Designation: ~~D4802 – 10~~ D4802 – 15

Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet[1]

This standard is issued under the fixed designation D4802; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers monolithic methacrylate sheets produced by various processes. For this specification, methacrylate sheet shall be composed of polymerized acrylic monomers of which at least 80 % shall be methyl methacrylate.

NOTE 1—This specification is intended to consolidate the requirements of the Cast Methacrylate Plastic Sheets portion of discontinued Fed. Spec. L-P-391D, discontinued Specification D702. Cast Methacrylate Plastic Sheets, Rods, Tubes and Shapes, and discontinued Specification D1547, Extruded Acrylic Plastic Sheet.

1.2 This specification is intended to cover acrylic sheet for general-purpose applications. For specialty applications consult the appropriate use standards.

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 8, of this specification:*This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.4 Acrylic sheet is used frequently in applications in which extreme clarity, lack of optical distortion and absence of any foreign particulate matter are of primary significance. Reground material is suitable for use as long as careful control is used to eliminate adverse effects on these properties. The use of recycled material in type B-1 and B-2 sheet, is not suitable for use when these properties are adversely affected. The use of recycled or reground material is not possible for type A-1 and A-2 materials since the sheet is produced directly from monomer

NOTE 2—This standard and ISO 7823-1 address the same subject matter, but differ in technical content.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
D542 Test Method for Index of Refraction of Transparent Organic Plastics
D570 Test Method for Water Absorption of Plastics
D638 Test Method for Tensile Properties of Plastics
D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position (Withdrawn 2016)[3]
D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
D883 Terminology Relating to Plastics
D1003 Test Method for Haze and Luminous Transmittance of Transparent Plastics
D1044 Test Method for Resistance of Transparent Plastics to Surface Abrasion
D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
D3002 Guide for Evaluation of Coatings Applied to Plastics (Withdrawn 2016)[3]
D3359 Test Methods for Measuring Adhesion by Tape Test
D3892 Practice for Packaging/Packing of Plastics
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

2.2 *ISO Standard:*

ISO 7823-1 (E) Plastics—Poly(Methyl Methacrylate) Sheets—Types, Dimensions, and Characteristics[4]

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials.
Current edition approved ~~July 1, 2010~~Dec. 15, 2015. Published ~~July 2010~~January 2016. Originally approved in 1988. Last previous edition approved in ~~2002~~2010 as ~~D4802 – 02.~~D4802 – 10. ~~DOI:10.1520/D4802-10.~~DOI:10.1520/D4802-15.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

***A Summary of Changes section appears at the end of this standard**

3. Terminology

3.1 *Definitions:*

3.1.1 *General*—The definitions given in Terminology D883 are applicable to this specification.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bow warp, n*—distortion in the form of a simple curve or arc extending across the sheet and displaced from the horizontal when the sheet is laying flat.

3.2.2 *edge kink warpage, n*—distortion in the form of a twist, wrinkle, or scallop occurring along the perimeter of the sheet.

3.2.3 *"S" warp, n*—distortion in the form of a compound curve or "S" shape caused by a nonuniform change in internal stresses.

4. Classification

4.1 *Categories:*

4.1.1 *Category A-1*—Methacrylate sheet typically manufactured by the cell-casting process. This category represents the best optical-quality sheet. It is characterized by the highest long-term design stress and the highest degree of chemical resistance found in methacrylate sheet.

4.1.2 *Category A-2*—Methacrylate sheet typically manufactured by the continuous-casting method. The physical, chemical, and thermal properties are similar to Category A-1 sheet. The optical quality is lower than Category A-1 sheet. This category has better thickness control than that of Category A-1 sheet.

4.1.3 *Category B-1*—Methacrylate sheet manufactured by any of several processes (typically described as continuously manufactured sheet). This sheet possesses lower heat, chemical, and stress-craze resistance than Category A-1 and Category A-2 sheet. It has equivalent or better optical quality and thickness tolerances than Category A-2 sheet.

4.1.4 *Category B-2*—Methacrylate sheet typically manufactured by conventional extrusion processes. This sheet is characterized by excellent thickness control similar to Category A-2 and Category B-1 sheet. This sheet has reduced long-term design stress, chemical resistance, optical quality, and thermal stability.

4.2 *Finish*—The following are suitable specified finishes of methacrylate sheet. The physical and optical properties in this specification are based on Finish 1 material unless otherwise noted.

4.2.1 *Finish 1*—Smooth or polished.

4.2.2 *Finish 2*—Patterned, including textures and frosting.

4.2.3 *Finish 3*—Abrasion-resistant coated.

4.2.3.1 Finish 3 material can be of any category provided it meets the requirements of that category plus the additional requirements listed in Table 1.

4.2.4 *Type UVF (UV-Filtering)*—Materials that contain an ultraviolet absorber to limit the transmission of UV radiation through the sheet especially for protection of items sensitive to sunlight or UV radiation.

4.2.5 *Type UVT (UV-Transmitting)*—Materials that do not contain any UV absorbers and are used where there is a need to transmit a greater portion of UV radiation.

4.2.6 For general-purpose applications neither type need be specified. If not specified, materials will usually contain UV absorbers only sufficient to protect the polymer from degradation from exposure to direct sunlight or UV radiation. There are no specific UV-transmission requirements for material of unspecified type.

TABLE 1 Finish 3 Abrasion Resistant Material

~~Property~~	~~Test Method~~	~~Requirement~~
~~Abrasion resistance, 100 cycles at 500 g load~~	~~D1044~~	
~~Haze, max, %~~		~~4.0~~
~~Coating adhesion, percent retention, min~~	~~see 8.1.14~~	~~Minimum Classification 4B, Fig. 1, Test Methods D3359~~
~~Chemical resistance, visual examination~~	~~D1308~~	~~no change~~

TABLE 1 Finish 3 Abrasion Resistant Material

Property	Test Method	Requirement
Abrasion resistance, 100 cycles at 500 g load	D1044	
Haze, max, %		4.0
Coating adhesion, percent retention, min	see 8.1.14	Minimum Classification 4B, Fig. 1, Test Methods D3359
Chemical resistance, visual examination	D1308	no change

5. Detail Requirements

5.1 The following applies to all specified limits in this specification. For purposes of determining conformance with this specification, an observed value or a calculated value shall be rounded to the nearest 1 MPa (100 psi) for tensile strength, and for all other properties shall be rounded to the nearest unit in the last righthand place of digits used in expressing the limiting value, in accordance with the rounding method of Practice E29.

5.2 Sheet shall conform to the requirements prescribed in Table 2. In addition, Category A-1 sheet shall conform to the permissible-thickness variations listed in Table 3.

5.3 *Shrinkage*—Test in accordance with 8.1.7.

5.4 *Thermal Stability*—Sheet shall show no evidence of bubbling or blistering when tested in accordance with 8.1.8.

5.5 *Abrasion-Resistant Material*—Finish 3 material (abrasion-resistant coated material) shall meet the requirements of the substrate material it is designated as and the properties shown in Table 1.

5.6 *Workmanship*—Sheet, as delivered, shall be free from warpage, cracks, scratches, blisters, voids, foreign matter, die lines, and other defects that affect appearance or serviceability.

5.6.1 *Flatness of Sheet*—Sheet shall be free from edge kink warpage and from edge "S" warp when lying on a flat surface. Overall bow warp is permitted for all types of sheet to a maximum of 6.3 mm (0.250 in.) displacement from the horizontal for each 4-ft length, or fraction thereof, of a sheet under its own weight when laying in the horizontal position on a flat continuous surface. "S" warp that disappears or becomes bow warp when turned over is permitted.

5.6.2 *Chips and Dirt in Sheet:*

5.6.2.1 *Chips in Sheet of Thickness Equal to or Less Than 51 mm (2.008 in.)*—The maximum permissible chip size shall be 3.2 mm (0.125 in.). Chips that are approximately the maximum permissible size shall not have a frequency greater than 1 chip per 0.4 m^2 (4.3 ft^2) of sheet area. Chips less than 0.8 mm (0.031 in.) are to be disregarded unless they form a concentrated pattern that affects serviceability. Chips from 0.8 mm (0.031 in.) to the maximum permissible size shall not have a frequency greater than 1 per 0.4 m^2 (4.3 ft^2). Chips out of tolerance in size when knifed off are considered acceptable if the remaining blemish can be removed by polishing, except for Finish 3 sheet which cannot be easily polished. For Finish 3 sheet, the maximum permissible chip size shall be 4.75 mm (0.187 in.); all other requirements above apply except as noted.

5.6.2.2 *Chips in Sheet of Thicknesses Greater Than 51 mm (2.008 in.)*—Chips acceptable providing they do not extend more than 0.4 mm (0.016 in.) above the surface.

5.6.2.3 *Dirt and Contaminants*—The maximum permissible dirt and contamination dimension shall be 3.2 mm (0.125 in.). Dirt and contaminants less than 0.8 mm (0.031 in.) shall be disregarded unless they form a concentrated pattern that affects the serviceability of the sheet. The maximum permissible frequency for dimensions ranging from 0.8 mm (0.031 in.) to the maximum permissible for each type of sheet shall be 1 per 0.4 m^2 (4.3 ft^2) of sheet area for thickness up to and including 12.0 mm (0.472 in.). For Finish 3 sheet the maximum permissible dimension for dirt and contaminants shall be 4.8 mm (0.187 in.); all other requirements above apply.

5.6.2.4 *Other Defects*—Minor defects, such as mold or handling scratches, or die lines that can be removed by polishing, shall be permitted provided these are not objectionable individually or in group patterns. Excluding side letgoes for masked and unmasked sheets in thicknesses greater than 51 mm (2.004 in.) and for unmasked sheets that are thicker than 6.0 mm (0.236 in.) up to and including 51 mm (2.004 in.), defects within 25 mm (0.984 in.) of the untrimmed edge of the sheet, that do not significantly reduce mechanical strength of the sheet, shall be permitted. Side letgoes for sheets thicker than 51 mm (2.004 in.) are permitted providing they do not extend more than 0.4 mm (0.016 in.) below the surface. Side letgoes for unmasked sheets thicker than 6.0 mm (0.236 in.) up to and including 51 mm (2.004 in.) shall be allowed within a 50 mm (1.97 in.) band from the untrimmed edge of the sheet. For Finish 3 sheet, the maximum permissible length for mold scratches shall be 25 mm (0.984 in.); the maximum permissible length for medium or heavy handling scratches or abrasions shall be 50 mm (1.97 in.); the maximum permissible length of light-handling scratches or abrasions shall be 153 mm (6.024 in.); and scratches or abrasions less than 6 mm shall be disregarded unless they form a concentrated pattern that affects the serviceability of the sheet. For Finish 3 sheet, the maximum permissible frequency for allowable scratches and abrasions as defined above shall be one per 0.4 m^2 (4.3 ft^2) of sheet area.

6. Sampling

6.1 Unless otherwise indicated in Section 8 or Table 2, select a sample from a sheet 3.0 mm thick sufficient to determine conformance of the material to this specification.

