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## Aircraft ground support equipment - Specific requirements - Part 13: Lavatory service equipment

Matériel au sol pour aéronefs - Exigences particulières  
- Partie 13: Vides toilettes

Luftfahrt-Bodengeräte - Besondere Anforderungen -  
Teil 13: Toiletten-Servicegeräte

This European Standard was approved by CEN on 27 February 2017.

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  
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## European foreword

This document (EN 12312-13:2017) 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of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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 12312-13:2002+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*, comprises 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;*
- *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 (the present document);*
- *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.*

Annex A is normative.

The main changes compared to the previous edition EN 12312-13:2002+A1:2009 are:

- 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 6.1, *Marking*, and Subclause 6.2 *Additional marking*, were changed;
- h) Clause 7, *Verification of requirements*, was updated;
- i) Annex A, *Examples of lavatory service equipment*, was deleted and replaced by a completely revised Annex A, *List of Hazards*;
- j) 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



## Introduction

This European Standard specifies health and safety requirements, as well as some functional and performance requirements for lavatory service equipment intended for servicing 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 lavatory service equipment. 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 standard and a manufacturer should be able to demonstrate an equivalent level of protection.

This European Standard is a type-C standard as stated in EN ISO 12100.

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 requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements 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 minimize the hazards listed in Clause 4 which can arise during the commissioning, operation and maintenance of lavatory service equipment 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 requirements recognized 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 lavatory vehicles;
- b) towable lavatory vehicles;
- c) moveable parts of ramp integrated systems,

designed for servicing aircraft and intended to be used under the conditions given in EN 1915-1:2013, Clause 1.

No extra requirements on noise and vibration are provided other than those in EN 1915-3 and EN 1915-4.

NOTE EN 1915-3 and EN 1915-4 provide the general GSE vibration and noise requirements.

This part of EN 12312 is not applicable to lavatory service equipment which is 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 lavatory service equipment.

## 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 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, *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 12312-8, *Aircraft ground support equipment — Specific requirements — Part 8: Maintenance stairs and platforms*

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)*

ISO 17775, *Aircraft — Ground-service connections — Potable water, toilet-flush water and toilet drain*

DIN 51130:2014-02, *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 ISO 12100:2010 and EN 1915-1:2013 and the following apply.

#### 3.1

##### **lavatory service equipment**

ground support equipment (GSE) for aircraft toilet servicing

#### 3.2

##### **lavatory vehicle**

self-propelled or towable lavatory service equipment

#### 3.3

##### **waste system**

part of the lavatory service equipment to collect the waste from toilet systems on aircraft

#### 3.4

##### **rinsing system**

part of the lavatory service equipment for flushing and refilling aircraft toilet systems

#### 3.5

##### **open work material**

flooring material for standing areas with openings to allow self-draining and cleaning

#### 3.6

##### **gauge**

measurement device to indicate the degree of filling of a tank

Note 1 to entry: It may provide continuous reading or it may be limited to pre-set positions.

### 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 lavatory service equipment and which require action to eliminate or reduce risks. Not covered are risks and hazards due to the traffic and repair.

### 5 Safety requirements and/or measures

#### 5.1 General requirements

**5.1.1** Lavatory service equipment shall conform to the relevant requirements of EN 1915-1, EN 1915-2, EN 1915-3 and EN 1915-4 unless otherwise specified in this standard. They shall also conform to the specific requirements of this standard.



Machinery shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

**5.1.2** Stability and strength calculations shall be carried out in accordance with EN 1915-2.

**5.1.3** The flushing/rinsing and drainage connections to the aircraft systems shall meet the respective requirements of ISO 17775.

**5.1.4** Where the lavatory service equipment is intended to be moved on public roadways, the dimensions, laden mass and other characteristics shall meet all applicable governmental regulations.

NOTE Applicable governmental regulations are dependent on the airport of use.

**5.1.5** The ground clearance shall allow without interference the transversing of two surfaces intersecting at an angle of  $\pm 3^\circ$  (5 %) either in bridging or cresting.

**5.1.6** The height of the lavatory vehicle shall allow the servicing of aircraft as intended by the manufacturer (see 6.4).

