

საქართველოს სტანდარტი

სამრეწველო-სატვირთო მანქანების უსაფრთხოება-ელექტრო მოთხოვნები -
ნაწილი 1: ზოგადი მოთხოვნები აკუმულატორის სიმძლავრეზე მომუშავე
სატვირთო მანქანებისათვის

საქართველოს სტანდარტებისა და მეტროლოგიის
ეროვნული სააგენტო
თბილისი

სსტ ენ 1175-1:1998+A1:2010/2019

საინფორმაციო მონაცემები

1 შემუშავებულია საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს სტანდარტების დეპარტამენტის მიერ

2 დამტკიცებულია და შემოღებულია სამოქმედოდ საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს 2019 წლის 6 დეკემბრის № 98 განკარგულებით

3 მიღებულია გარეკანის თარგმნის მეთოდით სტანდარტიზაციის ევროპული კომიტეტის სტანდარტი ენ 1175-1:1998+A1:2010 „სამრეწველო-სატვირთო მანქანების უსაფრთხოება-ელექტრო მოთხოვნები -ნაწილი 1: ზოგადი მოთხოვნები აკუმულატორის სიმძლავრეზე მომუშავე სატვირთო მანქანებისათვის”

4 პირველად

5 რეგისტრირებულია საქართველოს სტანდარტების და მეტროლოგიის ეროვნული სააგენტოს რეესტრში: 2019 წლის 6 დეკემბერი №268-1.3-016231

დაუშვებელია წინამდებარე სტანდარტის სრული ან ნაწილობრივი კვლავწარმოება, ტირაჟირება და გავრცელება სსიპ საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს ნებართვის გარეშე

English Version

Safety of industrial trucks - Electrical requirements - Part 1:
General requirements for battery powered trucks

Sécurité des chariots de manutention - Prescriptions
électriques - Partie 1: Prescriptions générales des chariots
alimentés par batterie

Sicherheit von Flurförderzeugen - Elektrische
Anforderungen - Teil 1: Allgemeine Anforderungen für
Flurförderzeuge mit batterieelektrischem Antrieb

This European Standard was approved by CEN on 23 November 1997 and includes Amendment 1 approved by CEN on 26 September 2010.

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, Croatia, 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

საინფორმაციო ნაწილი. სრული ტექსტის სახანავედ შეიძინეთ სტანდარტი.

Contents

Page

Foreword.....6

0 Introduction8

1 Scope8

2 Normative references9

3 Definitions 10

4 **A1** List of significant hazards **A1** 11

5 General requirements..... 15

5.1 Traction battery..... 15

5.1.1 Installation and protection 15

5.1.2 Constraining..... 16

5.1.3 Disconnection 16

5.2 Battery connectors 16

5.3 Heat dissipating electrical components 16

5.4 Electric motors..... 16

5.5 Contactors 16

5.6 Electro-mechanical brakes 16

5.7 Protection against electric shock 16

5.7.1 Direct contact..... 16

5.7.2 Indirect contact 17

5.7.3 Connection to the frame 17

5.7.4 On-board chargers..... 17

5.8 Protection of electrical equipment..... 17

5.8.1 Short circuits and overloads 17

5.8.2 Overcurrent protective devices..... 17

5.9 Safety related control systems..... 17

5.9.1 Low voltage 17

5.9.2 Frame faults..... 18

5.9.3 Travel control 18

5.9.4 Pulse control travel systems 18

5.9.5 Prevention of travel 18

5.9.6 Steering control 18

5.9.7 Load handling control 18

5.9.8 Tiller control 18

5.9.9 Speed limitation 19

5.9.10 Slack wire-ropes or chains 19

5.9.11 **A1** Parameter **A1** 19

5.10 Conductors..... 19

5.10.1 Protection 19

5.10.2 Cross-sectional area 19

5.10.3 Specification..... 20

5.11 Wiring practices 20

5.11.1 Multicore cables..... 20

5.11.2 Main current cables 20

5.11.3 Wiring that flexes 20

5.11.4 Mechanical protection 20

5.11.5 Identification..... 20

5.12 Battery charging 20

5.12.1 Movement during charging..... 20



5.12.2 Charger switching..... 21

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.

