



SLOVENSKI STANDARD SIST EN 12312-5:2021

01-maj-2021

Nadomešča:

SIST EN 12312-5:2005+A1:2009

Podporna oprema na tleh za letalski promet - Posebne zahteve - 5. del: Oprema za oskrbo letal z gorivom

Aircraft ground support equipment - Specific requirements - Part 5: Aircraft fuelling equipment

Luftfahrt-Bodengeräte - Besondere Anforderungen - Teil 5: Betankungseinrichtungen für Luftfahrzeuge

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Matériel au sol pour aéronefs - Exigences particulières - Partie 5 : Matériels d'avitaillement en carburant

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Ta slovenski standard je istoveten z: EN 12312-5:2021

ICS:

49.100

Oprema za servis in
vzdrževanje na tleh

Ground service and
maintenance equipment

SIST EN 12312-5:2021

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12312-5

March 2021

ICS 49.100

Supersedes EN 12312-5:2005+A1:2009

English Version

Aircraft ground support equipment - Specific requirements - Part 5: Aircraft fuelling equipment

Matériel au sol pour aéronefs - Exigences particulières
- Partie 5 : Matériels d'avitaillement en carburant

Luftfahrt-Bodengeräte - Besondere Anforderungen -
Teil 5: Betankungseinrichtungen für Luftfahrzeuge

This European Standard was approved by CEN on 18 January 2021.

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: Rue de la Science 23, B-1040 Brussels

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EN 12312-5:2021 (E)**European foreword**

This document (EN 12312-5:2021) 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 September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12312-5:2005+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 2006/42/EC on machinery.

For relationship with EU Directive 2006/42/EC on machinery, 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;*
- *Part 2: Catering vehicles;*
- *Part 3: Conveyor belt vehicles;*
- *Part 4: Passenger boarding bridges;*
- *Part 5: Aircraft fuelling equipment (this document);*
- *Part 6: Deicers and de-icing/anti-icing equipment;*
- *Part 7: Air-craft movement equipment;*
- *Part 8: Maintenance or service 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;*

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- 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.

Annexes C and D are normative; Annexes A, B, E and ZA are informative.

The main changes compared to the previous edition EN 12312-5:2005+A1:2009 are the following ones:

- a) Amendment A1:2009 was incorporated;
- b) the Introduction was updated in relation to the deviation from recommended criteria;
- c) the Scope was updated to cover reasonably foreseeable misuse;
- d) Clause 2, Normative references, was updated;
- e) the list of hazards was updated to exclude hazards due to traffic and repair and was moved to Annex A;
- f) Clause 5, Safety requirements and/or measures, was completely revised and changed;
- g) Subclause 5.6.5 Ergonomic aspects on AFE for fuel supply, was added
- h) Subclause 6.1, Marking, and Subclause 6.2 Additional marking, were changed;
- i) Clause 7, Verification of requirements, was updated;
- j) Annex D, Ancillary equipment to access the aircraft fuelling panel (refuelling ladder), was added;
- k) Annex ZA referring to the Machinery Directive 98/37/EC was replaced by Annex ZA referring to the new Machinery Directive 2006/42/EC.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 12312-5:2021 (E)**Introduction**

This document specifies health and safety requirements, as well as some functional and performance requirements for aircraft fuelling equipment (AFE) intended for use on all aircraft types commonly in service in civil air transport.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical and practical AFE. Deviations should occur only after careful consideration, extensive testing, risk assessment and thorough service evaluation have shown alternative methods or conditions to be satisfactory. Such deviations are outside the scope of this document and a manufacturer should be able to demonstrate an equivalent level of protection.

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

This document is a type-C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or 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 type-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 document.

In general, the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) is not applicable to AFE as they are not deemed to be used on public roads. However, certain requirements have been added in an informative Annex E.

The use of AFE on public roads is not intended with the following exceptions:

- a) transportation of fuel from tank farms to refuelling areas out of the airport premises;
- b) maintenance purposes with empty cargo tanks.

NOTE This could include the need of local traffic derogation (see EN 1915-1:2013, Introduction, f) — negotiation).

The intended functions of AFE are:

- c) loading fuel from the tank farm and/or a hydrant system to the AFE;
- d) storage and transportation of fuel;
- e) fuelling from the AFE to the aircraft;
- f) filtration of the fuel;
- g) metering the fuel for a transfer of custody;
- h) defuelling the aircraft to the AFE;
- i) flushing fuel from hydrant systems;
- j) unloading AFE to the tank farm after defuelling of an aircraft;
- k) transferring fuel from one AFE to another.

