



**SLOVENSKI STANDARD**  
**SIST EN 12312-3:2004**

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**Aircraft ground support equipment - Specific requirements - Part 3: Conveyor belt vehicles**

Aircraft ground support equipment - Specific requirements - Part 3: Conveyor belt vehicles

Luffahrt-Bodengeräte - Besondere Anforderungen - Teil 3: Förderbandwagen  
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Matériel au sol pour aéronefs - Exigences particulières - Partie 3 : Convoyeurs a bande

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English version

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## Foreword

This document EN 12312-3:2003 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of an identical text or by endorsement, at the latest by November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

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 EC Directive(s).

For relationship with EC Directive(s), see informative annex ZA, which is an integral part of this document.

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

Annexes A, C, D, E and F are informative. Annex B is normative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

This European Standard specifies health and safety requirements, as well as some functional and performance requirements, for conveyor belt vehicles intended for loading/unloading of individual items of baggage or cargo for 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 conveyor belt vehicles. 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 European Standard is a Type C standard as stated in EN 1070:1998.

## 1 Scope

This European Standard specifies the technical requirements to minimise the hazards listed in clause 4 which can arise during the commissioning, operation and maintenance of conveyor belt vehicles 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 standard applies to:

- self-propelled conveyor belt vehicles with or without driver's accommodation;
- self-propelled conveyor belt vehicles equipped with a van body;
- towed conveyor belt vehicles,

Intended to be used for manual loading/unloading of aircraft.

Examples of typical designs of conveyor belt vehicles are given in annex A.

This standard does not apply to pneumatic systems and to cableless remote controls.

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

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

## 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 industrial trucks — Electrical requirements — Part 1: General requirements for battery powered trucks*.

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*.

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070:1998 and EN 1915-1:2001 together with the following apply.

#### 3.1

##### **conveyor belt vehicle**

vehicle comprising a chassis, a boom with a belt, and a lifting device

#### 3.2

##### **boom**

load carrying assembly which includes a belt to move the load and any possible tray

#### 3.3

##### **telescopic boom**

load carrying assembly, adjustable in length

#### 3.4

##### **lifting device**

system to vary the height of the boom

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#### 3.5

##### **incline**

angle of the boom to a horizontal plane

#### 3.6

##### **guide rail**

lateral device attached to the boom to prevent loads from falling off the sides

#### 3.7

##### **tray**

loading platform fitted at either end of the boom and independent of the belt

#### 3.8

##### **contact protection system**

device at the end of the boom to disconnect the power source during approach/travel to the aircraft

## 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 conveyor belt vehicles 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.

## 5 Safety requirements and/or measures

### 5.1 General requirements

5.1.1 Self-propelled vehicles with a driver's accommodation shall be fitted with restraint straps.

5.1.2 Conveyor belt vehicles shall conform to the relevant requirements of EN 1915-1:2001, unless otherwise specified in this standard. They shall also conform to the specific requirements of this standard.

5.1.3 Strength calculations shall be carried out in accordance with EN 1915-2:2001.

5.1.4 Stability calculations shall be carried out according to EN 1915-2:2001. Special attention shall be paid to travel conditions.

5.1.5 The electrical system of battery powered conveyor belt vehicles shall conform to EN 1175-1:1998, with the exception of standard automotive chassis.

5.1.6 The boom shall protrude front and rear.

NOTE Therefore the overall length of the conveyor belt vehicle is defined by the overall boom length.

5.1.7 The conveyor belt vehicle shall be capable of servicing any aircraft sill height, for which it is designed, with the opposite end not higher than 760 mm from the intended loading level(s).

5.1.8 Where adjustment of elevation of both ends of the boom is provided it shall be possible to adjust the ends independent from each other.

5.1.9 It shall be possible to gain access to servicing points, e.g. dipstick, fluid replenishment points, without operating the power source; even with the boom in the lowest position.

5.1.10 All sharp edges or corners resulting from the manufacturing process shall be chamfered or rounded with a minimum radius of 1 mm.

