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

GB/T 1632.2-2025

Replacing GB/T 3401-2007

**Plastics - Determination of the viscosity of polymers in dilute
solution using capillary viscometers - Part 2: Poly(vinyl
chloride) resins**

塑料 使用毛细管黏度计测定聚合物稀溶液黏度 第2部分：聚氯乙烯树脂
(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 1632 "Determination of Viscosity of Dilute Polymer Solutions Using Capillary Viscometers".

The following sections have been released.

---Part 1: General Rules

---Part 2: Polyvinyl chloride resin.

---Part 3: Polyethylene and Polypropylene.

---Part 4: Polycarbonate (PC) Molding and Extrusion Materials

---Part 5: Thermoplastic homopolymers and copolymer polyesters (TP).

This document supersedes GB/T 3401-2007 "Determination of Viscosity of Dilute Polyvinyl Chloride Resin Solutions Using a Capillary Viscometer", and is consistent with...

Compared with GB/T 3401-2007, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope of application of the document has been changed (see Chapter 1, Chapter 1 of GB/T 3401-2007);
- b) The schematic diagram of the standard viscometer (see Figure 1 in GB/T 3401-2007) has been deleted, and requirements for the standard viscometer have been added (see...).
- c) Added requirements for other available viscometers (see 6.2);
- d) The requirement for the minimum scale value of the temperature measuring device has

been changed (see 6.8, 6.7 of GB/T 3401-2007);

e) The requirement for the minimum scale value of the timing device has been changed (see 6.9, 6.8 of GB/T 3401-2007);

f) General requirements for solution preparation have been added (see 9.1.1);

g) General requirements for flow time measurement have been added (see 9.2.1);

h) The specification for the amount of liquid to be added to the viscometer has been changed (see 9.2.2.3, 9.2.1.3 of GB/T 3401-2007);

i) The procedure for determining the flow time has been modified (see 9.2.2.4, 9.2.1.4 of GB/T 3401-2007);

j) The number of times the solvent flow time was measured was changed (see 9.2.2.5, 9.2.1.5 of GB/T 3401-2007);

k) Additional information on instrument cleaning (see Appendix E of GB/T 3401-2007) has been removed, and relevant provisions have been added (see 9.2.2.5);

l) The precision has been changed (see Chapter 11, GB/T 3401-2007).

This document is modified to adopt ISO 1628-2:2020 "Plastics - Determination of viscosity of dilute polymer solutions using capillary viscometers - Part 2..." Polyvinyl chloride resin.

Compared with ISO 1628-2:2020, this document has undergone many structural adjustments. A table comparing the changes in structural numbering between the two documents is provided.

See Appendix A.

This document differs significantly from ISO 1628-2:2020. The relevant clauses are indicated in vertical margins.

Single lines (l) are indicated. A summary of these technical differences and their causes can be found in Appendix B.

The following editorial changes have been made to this document.

---ISO 1042 has been replaced by GB/T 12806 (see note 6.3);

---Appendix A (informative) has been added. "Comparison of structural numbering changes between this document and ISO 1628-2:2020";

---Appendix B (Informative) has been added. "Technical Differences Between This Document and ISO 1628-2:2020 and Their Reasons";

---Appendix C (Informative) "Determination of Kinematic Viscosity of Cyclohexanone" has been added;

---Appendix D (Informative) "Preparation of Solutions by the Conical Flask Method" has been added;

---Added Appendix F (Informative) "Precision of ISO 1628-2:2020".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Plastics Standardization (SAC/TC15).

Introduction

Different polymer dilute solutions have different detailed requirements for viscosity testing; specific methods are more suitable for specific types, states, and forms than general rules.

Polymers of this type. This document provides an overview of these methods. The various methods described in this document have corresponding standards and are applied in practical measurements.

Tested.

GB/T 1632 specifies a method for determining the viscosity of dilute polymer solutions using a capillary viscometer, which is proposed to consist of five parts.

---Part 1: General Rules. The purpose is to specify general rules for determining the specific viscosity, intrinsic viscosity, and K value of dilute solutions of organic polymers.

Standard parameters for conditions and viscosity determination.

---Part 2: Polyvinyl Chloride Resins. The purpose is to specify the specific viscosity (also known as viscosity number) and K value of polyvinyl chloride (PVC) resins.

Establish the testing conditions and make the procedures operable, traceable, and verifiable.

---Part 3: Polyethylene and Polypropylene. The purpose is to specify the specific viscosity (also known as the viscosity of dilute polyethylene and polypropylene solutions at 135°C) of these solutions.

Establish methods for determining viscosity number and intrinsic viscosity, and establish operable, traceable, and verifiable procedures.

---Part 4: Polycarbonate (PC) Molding and Extrusion Materials. The purpose is to specify the viscosity (also known as specific viscosity) in dilute solutions of polycarbonate.

Establish methods for determining concentrated viscosity and relative viscosity, and establish operable, traceable, and verifiable procedures.

---Part 5: Thermoplastic Homopolymers and Copolymers (TP). The aim is to specify the thermoplastic polyesters in certain specific solvents.

Establish an operable, traceable, and verifiable procedure for determining the viscosity (also expressed as "specific viscosity") of dilute (TP) solutions.

Plastics are measured using a capillary viscometer.

Part 2: Viscosity of Dilute Solutions. Polyvinyl Chloride Resin

1 Scope

1.1

This document specifies the determination conditions for the specific viscosity (also known as viscosity number) and K value of polyvinyl chloride resin, applicable to polyvinyl chloride homopolymers and those derived from it.

Powdered resins such as binary copolymers and terpolymers of vinyl chloride with one or more other monomers (where vinyl chloride is the main component) Resins may contain small amounts of unpolymerized substances (e.g., emulsifiers or dispersants, residual initiators, etc.) and additives during polymerization.

Other substances. However, this document does not apply to resins with a volatile content exceeding 0.5% as measured by GB/T 2914, or resins that cannot be completely dissolved.

Resin dissolved in cyclohexanone.

1.2

The specific viscosity and K value of a particular resin are related to its molecular weight, but this relationship can vary depending on the presence of other monomers.

The type and concentration of the polymer. Therefore, homopolymers and copolymers with the same specific viscosity or K value may have different molecular weights.

1.3

For a specific polyvinyl chloride resin sample, the concentration of the selected test solution should be compared with the measured values of viscosity or K value.

Different effects. Therefore, only when the solution concentration used is the same, the specific viscosity and K value obtained by following the steps described in this document are consistent.

Only numerical values can be compared.

1.4

Limiting viscosity is not applicable to PVC resins.