

## საქართველოს სტანდარტი

---

უსაფრთხოების მოთხოვნები ლიფტების კონსტრუქციისა და დაყენებისადმი -  
გამოცდები და ტესტები - ნაწილი 50: დიზაინის წესები, გაანგარიშებები,  
გამოცდები და ტესტები ლიფტის კომპონენტების

საქართველოს სტანდარტების და მეტროლოგიის  
ეროვნული სააგენტო  
თბილისი

# სსტ ენ 81-50:2014/2015

## საინფორმაციო მონაცემები

1 დამტკიცებულია და შემოღებულია სამოქმედოდ საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს 2015 წლის 29 იანვრის №3 განკარგულებით

2 მიღებულია გარეკანის თარგმნის მეთოდით სტანდარტიზაციის ევროპული კომიტეტის სტანდარტი ენ 81-50:2014 „უსაფრთხოების მოთხოვნები ლიფტების კონსტრუქციისა და დაყენებისადმი - გამოცდები და ტესტები - ნაწილი 50: დიზაინის წესები, გაანგარიშებები, გამოცდები და ტესტები ლიფტის კომპონენტების”

### 3 პირველად

4 რეგისტრირებულია საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს რეესტრში: 2015 წლის 29 იანვარი №268-1.3-6650

წინამდებარე სტანდარტის სრული ან ნაწილობრივი აღწარმოება, ტირაჟირება და გავრცელება საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს ნებართვის გარეშე არ დაიშვება

English Version

## Safety rules for the construction and installation of lifts - Examinations and tests - Part 50: Design rules, calculations, examinations and tests of lift components

Règles de sécurité pour la construction et l'installation des  
élévateurs - Examens et essais - Partie 50: Règles de  
conception, calculs, examens et essais des composants  
pour élévateurs

Sicherheitsregeln für die Konstruktion und den Einbau von  
Aufzügen - Prüfungen - Teil 50: Konstruktionsregeln,  
Berechnungen und Prüfungen von Aufzugskomponenten

This European Standard was approved by CEN on 28 May 2014.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

Contents

Page

Foreword.....4

Introduction .....5

1 Scope .....6

2 Normative references .....6

3 Terms and definitions .....7

4 List of significant hazards .....7

5 Design rules, calculations, examinations and tests .....8

5.1 General provisions for type examinations of safety components .....8

5.1.1 Object and extent of the tests .....8

5.1.2 General provisions .....9

5.2 Type examination of landing and car door locking devices .....9

5.2.1 General provisions .....9

5.2.2 Examination and tests.....10

5.2.3 Test particular to certain types of locking devices .....12

5.2.4 Type examination certificate .....13

5.3 Type examination of safety gear .....13

5.3.1 General provisions .....13

5.3.2 Instantaneous safety gear .....13

5.3.3 Progressive safety gear .....16

5.3.4 Comments .....19

5.3.5 Type examination certificate .....19

5.4 Type examination of overspeed governors .....19

5.4.1 General provisions .....19

5.4.2 Check on the characteristics of the overspeed governor .....20

5.4.3 Type examination certificate .....21

5.5 Type examination of buffers.....21

5.5.1 General provisions .....21

5.5.2 Samples to be submitted .....21

5.5.3 Test.....22

5.5.4 Type examination certificate .....25

5.6 Type examination of safety circuits containing electronic components and/or programmable electronic systems (PESSRAL).....26

5.6.1 General provisions .....26

5.6.2 Test samples .....26

5.6.3 Tests.....27

5.6.4 Type examination certificate .....28

5.7 Type examination of ascending car overspeed protection means .....29

5.7.1 General provisions .....29

5.7.2 Statement and test sample .....29

5.7.3 Test.....29

5.7.4 Possible modification to the adjustments .....31

5.7.5 Test report .....31

5.7.6 Type examination certificate .....31

5.8 Type examination of unintended car movement protection means .....31

5.8.1 General provisions .....31

5.8.2 Statement and test sample .....32

5.8.3 Test.....33

5.8.4 Possible modification to the adjustments .....34

5.8.5 Test report .....35

5.8.6 Type examination certificate .....35

საინფორმაციო ნაწილი. სრული ტექსტის სახსრად შეიძინეთ სტანდარტი.

