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

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Replacing GB/T 14092.2-2009

Environmental conditions for machinery products - Part 2: Cold

机械产品环境条件 第2部分：寒冷

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Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents. This document is Part 2 of GB/T 14092 Environmental Condition for Machinery Products. GB/T 14092 has issued the following parts:

---GB/T 14092.1-2023 Environmental Condition for Machinery Products - Part 1: Warm Damp;

---GB/T 14092.2-2023 Environmental Condition for Machinery Products - Part 2: Cold;

---GB/T 14092.3-2009 Environmental Condition for Machinery Products - High Altitude;

---GB/T 14092.4-2009 Environmental Condition for Machinery Products - Ocean;

---GB/T 14092.5-2009 Environmental Condition for Machinery Products - Industrial Corrosion;

---GB/T 14092.6-2009 Environmental Condition for Machinery Products - Mine;

---GB/T 14092.7-2009 Environmental Condition for Machinery Products - Dry Heat. This document serves as a replacement of GB/T 14092.2-2009 Environmental Condition for Machinery Products - Cold. In comparison with GB/T 14092.2-2009, apart from structural adjustments and editorial modifications, the main technical changes are as follows:

a) The content of the chapter "Environmental Condition of Usage" is modified, and the title of the chapter is modified into "Environmental Condition" (see Chapter 4; Chapter 3 of Version 2009);

b) The content of the section "parameter values of various environmental conditions" is modified, and the title is modified into "severity levels of various environmental conditions" (see Chapter 5;

3.7 of Version 2009);

c) The contents of "environmental condition of climate", "environmental condition of special climate", "environmental condition of chemical active substance", "environmental condition of mechanical active substance" and "mechanical environmental condition" are modified, and the new classification is used to replace the old classification (see Table 1 ~ Table 5; Table 1, Table 2, Table 4 and Table 5 of Version 2009);

d) The content of "biological environmental condition" is added (see 5.6). Please be noted that certain content of this document may involve patents. The institution issuing this document does not undertake the responsibility of identifying these patents. Environmental Condition for Machinery Products - Part 2: Cold

1 Scope

Part 2 of China's series on the environmental conditions for machinery products, covering cold. It specifies the environmental parameters and the severity levels for machinery products in cold conditions, and it is the companion of Part 1 on warm damp. Like that part it is not a test standard: it says how cold, not how to test. The cold environment does its damage differently from the damp one, and faster. Materials contract, and they contract by different amounts, so clearances close and interference fits tighten and seals lose contact. Elastomers pass their glass transition and stop being elastic, which is why a seal that worked at twenty degrees leaks at minus thirty. Greases and hydraulic oils thicken, and a machine that starts at all may be damaged by trying. Batteries lose most of their capacity. Steel that is tough at room temperature becomes brittle below its transition temperature and breaks under a load it carried easily the day before - which is the failure that takes down structures and lifting equipment in a cold snap. And condensation and ice form wherever a cold surface meets warmer air, in exactly the places the designer did not intend. The severity levels in this part are what let a designer specify against all of that in advance, and the application clause relates them to service situations, so that machinery destined for the north of the country is designed for the north rather than for the average. Issued on 23 May 2023 and in force since 1 December 2023, it replaces GB/T 14092.2-2009.

This document specifies the environmental parameters and severity levels of machinery products in the environmental condition of cold. This document applies to machinery products used in the environmental condition of cold. The environmental condition

stipulated in this document include the environmental parameters and severity levels that the products are subject to and affected by. Applicable items and levels are selected for various types of products in accordance with the degree of environmental impact that they are subject to.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 4798.10 Environmental Conditions Existing in the Application of Electric and Electronic Products - Guidance

3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

4 Environmental Condition

The environmental condition of cold is respectively and hierarchically described by the environmental condition of climate (K), the environmental condition of special climate (Z), the condition of chemical active substance (C), the condition of mechanical active substance (S), the condition of mechanical environment (M) and the condition of biological environment (B). The classification of environmental conditions allows possible combinations of multiple environmental conditions, which can truly reflect the impact of environmental conditions on product storage, transportation and usage. For some environmental parameters, it is quite difficult to quantify their severity levels. In accordance with GB/T 4798.10, the level of environmental condition is marked as follows:

---The first digit, which identifies the application conditions (1 indicates storage, 2 indicates transportation, 3 indicates fixed use in a place with weather protection, and 4 indicates fixed use in a non-weather-protected place);

---Letter, the environmental condition of climate (K), the environmental condition of special climate (Z), the condition of chemical active substance (C), the condition of mechanical active substance (S), the mechanical environmental condition (M) and the biological environmental condition (B);

---Another digit, which identifies the severity level. Generally, the larger the value, the more severe the condition. For example: level 2K30, in which, 2 indicates transportation; K indicates the environmental condition of climate; 30 indicates the severity level.