TABLE 3 Permissible Thickness Variations for Category ~~C~~ 1 Cast Methacrylate Plastic Sheets

~~Nominal Thickness, mm (in.)~~[A]	~~Permissible Thickness Variation, mm (in.)~~		
	~~Size 1~~[B]	~~Size 2~~[C]	~~Size 3~~[D]
~~0.75 (0.030)~~	~~+0.178 (0.007)~~[E] ~~−0.229 (0.009)~~	~~NA~~[F]	~~NA~~[F]
~~1.0 (0.039)~~	~~+0.152 (0.006)~~[E] ~~−0.254 (0.010)~~	~~NA~~[F]	~~NA~~[F]

TABLE 2 Detail Requirements for Poly(Methyl Methacrylate) Acrylic Plastic Sheet

Property	Test Method	Category			
		A-1	A-2	B-1	B-2
Tensile strength, min, MPa (psi)	D638	62 (9.0 k)	62 (9.0 k)	62 (9.0 k)	62 (9.0 k)
Elongation at break, min, %	D638	2	2	2	2[A]
Index of refraction	D542				
min:		1.48	1.48	1.48	1.48[A]
max:		1.50	1.50	1.50	1.50
Specific gravity	D792				
min:		1.18	1.18	1.18	1.18[A]
max:		1.20	1.20	1.20	1.20
Luminous transmittance, min, %	D1003				
<4.5 mm (0.177 in.)		91	91	91	91
>4.5 mm (0.177 in.) ≤32 mm (1.259 in.)		89	89	89	89
>32.0 mm (1.259 in.)≤ 51.0 mm (2.000 in.)		87	87	87	87
Spectral transmittance, max, %	see 8.1.12				
Type UVF only 200 to 390 nm All thicknesses		5	5	5	5
Type UVT only 290 to 400 nm (3.0 mm, 0.118 in.)					
@290 nm		40	40	40	40
@310 nm		70	70	70	70
@340 nm		85	85	85	85
@400 nm		86	86	86	86
Haze, max,%	D1003	3	3	3	3
Dimensional tolerance, max:					
Thickness, %		see Table 3	±10	±5	±5
Length and width, mm (in.)		−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)
Shrinkage, max, %	see 8.1.7	2.8	2.8	...	...
Transverse:		...	...	0.0	5.0
Machine:		...	...	3.0	8.0
Water absorption, %	D570 (24-h method)		see Fig. 1Fig. 1	...	[A]
Deflection temperature under flexural load, 1820 kPa (264 psi), °C (°F), min	D648				
<12.0 mm (0.472 in.)		87 (188.6)	87 (188.6)	87 (188.6)	87 (188.6)
>12.0 mm (0.472 in.) ≤24.0 mm (0.944 in.)		88 (190.4)	88 (190.4)	88 (190.4)	N/A[B]
>24.0 mm (0.944 in.) ≤100 mm (3.937 in.)		93 (199.4)	93 (199.4)	N/A[B]	N/A[B]
Thermal stability		see 8.1.8.1	see 8.1.8.1	see 8.1.8.2	see 8.1.8.2
Impact strength, Izod, J/m (ft-lb/in.), min	D256, Method A	16.0 (0.3)	16.0 (0.3)	16.0 (0.3)	16.0 (0.3)[A]

TABLE 2 Detail Requirements for Poly(Methyl Methacrylate) Acrylic Plastic Sheet

Property	Test Method	Category			
		A-1	A-2	B-1	B-2
Tensile strength, min, MPa (psi)	D638	62 (9.0 k)	62 (9.0 k)	62 (9.0 k)	62 (9.0 k)
Elongation at break, min, %	D638	2	2	2	2[A]
Index of refraction	D542				
min:		1.48	1.48	1.48	1.48[A]
max:		1.50	1.50	1.50	1.50
Specific gravity	D792				
min:		1.18	1.18	1.18	1.18[A]
max:		1.20	1.20	1.20	1.20
Luminous transmittance, min, %	D1003				
<4.5 mm (0.177 in.)		91	91	91	91
>4.5 mm (0.177 in.) ≤32 mm (1.259 in.)		89	89	89	89
>32.0 mm (1.259 in.)≤ 51.0 mm (2.000 in.)		87	87	87	87
Spectral transmittance, max, %	see 8.1.12				
Type UVF only 200 to 390 nm All thicknesses		5	5	5	5
Type UVT only 290 to 400 nm (3.0 mm, 0.118 in.)					
@290 nm		40	40	40	40
@310 nm		70	70	70	70
@340 nm		85	85	85	85
@400 nm		86	86	86	86
Haze, max,%	D1003	3	3	3	3
Dimensional tolerance, max:					
Thickness, %		see Table 3	±10	±5	±5
Length and width, mm (in.)		−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)	−0.0, + 6.4 (−0.0, + 0.250)
Shrinkage, max, %	see 8.1.7	2.8	2.8	...	...
Transverse:		...	...	0.0	5.0
Machine:		...	...	3.0	8.0
Water absorption, %	D570 (24-h method)		see Fig. 1	...	[A]
Deflection temperature under flexural load, 1820 kPa (264 psi), °C (°F), min	D648				

