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**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

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

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**ICS:**

49.100

Oprema za servis in  
vzdrževanje na tleh

Ground service and  
maintenance equipment

**SIST EN 12312-5:2005+A1:2009**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12312-5:2005+A1**

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**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 3 January 2005 and includes Amendment 1 approved by CEN on 1 March 2009.

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

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

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## Foreword

This document (EN 12312-5:2005+A1:2009) 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of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2009-03-01.

This document supersedes EN 12312-5:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

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).

$\boxed{A_1}$  For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.  $\boxed{A_1}$

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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/antiicing 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: Nitrogen or Oxygen units
- Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions
- Part 20: Ground power equipment

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

**EN 12312-5:2005+A1:2009 (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 from the recommended criteria should occur only after careful consideration, extensive testing, risk assessment and thorough service evaluation have shown alternative methods or conditions to be satisfactory.

This document is a Type C standard as stated in EN ISO12100-1 and EN ISO 12100-2.

The machinery concerned and the extent to which hazards, hazardous situations and 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.

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## 1 Scope

This document specifies the technical requirements to minimise the hazards listed in Clause 4 which can arise during the commissioning, operation and maintenance of AFE when carried out in accordance with the specifications given by the manufacturer or his authorised representative. It also takes into account some performance requirements recognised 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:

- aircraft refuellers;
- hydrant dispensers;
- defuellers;
- hydrant pit servicing vehicles;
- 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.

NOTE 1 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 considered when developing this standard.

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

- transportation of fuel from tank farms to refuelling areas;
- maintenance purposes with empty cargo tanks.

NOTE 2 This may include the need of local traffic derogation (see Clause 0 of EN 1915-1:2001 — negotiation).

The intended functions of AFE are:

- loading fuel from the tank farm and/or a hydrant system to the AFE;
- storage and transportation of fuel;
- fuelling from the AFE to the aircraft;
- filtration of the fuel;
- metering the fuel for a transfer of custody;
- defuelling the aircraft to the AFE;
- flushing fuel from hydrant systems;
- unloading AFE to the tank farm after defuelling of an aircraft;
- transferring fuel from one AFE to another.

This document does not apply to:

- AFE whose only power source for aircraft refuelling is directly applied manual effort;
- hydrant systems, tank farms, pipework and underground tanks;
- specific hazards due to the operation of the AFE in a potentially explosive atmosphere;

**EN 12312-5:2005+A1:2009 (E)**

— built-in fire extinguisher systems.

This document does not establish requirements for noise and vibration.

Noise and vibration are dealt with respectively in EN 1915-4 and EN 1915-3.

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.

**[A1]** This part of EN 12312 is intended to be used in conjunction with EN 1915-1, EN 1915-2, EN 1915-3 (for vehicles) and EN 1915-4. **[A1]**

## 2 Normative references

The following referenced documents are indispensable for the application 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.

**[A1]** *deleted text* **[A1]**

**[A1]** EN 764-1, *Pressure equipment — Part 1: Terminology — Pressure, temperature, volume, nominal size* **[A1]**

EN 954-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

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

EN 1361, *Rubber hoses and hose assemblies for aviation fuel handling* - Specification

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

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

**[A1]** EN 1915-3, *Aircraft ground support equipment — General requirements — Part 3: Vibration measurement methods and reduction* **[A1]**

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

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety "i"*

**[A1]** EN 60079-0 **[A1]**, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements (IEC 60079-0:2004)*

EN 60079-1:2004, *Electrical apparatus for potentially explosive atmospheres – Part 1: Flameproof enclosure "d" (IEC 60079-1:2003)*

EN 60079-2:2004, *Electrical apparatus for explosive gas atmospheres – Part 2: Pressurized enclosure "p" (IEC 60079-2:2001)*

**[A1]** EN 60079-5, *Explosive atmospheres — Part 5: Equipment protection by powder filling "q" (IEC 60079-5:2007)* **[A1]**

**[A1]** EN 60079-6, *Explosive atmospheres — Part 6: Equipment protection by oil immersion "o" (IEC 60079-6:2007)* **[A1]**

**[A1]** EN 60079-7 **[A1]**, *Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety "e" (IEC 60079-7:2001)*



EN 60079-11, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"* (IEC 60079-11:2006)

EN 60079-14, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)* (IEC 60079-14:2002)

EN 60079-15, *Electrical apparatus for explosive gas atmospheres – Part 15: Type of protection "n"* (IEC 60079-15:2001, modified)

EN 60079-18, *Electrical apparatus for explosive gas atmospheres – Part 18: Construction, test, and marking of type of protection encapsulation "m" electrical apparatus* (IEC 60079-18:2004)

EN 60529, *Degrees of protection provided by enclosures (IP code)* (IEC 60529:1989)

EN ISO 12100-1:2003, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology* (ISO 12100-1:2003)

EN ISO 12100-2:2003, *Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles* (ISO 12100-2:2003)

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

ISO 45, *Aircraft - Pressure refuelling connections*

ISO 46, *Aircraft - Fuel nozzle grounding plugs and sockets*

ISO 102, *Aircraft - Gravity filling orifices* ~~deleted text~~

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

ISO 1728, *Road vehicles — Pneumatic braking connections between motor vehicles and towed vehicles — Interchangeability*. ~~Error! Bookmark not defined.~~

ISO 2883, *Rubber, vulcanized — Antistatic and conductive products for industrial use — Electrical resistance limits*

ISO 3584, *Road vehicles — Drawbar couplings — Interchangeability*

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 4009, *Commercial vehicles — Location of electrical and pneumatic connections between towing vehicles and trailers*

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

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### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003, EN ISO 12100-2:2003 and EN 1915-1:2001 and the following apply.

