NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 40911.2-2021

Plastics - Poly(methyl methacrylate)sheets - Types, dimensions and characteristics - Part 2: Extruded sheets

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1 Scope

This document specifies the requirements, test methods, inspection rules, marking, packaging, transportation and storage for extruded colorless or colored, transparent, translucent or opaque flat poly (methyl methacrylate) (PMMA) sheets.

This document applies to PMMA extruded sheets (hereinafter referred to as "sheets")

with a thickness ranging from 0.3 mm to 20.0 mm.

This document does not apply to PMMA modified with elastomers.

2 Normative references

The following documents are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 1033.1-2008, Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method liquid pycnometer method and titration method (ISO 1183-1:2004, IDT)

GB/T 1034-2008, Plastics - Determination of water absorption (ISO 62:2008, IDT)

GB/T 1040.2-2006, Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993, IDT)

GB/T 1043.1-2008, Plastics - Determination of Charpy impact properties - Part 1:

Non-instrumented impact test (ISO 179-1:2000, IDT)

GB/T 1633-2000, Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST) (ISO 306:1994, IDT)

GB/T 1634.1-2019, Plastics - Determination of temperature of deflection under load - Part 1: General test method (ISO 75-1:2013, MOD)

GB/T 1634.2-2019, Plastics - Determination of temperature of deflection under load - Part 2: Plastics and ebonite (ISO 75-2:2013, MOD)

GB/T 2410-2008, Determination of the luminous transmittance and haze of transparent plastics

GB/T 2828.1-2012, Sampling procedures for inspection by attributes - Part 1:

Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (ISO 2859-1:1999, IDT)

GB/T 2918-2018 Plastics - Standard atmospheres for conditioning and testing (ISO 291:2008, MOD)

GB/T 3398.2-2008, Plastics - Determination of hardness - Part 2: Rockwell hardness (ISO 2039-2:1987, IDT)

GB/T 3682.2-2018, Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 2: Method for materials sensitive to time-temperature history and/or moisture (ISO 1133-1:2011, MOD)

GB/T 6672, Plastics film and sheeting - Determination of thickness by mechanical scanning (GB/T 6672-2001, ISO 4593:1993, IDT)

GB/T 6673, Determination of length and width of plastics film and sheeting (GB/T 6673-2001, ISO 4592:1992, IDT)

GB/T 9341, Plastics - Determination of flexural properties (GB/T 9341-2008, ISO 178:2001, IDT)

GB/T 12027, Plastics - film and sheeting - Determination of dimensional change on heating (GB/T 12027-2004, ISO 11501:1995, IDT)

GB/T 16422.2-2014, Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc sources (ISO 4892-2:2013, IDT)

GB/T 36800.2, Plastics - Thermomechanical analysis (TMA) - Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature (GB/T 36800.2-2018, ISO 11359-2:1999, IDT)

GB/T 39691-2020, Plastics - Determination of refractive index (ISO 489:1999, MOD)

ISO 1628-6, Plastics - Determination of viscosity number and limiting viscosity number - Part 6: Methyl methacrylate polymers

ISO 2818, Plastics - Preparation of test specimens by machining

3 Terms and definitions

The following terms and definitions are applicable to this document.

6 Test methods

6.1 General

6.1.1 Standard environment for specimen state conditioning and testing Unless otherwise specified, the test specimens shall be conditioned at a temperature of (23+/-2) °C and a relative humidity of (50+/-10) % in accordance with the provisions of

GB/T 2918-2018, for not less than 48 h, and shall be tested in this environment.

The test specimen for Vicat softening temperature shall be placed at (80+/-2) °C for not less than 24 h, and then cooled to room temperature in a desiccator.

The test specimen for load deflection temperature shall be placed at (80+/-2) °C for 16 h ~ 24 h, and cooled to room temperature in a desiccator.

The measurement of dimensions of sheets shall be carried out at room temperature, but in case of dispute, it shall be measured under the conditions of temperature (23+/-2) °C and relative humidity (50+/-10) % specified in GB/T 2918-2018.

6.1.2 Preparation of test specimens Unless otherwise specified, the specimens shall be prepared in accordance with the provisions of ISO 2818. When it is necessary to process the sheets to the thickness required for a particular test method, one original surface shall remain unchanged.

6.1.3 Thickness of test specimens When the thickness of the sheet is less than the thickness of the specimen required in a particular test method, a specimen of that thickness shall be used.

6.2 Appearance Defects and their distribution shall be observed by irradiating the sheet with sunlight or a light source with a color temperature of (6 500+/-650) K and sufficient brightness.

6.3 Color Visually inspect.

6.4 Dimensions

6.4.1 length and width According to the provisions of GB/T 6673, use a measuring tool with a division value not greater than 1 mm to measure the length and width of the sheet at equal intervals along the length and width of the test specimen, and measure each test specimen at least

4 times. Calculate the width limit deviation of the recorded data according to Formula

(1), and calculate the length limit deviation according to Formula (2).

Where:

delta W - width limit deviation, in millimeters (mm);

Wmin or max - measured minimum or maximum width, in millimeters (mm);

W0 - nominal width, in millimeters (mm).

Where:

delta l - length limit deviation, in millimeters (mm);

lmin or max - measured minimum or maximum length, in millimeters (mm);

l0 - nominal length, in millimeters (mm).

6.4.2 Thickness According to the provisions of GB/T 6672, use a measuring tool with a division value not greater than 0.01 mm. Measurements shall be made at a distance not less than 10 mm from the edge of the sheet. Use the recorded data to calculate the thickness limit deviation according to Formula (3).

Where:

delta e - thickness limit deviation, in millimeters (mm);

emin or max - measured minimum or maximum thickness, in millimeters (mm);

e0 - nominal thickness, in millimeters (mm).

min or max min or max min or max

6.4.3 Diagonal difference Measure the lengths of the diagonals of the sheets respectively, and use a measuring tool with a division value not greater than 1 mm to find the difference.

6.5 Tensile property According to the provisions of GB/T 1040.2-2006, use 1B-type specimens, and the test direction is consistent with the extrusion direction of the sheet. The test speed for tensile strength and tensile strain at break shall be (5+/-1) mm/min, and the test speed for modulus of elasticity shall be (1+/-0.2) mm/min.