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EN 12312-5:2021 (E)**1 Scope**

This document specifies the technical requirements to minimize the hazards listed in Clause 4 which can arise during the commissioning, operation and maintenance of AFE 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 authorized representative. It also takes into account some performance requirements recognized as essential by authorities, aircraft and ground support equipment (GSE) manufacturers as well as airlines, airports and fuelling companies.

This document applies to all types of aircraft fuelling equipment:

- a) aircraft refuellers,
- b) hydrant dispensers,
- c) defuellers,
- d) hydrant pit servicing vehicles,
- e) pit cleaner vehicles, and
- f) stationary dispensing units

intended to service aircraft with aviation fuels and to be operated on airfields, heliports and other aircraft refuelling related areas such as maintenance bases.

This document does not apply to:

- g) AFE whose only power source for aircraft refuelling is directly applied manual effort,
- h) hydrant systems, tank farms, pipework and underground tanks,
- i) specific hazards due to the operation of the AFE in a potentially explosive atmosphere, and
- j) built-in fire extinguisher systems.

No extra requirements on noise and vibration are provided other than those in EN 1915-3:2004+A1:2009 and EN 1915-4:2004+A1:2009.

NOTE EN 1915-3:2004+A1:2009 and EN 1915-4:2004+A1:2009 provide the general GSE vibration and noise requirements.

This document does not deal with hazards in respect to a standard automotive chassis and from other vehicles on the apron.

This document is not applicable to AFE which are manufactured before the date of publication of this document by CEN.

This part of the EN 12312 series when used in conjunction with EN 1915-1:2013, EN 1915-2:2001+A1:2009, EN 1915-3:2004+A1:2009 (for vehicles) and EN 1915-4:2004+A1:2009 provides the requirements for AFE.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 131-1:2015+A1:2019, *Ladders — Part 1: Terms, types, functional sizes*

EN 131-2:2010+A2:2017, *Ladders — Part 2: Requirements, testing, marking*

EN 131-3:2018, *Ladders — Part 3: Marking and user instructions*

EN 131-7:2013, *Ladders — Part 7: Mobile ladders with platform*

EN 764-1:2015+A1:2016, *Pressure equipment — Part 1: Vocabulary*

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 1915-3:2004+A1:2009, *Aircraft ground support equipment — General requirements — Part 3: Vibration measurement methods and reduction*

EN 1915-4:2004+A1:2009, *Aircraft ground support equipment — General requirements — Part 4: Noise measurement methods and reduction*

EN 13082:2008+A1:2012, *Tanks for transport of dangerous goods — Service equipment for tanks — Vapour transfer valve*

EN 13094:2020, *Tanks for the transport of dangerous goods — Metallic gravity-discharge tanks — Design and construction*

EN 13308:2002, *Tanks for transport of dangerous goods — Service equipment for tanks — Non pressure balanced footvalve*

EN 13316:2002, *Tanks for transport of dangerous goods — Service equipment for tanks — Pressure balanced footvalve*

EN 14183:2003, *Step stools*

EN 14595:2016, *Tanks for transport of dangerous goods — Service equipment — Breather device*

EN 14596:2018, *Tanks for transport of dangerous goods — Service equipment for tanks — Emergency pressure relief valve*

EN 16257:2012, *Tanks for the transport of dangerous goods — Service equipment — Footvalve sizes other than 100 mm dia (nom)*

EN 16522:2014, *Tanks for transport of dangerous goods — Service equipment for tanks — Flame arresters for breather devices*

EN IEC 60079-0:2018, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0:2017)*

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EN ISO 1825:2017, *Rubber hoses and hose assemblies for aircraft ground fuelling and defuelling — Specification (ISO 1825:2017)*

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

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

ISO 45:1990, *Aircraft — Pressure refuelling connections*

ISO 46:1973, *Aircraft — Fuel nozzle grounding plugs and sockets*

ISO 102:1990, *Aircraft — Gravity filling orifices*

ISO 1102:2001, *Commercial road vehicles — 50 mm drawbar eye — Interchangeability*

ISO 1728:2006, *Road vehicles — Pneumatic braking connections between motor vehicles and towed vehicles — Interchangeability*

ISO 3584:2020, *Road vehicles — Clevis couplings — Interchangeability*

ISO 8755:2001, *Commercial road vehicles — 40 mm drawbar eye — Interchangeability*

DIN 51130:2014, *Testing of floor coverings — Determination of the anti-slip property — Workrooms and fields of activities with slip danger — Walking method — Ramp test*

EI 1529:2014, *Aviation fuelling hose and hose assemblies*

EI 1542:2012, *Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fuelling equipment*

EI 1584:2017, *Four-inch hydrant system components and arrangements*

EI 1596:2013, *Design and construction of aviation fuel filter vessels*

SAE AS 5877B, *Detailed Specification for Aircraft Pressure Refueling Nozzle*¹

¹ Published by: SAE National (US) Society of Automotive Engineers <http://www.sae.org/>.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

aircraft fuelling equipment

AFE

equipment used to handle aviation fuels on an airfield, including:

- aircraft refuellers;
- hydrant dispensers;
- defuellers;
- hydrant pit servicing vehicles;
- pit cleaner vehicles;
- stationary dispensing units

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3.2

aircraft fuel control panel

aircraft mounted panel, used to control fuel distribution and quantities in aircraft tanks

3.3

aircraft refueller

self-propelled or towable vehicle designed to carry aviation fuel and capable of refuelling aircraft by means of an on-board pump

Note 1 to entry: Some aircraft refuellers are also capable of defuelling aircraft.

3.4

aircraft refuelling adapter

aircraft mounted adapter to which the pressure refuelling nozzle is connected

Note 1 to entry: A similar adapter may be used to connect loading hoses to an aircraft refueller.

3.5

aircraft refuelling pressure

fuel pressure allowed by the aircraft manufacturer or airline operator at the aircraft manifold during fuel flow

3.6

aviation fuels

hydrocarbon type liquids used as fuel in an aircraft engine

EN 12312-5:2021 (E)**3.6.1****jet fuel**

kerosene type distillate fuel used in turbine engines

3.6.2**aviation gasoline****Avgas**

gasoline for use in piston type aircraft engines

3.7**baffle**

non liquid tight, transverse partition in a cargo tank

Note 1 to entry: If the baffle is fitted longitudinally it is called "a longitudinal baffle".

3.8**baffled area**

part of the cargo tank between two baffles or between baffle and tank end

3.9**battery master switch**

switch fitted close to the vehicle battery for isolating circuits of the AFE's electrical system

3.10**bonding cable**

electrically conducting cable/wire to equalize electrical potential

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EXAMPLE: between AFE and aircraft, aircraft refueller and loading facility

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3.11**bonding point**

designated attachment point for the bonding cable to ensure good electrical continuity

3.12**bottom loading**

loading an aircraft refueller or cargo tank into the bottom of the tank through a closed system

3.13**bottom loading adapter**

self-sealing device to which the loading hose or arm is connected

3.14**bulk meter**

means of measuring the quantity of fuel passed through it

3.15**cargo tank**

tank for the carrying of aviation fuels, having a liquid capacity of more than 1 000 l, mounted permanently or otherwise secured on an AFE

3.16 chassis

3.16.1 self-propelled chassis

part of the vehicle which comprises the driver's or operator's cabin, the engine and transmission including the fuel, intake and exhaust systems, the wheels, axles, suspension system, braking system and other parts of the running gear, the fifth wheel assembly (for towing a semi-trailer) or the drawbar coupling (for towing drawbar trailers), the lights and electrical system that are usually fitted by the manufacturer of the chassis and the frame on which it is built

3.16.2 trailer chassis

part of the trailer which comprises the running gear (wheels, axles, suspension system and braking system), the drawbar or A frame, that part of the assembly fitted to the trailer to connect to the tractor fifth wheel (the rubbing plate), the lights and electrical system and the frame on which the tank and/or equipment is fitted

3.17 closed circuit overwing/trigger nozzle

nozzle connected mechanically to the fuel filling orifice which is vented to the atmosphere

3.18 compartment

liquid tight division in a cargo tank

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3.19 hold to run system

deadman system

system consisting of a hold to run (deadman) valve and a hold to run (deadman) control which ensures human control while operating

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3.20 defueller

vehicle designed to defuel but not to refuel aircraft

3.21 defuelling

function of removing fuel from an aircraft into a vehicle, usually through the aircraft refuelling adapters, which is subdivided into:

- pressure defuelling: when aircraft pumps are used to pump the fuel from the tanks of the aircraft to the AFE;
- suction defuelling: when AFE's pump is used to draw the fuel from the aircraft

Note 1 to entry: A combination of both may be used.

3.22 filtration equipment

device installed on the AFE through which the aviation fuel passes for removal of particulate matter and/or water