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

Luftfahrt-Bodengeräte - Besondere Anforderungen - Teil 1: Fluggasttreppen

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

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

Luftfahrt-Bodengeräte - Besondere Anforderungen - Teil 1: Fluggasttreppen

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Foreword

This document (EN 12312-1:2013) 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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 12312-1:2004+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.

EN 12312, *Aircraft ground support equipment — Specific requirements*, consists of the following parts:

— *Part 1: Passenger stairs* (the present document);

— *Part 2: Catering vehicles*;

— *Part 3: Conveyor belt vehicles*;

— *Part 4: Passenger boarding bridges*;

— *Part 5: Aircraft fuelling equipment*;

— *Part 6: Deicers and deicing/anti-icing equipment*;

— *Part 7: Air-craft 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 vehicles*;

— *Part 15: Baggage and equipment tractors*;

— *Part 16: Air start equipment*;

— *Part 17: Air conditioning equipment*;

— *Part 18: Nitrogen or Oxygen units*;

— *Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions*;

— *Part 20: Electrical ground power units*.

The main changes compared to the previous edition are:

a) Amendment A1:2009 was incorporated;

b) the Introduction was updated;

c) the Scope was updated;

d) Clause 2, Normative references, was updated;

e) another term and definition was added;

f) List of hazards was moved to Annex A;

g) 5.1 was changed;

h) 5.2, Safeguards against falling, was inserted, thus making it necessary to re-number the following sub-clauses;

i) 5.3 to 5.10 were changed;

j) 6.2 and 6.3 were changed;

k) 7.1 was changed;

l) 7.2, Guard rails, 7.3, Barrier and 7.4, Platforms and steps, were inserted;

m) Annex A, Examples of passenger stairs, was deleted;

n) Annex ZA referring to the Machinery directive 98/37/EC was replaced by Annex ZA referring to the new Machinery directive 2006/42/EC;

o) the Bibliography was updated.

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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 defines health and safety 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 should occur only after careful consideration, extensive testing, risk assessment and service evaluation have shown alternative methods or conditions to be satisfactory. Such deviations are outside the scope of this standard and a manufacturer should be able to demonstrate an equivalent level of protection.

This European standard is a Type C standard as defined in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

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. Deviations from requirements do not fall within the presumption of conformity given by the standard.

1 Scope

This European Standard specifies 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 used as intended, including misuse reasonably foreseeable by the manufacturer, when carried out in accordance with the specifications given by the manufacturer or his authorised representative. It also takes into account some requirements recognised as essential by authorities, aircraft and ground support equipment (GSE) manufacturers as well as airlines and handling agencies.

This European Standard applies to:

a) self-propelled stairs with seated driver;

b) pedestrian controlled stairs;

c) towable stairs equipped with powered means, e.g. for height adjustment, stabilisers;

d) automatic levelling systems of stairs

for embarking/disembarking of passengers.

"Powered" should also be 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.

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 European Standard does not establish additional requirements for the following:

1) persons falling out of an aircraft with the passenger stairs not in position;

2) hazards resulting from a moving stairway (escalator);

3) upper deck door access.

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

This part of EN 12312 when used in conjunction with EN 1915-1, EN 1915-2, EN 1915-3 and EN 1915-4 provides the requirements for passenger stairs.

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 1175-1, *Safety of industrial trucks — Electrical requirements — Part 1: General requirements for battery powered trucks*

EN 1837, *Safety of machinery — Integral lighting of machines*

EN 1915-1:2013, *Aircraft ground support equipment — General requirements — Part 1: Basic safety requirements*

EN 1915-2:2001+A1:2009, *Aircraft ground support equipment — General requirements — Part 2: Stability and strength requirements, calculations and test methods*

EN 1915-3, *Aircraft ground support equipment — General requirements — Part 3: Vibration measurement methods and reduction*

EN 1915-4, *Aircraft ground support equipment — General requirements — Part 4: Noise measurement methods and reduction*

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

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

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

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard rails (ISO 14122-3:2001)*

ISO 7718-1:2009, *Aircraft — Passenger doors interface requirements for connection of passenger boarding bridge — Part 1: Main deck doors*

ISO 16004, *Aircraft ground equipment — Passenger boarding bridge or transfer vehicle — Requirements for interface with aircraft doors*

DIN 51130:2004, *Testing of floor coverings — Determination of the anti-slip property — Workrooms and fields of activities with slip danger, walking method — Ramp test*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1915-1:2013, EN ISO 12100:2010 and ISO 7718-1:2009 and the following apply.

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

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

3.14
barrier
movable element to prevent access into the area

4 List of hazards

The list of risks and hazards (given at Annex A) is based on EN ISO 12100:2010 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 hazards due to a standard automotive chassis, the traffic and repair.

5 Safety requirements and/or measures

5.1 General requirements

5.1.1 Passenger stairs shall conform to the requirements of this standard and relevant requirements of EN 1915-1, EN 1915-2, EN 1915-3 and EN 1915-4 unless otherwise specified in this standard. The specific requirements of this standard take precedence over those of the EN 1915 series.

5.1.2 Stability and 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 shall be provided at least after every 18 risers. The number of risers shall not normally exceed 40.

5.1.5 Step and platform inclination in all intended operating positions shall not exceed ± 3° (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, and be selected to minimise wear. The flooring materials shall also provide a durable slip-resistant surface, with a minimum R11 slip-resistance classification.

Slip resistance classification shall be measured in accordance with DIN 51130:2004, Table 3.

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 surface. In addition, the clearance shall allow without interference the traversing of two surfaces intersecting at an angle of 3° (5 %) either in bridging or in cresting.

5.1.8 The 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 is able to see the leading edge throughout its operating range.

5.1.9 Where an operator's workplace is provided on the upper (main) platform, the following requirements shall apply:

a) the workplace shall be entirely protected against the risk of falling in accordance with 5.2;

b) standing operation shall be limited to a travelling speed of 15 km/h. The minimum free space for standing operation shall be 600 mm wide by 500 mm deep. A rest pad shall be provided for a standing driver;

c) the operator's position shall provide an unobstructed view of the platform's leading edge and the full flight of stairs.

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 lx 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.

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

5.1.13 Pedestrian controlled or towable stairs shall be fitted with a service and parking brake function that can be engaged and released at the operator's workplace or at the towbar head.

5.1.14 The minimum field of view from the driver's position shall include the ground area immediately aft of the unit up to the first steps. This can be achieved either by using see-through risers on the stair flight, or indirect means such as e.g. mirrors or closed circuit TV. It is further recommended to consider providing indirect means for seeing the stairs upper platform from the driver's position.

5.2 Safeguards against falling

5.2.1 Provisions shall be made for eliminating or reducing the risk of falling of persons from the front edge of the stairs' upper platform when the stair is not completely connected to the aircraft or is being removed.

Such provisions shall consist of:

a) for passenger stairs with a maximum height of the upper (main) platform from 1 000 mm up to 2 000 mm: one barrier at the upper (main) platform of the passenger stairs;

b) for passenger stairs with a maximum height of the upper (main) platform in excess of 2 000 mm: two barriers, one at the bottom end of the passenger stairs, one at the upper (main) platform.

5.2.2 Upper (main) platform barriers shall: