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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 22359.2-2022

Replacing GB/T 22359-2008, GB/T 22359-2008

**Earth-moving and building construction machinery - Electromagnetic
compatibility(EMC) of machines with internal electrical power supply -
Part 2: Additional EMC requirements for functional safety**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

drafted.

This document is Part 2 of GB/T 22359 "Electromagnetic Compatibility (EMC) of Earth-moving Machinery and Construction Machinery with Built-in Power Supply"

point. GB/T 22359 has released the following parts.

--- Part 1. EMC general requirements under typical electromagnetic environmental conditions;

--- Part 2. EMC additional requirements for functional safety.

This document partially replaces GB/T 22359-2008 "Electromagnetic Compatibility of Earthmoving Machinery". Compared with GB/T 22359-2008, except for the

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

--- Added additional EMC requirements for functional safety (full text).

This document is equivalent to ISO 13766-2:2018 "Electromagnetic Compatibility of Earth-moving Machinery and Construction Machinery with Built-in Power Supply"

(EMC) Part 2. Additional EMC Requirements for Functional Safety.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

GB/T 22359 provides test methods and standards covering the characteristics and operating parameters of the machine, and is intended to consist of two parts.

--- Part 1. EMC general requirements under typical electromagnetic environmental conditions. The purpose is to determine the evaluation of earthmoving machinery and building construction

Test methods and acceptance criteria for mechanical electromagnetic compatibility (EMC).

--- Part 2. EMC additional requirements for functional safety. The purpose is to evaluate electromagnetic compatibility (EMC) for earth-moving machinery and construction

Effects of functional safety of construction machinery controls.

The scope of this document describes the relevant machinery and the extent of the hazard, hazardous situation or hazardous event.

This document is a Type C standard described by ISO 12100:2010. When the requirements of Type C standards are different from those of Type A or Type B standards, for

For machines designed and manufactured in accordance with the requirements of this Class C Standard, the requirements of this Class C Standard take precedence over the requirements of other standards.

With the widespread use of electronic equipment in the working areas of earthmoving machinery and construction machinery, it is necessary to ensure that the machinery has sufficient resistance to electromagnetic disturbances.

noise immunity. As more and more machinery is equipped with electrical and electronic equipment, it is also necessary to ensure that the internal subsystems of the machinery are induced by electromagnetic emissions.

The resulting internal electromagnetic interference (machine interference) is lower than the immunity of the individual subsystems.

The electrical disturbances and high-frequency disturbances described in this document refer to electromagnetic effects due to technical application (artificial effects). These electromagnetic effects are

can often be considered singular and restricted to narrow areas.

Although these mechanical effects cannot be considered universal, their mechanical effects still need to be considered. they have no

In a large frequency range with the same electrical characteristics, it is generated by conduction or radiation, and can be transmitted to other electrical/electronic equipment and systems. Depend on

Narrow-band signals or occasionally wide-band signals generated by sources of internal or external interference in machinery may also couple into electrical/electronic systems and affect

Normal functioning of electrical/electronic equipment.

Electrostatic discharge is mechanically related because control elements can be placed outside the driver's position and potential differences can develop at the contact points.

Machinery may contain open systems that combine multiple devices or components to complete the machine's function, it is necessary to consider conduction in power wiring transient.

This document provides information on the types and levels of known effects. Under the premise that the machine characteristics and operating parameters are fully considered and voluntarily

To carry out the test of the test level acceptable to the machine, the instructive test methods and standards can be obtained from the test data. despite this,

The functionality of these machines is not something that can only be assessed through experimentation. Functional safety assessments regarding EMC phenomena can also be

This is achieved through organizational measures at the site and at the job site.

Machinery has multiple systems, including components that can be used in multiple machine types. ESA specified in this document or ESA separated from machinery

The test methods are suitable for measuring the immunity and radiation of these components and make these components available in existing laboratory facilities (including specially equipped

prepared shielded room) for evaluation. When testing electrical/electronic subassemblies, it is necessary to consider the

any additional effects. These tests can also be performed mechanically.

Programmable electronic system (PES) as defined in ISO 13849-1:2015, intended for use in ISO 15998:2008 with pre-

Safety-related components (SRP/CS) of the control system for the intended functional measures. If a function becomes dangerous when disturbed, sometimes

The manufacturer of the PES does not know, as it depends on the intended application in the safety-related system of the entire machine. Therefore, it is necessary to

This document conducts tests to demonstrate the application of PES in safety-related systems.

Earthmoving Machinery and Construction Machinery

Electromagnetic Compatibility (EMC) of Machines with Built-in Power Supply

Part 2. EMC additional requirements for functional safety

1 Scope

This document specifies the evaluation of earth-moving machinery as defined in GB/T 8498-2017 and the following construction facilities as defined in ISO /T R12603.2010

Test methods and acceptance criteria for electromagnetic compatibility (EMC) of industrial machinery.

---Drilling and foundation construction equipment;

---Concrete and mortar preparation, conveying, tamping equipment and steel bar processing equipment;

---Road construction and maintenance machinery and equipment.

This document deals with electromagnetic compatibility related to the functional safety of mechanical, electrical/electronic devices (ESA) and mechanically separated ESA components

(EMC) requirements.

This document is only applicable to the control system safety-related components (SRP/CS) defined in GB/T 16855.1-2018, which use electrical/

The electronic device meets the design requirements that are greater than or equal to the safety performance level PL specified in GB/T 16855.1-2018. It also involves

Electrical/Electronic Apparatus (ESA) and individual ESA components that meet the requirements of PL for b class and are intended to be installed on machinery.

Evaluate the following electromagnetic disturbance phenomena.

--- Electromagnetic fields radiated by non-airborne sources of different field strengths and frequencies;

--- Radiated electromagnetic fields from airborne sources (inside/outside the antenna) of different field strengths and frequencies;

---Electrostatic discharge;

--- Conducted and coupled electrical transients.

The machine may be powered by DC, AC, or a combination of both as the internal power system.

This document does not apply to machinery powered by an external grid or as equipment for military applications.

Note. IEC 61000 covers grid-connected machines.