5.13	Emergency switching off	21
5.13.1	Access	21
5.13.2	Function	21
5.14	Dielectric test (type test)	21
5.14.1	Performance	21
5.14.2	Test voltage	21
5.14.3	Electronic components	22
5.15	Insulation resistance test (routine test)	22
5.15.1	Test voltage	22
5.15.2	Insulation resistance of truck	22
5.15.3	Insulation resistance of battery	22
5.16	[A1] Electromagnetic radiations	22
5.16.1	Non ionising radiations	22
5.16.2	Electromagnetic compatibility [A1]	22
6	Additional requirements for nominal voltages in excess of 120 V	23
6.1	Battery	23
6.1.1	Container	23
6.1.2	Terminals and connectors	23
6.1.3	Poles	23
6.1.4	Cover	23
6.2	Battery connectors	23
6.2.1	Requirements	23
6.2.2	Emergency disconnection	23
6.3	Protection against electric shock	23
6.3.1	Electrical enclosures	23
6.3.2	Circuits	24
6.3.3	Bonding	24
6.3.4	Detection of frame faults	24
6.4	Emergency switching off	24
6.5	Insulation resistance test (routine test)	24
6.5.1	Test voltage	24
6.5.2	Insulation resistance of truck	24
6.5.3	Insulation resistance of battery	24
7	Information for use	24
7.1	Electrical diagram	25
7.2	Safety checks	25
7.3	Battery	25
7.4	Minimum marking	25
7.5	[A1] Non-ionising radiation [A1]	25
Annex A	(normative) Connectors for traction batteries	26
A.1	Normative references	26
A.2	Definitions	26
A.3	Requirements	27
A.3.1	Mounting bracket	27
A.3.2	Physical properties	27
A.3.3	Contacts	27
A.3.4	Rated current	27
A.3.5	Polarity reversing	27
A.3.6	Contacts with connector casing	27
A.3.7	Temperature resistance	27
A.3.8	Enclosure protection	27
A.3.9	Protection of half-connector fitted to the battery	27
A.3.10	Coding	28
A.3.11	Cable sections	28
A.3.12	Locking of half-connectors	28
A.4	Type-test methods	28
A.4.1	Coding test	28
A.4.2	Samples	28

A.4.3	Preconditioning.....	28
A.4.4	Temperature rise test	28
A.4.5	Low temperature test	29
A.4.6	Mechanical life test.....	29
A.4.7	Sequential treatment for drop test.....	29
A.4.8	Drop test	29
A.4.9	Dielectric test	30
A.4.10	Test of disconnection in overload conditions for range 1 only.....	30
A.4.11	Test of disconnection under emergency conditions for range 1 only.....	30
A.5	Maintenance of quality	30
A.6	Information for use	32
Annex B	(normative) Electric motors - Output and test rules	33
B.1	Normative references	33
B.2	Definitions	33
B.3	Classification of enclosure and cooling.....	34
B.3.1	Protection	34
B.3.2	Cooling.....	34
B.4	Requirements	35
B.4.1	Rated output.....	35
B.4.2	Classes of insulation	35
B.4.3	Rated output test	35
B.4.4	Characteristic curves	36
B.4.5	Tolerances on characteristic curves	36
B.4.6	Overspeed test.....	37
B.4.7	Dielectric test	37
B.4.8	Terminal markings.....	37
B.4.9	Markings – Identification.....	38
B.5	Testing	38
B.5.1	General.....	38
B.5.2	Type tests	38
B.5.3	Routine tests	39
Annex C	(normative) Electromagnetic contactors	40
C.1	Definitions	40
C.2	Nominal service conditions	40
C.2.1	Climatic conditions.....	40
C.2.2	Voltage.....	40
C.3	Types of contactor.....	40
C.3.1	Type A.....	41
C.3.2	Type B	41
C.3.3	Type C	41
C.3.4	Type D.....	41
C.4	General requirements.....	41
C.4.1	Limits of operation.....	41
C.4.2	Mechanical durability	42
C.5	Type tests	42
C.5.1	Temperature rise test of main circuit	42
C.5.2	Temperature rise tests of operating coils	43
C.5.3	Dielectric tests	44
C.5.4	Verification of operating limits.....	44
C.5.5	Verification of making and breaking capacities in proving operation	45
C.5.6	Verification of rated making and breaking capacities of intermittently rated contactors of table C.6 category 2	45
C.5.7	Verification of mechanical durability	46
C.6	Routine test	46
C.6.1	Operating limits.....	46
C.6.2	Dielectric test	46
C.7	Marking	46