Parts of lavatory vehicles intended to be driven underneath the aircraft should not be more than 1,60 m (63 in) above the ground (see EN 1915-1:2013, Introduction, f) — negotiation).

**5.1.7** All parts of the waste and rinsing system shall be made of non-corrosive material.

**5.1.8** Self-propelled lavatory vehicles shall be equipped with driver accommodation.

**5.1.9** A working light shall be provided, e.g. for connection of hoses to the aircraft during night operations. The design and installation of the light shall conform to EN 1837. The minimum luminous flux of the lamp shall be 250 lm.

**5.1.10** Filling and emptying the tanks of the lavatory vehicle should where possible be performed from the ground level without climbing upon the vehicle. Any hose connection, the dump valve and controls shall be accessible from the ground level. Any gauge shall be readable from the ground level and preferably implanted on the same side as the driver accommodation.

Where climbing upon the vehicle is necessary, guard-rails shall be installed in accordance with EN 1915-1:2013, 5.13.2.

**5.1.11** Specific attention shall be paid to equipment such as traps, hoses, connectors as well as materials and slopes in order to allow easy cleaning with running water and avoid any area where liquids or solid waste can stagnate.

Any material used for the driver accommodation (e.g. seat covers) shall be washable by wiping.

**5.1.12** The lavatory service equipment shall be fitted with two distinct and separate compartments for respectively clean and dirty personal equipment such as gloves. It shall be equipped with means for washing/disinfecting hands (e.g. provision of an identified location for disinfecting tissues) including a closed bin to collect waste paper.

**5.1.13** The operator's workplace shall have a durable slip-resistant floor surface, with a minimum R11 slip-resistance classification.

Slip resistance classification shall be measured in accordance with DIN 51130:2014-02, Table 3.



## 5.2 Tanks

### 5.2.1 General

**5.2.1.1** The lavatory vehicle shall have separate waste-collection and rinse water tanks.

Separate tanks for disinfectant fluid can be installed.

**5.2.1.2** For easy cleaning, tanks shall have the following features:

- a) all inside fittings, welds, joints and rivets shall have a smooth finish;
- b) cylindrical tank ends shall have a convex shape.

**5.2.1.3** Baffles shall be installed inside the tank, if the capacity is over 1 000 l to prevent surge of load while the lavatory vehicle is driven.

**5.2.1.4** Tanks shall have at least one inspection hole with a minimum diameter of 400 mm (16 in) in the upper region to facilitate cleaning and inspection.

**5.2.1.5** Tanks shall be fitted with static ventilating means, e.g. a venting outlet on top of the tank.

**5.2.1.6** Tanks shall be securely fitted to the chassis of the lavatory service vehicle. Relative movement and torsion forces between tank and chassis shall be reduced to a minimum.

### 5.2.2 Waste tanks

**5.2.2.1** A dump valve of at least 100 mm (4 in) diameter shall be fitted to the lowest point of the tank.

**5.2.2.2** The control of the dump valve shall be easily accessible and positioned to protect the operator from being splashed with effluent when emptying the tank.

The tanks shall be equipped with a level gauge, easily readable from the workplace.

**5.2.2.3** The dump valve control in the closed position shall not protrude beyond the overall width of the lavatory vehicle.

**5.2.2.4** The tank shall be equipped for internal cleaning and flushing.

Internal baffles of the tanks shall not restrain drainage of waste nor rinsing water.

**5.2.2.5** All corners inside the tank shall have a radius of at least 25 mm (1 in).

**5.2.2.6** The bottom of the tank shall have a minimum slope of 2° towards the drain point.

**5.2.2.7** A dedicated and adequate place shall be designed to store the waste hoses, when not in operation.

Specific means shall be fitted to receive the end of the waste hose and to drain the remaining waste water directly into the waste tank, without spoiling the storage area.

### 5.2.3 Rinse tanks

**5.2.3.1** The tank shall be equipped with a drain plug, a filler cap, and a level gauge easily readable from the working position.



