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

GB/T 41931-2022

**Plastics/rubber - Polymer dispersions and synthetic rubber
latexes - Freeze-thaw cycle stability test**

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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 is modified to adopt ISO 1147.1995 "Plastics/Rubber Polymer Dispersions and Synthetic Rubber Latex Freeze-thaw Cycle Stability Test

Test".

Compared with ISO 1147.1995, this document has some structural adjustments.
Comparison list of structure number changes between two files

See Appendix A.

The technical differences between this document and ISO 1147.1995 and their reasons are as follows.

--- Added content related to applicable objects (see Chapter 1) to clarify the scope of application of the standard;

--- Added the terms and definitions defined by ISO 12000.2014 (see Chapter 3) to standardize the terms and definitions;

--- Added requirements for dimensional accuracy of cylindrical containers, and updated requirements for related equipment. For example, at freezing temperatures of -5°C or -10°C,

Add the requirement that stainless steel containers can be used; the test chamber is updated to a low-temperature test chamber (see 5.2) to ensure the reliability of the test results;

--- Replaced ISO 3219, ISO 2555 (see 5.4, 6.1) with normative references GB/T 21059, GB/T 40280 to adapt to

my country's technical conditions increase operability.

The following editorial changes have been made to this document.

--- Adjust Note 3 in Chapter 5 of ISO 1147.1995 to Chapter 4 as Note 2, and adjust the description in Part 5.5 to Note;

---Adjust the relevant logical order of the "test steps" section;

--- According to GB/T 20001.4-2015, the expression of the chapter "Test Report" is standardized.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document describes a test method for the freeze-thaw cycle stability of polymer dispersions and synthetic rubber latexes.

This document applies to polymer dispersions and synthetic rubber latexes.

This document does not apply to natural rubber latex.

Note. If the sample does not freeze under the test conditions, the test is meaningless.

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.

GB/T 21059 plastic liquid or emulsion or dispersion polymer/resin with rotational viscometer at specified shear rate

Determination of degree (GB/T 21059-2007, ISO 3219.1993, IDT)

GB/T 40280 Determination of Apparent Viscosity of Plastic Liquid or Emulsion or Dispersion Resin with Single-tube Rotational Viscometer

(GB/T 40280-2021, ISO 2555.2018, IDT)

ISO 12000.2014 Plastics/rubber polymer dispersions and rubber latexes (natural and synthetic) Definitions and test methods

3 Terms and Definitions

The terms and definitions defined in ISO 12000.2014 apply to this document.

4 principles

By measuring the viscosity change of the polymer dispersion sample before and after the freeze-thaw cycle at the selected test temperature, the freezing and thawing of the polymer dispersion can be judged.

financial cycle stability. Place the sample in a test box with a recommended temperature of -5°C, -10°C or -20°C for 16 hours, and then keep it at 23°C

8h. Check the appearance of the polymer dispersion, if coagulation is observed, the test is over, otherwise the viscosity is tested. If the viscosity change exceeds the

If the relevant regulations of the product are not met, the test is over, otherwise the freeze-thaw cycle test is carried out again, that is, the sample is stored at the selected temperature for another 16 hours, and then the sample is stored at the selected temperature.

Keep at 23°C for 8 hours, up to 3 cycles, and test the viscosity of the sample after each cycle.

Note 1. The choice of test temperature depends on the chemical properties of the polymer dispersion and the ambient temperature used. In addition to the above recommended temperature, other agreed temperatures can be used.

Spend. Pre-test can be carried out to determine the appropriate test temperature.

Note 2. Upon agreement of the relevant parties, the test may be performed using properties other than viscosity.