Property	Test Method	Category			
		A-1	A-2	B-1	B-2
<12.0 mm (0.472 in.)		87 (188.6)	87 (188.6)	87 (188.6)	87 (188.6)
>12.0 mm (0.472 in.) ≤24.0 mm (0.944 in.)		88 (190.4)	88 (190.4)	88 (190.4)	N/A[B]
>24.0 mm (0.944 in.) ≤100 mm (3.937 in.)		93 (199.4)	93 (199.4)	N/A[B]	N/A[B]
Thermal stability		see 8.1.8.1	see 8.1.8.1	see 8.1.8.2	see 8.1.8.2
Impact strength, Izod, J/m (ft-lb/in.), min	D256, Method A	16.0 (0.3)	16.0 (0.3)	16.0 (0.3)	16.0 (0.3)[A]

[A] For Category B-2 sheet only, ~~properties noted may be determined~~ it is acceptable to determine properties on the resin ~~from~~ or test specimens molded from the resin from which the sheet is extruded.
[B] Not applicable.

~~TABLE 3~~ *~~Continued~~*

~~Nominal Thickness, mm (in.)[A]~~	~~Permissible Thickness Variation, mm (in.)~~		
	~~Size 1[B]~~	~~Size 2[C]~~	~~Size 3[D]~~
~~1.25 (0.049)~~	~~+0.152 (0.006)[E] −0.254 (0.010)~~	~~NA[F]~~	~~NA[F]~~
~~1.5 (0.059)~~	~~+0.381 (0.015) −0.483 (0.019)~~	~~+0.610 (0.024) −0.686 (0.027)~~	~~NA[F]~~
~~2.0 (0.079)~~	~~+0.356 (0.014) −0.508 (0.020)~~	~~+0.559 (0.022) −0.711 (0.028)~~	~~NA[F]~~
~~2.5 (0.098)~~	~~+0.330 (0.013) −0.533 (0.021)~~	~~+0.533 (0.021) −0.737 (0.029)~~	~~NA[F]~~
~~2.5 (0.100)~~	~~+0.330 (0.013) −0.533 (0.021)~~	~~+0.533 (0.021 −0.737 (0.029)~~	~~NA[F]~~
~~3.0 (0.118)~~	~~+0.381 (0.015) −0.635 (0.025)~~	~~+0.508 (0.020) −0.762 (0.030)~~	~~+0.762 (0.030) −1.02 (0.040)~~
~~3.2 (0.125)~~	~~+0.381 (0.015) −0.635 (0.025)~~	~~+0.508 (0.020) −0.762 (0.030)~~	~~+0.762 (0.030) −1.02 (0.040)~~
~~3.8 (0.150)~~	~~+0.406 (0.016) −0.762 (0.030)~~	~~+0.559 (0.022) −0.914 (0.036)~~	~~+0.737 (0.029) −1.27 (0.050)~~
~~4.0 (0.157)~~	~~+0.406 (0.016) −0.762 (0.030)~~	~~+0.559 (0.022) −0.914 (0.036)~~	~~+0.737 (0.029) −1.27 (0.050)~~
~~4.5 (0.177)~~	~~+0.432 (0.017) −0.838 (0.033)~~	~~+0.559 (0.022) −0.965 (0.038)~~	~~+0.686 (0.027) −1.09 (0.043)~~
~~4.8 (0.187)~~	~~+0.432 (0.017) −0.838 (0.033)~~	~~+0.559 (0.022) −0.965 (0.038)~~	~~+0.686 (0.027) −1.09 (0.043)~~
~~5.5 (0.217)~~	~~+0.508 (0.020) −1.02 (0.040)~~	~~+0.635 (0.025) −1.14 (0.045)~~	~~+0.737 (0.029) −1.27 (0.050)~~