**5.2.3.2** All corners inside the tank shall have a radius of at least 10 mm (0,4 in).

**5.2.3.3** The bottom of the tank shall have a minimum slope of 1° towards the drain point.

### **5.3 Waste hoses**

Waste hoses shall:

- a) be flexible;
- b) be non-collapsible for vacuum systems;
- c) have an inside diameter of at least 100 mm (4 in);
- d) enable servicing of the intended aircraft (see EN 1915-1:2013, Introduction, f) — negotiation) and shall be equipped with a coupler meeting the requirements of ISO 17775 at the delivery end.

Unless provided as part of the coupler, ergonomic handles shall be fitted at the hose end. They shall be designed to be operated by gloved hands.

### **5.4 Rinsing system components**

**5.4.1** Where the pump is driven by a power take-off, it shall not be possible to operate the pump unless the vehicle's transmission is in neutral or park position and vice versa. The corresponding safety circuit shall achieve Performance Level “a” according to EN ISO 13849-1:2015.

**5.4.2** A valve and filter shall be installed between tank and pump.

**5.4.3** There shall be a relief valve to allow the pressure to be regulated according to the requirements of different aircraft types. The valve shall be easily adjustable, e.g. without using tools.

A pressure gauge easily readable and the means of adjustment of the pressure relief device shall be provided at the workplace.

**NOTE** The pressure range on commonly encountered civil transport aircraft is 1,5 bar to 3,5 bar.

**5.4.4** Control devices shall be provided to allow the pump to be operated from the ground and, where fitted, from the work platform.

**5.4.5** A meter, equipped with a zero reset, shall be provided to indicate the amount of rinsing water delivered to the aircraft.

**5.4.6** Rinse water hoses shall:

- a) be flexible and non-collapsible;
- b) have an inside diameter of at least 25 mm (1 in);
- c) enable servicing of the intended aircraft (see EN 1915-1:2013, Introduction, f) — negotiation) and shall be equipped with a coupler meeting the requirements of ISO 17775 at the delivery end.

## 5.5 Workplaces

**5.5.1** Fixed or vertically moving lifting/work platforms shall be provided on the lavatory vehicle. This is not applicable for vehicles where it is possible to reach the service connections from ground level (see EN 1915-1:2013, Introduction, f) — negotiation and 6.4). Moving lifting/work platforms shall comply with the applicable requirements of EN 12312-8.

Where there is a risk of falling from a height greater than 1 m, fixed guard-rails shall be installed in accordance with EN 1915-1:2013, 5.13.2.3.

Access to the lifting/work platforms shall comply with EN 1915-1:2013, 5.14.

**5.5.2** The minimum load capacity of work platforms shall be 200 kg (441 lb).

**5.5.3** The floor of work platforms shall be constructed of open-work material.

**5.5.4** Control devices for raising and lowering of the platform and for filling shall be reachable from the platform.

**5.5.5** Storage locations for the hoses shall be installed close to the workplace, e.g. control device.

NOTE 1 Self-rewinding or powered reel for hoses can be installed.

NOTE 2 An interlock can be installed to prevent the vehicle from being moved when hose couplings are not in stowed position.

**5.5.6** On lavatory vehicles with lifting/work platform hoses shall be located to prevent risk of hose damage caused by the movement of the platform.

**5.5.7** For lifting/work platforms an emergency lowering system with controls accessible from ground level shall be fitted, e.g. manually operated pump, manually activated valve.

**5.5.8** An interlock shall be fitted to prevent the lavatory vehicle from being moved with the lifting/work platform in an elevated position. The corresponding safety circuit shall achieve Performance Level “b” according to EN ISO 13849-1:2015.

## 6 Information for use

### 6.1 Marking

Permanent marking of data shall consist of metal plates securely attached (e.g. riveted, welded) to the structure.

Markings shall include at least those markings required by EN 1915-1 and the additional markings in 6.2.

### 6.2 Additional marking

In addition to the name-plate and markings specified in EN 1915-1:2013, 6.1, the following shall be marked on the lavatory service equipment:

— The tank capacities of lavatory vehicles shall be marked legibly and permanently.



### 6.3 Warnings

The following warning shall be affixed permanently at a prominent position of lavatory vehicles with lifting/work platform:

— “Keep clear of moving parts”.