5.9	Type examination of rupture valve/one-way restrictor.....	35
5.9.1	General provisions .....	35
5.10	Guide rails calculation .....	40
5.10.1	Range of calculation .....	40
5.10.2	Bending .....	40
5.10.3	Buckling .....	41
5.10.4	Combination of bending and compression/tension or buckling stresses .....	42
5.10.5	Flange bending .....	43
5.10.6	Deflections .....	43
5.11	Evaluation of traction.....	44
5.11.1	Introduction.....	44
5.11.2	Traction calculation.....	44
5.11.3	Formulae for a general case .....	49
5.12	Evaluation of safety factor on suspension ropes for electric lifts .....	52
5.12.1	General .....	52
5.12.2	Equivalent number $N_{equiv}$ of pulleys .....	52
5.12.3	Safety factor .....	53
5.13	Calculations of rams, cylinders, rigid pipes and fittings .....	55
5.13.1	Calculation against over pressure.....	55
5.13.2	Calculations of the jacks against buckling.....	57
5.14	Pendulum shock tests .....	60
5.14.1	General .....	60
5.14.2	Test rig.....	61
5.14.3	Tests .....	61
5.14.4	Interpretation of the results.....	62
5.14.5	Test report.....	62
5.15	Electronic components - Failure exclusion .....	65
5.16	Design rules for programmable electronic systems (PESSRAL).....	72
<b>Annex A (normative) Model form of type examination certificate .....</b>		<b>73</b>
<b>Annex B (normative) Programmable electronic systems in safety related applications for lifts (PESSRAL) .....</b>		<b>74</b>
B.1	Common measures .....	74
B.2	Specific measures .....	76
B.3	Descriptions of possible measures.....	78
<b>Annex C (informative) Example for calculation of guide rails .....</b>		<b>83</b>
C.1	General .....	83
C.2	General configuration for lifts with safety gear .....	85
C.2.1	Safety gear operation.....	85
C.2.2	Normal operation, running .....	87
C.2.3	Normal operation, loading.....	88
<b>Annex D (informative) Calculation of traction – Example.....</b>		<b>90</b>
<b>Annex E (informative) Equivalent number of pulleys <math>N_{equiv}</math> - Examples .....</b>		<b>92</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 95/16/EC amended by Directive 2006/42/EC .....</b>		<b>93</b>
<b>Bibliography.....</b>		<b>94</b>

## Foreword

This document (EN 81-50:2014) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

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 February 2015 and conflicting national standards shall be withdrawn at the latest by August 2017.

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, in conjunction with EN 81-20:2014 supersedes EN 81-1:1998+A3:2009 and EN 81-2:1998+A3:2009.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The content of this standard provides the design rules, calculations, examinations and tests for lifts component, the requirements of which are specified in other EN 81 series of standards. Therefore this standard can only be used in conjunction with the standards for specific lift types, e.g. EN 81-20 for passenger and goods passenger lifts.

This is the first edition of the standard. The need for replacement was based on the following points:

- improvement in safety due to changes in available technology;
- the need to reflect changes to the state of the art;
- incorporation of essential health and safety requirements from the relevant EU Directives;
- elimination of obvious errors;
- incorporation of proposals resulting from interpretation requests<sup>1)</sup>;
- improvement of the references to other standards according to the progress in that field.

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

---

1) Within CEN/TC 10 an interpretation committee has been established to answer questions about the spirit in which the experts have drafted the various clauses of this standard. All such interpretations are published within CEN TS 81-11 until incorporated by amendment into the standards concerned.

საინფორმაციო ნაწილი. სრული ტექსტის სახსრად შეიძინეთ სტანდარტი.

## Introduction

The object of this standard is to define safety rules related to lifts with a view to safeguarding persons and objects against the risk of accidents associated with the user-, maintenance- and emergency operation of lifts.

Reference should be made to the respective introductions of the standards calling for the use of this standard with regard to persons and objects to be safeguarded, assumptions, principles, etc.

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.