

RAUDTEEALASED RAKENDUSED. VEEREMI
KÜLGUKSESÜSTEEMID

Railway applications - Body side entrance systems for
rolling stock

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 14752:2015 sisaldab Euroopa standardi EN 14752:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 14752:2015 consists of the English text of the European standard EN 14752:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 25.03.2015.	Date of Availability of the European standard is 25.03.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 45.060.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Railway applications - Body side entrance systems for rolling stock

Applications ferroviaires - Systèmes d'accès latéraux pour matériel roulant

Bahnanwendungen - Seiteneinstiegssysteme für Schienenfahrzeuge

This European Standard was approved by CEN on 23 November 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.....	6
Introduction	8
1 Scope	9
2 Normative references	9
3 Terms and definitions	10
4 Constructional requirements.....	13
4.1 Door design	13
4.1.1 Door throughway design	13
4.1.2 Steps	15
4.1.3 Track level access	18
4.1.4 Relative position of the step edge	18
4.1.5 Train surfing.....	18
4.1.6 Door windows	18
4.1.7 Design of body side entrance doors used for accessing driver's cabs	18
4.1.8 Water drainage.....	18
4.2 Mechanical strength.....	18
4.2.1 Door mechanical strength	18
4.2.2 Step(s) mechanical strength.....	20
4.3 Local door control devices	21
4.3.1 Door buttons	21
4.3.2 Emergency egress device.....	23
4.3.3 Access device	24
4.4 Labels/warning signs	24
4.5 Interfaces with the vehicle	24
4.5.1 Electric and pneumatic power supplies	24
4.5.2 Mechanical interface with the vehicle	24
4.6 Other requirements.....	25
4.6.1 Fire protection.....	25
4.6.2 Insulation	25
4.7 Electronic equipment	25
4.7.1 Hardware.....	25
4.7.2 Software for electronic door control systems	25
4.8 Reliability, availability, maintainability, safety (RAMS)	25
4.9 Protection against electrical hazards	26
4.10 Environmental conditions.....	26
4.10.1 Weather	26
4.10.2 Water tightness	27
4.10.3 Air pressure tightness.....	27
4.11 Manual and semi-automatic ramps, bridging plates	27
5 Operational requirements	27
5.1 Door control	27
5.1.1 General.....	27
5.1.2 Release doors and steps	28
5.1.3 Interlocking of released doors	28
5.1.4 Single point failure.....	28
5.1.5 Mechanical locking	28
5.1.6 Out-of-service devices	28

5.1.7	Isolation for maintenance purposes.....	30
5.2	Closing and opening conditions.....	30
5.2.1	Safety during closing	30
5.2.2	Entrance system closed proving	40
5.3	Opening conditions	41
5.3.1	Safety during opening.....	41
5.3.2	Limitation of opening	41
5.4	Moveable step obstacle detection	41
5.4.1	General	41
5.4.2	Steps outside the vehicle	41
5.4.3	Steps inside the vehicles	41
5.5	Emergency operation	42
5.5.1	Emergency egress.....	42
5.5.2	Emergency windows in access doors.....	44
5.5.3	Access device	44
5.5.4	Powering up	45
5.6	Other requirements	45
5.6.1	Passenger access door area illumination.....	45
5.6.2	Status indication.....	45
6	Categories of tests	46
6.1	General	46
6.2	Type tests	46
6.3	Routine tests.....	46
6.4	Functional test on the fully assembled vehicle/train consist	46
7	Documentation related to installation and maintenance of the entrance system	47
Annex A (normative)	Passenger Interface devices	48
A.1	Purpose	48
A.2	Design of door buttons	48
A.3	Labels on or near door buttons	49
A.4	Recommended emergency egress device.....	51
A.5	Sample of labels	51
Annex B (normative)	Water test procedure	52
B.1	Purpose	52
B.2	Test arrangement	52
B.3	Test decision.....	52
Annex C (normative)	Specification and testing of the air tightness of door.....	54
C.1	Purpose	54
C.2	Calculation – Flowchart	54
C.3	Example of air tightness requirement specification.....	54
C.4	Air tightness testing.....	55
C.4.1	General	55
C.4.1.1	Sealing surface	55
C.4.1.2	Leakage surface	55
C.4.1.3	Equivalent leakage surface (ELS).....	55
C.4.1.4	Approximate equivalent leakage surface.....	55

