INTERNATIONAL STANDARD

ISO 7823-3

Third edition
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Plastics — Poly(methyl methacrylate) sheets — Types, dimensions and characteristics —

Part 3: Continuous cast sheets

Plastiques — Plaques en poly(méthacrylate de méthyle) — Types, dimensions et caractéristiques —

Partie 3: Plaques coulées continues

Reference number
ISO 7823-3:2021(E)

5.2 Appearance

5.2.1 Surface defects

The sheet shall have a smooth surface. There shall be no scratches, marks or other surface defects larger than 3 mm^2 each anywhere in the sheet.

5.2.2 Inclusion defects

There shall be no bubbles, inclusions, cracks or other defects that could adversely affect the performance of the sheet in its intended application which are larger than 3 mm^2 each anywhere in the sheet.

5.2.3 Classification of defects

The area of any defect found in the sheets shall be classified as specified in Table 1. Each defect shall be considered separately.

Table 1 — Classification of defects

Classification	Area of surface defect	Area of inclusion defect
Negligible	Less than 1 mm^2	Less than 1 mm^2
Acceptable	1 mm^2 to 3 mm^2	1 mm^2 to 3 mm^2

5.2.4 Distribution of defects

5.2.4.1 There shall be no significant number (for the application) of small defects, each of which is defined as negligible in Table 1, within 1 m^2 anywhere in the sheet. What constitutes a significant number shall be agreed between the interested parties.

5.2.4.2 No defect defined as acceptable in Table 1 shall be within 500 mm of another acceptable defect anywhere in or on the sheet.

5.3 Colour

The colour distribution shall be homogeneous, unless otherwise specified. Variations in colour shall be agreed upon between the interested parties.

5.4 Dimensions

5.4.1 Length and width

The length and width of the sheet shall be agreed upon between the interested parties. For cut sheets, the tolerances for each sheet shall be as specified in Table 2.

Table 2 — Tolerances on length and width of cut sheets

Length or width mm	Tolerance
Up to 1 000	$^{+3}_{0}$ mm
From 1 001 to 2 000	$^{+6}_{0}$ mm
From 2 001 to 3 000	$^{+9}_{0}$ mm
3 001 and over	$^{+0,3}_{0}$ %

5.4.2 Thickness

The thickness tolerance for sheets in the range from 1 mm to 10 mm and up to 6 m^2 in area shall be ± 0,1*h*, where *h* is the nominal sheet thickness in millimetres.

The tolerances apply within each sheet and from sheet to sheet.

5.4.3 Tolerances for other sheet sizes

Tolerances for sheet sizes and thicknesses outside the above ranges shall be agreed upon between the interested parties.

5.4.4 Conditions of measurement

Measurements of dimensions shall be made at room temperature, except that, in cases of dispute, measurements shall be made under standard conditions, as specified in ISO 291. For measurements made under ambient conditions, due allowance shall be made for dimensional changes due to the differences in temperature and relative humidity between test locations.

5.5 Basic and other properties

5.5.1 Basic properties

The basic mechanical, thermal and optical properties of sheets shall be as specified in Table 3.

5.5.2 Other properties

Other properties of sheets shall be agreed upon between the interested parties. Examples of, and test methods for, such properties are presented in Table 4.

Table 3 — Basic properties of PMMA continuous cast sheets — Required values

Property	Unit	Test method	Required value	Subclause
Tensile strength	MPa	ISO 527-2/1B/5	min. 60	6.5.2
Tensile strain	%	ISO 527-2/1B/5	min. 2	6.5.2
Modulus of elasticity in tension	MPa	ISO 527-2/1B/1	min. 2 700	6.5.2
Charpy impact strength (unnotched)	kJ/m^2	ISO 179-1/1fU	min. 8	6.5.3
Vicat softening temperature	°C	ISO 306, method B50	min. 95	6.6.1
Dimensional change on heating (shrinkage)	%	Annex A	max. 2,8	6.6.3
Total luminous transmittance[a]	%	ISO 13468-1	min. 90	6.8.1
Light transmittance at 420 nm (thickness 3 mm)[a]				
— before exposure to xenon lamp	%	ISO 13468-2	min. 90	6.8.3
— after exposure to xenon lamp for 1 000 h (ISO 4892-2:2013, method A)	%	ISO 13468-2	min. 88	6.8.3

[a] For transparent, colourless material.

Table 4 — Other properties of PMMA continuous cast sheets — Typical values

Property	Unit	Test method	Typical value	Subclause
Flexural strength	MPa	ISO 178	110 to 115	6.5.1
Rockwell hardness	Scale M	ISO 2039-2	95 to 100	6.5.4
Linear expansion coefficient	$°C^{-1}$	ISO 11359-2	7×10^{-5}	6.6.4
Temperature of deflection under load	°C	ISO 75-2:2013, method A	85 to 100	6.6.2
Haze	%	ISO 14782	0,5 to 1	6.8.2
Refractive index, n_D^{23}		ISO 489:1999, method A	1,49	6.8.4
Density[a, b]	g/cm^3	ISO 1183-1:2019, method A or C, or ISO 1183-2	1,19	6.9.1
Water absorption	%	ISO 62, method 1 (24 h, 23 °C)	0,5[c]	6.9.2

[a] For transparent, colourless material.

[b] Coloured sheets may have a higher value.

[c] Value reported refers to a square specimen of edge 50 mm and thickness 3 mm.

6 Test methods

6.1 General

6.1.1 Sampling

The sampling procedure shall be agreed upon between the interested parties. The sampling procedure given in ISO 2859-1 is widely accepted and frequently used. Hence it is recommended.

6.1.2 Conditioning and testing atmospheres

Conditioning of specimens (48 h) and tests shall be carried out in accordance with ISO 291 with class 2 tolerances for temperature and relative humidity, except for the Vicat softening temperature, temperature of deflection under load and dimensional change on heating (shrinkage) (see 6.6.1, 6.6.2 and 6.6.3).

6.1.3 Preparation of test specimens

Specimens shall be prepared in accordance with the procedures specified in ISO 2818, wherever applicable.

When it is necessary to machine the sheet to the thickness required for a particular test method, one original surface shall be left intact.

6.1.4 Specimen thickness

When the sheet has a thickness less than that required for the specimens in a particular test method, specimens having the thickness of the sheet shall be used.

6.2 Appearance

Defects and their distribution shall be evaluated by inspecting the sheet illuminated by daylight or by a daylight-type fluorescent lamp with a colour temperature of 6 500 K ± 650 K and a power rating of not less than 40 W.