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

GB/T 22437.3-2025

Replacing GB/T 22437.3-2008

**Cranes - Design principles for loads and load combinations -
Part 3: Tower cranes**

起重机 载荷与载荷组合的设计原则 第3部分：塔式起重机
(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 3 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 22437.3-2008 "Design Principles of Crane Loads and Load Combinations - Part 3: Tower Cranes".

Compared with GB/T 22437.3-2008, the main technical changes in the revised standard are as follows, except for structural adjustments and editorial modifications.

a) The scope description has been revised, adding "tower cranes used in construction projects are specially equipped with hooks as lifting devices (lifting tools)" and "for planned use..." for tower cranes used for other purposes and/or equipped with other lifting devices (slings), other parameter values may apply depending on their specific application.

Contents (see Chapter 1, Chapter 1 of the 2008 edition);

b) The term "lifting load" and its definition have been added (see Chapter 3);

c) The content of the symbols has been changed (see Chapter 4, Chapter 4 of the 2008 edition);

d) The general principles have been amended (see Chapter 5, Chapter 5 of the 2008 edition);

e) The basic requirements for loads have been increased (see 6.1);

f) The loads and applicable coefficients have been changed (see 6.2, Table 1; Chapter 6, Table 1, 2008 edition);

g) Added design requirements for wind loads in non-operating states (see 6.3);

h) Added design requirements for loads caused by installation, disassembly, and

transportation (see 6.4);

i) Increased design requirements for loads on the channel device (see 6.5);

j) Content related to inertial forces and wind loads under operating conditions has been removed (see 7.1 and 7.2 in the 2008 edition);

k) Added basic requirements for load combinations (see 7.1), favorable and unfavorable masses (see 7.2), and partial safety factors for tower crane mass.

(See 7.3), high-risk applications (see 7.4), load combinations for strength verification (see 7.5), load combinations for fatigue verification (see 7.6).

7.6) Load combinations for stability verification (see 7.7), wind slip resistance (for traveling tower cranes) (see 7.8), and other related design requirements;

l) The contents of the loads, load combinations, and partial safety factors used for strength verification have been changed (see Table 4, Table 2 in the 2008 edition);

m) The basic requirements for load design of tower crane support structures (see 8.1) and load combinations (see 8.2) have been added;

n) The design requirements for the load and load combination of the climbing system have been increased (see Appendix B).

This document is modified to adopt ISO 8686-3:2018 "Design principles for crane loads and load combinations - Part 3: Tower cranes".

Heavy machinery.

This document has undergone the following structural adjustments compared to ISO 8686-3:2018.

---Sections 3.1 "Balancing Moment" and 3.2 "Offset Moment" in ISO 8686-3:2018 have been deleted, and the term "lifting load" and its...

definition;

---The description of the direction of load application in section 6.5 "Loads on channel devices" of ISO 8686-3:2018 has been moved to Table 2 "Channel Devices".

In the phrase "load on the device";

---Added Appendix A, "Technical Differences Between This Document and ISO 8686-3:2018 and Their Reasons," which will include Appendix A of ISO 8686-3:2018.

"Load and Load Combination of Climbing System" is revised to Appendix B;

---Footnotes b-e and the description of load combinations in Table A.1 of ISO 8686-3:2018 have been moved to an appendix outside of Table B.1.

In the corresponding clauses of B.

This document differs significantly from ISO 8686-3:2018. The relevant clauses are indicated in vertical margins.

Single lines (I) are indicated. Appendix A provides a summary of these technical differences and their reasons.

The following editorial changes have been made to this document.

---Change "lifting device" to "lifting device (sling)" (see Chapter 1);

---Change the chapter title to "Symbol" (see Chapter 4);

---The phrase "These additional empirical load cases mainly involve extensions to rigid body stability checks" has been removed (see ISO 8686-3:2018).

(The third paragraph of 6.3.1)

---Change "Power amplification of row 1 in Table 1" to "Coefficient ϕ_1 of row 1 in Table 1" (see 6.4);

---Change "The following load combinations specified in Table 5" to "The following load combinations specified in Table 4" (see 8.2).

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 China Machinery Industry Federation.

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 6947.1.

The general principle is to verify the load-bearing capacity of various crane metal structures and mechanical parts, and it is proposed to consist of 5 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.