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

GB/T 22437.2-2023

Replacing GB/T 22437.2-2010

**Cranes - Design principles for loads and load combinations -
Part 2: Mobile cranes
(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 2 of GB/T 22437 "Design Principles of Crane Loads and Load

Combinations": GB/T 22437 has been issued the following parts have been published:

---Part 1: General provisions;

---Part 2: Mobile cranes;

---Part 3: Tower cranes;

---Part 4: Jib crane;

---Part 5: Bridge and gantry cranes:

This document replaces GB/T 22437.2-2010 "Design principles for crane loads and load combinations - Part 2: Mobile lifting "Machine", compared with GB/T 22437.2-2010, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Changed the content of the term "normal (intermittent) operation mode" (see 3.2, 3:2 of the:2010 version);
- b) Change the title of the article "Simultaneous acceleration effect" to "Synchronized acceleration effect", and change the requirements for synchronized acceleration effect (see 4.2,:2010 version 4:2);
- c) The dynamic load coefficient that should be used in the bearing capacity verification calculation has been changed from "Table 1 and Table 2" to "Table 1":
(See 4.4,:2010 version of 4:4);
- d) Changed the statement that "loads caused by unexpected shutdown" should be calculated during design (see 4.5,:2010 version of 4:5);
- e) Added "load caused by accidental loss of payload" (see 4.6);
- f) Change the title "General Provisions" to "General Provisions", and change the requirements for bearing capacity verification calculation (see 5.1, 5:1 in the:2010 version);
- g) Changed the requirements for verification of load-carrying capacity for gyration effects (see 5.2, 5:2 of the:2010 edition);
- h) The requirements for lifting effect have been changed (see 5.3, 5:3 of the:2010 edition);
- i) Delete "Application of driving force change value (ΔF)" (see 5.4 of the:2010 version);
- j) Added "driving effect" (see 5.4);
- k) Added "amplitude and telescopic effects" (see 5.5);
- l) Added "Application of loads caused by acceleration" (see 5.6);
- m) Change the title "General Provisions" to "General Provisions", and change the calculation requirements for bearing capacity verification (see 6.1, 6:1 in the:2010 version);

- n) Changed the "strength coefficient γ_{afi} " in the allowable stress method to "overall safety factor γ_{af} ", and changed the expression of the requirements of the allowable stress method (See 6.2, 2010 version of 6.2);
- o) Changed the expression of the requirements of the limit state method (see 6.3, 6.3 of the 2010 edition);
- p) Formula (1) is deleted (see 5.3.1 of the 2010 version);
- q) The symbolic interpretation of formula (2) and formula (3) has been changed, and " $\tan\theta$ " in formula (3) has been changed to " θ " (see 7.2, 7.2 of the 2010 version);
- r) Delete the "Table of loads and load combinations for calculation of metal structures of mobile cranes when designed using the allowable stress method" (see 2010 version of Table 1);
- s) Changed the "Table of loads and load combinations for calculation of metal structures of mobile cranes when designed using the limit state method" (see Table 1, Table 2 of the 2010 edition);
- t) Changed the "value and basis of dynamic load coefficient ϕ_{ii} " (see Table 2, Table 3 of the 2010 version);
- u) The appendix "Member Strength" is deleted (see Appendix A of the 2010 version);
- v) Changed the content of the appendix "Synchronized Acceleration Effect" and added the telescopic boom crawler crane (see Appendix A, 2010 edition) Record B);
- w) Appendix D has been deleted (see Appendix D of the 2010 version):

This document is modified to adopt ISO 8686-2:2018 "Design principles for crane loads and load combinations Part 2: Mobile cranes":

Compared with ISO 8686-2:2018, this document has made the following structural adjustments:

---Increased by 4.6:

Compared with ISO 8686-2:2018, there are many technical differences between this document and the clauses involved in the outer margin of the page:

Single lines (l) are marked: These technical differences and their reasons are as follows:

---Replace the undated ISO standards with equivalent national standards to adapt to my country's technical conditions:

- Replaced ISO 4306-2 with normatively quoted GB/T 6974.2 (see Chapter 1 and Chapter 2);
- Replaced ISO 4310 with normatively cited GB/T 5905-2011 (see 5.2, Table 2, Table B.1);

- Replaced ISO 4305 with normatively quoted GB/T 19924 (see 5.2 and 6.1):
- Replaced ISO 20332:2016 with normatively quoted GB/T 30024 to adapt to my country's technical conditions (see 6.1):
- Because the term "rated lifting capacity" is not quoted in the text of this document, 3:1 of ISO 8686-2:2018 has been deleted:
- Combined with ISO 8686-1, GB/T 22437.1, ISO 8686-3, ISO 8686-4, GB/T 22437.4, ISO 8686-5, According to domestic and foreign standards such as GB/T 22437.5, EN13001-2 and related accidents, the following modifications have been made to improve safety:
- Added load caused by accidental loss of payload (see 4.6);
- Added two rows of "Load caused by unexpected shutdown" and "Load caused by loss of effective load" in Table 1, and one row of "Load combination C7" Column (see Table 1);
- Added row numbers 12 and 13 in Table 1 corresponding to loads caused by unexpected shutdown and loads caused by unexpected loss of payload:

And the dynamic load coefficient value (see Table 2):

--- Change the requirement-type clauses containing "should" and "should" in Appendix B to statement-type clauses to comply with my country's relevant technical requirements:

The following editorial changes have been made to this document:

- Change part of 3:2 to "note";
- Formula (2) and formula (3) in the text are numbered uniformly;
- Formula (1), formula (2) and formula (3) add descriptions of L_j , β , θ , Z' , L_1 and L_2 ;
- Figure 1 adds descriptions of L_1 , L_2 , Z_j , Z_b , Z_1 , Z_2 , β , and θ ;
- Change " $\phi_{2,max}$ " in Table 2 to " ϕ_{2max} ";
- Added load combination C7 and description in Table B:1;
- Added the stress calculation formula for load combination C7;
- Change the dynamic load coefficient " ϕ " in B:2 and B:3 to " ϕ_{il} ":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

GB/T 22437 specifies the general methods for calculating various loads and selecting load combinations for various types of cranes defined in GB/T 6974.1 the general principle is to verify the load-bearing capacity of various types of crane metal structures and mechanical