C.4.2	Variable pressure measurement method	55
C.4.2.1	Principle of measurement	55
C.4.2.2	Modelling the phenomenon	55
C.4.2.2.1	Symbols	55
C.4.2.2.2	Modelling.....	56
C.4.2.2.3	Calculation of $\Delta P(t)$	56
C.4.2.2.4	Equivalent leakage surface	57
C.4.3	Variant: Constant pressure method of measurement.....	57
C.4.3.1	General.....	57
C.4.3.2	Principle: Equipment forms a chamber.....	58
C.4.3.3	Modelling the phenomenon	58
Annex D (normative)	Requirements for measuring the closing forces of power-operated doors.....	59
D.1	General.....	59
D.2	Terms and definitions	59
D.3	Measurements.....	60
D.3.1	Conditions of measurement	60
D.3.2	Measurement points.....	60
D.3.3	Measuring method	60
Annex E (normative)	Test plan	62
Annex F (normative)	Load requirements for doors due to aerodynamic loads on passenger trains	64
Annex G (informative)	Clauses in this European Standard requiring clarification in the technical specification	65
Annex H (normative)	RIC-KEY	67
Annex I (informative)	Calculation of kinetic energy	68
Annex J (informative)	Non-contact obstacle detection	74
J.1	General.....	74
J.2	Light barrier.....	74
J.3	Step sensors for external steps	74
J.4	Area monitoring systems.....	74
J.4.1	Arrangement of area monitoring system	74
J.4.2	Testing of area monitoring system	77
J.4.2.1	Test object.....	77
J.4.2.2	Open door (closing is not yet triggered by door control).....	78
J.4.2.2.1	Static.....	78
J.4.2.2.2	Dynamic	78
J.4.2.3	Automatically closing door (door leaf is moving)	78
J.4.2.3.1	Static.....	78

J.4.2.3.2 Dynamic	78
Annex K (informative) Migration rule for this European Standard.....	79
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC	80
Bibliography.....	82

This document is a preview generated by EVS

Foreword

This document (EN 14752:2015) has been prepared by Technical Committee CEN/TC 256 "Railway applications", 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 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

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 14752:2005.

EN 14752:2015 includes the following significant technical changes with respect to EN 14752:2005:

Clause/Paragraph/ Table/Figure	Change
3.2 bridging plate	added
3.4 contrast	added
3.11 entrance system	added
3.12 first step	added
3.17 manual ramp	added
3.18 moveable step	added
3.19 palm operated	added
3.24 semi-automatic ramp	added
3.25 slip resistant	added
3.26 tactile	added
4.1.2.1 Entrance area – General	a maximum of 4 steps added
4.1.2.2.1 Internal steps for external access	number of steps and height updated
4.1.2.2.2 External steps	door sill and verification updated
4.1.2.3 Step surface	contrasting band; added
4.1.3 Track level access	EN 16116-1; added
4.1.6 Door windows	dimension 1 000 mm added , other details more precise
4.3.1.4 Passenger door button location	dimensions changed
4.3.1.7 Visual indications of door buttons	added
4.3.2.1 Quantity and location of emergency of emergency egress device	"900" mm; dimension changed
4.8 Reliability, availability, maintainability, safety (RAMS)	FTA top events and some rules added
4.11 Manual and semi-automatic ramps, Bridging plates	added
5.1.2 Release doors and steps	updated

5.1.5.2 Manual doors	Palm operated; added
5.1.6.2 Step out-of-service	added
5.2.1.3 Closing and opening warning	rewritten
5.2.1.4.2.2 Closing force	force over whole door travel defined
5.2.1.4.2.3 Kinetic energy	added
5.2.1.4.2.4 Non-contact obstacle detection	added
5.2.1.5 Anti drag	added
5.4 Moveable step obstacle detection	rewritten
A.2 Design of door buttons	updated
D.1 General	new issue
Annex I	added
Annex J	added
Annex K	added
Annex ZA	updated
NOTE: The technical changes referred to include the significant technical changes from the EN revised but are not an exhaustive list of all modifications from the previous edition.	

