

**Õhusõidukite maapealsed  
teenindusseadmed. Üldnõuded. Osa 3:  
Vibratsiooni mõõtmise meetodid ja  
vähendamine**

Aircraft ground support equipment - General  
requirements - Part 3: Vibration measurement  
methods and reduction

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1915-3:2004 sisaldab Euroopa standardi EN 1915-3:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 21.12.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1915-3:2004 consists of the English text of the European standard EN 1915-3:2004.</p> <p>This document is endorsed on 21.12.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This Part of EN 1915 deals with vibration reduction as a safety requirement. It also specifies the methods for determining the vibration emission transmitted to the whole body of drivers standing and/or seated on freely moveable GSE, when driving for purposes of type evaluation, declaration and methods of verifying vibration emission.</p>	<p><b>Scope:</b> This Part of EN 1915 deals with vibration reduction as a safety requirement. It also specifies the methods for determining the vibration emission transmitted to the whole body of drivers standing and/or seated on freely moveable GSE, when driving for purposes of type evaluation, declaration and methods of verifying vibration emission.</p>
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**ICS** 17.160, 49.100

**Võtmesõnad:** materials handling, meth, methods of calculation, safety, safety requirements, space transport, specification (approval), specifications, strength of materials, testing, user information, vibration, vibration damping, vibration pick-ups, vibration resistance tests

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ICS 17.160; 49.100

English version

## Aircraft ground support equipment - General requirements - Part 3: Vibration measurement methods and reduction

Matériel au sol pour aéronefs - Exigences générales -  
Partie 3 : Vibrations, réduction et méthodes de mesure

Luftfahrtbodengeräte - Allgemeine Anforderungen - Teil 3:  
Schwingungsmessverfahren und -minderung

This European Standard was approved by CEN on 12 August 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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## Foreword

This document (EN 1915-3:2004) 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 April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

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 Directives, see informative Annex ZA, which is an integral part of this document.

EN 1915 "Aircraft ground support equipment — General requirements" consists of:

- Part 1: Basic safety requirements
- Part 2: Stability and strength requirements, calculations and test methods
- Part 3: Vibration measurement methods and reduction
- Part 4: Noise measurement methods and reduction

This is the first edition of this part of EN 1915.

A further European Standard (EN 12312) in several parts covering specific requirements for different aircraft ground support equipment is in preparation.

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

## Introduction

The aim of this European Standard is to deal with vibration as a hazard and to provide methods for the measurement and reduction of vibration emission transmitted to the whole body of drivers of GSE, when driving. For determining whole body vibrations under stationary operating conditions and hand-arm vibrations EN 1032:2003 is used.

It is intended that the results obtained can also be used to compare GSE of the same category or a given GSE when equipped with different seats or tyres, etc.

Fitting different seats, changing the tyre specification, etc. can lead to different vibration values. Due to the specific operation of GSE, however, EN 1032:2003 cannot be applied directly for whole body vibration under driving conditions, and therefore, the preparation of this European Standard for GSE has become necessary.

This European Standard cannot be used for field measurements to determine the daily exposure of the driver to vibration.

This European Standard is a Type C standard as stated in EN 1070:1998.

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.

## 1 Scope

This European Standard deals with vibration reduction as a safety requirement. It also specifies the methods for determining the vibration emission transmitted to the whole body of drivers standing and/or seated on freely moveable GSE, when driving for purposes of type evaluation, declaration and methods of verifying vibration emission.

The test results are not applicable to the determination of whole body vibration exposure of persons.

## 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.

EN 1032:2003, *Mechanical vibration — Testing of mobile machinery in order to determine the vibration emission value.*

EN 1070:1998, *Safety of machinery — Terminology.*

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

EN 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values.*

ISO 2041:1990, *Vibration and shock — Vocabulary.*

ISO 5805:1997, *Mechanical vibration and shock — Human exposure — Vocabulary.*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070:1998, EN 1915-1:2001, ISO 2041:1990 and ISO 5805:1997 and the following apply.

### 3.1

#### wheel diameter

arithmetic mean of each of the outside diameters of the load bearing wheels e.g.: if the first wheel of the GSE has the diameter  $D_1$ , the second wheel diameter  $D_2$  etc., the wheel mean diameter equals

$$\frac{D_1 + D_2 + \dots + D_n}{n}$$

where  $n$  is the total number of wheels

NOTE The outside diameter  $D$ , is the maximum in service diameter specified by the tyre's manufacturer.

### 3.2

#### seat pan

seat surface on which the driver is seated