

საქართველოს სტანდარტი

ამწეები - ელექტრული ამძრავიანი ვერტიკალური და ჰორიზონტალური
ჯალამბარი - ნაწილი 2: ელექტრული ვერტიკალური ამწეები

საქართველოს სტანდარტებისა და მეტროლოგიის
ეროვნული სააგენტო
თბილისი

სსტ ენ 14492-2:2006 +A1:2009/2015

საინფორმაციო მონაცემები

1 დამტკიცებულია და შემოღებულია სამოქმედოდ საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს 2015 წლის 27 მარტის № 21 და 2015 წლის 10 თებერვლის № 9 განკარგულებებით

2 მიღებულია გარეკანის თარგმნის მეთოდით სტანდარტიზაციის ევროპული კომიტეტის სტანდარტი ენ 14492-2:2006 +A1:2009 „ ამწეები - ელექტრული ამძრავიანი ვერტიკალური და ჰორიზონტალური ჯალამბარი - ნაწილი 2: ელექტრული ვერტიკალური ამწეები“

3 პირველად

4 რეგისტრირებულია საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს რეესტრში: 2015 წლის 27 მარტი №268-1.3-6989

აკრძალულია ამ სტანდარტის გადაცემა მესამე პირებისათვის ან/და მისი სხვა ფორმით გავრცელება

English Version

Cranes - Power driven winches and hoists - Part 2: Power driven hoists

Appareils de levage à charge suspendue - Treuils et palans motorisés - Partie 2: Palans motorisés

Krane - Kraftgetriebene Winden und Hubwerke - Teil 2: Kraftgetriebene Hubwerke

This European Standard was approved by CEN on 11 October 2006 and includes Amendment 1 approved by CEN on 6 August 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword..... 7

Introduction 8

1 Scope 9

2 Normative references 9

3 Terms and definitions 11

4 List of significant hazards 14

5 Safety requirements and/or protective measures 19

5.1 General..... 19

5.2 Devices 20

5.3 Couplings 26

5.4 Brakes for hoisting and lowering movements..... 26

5.5 Gearbox 27

5.6 Load hooks 27

5.7 Rope drives 27

5.8 Chain drives 30

5.9 Belt drives..... 31

5.10 Pneumatic equipment 32

5.11 Hydraulic equipment 34

5.12 Trolleys 38

5.13 Electrical equipment of hoists and their trolleys 39

5.14 Reduction of noise by design..... 42

5.15 Hoists for use in a potentially explosive atmosphere..... 43

6 Verification of the safety requirements and/or protective measures 44

6.1 Hoists manufactured in series 44

6.2 Hoists designed individually 44

7 User information 51

7.1 General..... 51

7.2 Special requirements 51

7.3 Marking 53

Annex A (informative) Examples of power driven hoists 55

A.1 Rope hoist 55

A.2 Chain hoist 56

A.3 Belt hoist..... 57

A.4 Open type hoist..... 58

A.5 NGL building hoists — Treuil potence de chantier — Bauaufzüge für nicht geführte Lasten 59

Annex B (normative) Additional requirements when transporting hot molten masses..... 60

Annex C (informative) Additional requirements for hoists intended to be used in potentially explosion atmosphere..... 63

C.1 Introduction 63

C.2 General..... 63

C.3 Hazard sources in explosion hazard areas 64

C.3.1 Electrically caused hazards 64

C.3.2 Mechanically caused hazards 64

C.3.3 Hazards caused by environmental conditions 64

C.3.4 Measures to eliminate hazards in explosion hazard areas 64

C.3.5 Marking 65

C.4 User information 65

საინფორმაციო ნაწილი. სრული ტექსტის სახსრავად შეიძინეთ სტანდარტი.

