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Piling equipment - Safety requirements CONSOLIDATED TEXT

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA	NATIONAL FOREWORD
Käesolev Eesti standard EVS-EN 996:1999+A3:2009 sisaldab Euroopa standardi EN 996:1995+A3:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 996:1999+A3:2009 consists of the English text of the European standard EN 996:1995+A3:2009.
Standard on kinnitatud Eesti Standardikeskuse 30.09.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 30.09.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 11.03.2009.	Date of Availability of the European standard text 11.03.2009.
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 996:1995+A3

March 2009

ICS 91.220

Supersedes EN 996:1995

English Version

Piling equipment - Safety requirements

Matériel de battage - Prescriptions de sécurité

Rammausrüstung - Sicherheitsanforderungen

This European Standard was approved by CEN on 26 October 1995 and includes Amendment 1 approved by CEN on 8 January 1999, Corrigendum 1 issued by CEN on 18 August 1999, Amendment 2 approved by CEN on 27 June 2003 and Amendment 3 approved by CEN on 25 January 2009.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. EN 996:1995+A3:2009: E

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Contents

Page

Foreword 4

Introduction 5

1 Scope 5

2 Normative references 6

3 Definitions 8

4 Safety measures and/or provisions 8
4.1 Stability 9
4.2 Ergonomics 9
4.3 Hot and cold surfaces and sharp edges 9
4.4 Hydraulic and pneumatic hoses or pipes 9
4.5 Isolation of energy sources 9
4.6 Pulleys, drums and wire ropes 9
4.7 Winches 10
4.8 Devices for transport and mounting 11
4.9 Operator's position 11
4.10 Visibility 12
4.11 Illumination 12
4.12 Starting 12
4.13 Controls 12
4.14 Guards to prevent falling 14
4.15 Personnel lift or platform 14
4.16 Suspension device of vibrators 15
4.17 Clamping devices 15
4.18 Inclination measuring system 16
4.19 Electrical installation 16
4.20 Control over output energy 16
4.21 Piling equipment – Auxiliary equipment 16
4.22 Emergency stop 17
4.23 Brakes of the carrier machine 17
4.24 Protection against moving parts 17
4.25 Hydraulic installations 18
4.26 Fire protection 18
4.27 Noise 19
4.28 Vibrations 20
4.29 Data plate 20
4.30 Warning devices and signs 20
4.31 Maintenance 21

5 Information for use 21
5.1 General 21
5.2 Operator's manual 21
5.3 Examinations or inspections 23
5.4 Spare parts list 24
5.5 Maintenance and service manual 24

6 Verification of safety requirements/measures 25

Annex A (normative) **List of significant hazards** 26

Annex B (normative) **Calculation of piling equipment stability and ground pressure** 28

Annex C (normative) **Diaphragm walling rig - Safety requirements** 41

Annex D (normative) **Wire rope grips for drop hammers - Selection and fitting** **44**

Annex E (informative) **Grouting and injection equipment - Safety** **47**

Annex F (informative) **Bibliography** **49**

Annex G (normative) **A2 Noise test code for pile installation and extracting equipment A2** **52**

Annex ZA (informative) **A3 Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC A1** **61**

Annex ZB (informative) **A3 Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC A1** **62**

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Foreword

This document (EN 996:1995+A3:2009) has been prepared by CEN/TC 151 “Construction equipment and building material machines - Safety”, the secretariat of which is held by DIN.

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 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This European Standard was approved by CEN on 26 October 1995 and includes Amendment 1 approved by CEN on 8 January 1999, Corrigendum 1 issued by CEN on 18 August 1999, Amendment 2 approved by CEN on 27 June 2003 and Amendment 3 approved by CEN on 25 January 2009.

This document supersedes EN 996:1995.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧, ⟦A2⟩ ⟨A2⟧ and ⟦A3⟩ ⟨A3⟧.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags ⟦AC⟩ ⟨AC⟧.

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).

⟦A3⟩ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A3⟧

The Annex A is normative and contains "List of significant hazards", the Annex B is normative and contains "Calculation of piling equipment stability and ground pressure", the Annex C is normative and contains "Diaphragm walling equipment – Safety requirements", the Annex D is normative and contains "Wire rope grips for drop hammers – Selection and fitting", the Annex E is informative and contains "Grouting and injection equipment – Safety" and the Annex F is informative and contains a "Bibliography". ⟦A2⟩ The Annex G is normative and contains “Noise test code for pile installation and extracting equipment". ⟨A2⟧

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.

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Introduction

This European standard is a Type C – standard as defined in EN 292-1:1991.

The machinery concerned and the extent to which hazards are covered is indicated in the scope of this standard.

1 Scope

1.1 This standard specifies safety requirements for piling equipment suitable for the following purposes:

a) Construction of foundations, slurry walls or retaining walls, using piles or other longitudinal elements;

b) Removal of piles;

c) Installation of drain – or injection elements.

The pile material can be timber, concrete (precast or cast in situ) or steel (tubes or rolled sections). Additionally, piles may have an interlocking feature to enable adjacent piles to be joined together.

1.2 This European standard deals with all significant hazards pertinent to piling equipment, when they are used as intended and under the conditions foreseen by the manufacturer (see annex A) associated with the following:

— Transport of equipment;

— Rigging and dismantling of equipment;

— Equipment in service and out of service;

— Moving of equipment between pile positions;

— Storage of equipment.