### 6.4 Instructions

Operating and maintenance instructions shall be supplied with each lavatory service equipment. They shall generally meet the requirements of EN 1915-1:2013, 6.2. In addition, the operating and maintenance instructions shall contain, depending on the design of the lavatory service equipment, information about:

- a) types of aircraft to be served;
- b) type of disinfectant fluid intended to be used;
- c) measures to be taken in case of emergency situations or breakdown;
- d) routine checks to be carried out by the operator;
- e) minimum training programme for the operator;
- f) jacking points and transport means;
- g) types of hose to be used in hydraulic systems;
- h) types of hoses to be used in the waste and rinsing system;
- i) lifting range of work platform;
- j) tank capacities;
- k) type of pump;
- l) cleaning/disinfection means;
- m) cleaning, disinfection and inspection frequency of tanks and water system with regard to environmental conditions;
- n) intended positioning towards the types of aircraft to be served;
- o) intended use of platform;
- p) safety requirements for the maintenance resulting from the specific design;
- q) noise declaration established in accordance with EN 1915-4..

## 7 Verification of requirements

The verification of requirements shall be carried out generally in accordance with EN 1915-1:2013, Clause 7. See also details for verification in EN 1915-3 as relevant and EN 1915-4.

The following shall be verified as indicated:

- a) ground clearance during movement (see 5.1.5) by function test;
- b) tanks (see 5.2.3 and 5.2.4) by inspection, measurement and function test;
- c) pump drive (see 5.4.1) by inspection and function test;
- d) controls (see 5.4.4) by inspection and function test;
- e) emergency lowering system (see 5.5.7) by inspection and function test;
- f) interlock (see 5.4.1 and 5.5.8) by inspection and function test;
- g) brakes, steering, guard-rails, warning devices, lifting systems, speeds (see EN 1915-1).



## Annex A (normative)

### List of hazards

**Table A.1 — List of hazards**

No	Hazards identified in EN ISO 12100:2010, Annex B and Table B.1	Hazardous situations	Relevant clauses in EN 12312-13
1	<b>Mechanical hazards</b>		
	General mechanical hazards	Unbalance due to energy of moving elements (dynamic forces)	5.1.2, 5.1.4, 5.2.1.3
		Structural failure due to insufficient mechanical strength	5.1.2, 5.2.1.6, 5.5.2
		Structure falling due to lifting chains failure Structure falling due to lifting wire ropes failure Liquids and gases under pressure Structural failure due to snow load	5.1.2
		Vehicle tilting or overturn and instability due to insufficient load security securing	5.2.1.3
		Being run over due to machinery mobility	5.4.1, 5.5.8
	Being thrown	Driver thrown or injured due to unintended sudden deceleration because of insufficient ground clearance	5.1.5
		Driver thrown or injured due to unintended sudden stop because of collision with parts of the aircraft	5.1.6
		Driver thrown or injured due to unintended sudden movement of the equipment because of insufficient load security securing	5.2.1.3
	Crushing or shearing	Crushing between fixed elements of the equipment and parts of the aircraft due to unintended driving movement of the equipment with raised lifting/work platform	5.5.8
	Impact	Hit by parts of the waste hose system due to inadequate couplings	5.1.3, 5.3, 5.4.6
		Hit by parts of the rinsing system, due to pressurizing parts of	5.4.3
		Hit by parts of the tank, e.g. covers of openings, due to pressurizing of the tank	5.2.1.5
	Slipping or tripping	Slipping due to slippery walkway or standing position surface or accumulation of water or waste	5.1.11, 5.1.13, 5.5.3

