



SLOVENSKI STANDARD
SIST EN 12312-1:2002

01-januar-2002

Aircraft ground support equipment - Specific requirements - Part 1: Passenger stairs

Aircraft ground support equipment - Specific requirements - Part 1: Passenger stairs

Luftfahrt-Bodengeräte - Besondere Anforderungen - Teil 1: Fluggasttreppen

Matériels au sol pour aéronefs - Exigences particulières - Partie 1: Escaliers passagers

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Ta slovenski standard je istoveten z: EN 12312-1:2001

ICS:

49.100

Oprema za servis in
vzdrževanje na tleh

Ground service and
maintenance equipment

SIST EN 12312-1:2002

en

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English version

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1: Passenger stairs

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This European Standard was approved by CEN on 11 May 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 274 "Aircraft ground support equipment", 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of an identical text or by endorsement, at the latest by January 2002, and conflicting national standards shall be withdrawn at the latest by January 2002.

This European Standard 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 standard.

The Parts of EN 12312 Aircraft ground support equipment — Specific requirements are:

- Part 1: Passenger stairs
- Part 2: Catering vehicles
- Part 3: Conveyor belt vehicles
- Part 4: Passenger boarding bridges
- Part 5: Aircraft fuelling equipment
- Part 6: Deicers and deicing equipment
- Part 7: Aircraft movement equipment
- Part 8: Maintenance stairs and platforms
- Part 9: Container/Pallet loaders
- Part 10: Container/Pallet transfer transporters
- Part 11: Container/Pallet dollies and loose load trailers
- Part 12: Potable water service equipment
- Part 13: Lavatory service equipment
- Part 14: Disabled/Incapacitated passenger boarding equipment
- Part 15: Baggage and equipment tractors
- Part 16: Air start equipment
- Part 17: Air conditioning equipment
- Part 18: Oxygen/Nitrogen units
- Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions
- Part 20: Ground power equipment

This is the first edition of this Part of EN 12312.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard defines health and safety requirements, as well as some functional and performance requirements, for stairs including a built-in source of power (see Clause 1, Scope) intended for passengers embarking/disembarking aircraft.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical, and practical passenger stairs. Deviations from the recommended criteria should occur only after careful consideration, extensive testing, risk assessment and service evaluation have shown alternative methods or conditions to be satisfactory.

This European standard is a Type C standard as defined in EN 1070:1998.

1 Scope

This Part of EN 12312 deals with the technical requirements to minimise the hazards listed in clause 4 which can arise during the commissioning, the operation and the maintenance of passenger stairs when carried out in accordance with the specifications given by the manufacturer or his authorised representative. It also takes into account some requirements recognized as essential by the health and safety authorities, aircraft and vehicle manufacturers as well as airlines and handling agencies.

This standard applies to:

- self-propelled stairs with seated driver (see annex A);
- pedestrian controlled stairs;
- towable stairs equipped with powered means, e.g. for height adjustment, stabilizers (see annex A);
- automatic levelling systems of stairs;

for embarking/disembarking of passengers.

NOTE 1 Powered should be also understood as manual effort stored in springs or hydraulic accumulators, etc., the dangerous action of which can be produced or can continue after the manual effort has ceased or directly applied manual effort for lifting or lowering loads.

NOTE 2 Those clauses of this standard that can apply may also be used as a guideline for the design of towable stairs without powered means.

This standard does not apply to pneumatic systems.

This standard does not establish requirements for hazards caused by noise and vibration.

This Part of EN 12312 is not applicable to passenger stairs which are manufactured before the date of publication by CEN of this standard.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-2:1991/A1:1995, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications.*

EN 418:1992, *Safety of machinery — Emergency stop equipment, functional aspects — Principles for design.*

EN 1050:1996, *Safety of machinery — Principles for risk assessment.*

EN 1070:1998, *Safety of machinery — Terminology.*

EN 1175-1:1998, *Safety of machinery — Industrial trucks — Part 1: Electrical requirements for battery powered trucks.*

EN 1386:1996, *Aluminium and aluminium alloys — Tread plate — Specifications.*

EN 1837:1999, *Safety of machinery — Integral lighting of machines.*

EN 1915-1:2001, *Aircraft ground support equipment — General requirements — Part 1: Basic safety requirements.*

EN 1915-2:2001, *Aircraft ground support equipment — General requirements — Part 2: Stability and strength requirements, calculations and test methods.*

ISO 7718:1984¹⁾, *Aircraft — Connection of passenger loading bridge or transfer vehicle — Interface requirements in the vicinity of main deck passenger doors.*

ISO/DIS 16004:2000²⁾, *Ground equipment — Passenger boarding bridge or transfer vehicle — Interface requirements with aircraft doors.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1915-1 and EN 1070 : 1998 apply together with the following:

3.1

passenger stair

stair designed for the embarking and disembarking of passengers between the aircraft and the ground

3.2

stair flight

series of steps between ground level and platform or between two platforms

3.3

riser height (R)

distance between the surface of the tread of one step and the surface of a step above or below when measured perpendicularly between the tread surfaces

3.4

tread depth (T)

distance from one step nosing to the adjacent step nosing when measured parallel to the tread surface

3.5

step width

maximum usable width measured along the nose of the step

3.6

handrail height

distance to the top surface of the handrail as measured at the nose of the step or platform and perpendicular to the tread surface

3.7

upper (main) platform

platform at the upper end of a stair flight with access to the aircraft

1) Revision in preparation at the time of publication of this standard.