~~5.56 (0.220)~~	~~+0.508 (0.020) −1.02 (0.040)~~	~~+0.635 (0.025) −1.14 (0.045)~~	~~+0.737 (0.029) −1.27 (0.050)~~
~~6.0 (0.236)~~	~~+0.508 (0.020) −1.02 (0.040)~~	~~+0.635 (0.025) −1.14 (0.045)~~	~~+0.508 (0.030) −1.27 (0.050)~~
~~6.4 (0.250)~~	~~+0.508 (0.020) −1.02 (0.040)~~	~~+0.635 (0.025) −1.14 (0.045)~~	~~+0.737 (0.029) −1.27 (0.050)~~
~~7.9 (0.312)~~	~~+0.559 (0.022) −1.22 (0.048)~~	~~+0.686 (0.027) −1.35 (0.053)~~	~~+0.813 (0.032) −1.47 (0.058)~~
~~8.0 (0.315)~~	~~+0.559 (0.022) −1.22 (0.048)~~	~~+0.686 (0.027) −1.35 (0.053)~~	~~+0.813 (0.032) −1.47 (0.058)~~
~~9.0 (0.354)~~	~~+0.635 (0.025) −1.40 (0.055)~~	~~+0.762 (0.030) −1.52 (0.060)~~	~~+0.889 (0.035) −1.65 (0.065)~~
~~9.5 (0.375)~~	~~+0.635 (0.025) −1.40 (0.055)~~	~~+0.762 (0.030) −1.52 (0.060)~~	~~+0.889 (0.035) −1.65 (0.065)~~
~~12.0 (0.472)~~	~~+0.635 (0.025) −1.65 (0.065)~~	~~+0.762 (0.030) −1.78 (0.070)~~	~~+0.889 (0.035) −1.91 (0.075)~~
~~12.7 (0.500)~~	~~+0.635 (0.025) −1.65 (0.065)~~	~~+0.762 (0.030) −1.78 (0.070)~~	~~+0.889 (0.035) −1.91 (0.075)~~
~~15.0 (0.591)~~	~~+0.737 (0.029) −1.80 (0.071)~~	~~+0.737 (0.029) −1.80 (0.071)~~	~~+0.864 (0.034) −1.93 (0.076)~~
~~15.9 (0.625)~~	~~+0.838 (0.033) −1.96 (0.077)~~	~~+0.838 (0.033) −1.96 (0.077)~~	~~+0.965 (0.038) −2.08 (0.082)~~
~~16.0 (0.630)~~	~~+0.838 (0.033) −1.96 (0.077)~~	~~+0.838 (0.033) −1.96 (0.077)~~	~~+0.965 (0.038) −2.08 (0.082)~~
~~18.0 (0.709)~~	~~+0.762 (0.030) −2.03 (0.080)~~	~~+0.762 (0.030) −2.03 (0.080)~~	~~+1.02 (0.040) −2.29 (0.090)~~
~~19.0 (0.750)~~	~~+0.762 (0.030) −2.03 (0.080)~~	~~+0.762 (0.030) −2.03 (0.080)~~	~~+1.02 (0.040) −2.29 (0.090)~~
~~22.0 (0.866)~~	~~+0.660 (0.026) −2.13 (0.084)~~	~~+0.660 (0.026) −2.13 (0.084)~~	~~+1.17 (0.046) −2.64 (0.104)~~
~~24.0 (0.945)~~	~~+0.584 (0.023) −2.21 (0.087)~~	~~+0.584 (0.023) −2.21 (0.087)~~	~~+1.22(0.048) −2.84 (0.112)~~
~~25.4 (1.00)~~	~~+0.584 (0.023) −2.21 (0.087)~~	~~+0.584 (0.023) −2.21 (0.087)~~	~~+1.22(0.048) −2.84 (0.112)~~
~~31.8 (1.250)~~	~~+1.32 (0.052) −2.39 (0.094)~~	~~+1.32 (0.052) −2.39 (0.094)~~	~~+1.32 (0.052) −2.39 (0.094)~~