No	Hazards identified in EN ISO 12100:2010, Annex B and Table B.1	Hazardous situations	Relevant clauses in EN 12312-13
		Tripping due to unintended movements of the equipment	5.5.8
	Falling from height	Falling from height due to absence or insufficient guard-rails	5.1.10, 5.5.1
		Falling from height as a result of unintended use due to inadequate height or range for lifting the lifting/work platform	5.5.1
<b>2</b>	<b>Electrical hazards</b>		
	Burn, electrocution from arc or live parts	Contact of persons with live parts (direct or indirect contact)	5.1.1
<b>3</b>	<b>Hazards generated by noise</b>		
	Loss of hearing, loss of awareness, accidents	Deafness, physiological disorders (e.g. loss of balance, loss of awareness), accidents due to interference with communication and to non-perception of auditory warning signals	5.1.1
<b>4</b>	<b>Hazards generated by vibration</b>		
	Neurological or osteo-articular disorder	Whole body vibration, particularly when combined with poor postures	5.1.1
<b>5</b>	<b>Hazards generated by materials or substances</b>		
	Contact with harmful substances	Contamination by harmful substances, due to inadequate design of tanks and/or systems intended for waste, rinsing and delivery	5.1.7, 5.1.11, 5.2.1.1, 5.2.1.2, 5.2.2.1, 5.2.2.2, 5.2.2.4, 5.2.2.5, 5.2.2.6, 5.2.2.7, 5.2.3.1, 5.2.3.2, 5.2.3.3, 5.4.2, 5.5.6
		Contamination by harmful substances, due to inadequate or missing equipment components as compartments, sanitation, waste chutes and driver's accommodation	5.1.12, 5.2.2.7,
	Water splash impact	Operator hit, drenched or blinded by sudden water splash due to rinsing water overflow resulting from excess amount pumped into the aircraft	5.4.5
<b>6</b>	<b>Ergonomic hazards</b>		
	Discomfort, musculo-skeletal disorder	Unhealthy postures or excessive effort	5.1.10, 5.2.1.4, 5.2.2.2, 5.3, 5.4.4, 5.4.6, 5.5.5, 5.5.7
	Consequences of human error	Inadequate design, location or identification of manual controls	5.4.4, 5.5.4, 5.5.7



No	Hazards identified in EN ISO 12100:2010, Annex B and Table B.1	Hazardous situations	Relevant clauses in EN 12312-13
		Misunderstanding of safety signs or markings	6.3
		Misunderstanding of manufacturer's instructions	6.4
	Visual fatigue	Inadequate local lighting	5.1.9
7	<b>Hazards associated with the operating environment</b>		
	Injury due to collision of vehicles	Hazards to driver and/or operator from collision with other equipment, parts of aircraft or objects/buildings	5.1.4, 5.1.8, 5.1.6, 5.2.1.3, 5.2.1.6, 5.2.2.3, 5.5.8
	Adverse health effects	Inadequate or missing driver's accommodation	5.1.8
8	<b>Combination of hazards</b>		
	Injury due to failure of a safety system	Hazards resulting from simultaneous hazardous situation and relevant safety system dysfunction or failure	5.4.1, 5.5.1, 5.5.8
	Injuries or distressing situation due to lifting equipment	Persons stuck up in the raised lifting/work platform in an emergency situation due to lifting system failure	5.5.7
		Multiple hazards from unintended powered movements	5.5.8
	Hazards due to misuse	Miscellaneous hazards from exceeding vehicle's rated capabilities	6.2

## Annex ZA (informative)

### Relationship between this European standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered

This European standard has been prepared under a Commission's standardization request "M/396" to provide one voluntary means of conforming to essential requirements of EU Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZA.1 — Correspondence between this European standard and EU Directive 2006/42/EC**

Essential Requirements of EU Directive 2006/42/EC	Clause(s)/subclause(s) of this EN	Remarks/Notes
all requirements covered	all clauses	

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## Bibliography

This bibliography contains additional references for lavatory service equipment from regulations, publications, standards or draft standards.

- [1] EN ISO 3411, *Earth-moving machinery - Physical dimensions of operators and minimum operator space envelope (ISO 3411)*

— **International standards:**

- [2] ISO 9666, *Aircraft — Self-propelled lavatory-servicing vehicle — Functional requirements*

— **International Air Transport Association (IATA), Airport Handling Manual (AHM), Section 9<sup>1)</sup>:**

- [3] AHM 971, *Functional specification for a self-propelled lavatory vehicle*
- [4] AHM 978, *Functional specification for a towed lavatory service cart for commuter type aircraft*

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1) Publications Assistant, International Air Transport Association, 800 Place Victoria, P.O. Box 113, Montreal, Quebec, Canada, H4Z 1M1.





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