

Ehitusmasinad. Sisemise elektrivarustusega masinate elektromagnetiline ühilduvus

Construction machinery - Electromagenetic compatibility of machines with internal electrical power supply

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 13309:2010 sisaldab Euroopa standardi EN 13309:2010 ingliskeelset teksti.

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English Version

**Construction machinery - Electromagnetic compatibility of
machines with internal power supply**

Machines de génie civil - Compatibilité électromagnétique
des machines équipées de réseau électrique de distribution
interne

Baumaschinen - Elektromagnetische Verträglichkeit von
Maschinen mit internem elektrischen Bordnetz

This European Standard was approved by CEN on 19 June 2010.

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Foreword

This document (EN 13309:2010) has been prepared by Technical Committee CEN/TC 151 "Construction equipment and building material machines - Safety", 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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

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 Directive(s), see informative Annex ZA, which is an integral part of this document.

This document supersedes EN 13309:2000.

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, Croatia, 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 the United Kingdom.

Introduction

With the use of more electronic devices in areas where construction machinery operates, there is a need to ensure that construction machinery is provided with adequate immunity to external electromagnetic fields. As more construction machinery is fitted with electrical and electronic devices, it is necessary to ensure that the emissions of electromagnetic fields from the construction machinery meet acceptable limits.

Electrical and high frequency disturbances emerge during the normal operation of many parts of the construction machinery devices and systems. They are generated within a large frequency range with different electrical characteristics and, by conduction and/or radiation, can be imparted to other electrical/electronic devices and systems of the construction machinery. Narrowband signals generated by sources of interference inside or outside the construction machinery can also be coupled in electrical/electronic systems whereby they can influence the normal function of electrical/electronic devices.

Electrostatic discharges are relevant to construction machinery because control elements can be positioned outside the operator's station and potential differences can emerge at contact points. Conducted transients in power supply wiring have to be taken into account because construction machinery often represents open systems and several devices and/or components of construction equipment are combined with one another.

While there are many existing standards for a variety of products and systems, the test method presented in this European Standard provides for the specific test conditions of construction machinery and the "electrical/electronic sub-assemblies or separate technical units" of construction machinery. The test method recognises that because of the size and usage of construction machinery, the arrangement of the construction machinery in the test facility needs to be responsive to the operating characteristics of these types of construction machinery. This European Standard provides test methods and criteria which are acceptable for construction machinery considering the unique characteristics and operating parameters of construction machinery.

Because construction machinery has a number of systems that consist of components that may be used on a number of different construction machinery the approach of defining "electrical/electronic sub-assemblies or separate technical units" for these components is applied for the immunity and emissions test methods. This allows these components to be evaluated by the test method in existing laboratory facilities consisting of specially equipped shielded rooms. When electrical/electronic sub-assembly tests are conducted, it is necessary to consider the effects of the wiring systems used to connect the sub-assemblies into the construction machinery. The tests can also be conducted on the construction machinery.

1 Scope

This European Standard provides test methods and acceptance criteria for the evaluation of the electromagnetic compatibility of construction machinery with respect to free trade of goods in the European Union. It deals with functional EMC requirements under typical EMC environmental conditions.

This European Standard does not deal with safety requirements.

Electrical and/or electronic component(s) or separate technical unit(s) intended to be fitted in construction machinery are also dealt with in this European Standard. The following electromagnetic disturbance phenomena are evaluated:

- broadband and narrowband electromagnetic interference;
- electromagnetic field immunity test;
- broadband and narrowband interference of electrical/electronic sub-assemblies;
- electromagnetic field immunity test of electrical/electronic sub-assemblies;
- electrostatic discharge;
- conducted transients.

Construction machinery can have DC and/or AC internal electrical power supply systems.

Machines that are designed to be supplied by the "Public Mains Network" are specifically excluded.

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 55016-1-1:2007, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 1-1: Radio disturbance and immunity measuring apparatus — Measuring apparatus (CISPR 16-1-1:2006)*

EN 55025:2008, *Vehicles, boats and internal combustion engines — Radio disturbance characteristics — Limits and methods of measurement for the protection of on-board receivers (CISPR 25:2008)*

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

ISO 7637-1:2002, *Road vehicles — Electrical disturbances from conduction and coupling — Part 1: Definitions and general considerations*

ISO 7637-2:2004, *Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only*

ISO 10605:2008, *Road vehicles — Test methods for electrical disturbances from electrostatic discharge*

ISO 11451-1:2005, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology (including ISO 11451-1:2005/Amd 1:2008)*

ISO 11451-2:2005, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 2: Off-vehicle radiation sources*

ISO 11452-1:2005, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology* (including ISO 11452-1:2005/Amd 1:2008)

ISO 11452-2:2004, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 2: Absorber-lined shielded enclosure*

ISO 11452-3:2001, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 3: Transverse electromagnetic mode (TEM) cell*

ISO 11452-4:2005, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 4: Bulk current injection (BCI)* (including ISO 11452-4:2005/Cor 1:2009)

ISO 11452-5:2002, *Road vehicles — Component test methods for electrical disturbances by narrowband radiated electromagnetic energy — Part 5: Stripline*

CISPR 12:2007+Amd1:2009, *Vehicles, boats and internal combustion engines — Radio disturbance characteristics — Limits and methods of measurement for the protection of off-board receivers*

CISPR 16-1-4:2007+Amd1:2008, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 1-4: Radio disturbance and immunity measuring apparatus — Ancillary equipment — Radiated disturbances*

3 Terms and definitions

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

3.1

internal electrical power supply

is to be understood which is absolutely independent from outside sources (mains supply) and the connection to mains is not intended during operation

3.2

electromagnetic compatibility

EMC

ability of construction machinery or component(s) or separate technical unit(s) to function satisfactorily in its electromagnetic environment, without introducing intolerable electromagnetic disturbances to anything in that environment

NOTE See IEC 60050-161:1990 with amendments 1997 and 1998.

3.3

electromagnetic disturbance

electromagnetic phenomenon which may degrade the performance of construction machinery or component(s) or separate technical unit(s)

NOTE An electromagnetic disturbance can be electromagnetic noise, an unwanted signal or a change in the propagation medium itself (see IEC 60050-161:1990).

3.4

electromagnetic immunity

ability of construction machinery or components(s) or separate technical unit(s) to perform in the presence of specific electromagnetic disturbances without degradation of performance