Annex D (informative) Additional requirements for operation in aggressive environments and outdoors	66
D.1 General.....	66
D.2 Ropes and chains	66
Annex E (informative) Additional requirements for operation at low temperatures	68
Annex F (normative) Supporting structures for NGL building hoists	69
F.1 General.....	69
F.2 Terms and definitions	69
F.3 Classification	70
F.4 Construction characteristics	72
F.4.1 General requirements.....	72
F.4.2 Interchangeability of parts and modularity.....	73
F.4.3 Ease of transportation.....	73
F.5 Calculations	76
F.5.1 General.....	76
F.5.2 Forces and load combinations to be considered.....	77
F.5.3 Stability	77
F.5.4 Structural verification.....	78
F.5.5 Loads transmitted calculations.....	79
F.6 Instructions	79
F.6.1 Transmitted forces/moments information	79
F.6.2 Markings	82
F.6.3 User information	82
F.7 Verifications	83
Annex G (normative) Power driven series hoist mechanisms – Test procedure for verification of the classification	84
G.1 Introduction.....	84
G.2 Application	84
G.3 Implementation of the test.....	84
G.3.1 Framework conditions	84
G.3.2 Configurations	85
G.3.3 Test programme.....	85
G.4 Acceptance criteria.....	86
G.5 Calculation and Figures	86
Annex H (informative) Documents for hooks	91
Annex I (informative) Values of ϕ_{AL}, ϕ_{DAL} for different types of rated capacity limiters	92
I.1 Calculation of rated capacity limiters.....	92
Annex J (normative) Selection of motors	94
J.1 General.....	94
J.2 Criteria for motor selection (EN 60034-1).....	94
J.2.1 General.....	94
J.2.2 Remarks on the selection of motors	95
J.2.3 Degree of protection according to EN 60034-5	95
J.2.4 Thermal calculation of the motor	95
J.2.5 Squirrel cage motor.....	98
J.2.6 Power correction in function of ambient temperature and altitude	99
J.2.7 Cyclic duration factor and number of working cycles per hour	101
J.3 Motors for vertical motions	101
J.3.1 Determination of required torque	101
J.3.2 Cyclic duration factor and number of cycles per hour.....	102
J.4 Motors for horizontal motions.....	104
J.4.1 General.....	104
J.4.2 Determining the torque necessary	104
J.4.3 Cyclic duration factor and number of cycles per hour.....	105
J.4.4 Rotation	106
J.4.5 Span variation	106
Annex K (normative) Noise test code	108
K.1 Scope	108

K.2	Standards used in this annex.....	108
K.3	Description of the machine family	108
K.4	Determination of the emission sound pressure level at the operator's position by measurement.....	109
K.4.1	General.....	109
K.4.2	Hoists, other than NGL building hoists	109
K.5	Determination of the sound power level	109
K.5.1	General.....	109
K.5.2	Hoists, other than NGL building hoists	109
K.5.3	NGL building hoists	110
K.6	Mounting and operation conditions.....	112
K.6.1	General.....	112
K.6.2	Hoists, other than NGL building hoists	112
K.6.3	NGL building hoists.....	112
K.7	Uncertainties	113
K.8	Information to be recorded	113
K.9	Information to be reported.....	113
K.10	Declaration and verification of noise emission values.....	113
Annex L (informative)	Selection of a suitable set of crane standards for a given application.....	114
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC	115
Annex ZB (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 94/9/EC	116
Annex ZC (informative)	[A] Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC [A]	117
Bibliography	118
Figures		
Figure 1	— fleet angle.....	12
Figure A.1.1	— Rope hoist — Palan à câble — Seilzug	55
Figure A.1.2.1	— Monorail trolley, “standard headroom” — Chariot monorail, “hauteur perdue normale” Einschienenuntergurtfahwerk, “normale Bauhöhe”	55
Figure A.1.2.2	— Monorail trolley, “short headroom” — Chariot monorail, “hauteur perdue réduite” — Einschienenuntergurtfahwerk, “kurze Bauhöhe”	55
Figure A.1.2.3	— Crab — Chariot birail — Zweischieneobergurtfahwerk	55
Figure A.1.2	— Travel carriages (Hoist mounted) — Chariots (Palan monté) — Fahrwerke (Hubwerk angebaut).....	55
Figure A.2.1	— Chain hoist — Palan à chaîne — Kettenzug	56
Figure A.2.2.1	— Monorail trolley, “standard headroom” — Chariot monorail, “hauteur perdue normale” — Einschienenuntergurtfahwerk, “normale Bauhöhe”	56
Figure A.2.2.2	— Monorail trolley, “short headroom” — Chariot monorail, “hauteur perdue réduite” — Einschienenuntergurtfahwerk, “kurze Bauhöhe”	56
Figure A.2.2.3	— Crab — Chariot birail — Zweischieneobergurtfahwerk	56
Figure A.2.2	— Travel carriages (Hoist mounted) — Chariots (Palan monté) — Fahrwerke (Hubwerk angebaut).....	56

საინფორმაციო ნაწილი. სრული ტექსტის სახსრავად შეიძინეთ სტანდარტი.

