



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

GB/T 5972-2023

**Cranes - Wire ropes - Care and maintenance, inspection and
discard**

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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 for Standardization Documents" drafting: This document replaces GB/T 5972-2016 "Maintenance, maintenance, inspection and scrapping of crane wire ropes", and GB/T 5972-2016 In comparison, except for structural adjustments and editorial changes, the main technical changes are as follows:

- Changed the scope (see Chapter 1, Chapter 1 of the:2016 edition);
- Changed "terms and definitions", including revising the definition of "supervisor" and "groin broken wire", adding "wire rope electromagnetic detection" Terms and definitions such as "detection head", "basic trace", "local defect", "loss of metal cross-sectional area" (see Chapter 3,:2016 edition Chapter 3);
- Changed the replacement of the wire rope (see 4:2, 4:2 of the:2016 edition);
- Changed the preparation before installing the wire rope (see 4:4, 4:4 of the:2016 edition);
- Changed the periodic inspection (see 5:3, 5:3 of the:2016 edition);
- Change non-destructive testing to electromagnetic testing (see 5:6 and 6:3, 5:6 of the:2016 edition);
- Added the work level in Table 3 to comply with the provisions of ISO 4301-1:1986 (see Table 3): This document is equivalent to ISO 4309:2017 "Care, Maintenance, Inspection and Scrapping of Wire Ropes for Cranes": The following minimal editorial changes have been made to this document:
- Added the description of the indexing symbols in Figure 2;
- Added the informative reference standard GB/T 21837-2008 in 5:6;

--- Added informative appendix C "Scrap criteria for wire rope electromagnetic testing (MRT)": Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed by China Machinery Industry Federation: This document is under the jurisdiction of the National Hoisting Machinery Standardization Technical Committee (SAC/TC227): This document is drafted by: Juli Rigging Co., Ltd., Beijing Lifting and Transportation Machinery Design and Research Institute Co., Ltd., Taiyuan Heavy Industry Co., Ltd. Co., Ltd., Zhejiang Zhongjian Road and Bridge Equipment Co., Ltd., Anji Changhong Chain Co., Ltd., Beijing Lifting and Transportation Machinery Design and Research Institute Co., Ltd. Division Henan Branch, Beijing Kezhengping Engineering Technology Testing Research Institute Co., Ltd., Hangzhou Guodian Dali Electromechanical Engineering Co., Ltd., China Yangtze River Three Gap Group Co., Ltd., China Three Gorges Construction (Group) Co., Ltd., Zhejiang Seaport Investment and Operation Group Co., Ltd., Nanjing Special Equipment Safety Supervision and Inspection Institute, Henan Mining Crane Co., Ltd., Henan Weihua Heavy Machinery Co., Ltd., Eurocrane Heavy Industry Co., Ltd. Co., Ltd., Zhejiang Shuangniao Machinery Co., Ltd., Jiangxi Hoisting Machinery General Factory Co., Ltd., Henan Giant Crane Group Co., Ltd., Weite Technology Co., Ltd., Changyuan City Market Supervision Administration, Southeast University, Nanjing Switch Factory Co., Ltd., Xinxiang University, Henan Zhengda Lifting Equipment Ltd: The main drafters of this document: Yang Chao, Zhang Pei, Keng Jian, Lin Fukui, Ma Qiang, Tong Guozhu, Yang Weibo, You Haiwu, Zhang Shibao, Tan Zhiguo, Feng Hualong, Qing Guangwei, Ji Hongyun, Han Hongan, Yuan Xiufeng, Zhang Jijun, Zhu Xuan, Huang Xiaolin, Han Zhaopeng, Li Bin, Wang Hongbo, Jin Hui, Wang Guangming, Wu Yiguo, Qie Yake, Xia Xinyan, Yang Shunxi, Hu Jianhong, Zhang Hongbo: This document was first released in 1986, revised for the first time in:2006, revised for the second time in:2009, and revised for the third time in:2016: Fourth revision:

The steel wire ropes used for cranes are regarded as vulnerable parts: When the inspection results show that their own condition has been reduced to such an extent that they cannot continue to be used from the perspective of safety: level, it must be replaced: Follow the established principles (such as the provisions of this document), in accordance with the operating instructions provided by the crane (or hoist) and wire rope manufacturer Guided use, it will not exceed the control point: If the obsolescence criteria given in this document are correctly implemented, an adequate degree of safety can be maintained: Conversely, if ignoring it They may cause great harm, danger and destruction: In order to provide more targeted assistance to those responsible for "care and maintenance" and those responsible for "inspection and scrapping", the two parts Appropriate separation was made: Crane wire rope care, maintenance, inspection and scrapping

1 Scope

GB/T 5972-2023 governs the care, maintenance, inspection and discard of the wire ropes

used on cranes and hoists. It answers the one question every crane owner has to answer correctly, when a rope has to come off, and it does so with criteria rather than intervals: visible and internal wire breaks and their distribution, the decrease in rope diameter, corrosion, deformation and damage, and a method for assessing the combined effect of several kinds of deterioration at the same position. It gives particular attention to ropes subject to multi-layer spooling, where field experience and testing show deterioration is far worse at the crossover zones on the drum than anywhere else in the system, and it also covers storage, handling and installation. The scope is wide: cable and portal cable cranes, cantilever, deck, derrick and guy derrick cranes, floating, mobile, overhead travelling, portal and semi-portal, railway, tower and offshore cranes, and the ropes on winches, hoists and hoist blocks. The 2023 edition takes effect on 1 December 2023.

This document specifies general requirements for the care and maintenance, inspection and scrapping of wire ropes for cranes and hoists: In addition to providing guidance on storage, handling, installation and maintenance, this document also provides scrap requirements for multi-layer wound wire ropes: Both experience and testing have shown that the rope crossover area on the drum deteriorates significantly more than the rest of the rope system: This document also provides more practical scrapping requirements, covers rope diameter reduction and corrosion, and provides The combined effect of location degradation method: This document applies to wire ropes used on the following types of cranes:

- a) cable cranes and portal cable cranes;
- b) cantilever cranes (column, wall and bicycle);
- d) cable derricks;
- e) Rigid diagonally braced mast cranes;
- f) floating cranes;
- g) mobile cranes;
- h) Overhead cranes;
- i) Gantry cranes and semi-gantry cranes;
- j) Portal cranes and semi-portal cranes;
- k) Railway cranes;
- l) tower cranes;
- m) Offshore cranes, i.e: cranes mounted on fixed structures supported by the seabed or floating units supported by buoyancy:

Note: Refer to GB/T 6974:1 for the definition of cranes in a)–l) above: This document is applicable to the hooks, grabs, electromagnetic suckers, steel Wire ropes for baling, digging

or stacking operations: This document also applies to wire ropes for lifting tackle:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: tion-Part 1:General) cation)