5.1.11 Where a sprung front axle is used, the suspension shall be restricted so as to limit vertical movement at the front end of the boom, when the conveyor belt vehicle is being driven, e.g. by using shock absorbers.

5.1.12 Where power operated stabilizers are provided, it shall be possible to retract the stabilizers in the event of primary power loss by auxiliary means, e.g. hand pump.

5.1.13 Structural parts or stabilizers of pedestrian controlled self-propelled conveyor belt vehicles shall not protrude from the overall length within the operating range of the tiller.

5.1.14 Where lights for the illumination of working areas are fitted, their design shall conform to EN 1837:1999. The minimum electrical power of the lamp shall be 25 W.

5.1.15 Self-propelled vehicles with driver's cabin shall have an alternative means of exit in the event of an emergency.



## 5.2 Boom design

**5.2.1** The design of the boom, where intended, shall be such that it can be used by the operator as a ramp to gain access to the hold door and safely open or close it, enter the hold or exit from it (see clause 0 of EN 1915-1:2001 — negotiation).

NOTE Requirements for railings see 5.3.1 to 5.3.6.

**5.2.2** Steps shall be provided for access to the belt surface.

**5.2.3** The boom shall be connected to the lifting system by means of a positive-fit to prevent any disconnection.

**5.2.4** The lifting device of the boom shall be protected against unintentional movement by means of a positive-fit safeguard, e.g. on hydraulic cylinders by a lock-valve mounted directly to the cylinder.

**5.2.5** Hazards of being caught or trapped by the running belt shall be avoided by construction.

NOTE Possible solutions for safeguarding of hazardous areas are given in annex D.

**5.2.6** Where a tray is mounted at either end of the boom, protection against trapping of limbs between the tray and the running belt shall be given by construction (see annex E.2 and annex E.3) or by safety distances (see annex E.1 and annex F).

**5.2.7** Where the conveyor belt vehicle is equipped with driver's accommodation, protection against crushing and shearing between the boom and fixed parts in the vicinity shall be provided, e.g. by shielding with protective plates.

**5.2.8** The front end of the boom shall be protected by suitable means, e.g. cylindrical fender or side wheels. If the rear end of the boom is to be used adjacent to the aircraft door, this part shall also be protected.

**5.2.9** Where a contact protection system at the end(s) of the boom is installed, it shall stop the movement of the conveyor belt vehicle in the direction of travel.

**5.2.10** The minimum belt width shall be 600 mm. The belt shall be vulcanised and where other linking means are used, care shall be taken to avoid protruding parts or gaps.

**5.2.11** The belt shall have an anti-slip surface and shall be designed to provide for drainage of water.

**5.2.12** The belt shall be supported by rollers and/or other devices to allow safe conveyance of load(s) and for safe walking purposes preferably by plates.

**5.2.13** The friction between drive drum and belt shall be sufficient to exclude slipping under maximum payload.

NOTE The influence of weather conditions to be expected on the airport of use should be taken into account (see clause 0 of EN 1915-1:2001 — negotiation).

**5.2.14** A belt tensioning system covering the foreseeable elongation of the belt shall be installed. The adjustment shall be possible without dismantling of parts or use of special tools.

**5.2.15** The belt drive system shall include a safety device which operates whenever the motive power is cut off or fails, to prevent a loaded belt from free running due to the potential energy of the load.

### 5.3 Railings, guide rails

**5.3.1** A railing shall be installed on each long side of the boom where the maximum intended height from ground level to the belt surface exceeds 1 m. One or both of the railings may be foldable or retractable. Foldable or retractable railings shall retract below the belt surface and shall be automatically secured in the protecting position by a positive-fit safeguard.

NOTE Railings and guide rails can be lowered or folded outwards for operational reasons.

**5.3.2** The total height of railings shall not be less than 850 mm measured at a right angle to the working surface on the boom.

NOTE On some aircraft types, the height of 850 mm can hinder correct positioning of the conveyor belt vehicle which can cause damage to the aircraft. Therefore parts of the railings can be constructed as foldable or retractable safeguards.