~~TABLE 3 *Continued*~~

~~Nominal Thickness, mm (in.)[A]~~	~~Permissible Thickness Variation, mm (in.)~~		
	~~Size 1[B]~~	~~Size 2[C]~~	~~Size 3[D]~~
~~32.0 (1.280)~~	~~+1.32 (0.052)~~ ~~−2.39 (0.094)~~	~~+1.32 (0.052)~~ ~~−2.39 (0.094)~~	~~+1.32 (0.052)~~ ~~−2.39 (0.094)~~
~~38.0 (1.496)~~	~~+1.00 (0.039)~~ ~~−3.07 (0.021)~~	~~+1.00 (0.039)~~ ~~−3.07 (0.121)~~	~~+1.96 (0.077)~~ ~~−4.04 (0.159)~~
~~44.0 (1.732)~~	~~+1.24 (0.049)~~ ~~−3.48 (0.137)~~	~~+1.24 (0.049)~~ ~~−3.48 (0.137)~~	~~+2.34 (0.092)~~ ~~−4.57 (0.180)~~
~~44.4 (1.750)~~	~~+1.24 (0.049)~~ ~~−3.48 (0.137)~~	~~+1.24 (0.049)~~ ~~−3.48 (0.137)~~	~~+2.34 (0.092)~~ ~~−4.57 (0.180)~~
~~50.8 (2.000)~~	~~+1.47 (0.058)~~ ~~−3.86 (0.152)~~	~~+1.47 (0.058)~~ ~~−3.86 (0.152)~~	~~+2.74 (0.108)~~ ~~−5.13 (0.202)~~
~~51.0 (2.008)~~	~~+1.47 (0.058)~~ ~~−3.86 (0.152)~~	~~+1.47 (0.058)~~ ~~−3.86 (0.152)~~	~~+2.74 (0.108)~~ ~~−5.13 (0.202)~~
~~57.0 (2.244)~~	~~+1.78 (0.070)~~ ~~−4.22 (0.166)~~	~~+1.78 (0.070)~~ ~~−4.22 (0.166)~~	~~NA[F]~~
~~64.0 (2.520)~~	~~+2.01 (0.079)~~ ~~−4.60 (0.081)~~	~~+2.01 (0.079)~~ ~~−4.60 (0.181)~~	~~NA[F]~~
~~70.0 (2.756)~~	~~+2.34 (0.092)~~ ~~−4.93 (0.194)~~	~~+2.34 (0.092)~~ ~~−4.93 (0.194)~~	~~NA[F]~~
~~76.0 (2.992)~~	~~+2.59 (0.102)~~ ~~−5.28 (0.208)~~	~~+2.59 (0.102)~~ ~~−5.28 (0.208)~~	~~NA[F]~~
~~80.0 (3.150)~~	~~+2.89 (0.114)~~ ~~−5.64 (0.222)~~	~~+2.89 (0.114)~~ ~~−5.64 (0.222)~~	~~NA[F]~~
~~90.0 (3.543)~~	~~+3.07 (0.121)~~ ~~−6.07 (0.239)~~	~~+3.07 (0.121)~~ ~~−6.07 (0.239)~~	~~NA[F]~~
~~95.0 (3.740)~~	~~+3.40 (0.134)~~ ~~−6.40 (0.252)~~	~~+3.40 (0.134)~~ ~~−6.40 (0.252)~~	~~NA[F]~~
~~100.0 (3.937)~~	~~+3.61 (0.142)~~ ~~−6.81 (0.268)~~	~~+3.61 (0.142)~~ ~~−6.81 (0.268)~~	~~NA[F]~~