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 2008/57/EC.

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

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.

Introduction

This European Standard specifies the minimum requirements for construction and operation of railway passenger access systems to ensure:

- safe access and egress from passenger trains through body side doors and steps;
- usability for persons with reduced mobility;
- a minimum risk of injury to persons as a result of door and step operation;
- that the doors and moveable steps, ramps, bridging plates remain closed when the vehicle is in motion;
and
- safe maintenance of the entrance systems.

1 Scope

This European Standard applies to passenger body side entrance systems of all newly designed railway vehicles such as tram, metro, suburban, mainline and high-speed trains that carry passengers. The requirements of this European Standard also apply to existing vehicles undergoing refurbishment of the door equipment, as far as it is reasonably practicable.

This European Standard also specifies the requirements for testing of entrance systems.

This European Standard makes reference to manual and power operated entrance systems. For manual doors, clauses referring to power operation are not applicable.

This European Standard does not apply to the following:

- entrance systems for equipment access, inspection or maintenance purposes and for crew only use;
- doors on freight wagons; and
- doors or hatches specifically provided for escape under emergency conditions.

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.

DIN 5032-7, *Photometry; classification of illuminance meters and luminance meters*

DIN 6164-1, *DIN colour chart; system based on the 2° standard colorimetric observer*

DIN 6164-2, *DIN colour chart; specification of colour samples*

EN 12663-1, *Railway applications — Structural requirements of railway vehicle bodies — Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 13032 (all parts), *Light and lighting — Measurement and presentation of photometric data of lamps and luminaires*

EN 13272, *Railway applications — Electrical lighting for rolling stock in public transport systems*

EN 14067 (all parts), *Railway applications — Aerodynamics*

EN 16116-1, *Railway applications — Design requirements for steps, handrails and associated access for staff - Part 1: Passenger vehicles, luggage vans and locomotives*

EN 45545-2, *Railway applications — Fire protection on railway vehicles — Part 2: Requirements for fire behaviour of materials and components*

EN 50121-3-2, *Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock - Apparatus*

EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Rolling stock and on-board equipment*

EN 50126 (all parts), *Railway applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS)*

EN 50128, *Railway applications — Communication, signalling and processing systems — Software for railway control and protection systems*

EN 50153, *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN 50155, *Railway applications — Electronic equipment used on rolling stock*

EN 50215, *Railway applications — Rolling stock — Testing of rolling stock on completion of construction and before entry into service*

EN 60077-1:2002, *Railway applications — Electric equipment for rolling stock — Part 1: General service conditions and general rules (IEC 60077-1:1999, mod.)*

EN 61373, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373)*

EN ISO 10140-2, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation (ISO 10140-2)*

EN ISO 12567-1, *Thermal performance of windows and doors — Determination of thermal transmittance by the hot-box method — Part 1: Complete windows and doors (ISO 12567-1)*

UIC 566:1990, *Loadings of coach bodies and their components*

UIC 660:2002, *Measures to ensure the technical compatibility of high-speed trains*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
access device
operating element used to unlock a locked door in order to allow for door opening from outside when the door is not available for normal operation

3.2
bridging plate
extendable device which is integrated into the vehicle as close as possible to the door threshold level, fully automatic and activated/controlled in conjunction with the door opening/closing sequences, to facilitate PRM (Persons with Reduced Mobility) and wheelchair access and which is not supported by the platform when extended

Note 1 to entry: The bridging plate retains its strength without support on the station platform.

3.3
central closing
powered closing of the door by remote command without intervention by the passenger

3.4
contrast
perception of a difference visually between one surface or element of a building/rail vehicle and another by reference to their light reflectance values (LRV)

[SOURCE: prEN 16584–1:2013, 3.5]