 2. del: Orodja za odrezovanje in stiskanje

Hand-held non-electric power tools - Safety requirements - Part 2: Cutting-off and crimping power tools

Handgehaltene nicht-elektrisch betriebene Maschinen - Sicherheitsanforderungen - Teil 2: Maschinen zum Abschneiden und Quetschen

Machines portatives à moteur non électrique - Prescriptions de sécurité - Partie 2 : Machines de découpe et de sertissage

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

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Foreword

This document (EN 792-2:2000+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of an identical text or by endorsement, at the latest by March 2009 and conflicting national standards shall be withdrawn at the latest by December 2009.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 2008-07-26.

This document supersedes EN 792-2:2000.

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.

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 harness,

— a suspension, e.g. a balancer.

This part, EN 792-2, applies to non-electric, hand-held power tools without rotation, for cutting-off wires, cables, etc., and for crimping for example connectors to cable ends.

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:

— crimping tools without a yoke,

— cutters,

— cutting-off tools,

— cutting pliers.

”Double acting hydraulic rescue tools for fire and rescue service use” are not covered by this standard.

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.

2 Normative references

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, *Temperatures of touchable surfaces - Ergonomic 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)*

A1⟩ EN ISO 15744:2008, *Hand-held non-electric power tools – Noise measurement code – Engineering method (grade 2) (ISO 15744:2002)* ⟨A1

EN 28662-1, *Hand-held portable power tools - Measurement of vibration at the handle – Part 1: General*

ISO 3857-3, *Compressors, Pneumatic tools and machines, Vocabulary – Part 3: Pneumatic tools and machines*

ISO 5391, *Pneumatic tools and machines – Vocabulary*

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

3.1.3 service tool: Tool intended for performing maintenance or service on the hand-held power tool.

3.1.4 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.

3.1.5 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 cutting-off and crimping power tools

3.2.1 crimping tool without a yoke: Power tool with a mechanism to permanently fasten by crimping or clinching a connection element, e.g. to a cable or a hose.

3.2.2 cutting-off tool: Power tool where two jaws fully close the gap between them for cutting-off.

3.2.3 cutting pliers: Cutting-off tool whereby two angle-mounted jaws cut the work piece.

For other terms, see EN 1070 and also ISO 3857-3 and ISO 5391.

For examples of power tools treated in this part see annex A.

4 List of hazards

The following hazards can occur in the use of the cutting-off and crimping power tools.

Hazard type	Reference to safety requirement	
	By design or guarding	Information for use
4.1 Mechanical hazards		
- crushing	5.1.3, 5.7.3	
- cutting	5.1.1	
- friction or abrasion hazard	5.1.1	
- loss of stability	5.1.2	6.2.2
- whipping hose		
- ejection from high pressure hydraulic system	5.1.3	6.2.2
- hose and hose coupling specifications		
4.2 Electrical hazards		6.2.2
4.3 Thermal hazards		
- explosions	5.2	
- health damage due to hot or cold surfaces	5.2	
4.4 Hazards caused by noise	5.3	6.2.2
4.5 Hazards generated by vibration	5.4	6.2.2
4.6 Hazards generated by materials and substances processed, used or exhausted		
- exhaust air or gas	5.5.1	
- lubricants	5.5.2	6.2.2
- hydraulic fluid		
4.7 Hazards caused by neglecting ergonomic principles		
- repetitive strain injuries	5.6.1, 5.6.2,5.6.3,	6.2.2
- unsuitable postures		
- inadequate grip design and tool balance	5.6.1	6.2.2
- neglected use of personal protection equipment		
4.8 Hazards caused by failure of energy supply		
- unexpected return of energy supply after a breakdown		6.2.2
- incorrect hydraulic fluid flow and outlet pressure		6.2.2
4.9 Hazards caused by missing and/or incorrectly positioned safety related means		
- start and stop device	5.7.1	6.2.2
- unintentional start	5.7.2	

5 Safety requirements and measures

5.1 Mechanical safety

5.1.1 Surfaces, edges and corners

Accessible parts of the power tool, 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

Power tools 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 tool shall be enclosed so as to give protection against high pressure fluid ejection.

5.2 Thermal safety

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

NOTE 1 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 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,

— noise from exhaust air or gases at pneumatic tools,

— vibration induced noise.

The noise from the exhaust of air and gases is one major contributor of noise from pneumatic driven hand-held power tools. A silencer of good design will reduce this noise.

The principles contained in EN ISO 11688-1 should be followed to reduce the noise emitted by the power tool.

NOTE The exhaust air or gases can also be piped away in a hose away from the operator, however this method has limitations in practice.

Vibration induced noise can be reduced by use of acoustic isolation and vibration damping.

5.4 Vibration

Vibration at the handle of a hand-held power tool shall be kept as low as possible.

The principles contained in CR 1030-1 should be followed to reduce the vibration emitted by the power tool.

5.5 Materials and substances processed, used or exhausted

5.5.1 Exhaust air or gas

For power tools driven with compressed air or gas or by an internal combustion engine the exhaust air or gases shall be directed in such a way that it cannot cause a hazard to the operator and so that any secondary effects are minimized. e.g. blowing the dust and reflected air or gas from the workpiece onto the operator.

5.5.2 Lubricants

Lubricants for power tools, specified by the manufacturer, shall not cause hazards to the operator or the environment.

5.6 Ergonomics

5.6.1 Design of the handle

Handles and other parts used for gripping the power tool shall be designed to ensure that the operator is able to grip the power tool correctly and to perform the expected work. Handles shall suit the functional anatomy of the hand and the dimensions of the hands of the operator population. See 3.6 of EN 292-2:1991 and EN 614-1.

Power tools having a mass greater than 2 kg (including the inserted tool) shall be capable of being supported by two hands whilst being lifted or operated.

The strength of a second handle and the nature of fixing it shall be appropriate to the intended principal use.

5.6.2 Control device

The control device shall be adapted to the handle or to the part of the power tool being gripped by the operator so that it can be held comfortably in the run position.

For power tools which are normally started frequently and often used for precision works the trigger force should be small.

For further information on trigger forces for control devices see EN 894-3:2000.