TABLE 3 Permissible Thickness Variations for Category A-1 Cast Methacrylate Plastic Sheets

Nominal Thickness, mm (in.)[A]	Permissible Thickness Variation, mm (in.)		
	Size 1[B]	Size 2[C]	Size 3[D]
0.75 (0.030)	+0.178 (0.007)[E] −0.229 (0.009)	NA[F]	NA[F]
1.0 (0.039)	+0.152 (0.006)[E] −0.254 (0.010)	NA[F]	NA[F]
1.25 (0.049)	+0.152 (0.006)[E] −0.254 (0.010)	NA[F]	NA[F]
1.5 (0.059)	+0.381 (0.015) −0.483 (0.019)	+0.610 (0.024) −0.686 (0.027)	NA[F]
2.0 (0.079)	+0.356 (0.014) −0.508 (0.020)	+0.559 (0.022) −0.711 (0.028)	NA[F]
2.5 (0.098)	+0.330 (0.013) −0.533 (0.021)	+0.533 (0.021) −0.737 (0.029)	NA[F]
2.5 (0.100)	+0.330 (0.013) −0.533 (0.021)	+0.533 (0.021 −0.737 (0.029)	NA[F]
3.0 (0.118)	+0.381 (0.015) −0.635 (0.025)	+0.508 (0.020) −0.762 (0.030)	+0.762 (0.030) −1.02 (0.040)
3.2 (0.125)	+0.381 (0.015) −0.635 (0.025)	+0.508 (0.020) −0.762 (0.030)	+0.762 (0.030) −1.02 (0.040)
3.8 (0.150)	+0.406 (0.016) −0.762 (0.030)	+0.559 (0.022) −0.914 (0.036)	+0.737 (0.029) −1.27 (0.050)
4.0 (0.157)	+0.406 (0.016) −0.762 (0.030)	+0.559 (0.022) −0.914 (0.036)	+0.737 (0.029) −1.27 (0.050)
4.5 (0.177)	+0.432 (0.017) −0.838 (0.033)	+0.559 (0.022) −0.965 (0.038)	+0.686 (0.027) −1.09 (0.043)
4.8 (0.187)	+0.432 (0.017) −0.838 (0.033)	+0.559 (0.022) −0.965 (0.038)	+0.686 (0.027) −1.09 (0.043)
5.5 (0.217)	+0.508 (0.020) −1.02 (0.040)	+0.635 (0.025) −1.14 (0.045)	+0.737 (0.029) −1.27 (0.050)
5.56 (0.220)	+0.508 (0.020) −1.02 (0.040)	+0.635 (0.025) −1.14 (0.045)	+0.737 (0.029) −1.27 (0.050)
6.0 (0.236)	+0.508 (0.020) −1.02 (0.040)	+0.635 (0.025) −1.14 (0.045)	+0.508 (0.030) −1.27 (0.050)
6.4 (0.250)	+0.508 (0.020) −1.02 (0.040)	+0.635 (0.025) −1.14 (0.045)	+0.737 (0.029) −1.27 (0.050)
7.9 (0.312)	+0.559 (0.022) −1.22 (0.048)	+0.686 (0.027) −1.35 (0.053)	+0.813 (0.032) −1.47 (0.058)
8.0 (0.315)	+0.559 (0.022) −1.22 (0.048)	+0.686 (0.027) −1.35 (0.053)	+0.813 (0.032) −1.47 (0.058)
9.0 (0.354)	+0.635 (0.025) −1.40 (0.055)	+0.762 (0.030) −1.52 (0.060)	+0.889 (0.035) −1.65 (0.065)
9.5 (0.375)	+0.635 (0.025)	+0.762 (0.030)	+0.889 (0.035)