Figure A.3.1 — Belt hoist — Palan à sangle — Bandzug	57
Figure A.3.2 — Monorail trolley — Chariot monorail — Einschienenuntergurtfahrwerk	57
Figure A.4 — Open type hoist — Treuil ouvert — Offenes Hubwerk	58
Figure A.5.1 — Jib hoist with parallel drum — Treuil potence à tambour parallèle — Auslegerhubwerk mit paralleler Trommel	59
Figure A.5.2 — Jib hoist with axial drum — Treuil potence à tambour axial — Auslegerhubwerk mit axialer Trommel	59
Figure A.5.3 — Hoist with trolley — Treuil potence pour chariot — Hubwerk mit Fahrwerk	59
Figure A.5.4 — Suspended hoist — Treuil potence suspendu — Aufgehängtes Hubwerk	59
Figure A.5.5 — Scaffold hoist — Treuil d'échafaudage — Gerüstwinde	59
Figure F.1 — Column support — Support — Colonne — Dreibock	71
Figure F.2 — Jib-extension — Extension de potence — Zwischenrahmen	71
Figure F.3 — Prop support — Chandelle — Geschosstütze	71
Figure F.4 — Window support — Support fenêtre — Fensterwinkel	71
Figure F.5 — Scaffold support — Support pour échafaudage — Gerüsthalterung oder –befestigung	71
Figure F.6 — Gantry support — Chevalet — Doppelrahmenstütze mit Ausleger	72
Figure F.7 — Up-jib — Flèche potence — Schwenkarm	72
Figure F.8 — Connection device to the scaffold with T-head bolt	74
Figure F.9 — Example of hinge with anti pull-out system	74
Figure F.10 — Connection devices for counterweight and hand rail position	74
Figure F.11 — Example of jib positioning devices and sheave protection	74
Figure F.12 — Example of hand lever jib positioning device	75
Figure F.13 — Self retaining locking handle	75
Figure F.14 — Rail buffers	75
Figure F.15 — Feet stop and body guard for gantry support	75
Figure F.16 — Prop head/length rate	76
Figure F.17 — Window support hoisting position	76
Figure F.18 — Transmitted loads from prop support	80
Figure F.19 — Transmitted loads from scaffold support	80
Figure F.20 — Transmitted loads from up-jib	81
Figure F.21 — Transmitted loads from window support	81

Figure F.23 — Transmitted loads from gantry support81

Figure G.1 — Opposed winding arrangement88

Figure G.2 — Symmetrical rope lead-off about the drum centre88

Figure G.3 — Normal lifting operation during the test (Cycle I)89

Figure G.4 — Picking the load up from the floor at the start of every 4th lifting operation (Cycle II).....89

Figure G.5 — Every 4th pick up from the floor at main lifting speed, if possible (Cycle III)89

Figure J.1 — Torque operation for two different cycles97

Figure J.2 — Correction as function of ambient temperature and altitude100

Figure K.1 — Microphone positions on the hemisphere111

Tables

Table 1 — List of significant hazards and associated requirements15

Table 2 — Values for v_h for estimation of ϕ_{IAL} 24

Table 3 — Speed limit for three-phase slipring motors41

Table 4 — Stall torques for three-phase slipring motors with contactor control41

Table 5 — Methods to be used to verify conformity with the safety requirements and/or measures45

Table B.1 — Additional requirements when transporting hot molten masses62

Table F.1 — Stability safety factor S_o for various forces78

Table F.2 — Safety coefficients for steel structures78

Table F.3 — Load cases78

Table F.4 — Means of verification of the safety requirements and/or measures83

Table I.1 — Example of values92

Table J.1 — Typical operation of torque for 2 different cycles98

Table J.2 — Indications for the number of cycles per hour and the cycles duration factor for the vertical motions 103

Table J.3 — Indications for the number of cycles per hour and the cyclic duration factor for the horizontal motions107

Table K.1 — Coordinates of the 6 microphone positions110

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.

Foreword

This document (EN 14492-2:2006+A1:2009) has been prepared by Technical Committee CEN/TC 147 "Cranes - Safety", the secretariat of which is held by BSI.

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 2010, and conflicting national standards shall be withdrawn at the latest by March 2010.

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.

This document includes Amendment 1, approved by CEN on 2009-08-06.

This document supersedes EN 14492-2:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

This document 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).

$\boxed{A_1}$ For relationship with EU Directive(s), see informative Annexes ZA, ZB and ZC, which are integral parts of this document. $\boxed{A_1}$

This is the second part of the standard "Cranes — Power driven winches and hoists". The parts of the standard are:

Part 1: Power driven winches

Part 2: Power driven hoists

For the relationship with other European Standards for cranes, see Annex L.

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

^{A1} This European standard is a harmonized standard to provide one means for power driven winches to conform to the essential health and safety requirements of the Machinery Directive 98/37/EC and the Machinery Directive 2006/42/EC. ^{A1}

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

This European Standard is a type C standard as stated in EN ISO 12100-1.

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

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.