This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards.

1.3 Piling equipment includes:

a) Piling rig consisting of carrier machine (crawler, wheel or rail mounted, floating), leader attachment, leader or other guiding systems, e.g. direct mounted, boom supported, swinging, guide cage or free riding;

b) Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices;

c) Accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and shock/vibration absorbing devices, power packs/generators and personnel lifts or platforms.

1.4 In addition, this standard applies to diaphragm walling rigs. Additionally, the particular requirements which apply to diaphragm walling equipment are given in normative annex C.

1.5 If the carrier machine of a piling rig consists of an excavator, crane etc. the carrier shall be covered by its own standards to the extent the requirements of this standard are not applicable.

[A1] If piling equipment is also intended to operate with drilling attachment, EN 791 shall be complied with, too, except for the stability requirements which shall be in accordance with 4.1 of this European Standard (EN 996). [A1]

1.6 When operating in explosive atmosphere, additional requirements are needed which are not contained in this standard.

1.7 Informative Annex E is provided for the information and guidance for manufacturers of grouting and injection equipment for use in the foundation industry in the absence of a European Standard for this equipment. It is not a normative part of this standard and does not contain sufficient guidance on safety requirements and measures to achieve conformity with the essential safety requirements of any EC Directive.

1.8 This European Standard applies primarily to machines which are manufactured after the date of approval by CEN of the standard.

2 Normative references

This European Standard incorporates by dated or undated references, 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 these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 3, *Portable fire extinguishers*

EN 292-1, *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 418, *Safety of machinery – Emergency stop equipment, functional aspects – Principles for design*

EN 474-1:1994, *Earth-moving machinery – Safety – Part 1: General requirements*

EN 791, *Drill rigs - Safety*

prEN 809, *Pumps and pump-units for liquids – Safety requirements*

prEN 853, *Rubber hoses and hose assemblies – Wire braid reinforced hydraulic type - Specification*

prEN 854, *Rubber hoses and hose assemblies – Textile reinforced hydraulic type - Specification*

prEN 855, *Plastic hoses and hose assemblies – Thermoplastics textile reinforced hydraulic type - Specification*

prEN 856, *Rubber hoses and hose assemblies – Spiral wire reinforced hydraulic type - Specification*

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prEN 857, *Rubber hoses and hose assemblies – Wire braid reinforced compact type for hydraulic applications - Specification*

prEN 953, *Safety of machinery – General requirements for the design and construction of guards (fixed, movable)*

prEN 954-1, *Safety of machinery - Safety related parts of control systems — Part 1: General principles for design*

prEN 982, *Safety requirements for fluid power systems and components – Hydraulics*

prEN 983, *Safety requirements for fluid power systems and components – Pneumatics*

prEN 1037, *Safety of machinery – Isolation and energy dissipation – Prevention of unexpected start-up*

prEN 12151, *Machinery and plant for the preparation of concrete and mortar – Safety requirements*

ENV 1070, *Safety of machinery – Terminology*

EN ISO 3457:1995, *Earth-moving machinery – Guards and shields – Definitions and specifications*

[A2] EN ISO 3744:1995, *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free-field over a reflecting plane (ISO 3744:1994)* [A2]

EN ISO 6682, *Earth-moving machinery – Zones of comfort and reach for controls*

[A2] EN ISO 11201, *Acoustics - Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions - Engineering method in an essentially free-field over a reflecting plane (ISO 11201:1995)*

EN ISO 11203:1995, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995)* [A2]

EN 22860, *Earth-moving machinery – Minimum access dimensions*

EN 23411, *Earth-moving machinery – Human physical dimensions of operators and minimum operator space envelope*

EN 60204-1:1992, *Safety of machinery - Electrical equipment of industrial machines – Part 1: General requirements*

[A2] EN 60804, *Integrating-averaging sound level meters (IEC 60804:2000)* [A2]

ISO 2631-1:1985, *Evaluation of human exposure to whole-body vibration – Part 1: General requirements*

ISO 2631-3:1985, *Evaluation of human exposure to whole-body vibration – Part 3: Evaluation of exposure to whole-body z-axis vertical vibration in the frequency range 0,1 to 0,63 Hz*

ISO 2867:1994, *Earth-moving machinery – Access systems*

ISO 3449:1992, *Earth-moving machinery – Falling object protective structures (FOPS) – Laboratory tests and performance requirements*

ISO 3795:1989, *Road vehicles and tractors and machinery for agriculture and forestry – Determination of burning behaviour of interior materials*

ISO 3864:1984, *Safety colours and safety signs*

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ISO 4302:1981, *Cranes – Wind load assessment*

ISO 4305:1991, *Mobile cranes – Determination of stability*

ISO 4309:1990, *Cranes – Wire ropes – Code of practice for examination and discard*

ISO 6394:1985, *Acoustics – Measurement of airborne noise emitted by earth-moving machinery – Operator's position – Stationary test condition*

ISO 6405-1:1991, *Earth-moving machinery – Symbols for operator controls and other displays – Part 1: Common symbols*

ISO 7095:1982, *Earth-moving machinery – Crawler tractor and crawler loader – Operator's controls*

ISO 12508:1994, *Earth-moving machinery – Limits for potentially injury-causing sharp edges*

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