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

GB/T 44557-2024

**Refrigeration systems and heat pumps - Flexible pipe elements
and non-metallic tubes - Requirements and classification**

制冷系统及热泵 挠性管道元件和非金属管件 要求和分类

(English Translation)

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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 is required.

This document is modified to adopt ISO 13971:2012 "Flexible piping elements, isolators, expansion joints and non-metallic pipes for refrigeration systems and heat pumps" Requirements and classification of pipe fittings.

Compared with ISO 13971:2012, this document has the following structural adjustments.

Added a chapter on "Classification" (see Chapter 4). -the technical differences between this document and ISO 13971:2012 and their reasons are as follows.

Added the description of the classification of flexible piping components (see Chapter 4) to correspond to the standard name; a) the pressure that flexible piping components should be able to withstand was changed from "-99 kPa" to 2 kPa (absolute pressure) (see 7.1) to Absolute pressure is used uniformly in this document;

The normative reference GB/T 7939.3-2023 replaces ISO 6605:2002 (see 7.3, 7.4) to adapt to my country's technical requirements.

Technical conditions, increase operability;

Added interval division of leakage rate values (see Table 1) to improve the operability of determining leakage rate levels; d) ISO 5149-2 (see 8.1.3, 10.3) was replaced by the normative reference GB/T 9237 to adapt to my country's technical conditions.

Increase operability;

Changed the internal pressure control requirement from "20 kPa" to " ± 20 kPa" (see 8.2.7), and deleted the description of vacuum pressure control (" < 0.95 bar") for internal pressure control and (" ± 0.2 bar") for internal pressure control (see ISO 13971:2012 7.2.5 and 7.2.7) to conform to my country's national conditions and improve operability;

The requirements for moisture content and water vapor permeability of non-metallic flexible pipe fittings have been increased, and the water vapor permeability requirement has been changed from no more than "10 mg/dm²" was changed to "1 g/m²" (see 9.4) to improve the requirements for non-metallic flexible fittings and unify the requirements in this document.

Units of permeability;

The production date of non-metallic flexible tubing (including capillary tubing) may be part of the serial number.

The information can be part of the equipment nameplate and can be changed from "code" to the content of the main text (see Chapter 12) to comply with GB/T 1.1-2020 requirements;

The "Manufacturer Type" required in the user information (see Chapter 12 of ISO 13971:2012) has been deleted to suit my country National conditions.

The following editorial changes were made to this document.

In order to be consistent with the content of the standard, the name of the standard is changed to "Requirements for flexible piping components and non-metallic pipe fittings for refrigeration systems and heat pumps" and classification";

Deleted the parallel "isolators, expansion joints" in "flexible piping elements, isolators, expansion joints" (see ISO 13971).

4.1.3 and 6.5 in 2012);

ISO 175 is replaced by the informative reference GB/T 11547 (see Chapter 6); c) Added the statement "(see 8.1.2)" to refer to the document itself (see 8.2.6); d) Changed the structure of Table 2.e)

1 Scope

This document specifies the technical requirements for various flexible piping components and non-metallic pipe fittings used in refrigeration systems and heat pump refrigerant circuits.

Design and installation requirements.

This document does not apply to flexible pipes which may be subjected to stresses occasionally exceeding their elastic limit (e.g. during maintenance work) or to pipes which may be Freely rotating joints and hinged joints.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies.

in this document.

GB/T 7939.3-2023 Hydraulic transmission connection test methods Part 3: Hose assemblies (ISO 6605:2017, IDT) GB/T 9237 Safety and environmental requirements for refrigeration systems and heat pumps (GB/T 9237-2017, ISO 5149-1:2014, ISO 5149-2:2014, ISO 5149-3:2014, ISO 5149-4:2014, MOD)

3 Terms and definitions

The following terms and definitions apply to this document.

Expansion joint

A tubular conduit element whose shape provides limited movement to accommodate thermal expansion without reaching its elastic limit.

Flexible pipe element Pipes or fittings with non-fixed shapes that are used to connect two relatively movable parts.

Note 1: This general term includes all types defined in 3.1, 3.3~3.5, 3.8~3.11.

Note 2: The structure of flexible pipe components may include a plastic barrier, which may be a liner on the inner surface or a layer in the pipe wall. Its main function is to Reduce refrigerant gas penetration.

NOTE 3 The flexibility of this element results from its curved shape, such as a coiled capillary tube.

flexible pipe element, fixed installed Flexible piping elements that minimize assembly difficulties by accommodating slight misalignments or relative movements between refrigeration system components.

flexible pipe element, for intermittent movement A flexible piping element that moves intermittently to accommodate relative movement between components in a refrigeration system.

flexible pipe element, for significant movement Flexible piping elements that are regularly moved over long distances to accommodate the operation of refrigeration equipment.