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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 22437.1-2018

Replacing GB/T 22437.1-2008

Cranes -- Design principles for loads and load combinations -- Part 1: General

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22 --- the coefficient obtained according to the crane lifting state level (see Table 2a);

Foreword

GB/T 22437 "Design Principles for Crane Load and Load Combination" is divided into five parts.

--- Part 1. General;

--- Part 2. Mobile cranes;

--- Part 3. Tower cranes;

--- Part 4. Boom cranes;

--- Part 5. Bridge and gantry cranes.

This part is the first part of GB/T 22437.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 22437.1-2008 "Design Principles for Crane Load and Load Combination", and GB/T 22437.1-

The main technical changes in.2008 are as follows.

--- Modify the "item load factor" to "item safety factor" (see Table 1 in Chapter 4, Table 4 of Chapter 4 of the.2008 edition);

--- Increased the dynamic effect coefficient phi9 caused by accidental loss of payload (see Table 1 in Chapter 4);

--- "When applying this part to different types of cranes operating under the same operating and environmental conditions, the equivalent equivalent resistance should be sought

The provisions of "force" are adjusted from Chapter 1 to Chapter 5 (see Chapter 5.1, Chapter 1 of the.2008 edition);

--- Added in the limit state method "If this part is used in combination with ISO 20332, the limit state method is the first necessary second order

The provisions of the method (see 5.2);

--- Adjust the load type from Chapter 6 to Chapter 5 (see Chapter 5, Chapter 6 of the.2008 edition);

--- Amend the "when the lifting load is off the ground" to "when the lifting payload leaves the ground" (see 6.1.1, 6.1.1 of the.2008 edition);

--- Modified the calculation formula of phi2 and the corresponding number table (see 6.1.2.1.1, 6.1.2.1 and 6.1.2.2 of the.2008 edition);

--- Added the expression "accuracy of axle parallelism" (see 6.2.2);

--- Added the expression "for the verification calculation of the test load, the minimum wind speed should be considered 5.42m/s" (see 6.3.2);

--- Increased the "load caused by accidental loss of payload" (see 6.3.5);

--- Increased the "quality of crane or crane parts" (see 7.3.7);

--- Added "quality that is advantageous or unfavorable for structural calculations" (see 7.3.7.1);

--- Added "sub-safety factor for crane quality" (see 7.3.7.2);

--- Increased the "safety factor for crane quality" (see 7.3.7.3);

--- Added "sub-safety factor applicable to loads caused by displacement" (see 7.3.8);

--- Added "sub-item safety factor for verifying the stability of rigid body" and the corresponding number table (see 7.4);

This section uses the translation method equivalent to ISO 8686-1.2012 "Design Principles for Crane Load and Load Combinations Part 1.

General.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

---GB/T 5905-2011 Crane test specifications and procedures (ISO 4310.2009, IDT)

---GB/T 6974 (all parts) Crane terminology [ISO 4306 (all parts)]

---GB/T 30024-2013 Crane metal structure capability verification (ISO 20332.2008, IDT)

This section has made the following editorial changes.

--- The text and the formula in the appendix are uniformly numbered;

--- Modify the absolute value of the relationship between the C.2.4 coefficient xi and the coefficient alpha in Appendix C.

This part was proposed by the China Machinery Industry Federation.

This part is under the jurisdiction of the National Machinery Standardization Technical Committee for Lifting Machinery (SAC/TC227).

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Limited company, Henan Mining Crane Co., Ltd., Shanghai Machinery Construction Group Co., Ltd.

1 Scope

This part of GB/T 22437 specifies the general methods for various load calculations and the general principles for selecting load combinations. The purpose is to

Verification of the load carrying capacity of various crane metal structures and mechanical components as defined in ISO 4306-1.

The method is based on rigid body dynamic analysis and elastic static analysis, but also allows the use of theoretically and practically proven

A more advanced (calculation or test) method estimates the effect of the load and load combination and the value of the dynamic load factor.

This section has two different uses.

a) Develop more specific standards for different types of hoisting machinery, providing a common form, content and scope of parameter values.

b) agreement between the designer, the manufacturer and the purchaser on the combination of load and load for hoisting machinery without dedicated standards

a framework.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

ISO 4302 crane wind load estimation (Cranes-Windloadassessment)

ISO 4306 (all parts) Crane terminology (Liftingappliances-Vocabulary)

ISO 4310 Crane Test Specifications and Procedures (Cranes-Testcodeandprocedures)

ISO 20332 crane metal structure capability verification (Cranes-Proofofcompetenceofsteelstructures)

3 Terms and definitions

The following terms and definitions defined by ISO 4306 apply to this document.

3.1

Load loadloads

Acting externally or internally in the form of force, displacement or temperature, causing stress on the metal structure or mechanical components of the crane.

3.2

Dynamic analysis

< rigid body> studies the motion and internal forces of a system model assumed to be a non-elastic component.

3.3

Dynamic analysis

< Elastomer> A study of the elastic displacement, motion, and internal forces of a system model assumed to be an elastic component.

4 symbol

The main symbols used in this section are shown in Table 1.

Table 1 main symbols

Symbol description refer to the relevant content of this section

Phii reflects multiple dynamic load coefficients of dynamic effects