



# SLOVENSKI STANDARD

## SIST EN 14044:2014

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Nadomešča:

SIST EN 14044:2005+A1:2009

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**Prevozne dvizne naprave za gasilske enote - Izvlečne vrtljive gasilske avtolestve -  
Zahteve za varnost in obnašanje v uporabi in preskusne metode**

High rise aerial appliances for fire service use - Turntable ladders with sequential movements - Safety and performance requirements and test methods

Hubrettungsfahrzeuge für die Feuerwehr - Drehleitern mit aufeinander folgenden (sequenziellen) Bewegungen (Halbautomatik-Drehleitern) - Sicherheits- und Leistungsanforderungen sowie Prüfverfahren

[SIST EN 14044:2014](#)

Moyens élévateurs aériens pour la lutte contre l'incendie - Echelles pivotantes à mouvements séquentiels - Prescriptions de sécurité et des performances et méthodes d'essais

**Ta slovenski standard je istoveten z: EN 14044:2014**

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**ICS:**

13.220.10	Gašenje požara	Fire-fighting
97.145	Lestve	Ladders

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EUROPEAN STANDARD

EN 14044

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2014

ICS 13.220.10

Supersedes EN 14044:2005+A1:2009

English Version

## High rise aerial appliances for fire and rescue service use - Turntable ladders with sequential movements - Safety and performance requirements and test methods

Moyens élévateurs aériens à l'usage des services de secours et de lutte contre l'incendie - Échelles pivotantes à mouvements séquentiels - Prescriptions de sécurité et de performances et méthodes d'essais

Hubrettungsfahrzeuge für die Feuerwehr - Drehleitern mit aufeinander folgenden (sequenziellen) Bewegungen (Halbautomatik-Drehleitern) - Sicherheits- und Leistungsanforderungen sowie Prüfverfahren

This European Standard was approved by CEN on 26 October 2013.

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.

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

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

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**EN 14044:2014 (E)****Foreword**

This document (EN 14044:2014) has been prepared by Technical Committee CEN/TC 192 "Fire and rescue service equipment", 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 July 2014, and conflicting national standards shall be withdrawn at the latest by July 2014.

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 supersedes EN 14044:2005+A1:2009.

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 significant changes with respect to the previous edition of EN 14044 are as follows:

- a) ladder class > 30 to 56 added;
- b) terms and definitions for turntable ladder with sequential movements, rescue height, supported boundary, jacking width and load per person reworded, for dead man's device, working position and boundary added and for special boundary of use deleted;
- c) calculation of the working load and of diverse force revised;
- d) fatigue stress analysis completely revised;
- e) static stability revised and depends on the jacking width with defined residual forces;
- f) verification of static stability and dynamic stability revised;
- g) functional requirements revised;
- h) requirement for audible alarm at low battery voltage added;
- i) verification relating to the strength of the turntable ladder at the boundary of free-standing use with  $a_{max}$  revised;
- j) verification relating to the strength of the turntable ladder at the boundary of free-standing use (without or with rescue cage) deleted;
- k) verification relating to turntable ladders constructed to be operated only with the rear axle suspension fully or partially locked revised;
- l) requirement that loaded ladder shall maintain its position for 10 min with a variation less than 150 mm added;
- m) at least 100 mm difference at relative positions for the suspension locking device added;
- n) static tilt angle added;

- o) requirements on hand and guard-rails of the rescue cage revised and a requirement relating to aperture size added;
- p) requirements for anchoring points in the rescue cage for personal protective equipment against falling added;
- q) requirements relating to access doors and door locking devices in the rescue cage fully revised;
- r) requirements and verification revised relating to attachment systems for turntable ladders with a removable rescue cage;
- s) working light requirements revised;
- t) safety related parts of the control system according to category 1 or 2 of EN 954-1 changed to performance level (PL) according to EN ISO 13849-1;
- u) general normative reference to CEN/TS 15989 for the symbols on the control console added and all figures and tables with symbols deleted;
- v) requirements for the main control console added, that movement via the control lever of the rescue cage control console shall only take place after unlocking the emergency stop control in the rescue cage;
- w) indicator (e.g. display) to show the actual values of ladder length, ladder extension and elevation angle together with the maximum achievable values added;
- x) requirement revised relating to access from the ground to the ladder set (either directly (e.g. access ladder) or indirectly (e.g. deck));
- y) voice communication revised;
- z) rung alignment revised;
- aa) requirement revised relating to transmission systems (safety factors) and cable drums (grooves or devices preventing the cable running off the drum);
- bb) safety requirements related to electromagnetic phenomena and requirements relating to noise revised;
- cc) recommendation to use dependability management systems added;
- dd) precision of designation;
- ee) instruction handbook revised;
- ff) list of all known nominal reaches in several European countries applicable to turntable ladders in Annex C added;
- gg) list of verification and reception tests in Annex D with short description of requirement/test added;
- hh) Annex ZA deleted relating to the relationship between this European Standard and the Essential Requirements of the replaced EU Directive 98/37/EC;
- ii) Normative references revised: withdrawn standards EN 418, EN 457, EN 954-1, EN 982, EN 1050, EN ISO 12100-1:2003, EN ISO 12100-2:2003 have been deleted, CEN/TS 15989, EN ISO 4413, EN ISO 7731, EN ISO 12100:2010, EN ISO 13849-1, EN ISO 13850 have been added, and EN 1846 (all parts) as well as EN 60204-1 have been updated regarding dated reference;
- jj) Bibliography revised;

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**EN 14044:2014 (E)**

kk) content of standard editorially revised.