საინფორმაციო ნაწილი. სრული ტექსტის სახსრავად შეიძინეთ სტანდარტი.

Annex ZA (informative)  Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC 47

საინფორმაციო ნაწილი. სრული ტექსტის სახასიათოდ შეიძინეთ სტანდარტი.

Foreword

This document (EN 1175-1:1998+A1:2010) has been prepared by Technical Committee CEN/TC 150 "Industrial trucks - 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 May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

A1 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. **A1**

This document includes Amendment 1, approved by CEN on 2010-09-26.

This document supersedes EN 1175-1:1998.

A1 The main changes compared to the previous version are:

- modification of Annex ZA;
- minor technical changes in 5.9.4 to 5.9.11 and 7.3;
- reference to EN 292-1 be replaced with EN ISO 12100-1:2003, EN 292-2 be replaced with EN ISO 12100-2:2003 and EN 954-1 be replaced with EN ISO 13849-1:2008;
- addition of requirements for radiation and software parameter. **A1**

A1 *deleted text* **A1**

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

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 European Standard is one of a package of standards for the safety of industrial trucks:

A1 prEN ISO 3691-1, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks (ISO/DIS 3691-1:2008)* **A1**

A1 EN 1726-2 **A1** Safety of machinery - Industrial trucks - Self propelled trucks up to and including 10 000 kg capacity and tractors with a drawbar pull up to and including 20 000 N - Part 2: Additional requirements for trucks with elevating operator position and trucks specially designed to travel with elevated load

A1 EN 1551 **A1** Safety of industrial trucks - Self propelled trucks over 10 000 kg capacity

A1 EN 1459 **A1** Safety of industrial trucks - **A1** Self propelled variable **A1** reach trucks

A1 EN ISO 3691-5, *Industrial trucks — Safety requirements and verification — Part 5: Pedestrian-propelled trucks (ISO 3691-5:2009)* **A1**

საინფორმაციო ცენტრი. სრული ტექსტის სახსრად შეიძლება სტანდარტი.

A1 *deleted text* **A1**

A1 EN 1757-3 **A1** Safety of industrial trucks - Pedestrian controlled manual and semi manual trucks - Part 3: Platform trucks

A1 *deleted text* **A1**

EN 1525 Safety of industrial trucks - Driverless trucks and their systems

EN 1175-1 Safety of industrial trucks - Electrical requirements - Part 1 - General requirements for battery powered trucks

EN 1175-2 Safety of industrial trucks - Electrical requirements - Part 2 - General requirements for internal combustion engine powered trucks

EN 1175-3 Safety of industrial trucks - Electrical requirements - Part 3 - Specific requirements for the electric power transmission systems of internal combustion engine powered trucks

EN 1526 Safety of industrial trucks - Additional requirements for automated functions on trucks

A1 EN 1755 **A1** Safety of **A1** industrial **A1** trucks - Operation in potentially explosive atmospheres; Use in flammable gas, vapour, mist and dust

A1 EN 12053 **A1** Safety of industrial trucks - Test methods for measuring noise **A1** emissions **A1**

prEN ISO/DIS 13564 Test method for measuring visibility from self-propelled trucks (ISO/DIS 13564:1996)

A1 EN 13059 **A1** Safety of industrial trucks - Test methods for measuring vibration

A1 EN 12895 **A1** Industrial trucks - Electromagnetic compatibility

A1 *deleted text* **A1**

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