#### 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,
- stationary dispensing units

**EN 12312-5:2005+A1:2009 (E)****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. Most vehicles of this type are also capable of defuelling aircraft

**3.4****aircraft refuelling adapter**

aircraft mounted adapter to which the pressure refuelling coupling is connected

NOTE 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 including

- Jet fuel  
Kerosene type distillate fuel used in turbine engines

- Aviation gasoline — Avgas  
Gasoline for use in piston type aircraft engines

**3.7****baffle**

non liquid tight, transverse partition in a cargo tank

NOTE 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 equalise electrical potential, e.g. between AFE and aircraft, aircraft refueller and loading facility

**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****brake interlock**

system fitted to ensure that the vehicle cannot be moved, if hoses and/or other equipment have not been disconnected from aircraft or loading point and properly stowed, lowered or secured

**3.15****bulkhead**

liquid tight, transverse closure between compartments of a cargo tank

**3.16****bulk meter**

means of measuring the quantity of fuel passed through it

**3.17****cargo tank**

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

**3.18****chassis**

- 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
- 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

**iTeh STANDARD PREVIEW****3.19****closed circuit overwing/trigger nozzle** (standards.iteh.ai)

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

**3.20****compartment**

liquid tight division in a cargo tank

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device that requires permanent or pulsing operator input throughout an operation in order for the operation to continue and which stops the operation if not properly activated

**3.22****hold to run valve ("deadman valve")**

on-off valve to start and stop the flow of fuel, controlled by the hold to run control

**3.23****defueller**

vehicle designed to defuel but not to refuel aircraft

**3.24****defuelling**

function of removing fuel from an aircraft into a vehicle, usually through the aircraft refuelling adapters. This 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.

A combination of both may be used

**3.25****filtration equipment**

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

**EN 12312-5:2005+A1:2009 (E)****3.26****fuel sense pressure**

pressure measured in a refuelling system downstream of the pressure control device used as a reference for the pressure control device (see also Pressure Control System)

**3.27****hose end pressure control valve (HEPCV)**

pressure regulator mounted on the refuelling coupling to limit pressure at its outlet and to control surge pressure limits at the aircraft fuelling adapter

**3.28****hydrant dispenser**

self-propelled or towable vehicle used to refuel aircraft requiring an external fuel supply. The pressure source is the hydrant system

NOTE Hydrant dispensers may be fitted with a boost pump where hydrant pressure is insufficient to provide adequate flow rates into the aircraft.

**3.29****hydrant pit box**

box set in the operational area which contains the hydrant pit valve or the low point or vent valve

**3.30****hydrant pit coupler**

device fitted to the intake hose to connect the hose to the hydrant pit valve

NOTE The coupler may be fitted with additional devices such as deadman control, pressure control and an excess flow limiter.

**3.31****hydrant pit servicing vehicle**

AFE designed to flush and test hydrant pit valves in situ as well as to flush and vent low and high points on the hydrant system

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**3.32****hydrant pit valve**

valve set in a hydrant pit box, equipped with an emergency shut-off device, to which the hydrant pit coupler can be attached

NOTE The hydrant pit valve may be fitted with additional devices such as deadman control, pressure control valve or excess flow limiter.

**3.33****hydrant system**

system of tanks, stationary pumps, valves, filters and pipework to supply fuel to the operational area where aircraft are refuelled

**3.34****in-line pressure control valve**

valve installed in the AFE pipework or at the hydrant pit coupler to control fuel pressure

NOTE It may also incorporate the deadman function.

**3.35****intake hose**

hose for fuel flow from the hydrant pit valve to the AFE

**3.36****interlock override switch**

device to render the brake interlock inoperative in emergency situations

**3.37****brake interlock**

device which prevents a vehicle being moved when components are not in their secured positions

**3.38****internal stop valve**

valve designed for loading or discharging of fuel fitted in the bottom of a cargo tank

**3.39****operational area**

part of an airfield used for servicing aircraft

**3.40****overwing/trigger nozzle**

nozzle used for non-pressure fuelling and hand held in an open fuel filling orifice giving access to the aircraft fuel tank

**3.41****power take-off**

device fitted to the vehicle to provide power to auxiliary services such as a hydraulic pump or fuel pump

**3.42****pressure control system**

system fitted to AFE or hydrant pit valves to limit the pressure of fuel delivered to aircraft

**3.43****pressure refuelling coupling**

quick disconnect device, used in pressure refuelling, fitted to the hose end, connecting hose and aircraft fuelling adapter

**3.44****refuelling**

- underwing or pressure refuelling: refuelling under positive pressure through a coupling directly connected to the aircraft fuelling adapter;
- overwing or non-pressure refuelling: refuelling at atmospheric pressure through an overwing/trigger nozzle and entered into a fuel filling orifice

**3.45****refuelling platform**

fixed or moveable platform to enable the operator to gain access to the aircraft fuel control panel and aircraft refuelling adapters

NOTE This may be an elevating platform, an extending structure or both, and may be part of or remote from an AFE.

**3.46****rigid vehicle**

self-propelled road chassis to which an aviation fuel tank is permanently attached

**3.47****self-loading/dual purpose refueller**

vehicle equipped to be self-loaded from the hydrant system or fitted out as a dual purpose vehicle that can also be used as a hydrant dispenser, i.e. hydrant sourced fuel is delivered directly to the aircraft and not via the cargo tank. In both cases, the refuellers are fitted with an intake hose and coupler to connect to the hydrant pit valve

**3.48****specific fuelling equipment**

part of the AFE comprising the fuel handling components, including, but not limited to

- cargo tank,
- deadman systems,
- filtration,
- hoses,
- metering equipment,
- pipework,
- pressure control,
- pumps,

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