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.

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## Introduction

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

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this European 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 the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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**EN 14044:2014 (E)****1 Scope**

**1.1** This European Standard specifies the safety and performance requirements and test methods applicable to turntable ladders with sequential movements of classes 18, 24, 30 and > 30 to 56, as defined in 3.13, under the control of fire-fighters and intended for fire fighting and rescuing people.

NOTE This European Standard is intended to be used in conjunction with EN 1846–1, EN 1846–2 and EN 1846–3.

Turntable ladder vehicles comprise a chassis, bodywork and a powered extending structure unit in the form of a ladder with or without a rescue cage.

Turntable ladder vehicles covered by this European Standard have a self-propelled chassis, the motor of which supplies the power necessary for the operation of the ladder. They do not permit operational movements to be made simultaneously.

**1.2** This European Standard deals with the technical safety requirements to minimize the hazards listed in Clause 4 which can arise during commissioning, operational use, routine checking and maintenance of turntable ladders when carried out in accordance with the specifications given by the manufacturer or the manufacturer's authorized representative.

**1.3** This European Standard deals with the use of turntable ladder vehicles within an ambient temperature range from  $-15\text{ °C}$  to  $+35\text{ °C}$  and with a wind velocity on the ladder set  $\leq 12,5\text{ m/s}$ . Additional measures can be necessary for use outside this range. Special designs for use under special climatic conditions should be agreed between the manufacturer and the purchaser. Any additional requirements are outside the scope of the standard.

**1.4** This European Standard does not deal with the design of a standard automotive chassis with regard to hazards resulting from or due to use as a road vehicle.

**1.5** This European Standard is not applicable to turntable ladder vehicles with sequential movements which are manufactured before the date of publication of this European Standard by CEN.

**2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1846-1, *Firefighting and rescue service vehicles - Part 1: Nomenclature and designation*

EN 1846-2:2009+A1:2013, *Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance*

EN 1846-3, *Firefighting and rescue service vehicles - Part 3: Permanently installed equipment - Safety and performance*

CEN/TS 15989, *Firefighting vehicles and equipment - Symbols for operator controls and other displays*

EN 60204-1:2006, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 61310-1, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1)*

EN ISO 4413, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413)*

EN ISO 7731, *Ergonomics - Danger signals for public and work areas - Auditory danger signals (ISO 7731)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1)*

EN ISO 13850:2008, *Safety of machinery - Emergency stop - Principles for design (ISO 13850:2006)*

### 3 Terms and definitions, symbols and abbreviated terms

For the purposes of this document, the terms and definitions given in EN ISO 12100, EN 1846-1, EN 1846-2 and the following apply.

#### 3.1

##### **turntable ladder with sequential movements**

machine with an extending structure in the form of a ladder set mounted on a self-propelled chassis with no restriction on the angle of the slewing movement, where the chassis engine supplies the power necessary for operation and where there are no provisions for simultaneous operation of the different movements

#### 3.2

##### **turntable ladder equipment**

entire assembly of the mobile components mounted on the chassis which can carry at its upper extent, fixed or removable rescue equipment

Note 1 to entry: The jacking system is part of the turntable ladder equipment.

[SOURCE: EN 14043:2014, 3.2]

#### 3.3

##### **ladder set**

part of turntable ladder comprising several ladder sections which are connected together so as to extend telescopically

[SOURCE: EN 14043:2014, 3.3]

#### 3.4

##### **extended ladder set length**

*L*

distance between the extreme points of the extended ladder

Note 1 to entry: The length is expressed in metres.

[SOURCE: EN 14043:2014, 3.4]

#### 3.5

##### **rescue cage**

fixed or removable complementary device principally used for firefighting, rescuing people and other operational services

[SOURCE: EN 14043:2014, 3.5]

**EN 14044:2014 (E)****3.6  
angle of elevation** $\alpha$ 

angle between the longitudinal axis of the last (downmost) ladder section and the horizontal

Note 1 to entry: The angle is expressed in degrees.

[SOURCE: EN 14043:2014, 3.6]

**3.7  
camber angle** $\beta$ 

angle in the transverse direction to the longitudinal axis of the vehicle between the horizontal and the ground surface

Note 1 to entry: The angle is expressed in degrees.

[SOURCE: EN 14043:2014, 3.7]

**3.8  
gradient angle** $\gamma$ 

angle in the longitudinal axis of the vehicle between the horizontal and the ground surface

Note 1 to entry: The angle is expressed in degrees.