**5.3.3** Railings shall be adjustable to the fuselage of the aircraft. Telescopic parts shall be secured against movement by means of a friction-fit safeguard resistant to a force of at least 200 N. The friction-fit safeguard shall be releasable easily without hazard of squeezing or pinching. It shall be possible to release the safeguard with gloved hands.

**5.3.4** Where weather protection with a canopy and a sliding roof is installed over the boom it shall not interfere with moveable parts of the railings.

**5.3.5** The leading edge of railings shall be adequately padded to avoid damage to the aircraft fuselage.

**5.3.6** Lateral guide rails with a minimum height of 100 mm above the belt surface shall be installed on each long side of the boom.

NOTE Guide rails can be combined with railings and thus replace the kick plate.

**5.3.7** The internal surface of guide rails shall be smooth.

**5.3.8** The minimum width between the guide rails shall be 700 mm.

**5.3.9** Guide rails shall be shorter than the conveyor and provide lateral access of 1,2 m maximum at the aircraft side and of 1,5 m maximum at the ramp side of the conveyor.

### 5.4 Performance (loads and speeds)

**5.4.1** For the structural design and calculations of the complete conveyor belt vehicle, excluding belt drive power, the following loads are to be considered:

- a minimum load of 1 324 N (135 kgf) on each metre length of the conveyor, evenly distributed;
- a minimum single load of 3 924 N (400 kgf) on a base area of 0,6 × 0,8 m;

at the most unfavourable position.

NOTE These loads may not apply in the case of specialized light duty conveyors for light weight commodities such as flower boxes or mail (see clause 0 of EN 1915-1:2001 — negotiation).

**5.4.2** The maximum driving speed of a self-propelled conveyor belt vehicle with driver accommodation shall not exceed 40 km/h.

**5.4.3** The belt speed shall not exceed 0,3 m/s and shall be adjustable at least between 50 % and 100 % of the nominal speed to suit loading conditions.

NOTE Higher belt speeds can be stipulated for special purposes (see clause 0 of EN 1915-1:2001 — negotiation).

**5.4.4** The maximum sag at any point of the load surface of the belt shall not exceed 20 mm under loaded conditions of 5.2.2.3 of EN 1915-2:2001 (see also 5.2.12).

## 5.5 Controls

- 5.5.1** Control device actuators shall be protected against activation or damage from falling items of load, e.g. by position, solid guarding.
- 5.5.2** Simultaneous movement of the conveyor belt vehicle, the boom and/or the belt shall not be possible.
- 5.5.3** On self-propelled conveyor belt vehicles with driver accommodation any changes of length or angle of the boom shall be controlled from the driver accommodation only.
- 5.5.4** On towable or pedestrian controlled self-propelled conveyor belt vehicles, the position for the control of boom height and length shall be located in an optimum position to allow full visibility of both ends of the boom.
- 5.5.5** The belt controls (forwards-stop-reverse) need not be of the hold-to run type and shall be installed at the usual working positions of the operator(s).
- 5.5.6** The stop devices of the belt control shall override the control selection at all other working positions.
- 5.5.7** Where a remote control with cable linkage for the belt drive on the aircraft side of the boom is provided, it shall fulfil the requirements in 5.5.5 and 5.5.6.
- 5.5.8** Emergency stops shall be installed at both extreme ends of the boom. They shall meet the requirements in EN 418:1992 category 0 (see 4.1.5 of EN 418:1992).
- 5.5.9** Where a remote control is provided, it shall include an emergency stop meeting the requirements in 5.5.8.
- 5.5.10** Emergency stops shall stop all equipment functions including the power source.
- 5.5.11** It shall be possible to lower the boom with an emergency stop activated.

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## 6 Information for use

### 6.1 Marking

Permanent marking of data shall consist of metal plates fixed with rivets or welded to the structure.

In addition to the name-plate the following shall be marked:

- permissible total payload evenly distributed on the boom at maximum and minimum incline angle;
- maximum single load on the boom.

### 6.2 Warnings

The following warnings shall be affixed permanently at prominent positions:

- Keep clear from moving parts;
- Do not use the belt as a walkway when the belt is in motion;
- Keep clear from unpropped boom during maintenance;
- Attention! Falling loads!