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

GB/T 22437.4-2025

Replacing GB/T 22437.4-2010

**Cranes - Design principles for loads and load combinations -
Part 4: Jib cranes**

起重机 载荷与载荷组合的设计原则 第4部分：臂架起重机
(English Translation)

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Foreword

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

Drafting.

This document is Part 4 of GB/T 22437 "Design Principles for Crane Loads and Load Combinations". GB/T 22437 has been issued.

The following parts were laid out.

- Part 1: General Provisions;
- Part 2: Mobile Cranes;
- Part 3: Tower Cranes;
- Part 4: Boom Cranes;
- Part 5: Bridge and Gantry Cranes.

This document replaces GB/T 22437.4-2010 "Design Principles of Crane Loads and Load Combinations - Part 4: Boom Lifting".

Compared with GB/T 22437.4-2010, the main technical changes in the "Machinery" standard, apart from structural adjustments and editorial modifications, are as follows.

- The wording and requirements for "simultaneous acceleration" have been revised (see 4.2, 2010 version 4.2);

---Added the requirement for "load caused by unexpected loss of payload" (see 4.5);

---Changed the content regarding loads and load combinations. changed "partial load factor" to "partial safety factor", and added information about lifting machinery.

The value of the safety factor 'a' for the mass component and its explanation have been added, along with the value of the safety factor 'b' for the load component caused by displacement.

The explanation of b includes the addition of a wind sensitivity coefficient ω for the crane system, and an explanation of the relationship between the high-risk coefficient γ and the various coefficients.

Ming added " ϕ_9 " (see Table 1, Tables 1 and 2 in the 2010 edition);

---Changed the dynamic load factor ϕ_{ii} value and its basis. changed the description of " ϕ_1 ", added descriptions of " ϕ_2 ", " ϕ_3 ", and " ϕ_4 ", and changed...

The description of the dynamic load factor for wind load under operating conditions has been expanded to include "temperature" and " ϕ_9 " (see Table 2, 2010 edition).

(Table 3)

---The description of load combinations has been changed (see Table 3, Table 4 in the 2010 edition).

This document is modified to adopt ISO 8686-4:2005 "Design principles for crane loads and load combinations - Part 4: Boom lifting".

Heavy machinery.

This document has undergone the following structural adjustments compared to ISO 8686-4:2005.

---Increased by 4.5;

---Setting up secondary bars in 6.2 and 6.3.

The technical differences between this document and ISO 8686-4:2005, and the reasons therefor, are as follows.

---The normative reference GB/T 6974.4 (see Chapter 3) has been added to adapt to my country's technical conditions;

---Added the requirement for "load caused by unexpected loss of payload" (see 4.5), harmonizing with GB/T 22437.1-2018, to...

Adapting to my country's technological conditions;

---ISO 8686-1:1989 (see 5.1, 5.3, 6.1 and 6.3) has been replaced by the normatively referenced GB/T 22437.1-2018 to adapt to...

Based on my country's technological conditions;

---The contents of the loads and load combinations have been changed (see Table 1, Tables 1 and 2 of ISO 8686-4:2005), in accordance with GB/T 22437.1-in 2018, we coordinated and aligned our efforts to adapt to our country's technological conditions.

---The normative reference document GB/T 10183.1-2018 (see Table 2) has been added to adapt to my country's technical conditions;

---Added "phi9" and its contents (see Table 2) to align with GB/T 22437.1-2018 and adapt to my country's technical conditions;

---The normative reference document GB/T 3811-2008 (see Table 2 and Appendix A) has been added to adapt to my country's technical conditions;

---The normative reference ISO 10721-1 (see Annex A) has been added to adapt to my country's technical conditions and meet practical needs;

---The normative reference ISO 10721-2 (see Annex A) has been added to adapt to my country's technical conditions and meet practical needs.

The following editorial changes have been made to this document.

---In this document, the subscript in the symbol for the dynamic load factor has been changed from "n" to "i".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Transport of the People's Republic of China.

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

Introduction

GB/T 22437 specifies the general methods for calculating various loads and selecting load combinations for various types of cranes as defined in GB/T 6974.1.

The general principle, the purpose of which is to verify the load-bearing capacity of various crane metal structures and mechanical parts, is proposed to consist of five parts.

---Part 1: General Principles. The purpose is to specify the general methods for calculating various loads and the general principles for selecting load combinations.

---Part 2: Mobile Cranes. The purpose is to specify the methods for calculating various loads on mobile cranes and to select load groups.

The principle of harmony.

---Part 3: Tower Cranes. The purpose is to specify the methods for calculating various loads on tower cranes and selecting load combinations.

in principle.

---Part 4: Boom Cranes. The purpose is to specify the methods for calculating various loads on boom cranes and selecting load combinations.

in principle.

---Part 5: Bridge and Gantry Cranes. The purpose is to specify the methods for calculating various loads on bridge and gantry cranes and for selecting appropriate loads.

The principle of selecting load combinations.

Crane load and load combination design principles Part 4: Boom Cranes

1 Scope

This document specifies the selection principles for loads and load combinations of boom cranes, crane drive acceleration loads, and the load-bearing capacity of metal structures.

Force verification calculation.

This document applies to the design of boom cranes as defined in GB/T 6974.4.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 3811-2008 Crane Design Specification GB/T 6974.4 Crane Terminology Part 4: Boom Cranes (GB/T 6974.4-2025, ISO 4306-4:2020) MOD) GB/T 10183.1-2018 Crane wheels and trolley/roller rails - Tolerances - Part 1: General (ISO 12488-1.

2012, IDT)

GB/T 22437.1-2018 Design principles for crane loads and load combinations - Part 1: General principles (ISO 8686-1.

2012, IDT)

ISO 4302:2016 Cranes - Windload assessment