ICS 83.080.20
CCS G 31

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 1632.4-2020

Plastics. Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 4: Polycarbonate(PC) moulding and extrusion materials

Issued on: December 14, 2020 **Implemented on: July 1, 2021**

Issued by: State Administration for Market Regulation, China National Standardization Administration

Table of Contents

Foreword

GB/T 1632 "Plastics uses capillary viscometer to determine the viscosity of polymer dilute solutions" includes the following 6 parts:

---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 homopolymer and copolymer polyester (TP);

---Part 6: Methyl methacrylate polymer:

This part is Part 4 of GB/T 1632:

This section was drafted in accordance with the rules given in GB/T 1:1-2009:

This part uses the redrafting method to modify and adopt ISO 1628-4:1999 ``Plastics use capillary viscometer to determine polymer dilute solution

Viscosity Part 4: Polycarbonate (PC) molding and extrusion materials":

Compared with ISO 1628-4:1999, the main technical differences and reasons for this part are as follows:

---Regarding normative reference documents, this section has made adjustments with technical differences to adapt to my country's technical conditions and adjustments:

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows:

* Replace ISO 4793:1980 with non-equivalent adopting international standard GB/T 11415-1989;

* Replace ISO 3105:1994 with GB/T 30514-2014 which is modified to adopt international standards;

* Since it is not quoted in the main text, ISO 7391-1:2006 and ISO 7391-2:1996 are deleted;

--- Modify "The temperature can be adjusted to 110 degrees C" to "The temperature can be adjusted to 120 degrees C" (see 5:6);

---Before the sample test, the moisture should be removed, and the "sample should be placed in an oven at 120 degrees C for 2h, then taken out and placed in a desiccator to cool to the room

temperature: "(See 6:4:1);

---In order to make the expression clearer and clearer, amend "under calibration temperature" to "under calibration temperature 25 degrees C+/-0:1 degrees C" (see 6:4:1);

---5:1, 5:8, 5:9 cited documents changed from undated reference to dated reference, in order to be consistent with Chapter 2:

This part was proposed by the China Petroleum and Chemical Industry Federation:

This part is under the jurisdiction of the National Plastics Standardization Technical Committee (SAC/TC15):

Drafting organizations of this section: Zhonglan Chenguang Chemical Research and Design Institute Co:, Ltd:, Liaocheng Luxi Polycarbonate Co:, Ltd:, Anhui Tianyuan Plastic Industry

Co:, Ltd:, Qingdao Dagang Customs House, People's Republic of China, Kingfa Technology Co:, Ltd:, Liaocheng University, Beijing Physics and Chemistry Analysis Test

Xin, China Guangdong Nuclear Power Juner New Material Co:, Ltd:, Jiangmen Xinhui Henglong Household Innovation Co:, Ltd:

1 Scope

This part of GB/T 1632 specifies a method for determining the viscosity (also known as reduced viscosity) and relative viscosity in a dilute solution of polycarbonate:

This section applies to polycarbonate (PC) pure materials and blends and mixtures with or without other fillers:

2 Normative references

The following documents are indispensable for the application of this document: For dated reference documents, only the dated version applies to this article

Pieces: For undated references, the latest version (including all amendments) applies to this document:

GB/T 1632:1-2008 Plastics use capillary viscometer to determine the viscosity of polymer dilute solutions Part 1: General rules

(ISO 1628-1:1998, IDT)

GB/T 11415-1989 Laboratory sintered (porous) filter pore size, classification and grade (ISO 4793:1980, NEQ)

GB/T 30514-2014 glass capillary kinematic viscometer specifications and operating instructions (ISO 3105:1994, MOD)

3 Definitions and units

The definition of the viscosity number VN (in mL/g) is shown in formula (1):

VN=eta

-eta0

eta0c

nurho-nu0rho0

nu0rho0c

nurho

rho0

-nu0

nu0c =

nu-nu0

nu0

(1)

Where:

eta --- the dynamic viscosity of the solution, in Pascal seconds (Pa s);

eta0 --- the dynamic viscosity of the solvent, in Pascal seconds (Pa s);

rho ---The density of the solution, in kilograms per cubic meter (kg/m3);

rho0 ---Solvent density, in kilograms per cubic meter (kg/m3);

nu=eta/rho --- kinematic viscosity of the solution, in square meters per second (m2/s);

nu0=eta0/rho0---solvent kinematic viscosity, in square meters per second (m2/s);

c --- The mass concentration of the polymer solution, in grams per milliliter (g/mL):

Since the difference between the density rho of the solution and the density rho0 of the solvent is very small, the eta in the formula for calculating the reduced viscosity can be replaced by nu: Solution

The relative viscosity etarel (dimensionless), defined in formula (2):

etarel=

nu0

(2)

Where:

nu=eta/rho --- kinematic viscosity of the solution, in square meters per second (m2/s);

nu0=eta0/rho0---Kinematic viscosity of the solvent, in square meters per second (m2/s):