[SOURCE: EN 14043:2014, 3.8]

**3.9  
slewing angle** $\theta$ 

angle determined clockwise from the straight ahead position between the longitudinal axis of the vehicle and the longitudinal axis of the last ladder section projection

Note 1 to entry: The angle is expressed in degrees.

Note 2 to entry: The zero degrees position corresponds to the longitudinal axis of the vehicle facing towards the driver's cab.

[SOURCE: EN 14043:2014, 3.9]

**3.10  
rescue height** $h$ 

vertical height from the horizontal ground surface to the base floor of the rescue cage without loading and in the case of turntable ladders without rescue cage the height of the topmost ladder rung

Note 1 to entry: The length is expressed in metres.

[SOURCE: EN 14043:2014, 3.10]

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**3.11****nominal rescue height** $h_N$ 

specified rescue height at nominal reach

Note 1 to entry: The length is expressed in metres.

Note 2 to entry: Measured on level ground.

[SOURCE: EN 14043:2014, 3.11]

**3.12****maximum rescue height** $h_m$ 

rescue height at the maximum angle of elevation and the maximum extension distance

Note 1 to entry: The length is expressed in metres.

Note 2 to entry: Measured on level ground.

[SOURCE: EN 14043:2014, 3.12]

**3.13****ladder's class**

identification of a turntable ladder which corresponds to the value equal or immediately less than the nominal rescue height

Note 1 to entry: The value is expressed in metres.

[SOURCE: EN 14043:2014, 3.13]

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distance from the outer edge of the vehicle to the perpendicular dropped from the outer edge of the base of the rescue cage or the working platform or the projection from the outer edge of the vehicle to perpendicular from the topmost rung

Note 1 to entry: The distance is expressed in metres.

Note 2 to entry: The measurement is taken at right angles to the longitudinal axis of the vehicle on horizontal terrain without loading.

Note 3 to entry: If the jacks extend beyond the maximum width of the vehicle, the distance is measured from the outer edge of the most extended jack.

[SOURCE: EN 14043:2014, 3.14]

**3.15****nominal rescue projection** $l_N$ 

specified horizontal projection at nominal rescue height

Note 1 to entry: The projection is expressed in metres and measured in accordance with nominal rescue height (see 3.11).

[SOURCE: EN 14043:2014, 3.15]

**EN 14044:2014 (E)****3.16****nominal reach** $h_N / l_N$ 

<high rise aerial appliances> coordinates derived from nominal rescue height and nominal horizontal projection

Note 1 to entry: Values for the nominal reaches may be specified in the regulations in force in each country (see 5.2.2).

[SOURCE: EN 14043:2014, 3.16]

**3.17****nominal load** $P_N$ 

<high rise aerial appliances> specified load with which a rescue cage or the tip of the turntable ladder may be loaded vertically within the corresponding range of free-standing use

Note 1 to entry: The load is expressed in newtons.

[SOURCE: EN 14043:2014, 3.17]

**3.18****test loads** $P_P$ 

<high rise aerial appliances> loads applied in tests for stability, overload, and proper functioning, etc. of the turntable ladder

[SOURCE: EN 14043:2014, 3.18]

**3.19****supplementary load** $P_Z$ 

load in addition to the nominal load, e.g. loose equipment

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[SOURCE: EN 14043:2014, 3.19]

**3.20****maximum working load** $P_L$ 

<high rise aerial appliances> greatest load with which the turntable ladder may be loaded

Note 1 to entry:  $P_L = P_N + P_Z$

[SOURCE: EN 14043:2014, 3.20]

**3.21****residual force** $F_R$ 

force (at any ladder position and loading within the range of use) which is transferred to the bearing surface on the unloaded side of the vehicle during operation of the turntable ladder

Note 1 to entry: See also Figure 4.

[SOURCE: EN 14043:2014, 3.21]

**3.22****range of use**

space within which the turntable ladder may be operated without endangering stability

[SOURCE: EN 14043:2014, 3.22]

**3.22.1****range of free-standing use**

space in which movement at the maximum working load  $P_L$  for this range does not endanger the stability of the turntable ladder, the head of the ladder set being unsupported

[SOURCE: EN 14043:2014, 3.22.1]

**3.22.2****range of supported use**

space in which the movement without loading does not endanger stability of the turntable ladder and within this space, the head of the turntable ladder set is supported, at the object, before applying the load

[SOURCE: EN 14043:2014, 3.22.2]

**3.23****boundary**

<high rise aerial appliances> range of free standing boundary and supported boundary

Note 1 to entry: See Figure 1.

[SOURCE: EN 14043:2014, 3.23]

**3.23.1****free standing boundary**

boundary in the range of free-standing use within which movement is permitted with the load  $P_L$  permitted for this range

[SOURCE: EN 14043:2014, 3.23.1]

**3.23.2****supported boundary**

boundary in the range of supported use within which movement in this area is permitted, without load and with or without rescue cage

[SOURCE: EN 14043:2014, 3.23.2]

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