2) First edition in preparation at time of publication of this standard.

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3.8

intermediate platform

platform between two stair flights

3.9

incline

angle of stair flight to a horizontal plane, measured across the noses of the steps

3.10

inclination

angle of the platforms and steps surfaces to a horizontal plane, measured at a right angle to the noses of the steps

3.11

bottom hinged step

foldable step at the bottom end of the stair to provide sufficient ground clearance during movement

3.12

leading edge

front end of the upper (main) platform at the aircraft door interface

3.13

auxiliary system

independent system for the operation of the passenger stair in case of power loss

4 List of hazards

The list of risks and hazards (see annex B) is based on EN 1050 : 1996 and contains the hazards and hazardous situations, as far as they are dealt with in this European Standard, identified by risk assessment as significant for passenger stairs and which require action to eliminate or reduce risks. Not covered are risks and hazards due to a standard automotive chassis, the traffic, maintenance and repair and general misuse.

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5 Safety requirements and/or measures

5.1 General requirements

5.1.1 Passenger stairs shall conform to the relevant requirements of EN 1915-1, unless otherwise specified in this standard. They shall also conform to the specific requirements of this standard.

5.1.2 Strength calculations shall be carried out in accordance with EN 1915-2.

5.1.3 For stairs to be moved on public roadways, the dimensions, laden mass and other characteristics shall meet all applicable government regulations when in fully retracted position.

NOTE Applicable government regulations depend on the airport of use.

5.1.4 Passenger stairs shall have an upper (main) platform and, where the number of risers exceeds 18, an intermediate platform.

5.1.5 Step and platform inclination in all intended operating positions shall not exceed $\pm 3^\circ$ (5 %) when the passenger stair rests on a horizontal plane.

5.1.6 The step and platform cover material shall provide the possibility of easy elimination of water and snow, e.g. by using treadplate conforming to EN 1386:1996.

5.1.7 With the passenger stair fully stowed for movement, the lowest point of any part of the passenger stair shall not be less than 150 mm above a horizontal ground. In addition, the clearance shall allow without interference the transversing of two surfaces intersecting at an angle of 3° (5 %) either in bridging or in cresting.

5.1.8 Operator's cabin or driver's accommodation shall not project forward of the leading edge of the upper (main) platform when in its fully retracted position. The passenger stair shall be constructed so that the driver at the operating position is able to see the leading edge throughout its operating range.

5.1.9 Passenger stairs shall be fitted with barrier devices to prevent access to the stair flight as follows:

- passenger stairs with a maximum height of the upper (main) platform up to 2 m require one barrier at the bottom end of the passenger stairs;
- passenger stairs with a maximum height of the upper (main) platform in excess of 2 m in its fully retracted position require two barriers, one at bottom end of the passenger stair, one at the upper (main) platform.

NOTE In the context of this clause, barrier devices can be taken to mean solid rails or more flexible means such as inertial reel straps. A simple microswitch or similar system may be used to immobilize the stair.

The barrier at the upper (main) platform shall be installed at a height of 1 m.

5.1.10 Stair flights and platforms shall have illumination of a non-glare quality for floor and step treads. A minimum illumination of 50 Lux shall be provided, as measured at the centre line of the stair flight and platforms, parallel to and on the tread surface.

5.1.11 The electrical system of battery powered passenger stairs shall conform to EN 1175-1:1998.

5.1.12 The driver accommodation of self-propelled passenger stairs shall be equipped with a restraint system for the driver.

5.2 Stair flight

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5.2.1 All steps of a stair flight shall be designed with the same riser height and the same tread depth.

5.2.2 Riser height and tread depth dimensions shall meet the following geometry criteria:

$$\text{Riser height (R) + Tread depth (T) = } 460 \text{ mm } \pm 10 \text{ mm}$$

The riser height (R) shall be between 140 mm and 210 mm, the tread depth (T) shall be between 250 mm and 320 mm.

5.2.3 The incline for the stair flight shall be between 24° and 40°.

NOTE The optimum angle for the stair flight incline is between 30° and 38°.

5.2.4 The minimum usable clear width of a stair flight shall be 1 m.

5.2.5 Any hinged step that may be fitted at the bottom of the stair shall meet the criteria in 5.1.7 and 5.2.1. This step shall be easy to handle and be able to be stowed safely.

5.2.6 The distance from the ground to the tread surface of the bottom step shall not exceed 260 mm, when the stair is positioned on a horizontal supporting surface.

5.3 Platforms

5.3.1 The upper (main) platform shall have a minimum usable length of 1,2 m. The minimum width dimension shall be the width of the stair flight.

5.3.2 The leading edge of the upper (main) platform shall be designed in a manner that provides a good fit to the aircraft fuselage, i.e. a maximum gap of 100 mm along the length of the interface. Bumpers made of flexible material shall allow direct contact between leading edge and aircraft fuselage.