



Standard Performance Requirements for Plastic Chairs for Outdoor Use¹

This standard is issued under the fixed designation F1561; 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.

1. Scope

1.1 These requirements establish nationally recognized performance requirements for Class A (residential) and Class B (nonresidential) plastic chairs intended for outdoor use.

1.2 These requirements do not address conditions that affect the performance of the chair beyond the manufacturing site.

1.3 These requirements are not applicable to chaises, multipositional chairs, upholstered chairs, or other types of furniture.

1.4 These requirements cover the physical performance of product regarding the aspects of outdoor weathering, impact, static load, and rear leg testing.

1.5 Products may be manufactured from recycled plastics as long as the performance requirements are met.

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D638 Test Method for Tensile Properties of Plastics

D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications

D4329 Practice for Fluorescent Ultraviolet (UV) Lamp Apparatus Exposure of Plastics

D5033 Guide for Development of ASTM Standards Relating

to Recycling and Use of Recycled Plastics (Withdrawn 2007)³

G23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn 2000)³

3. Terminology

3.1 *Definitions:*

3.1.1 *plastic chair, n*—for the purposes of these requirements, a molded, upright piece of furniture with or without arms, having a back in a fixed position with no moving parts, intended for seating one person, and having a seat height not less than 15 in. (381 mm) and not greater than 19 in. (483 mm); for a chair with arms, having a seat width not less than 16 in. (406 mm) and not greater than 30 in. (762 mm); and for a chair without arms, having a seat width not less than 14 in. (356 mm) and not greater than 30 in. (as shown in Fig. 1).

3.1.1.1 *Discussion*—Class A (residential) plastic chairs are intended for use by the customer in and around the home.

3.1.1.2 *Discussion*—Class B (nonresidential) plastic chairs are intended for use by the customer in all other areas, including those defined as Class A.

4. Significance and Use

4.1 Tests and criteria as outlined determine the overall usability and stability of chairs in an environment simulating the conditions of use.

4.2 Tests simulate two types of surfaces:

4.2.1 Smooth surfaces such as linoleum, wet pool decks, etc. The glass testing base (Fig. 2) is used to simulate this surface.

4.2.2 Rough surfaces such as wooden decks, outdoor grassed areas, etc. The plywood testing base (Fig. 3) is used to simulate this surface.

5. Apparatus

5.1 *Plastic Chairs*, which have been inspected and met a manufacturer's internal quality standards.

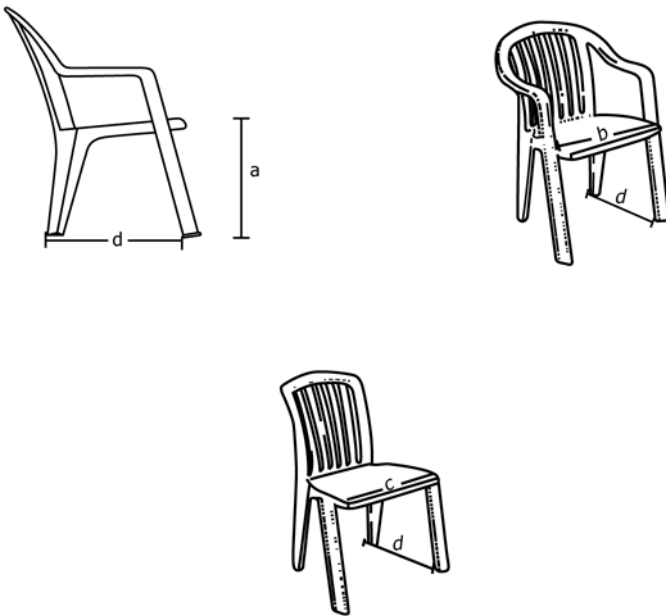
5.2 *One Heavy-Weight Canvas or Leather Bag*, 16 $\pm$ 0.2 in. (406 $\pm$ 4 mm) in diameter, which shall be measured prior to

¹ These performance requirements are under the jurisdiction of ASTM Committee F15 on Consumer Products and are the direct responsibility of Subcommittee F15.33 on Outdoor Plastic Lawn Furniture.

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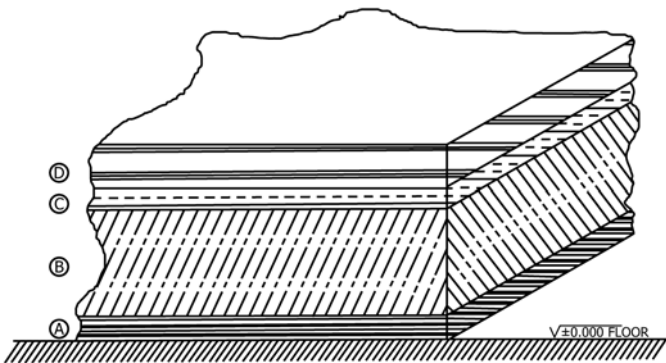
² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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



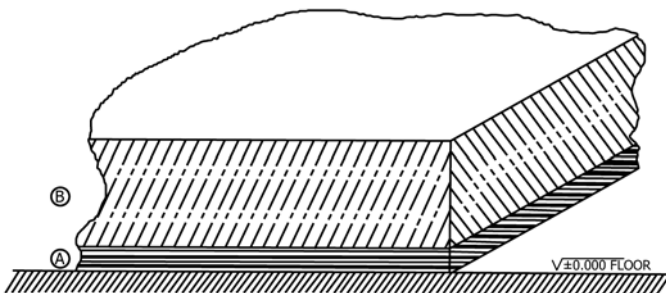
NOTE 1—*a* = seat height, chair with or without arms; *b* = seat width, chair with arms; *c* = seat width, chair without arms; and, *d* = leg stance, measured from back of front leg to back of rear leg.

FIG. 1 Measurements of a Chair



NOTE 1—*A* = poly(methyl methacrylate) sheet (see standard specifications); *B* = AC exterior glue fir plywood (see standard specifications); *C* = polypropylene microfoam sheet (see standard specifications); *D* = glass/tempered (see standard specifications).

FIG. 2 Glass Testing Base



NOTE 1—*A* = poly(methyl methacrylate) sheet (see standard specifications); *B* = AC exterior glue fir plywood (see standard specifications).

FIG. 3 Plywood Testing Base

testing to determine stretching, having a total measurement not to exceed 17.5 in. (445 mm) and filled with steel or lead shot

(0.09 to 0.12 in. (2.3 to 3.0 mm) in diameter) to a total weight of 150 ± 1.5 lb (68 ± 0.7 kg). The bag shall be fitted with a safety cable to prevent it from hitting the glass testing base but should not interfere with the test.

5.3 *One Heavy-Weight Canvas or Leather Bag*, identical to the bag in 5.2; however, the weight is increased by addition to the bag of 150 ± 1.5 lb (68 ± 0.7 kg) of either (1) additional steel or lead shot, or (2) barbell weights distributed evenly on top of the steel or lead shot, for a total weight of 300 ± 3 lb (136 ± 1.4 kg).

5.4 *One Heavy-Weight Canvas or Leather Bag*, identical to the bag in 5.2; however, the weight is increased by addition to the bag of 250 ± 2.5 lb (114 ± 1.1 kg) of either (1) additional steel or lead shot or (2) barbell weights distributed evenly on top of the steel or lead shot, for a total weight of 400 ± 4 lb (182 ± 1.8 kg).

5.5 *Tempered Sheet Glass (as Base)*, one piece 36 ± 0.4 -in. (914 ± 10 -mm) square and clean, 0.38 ± 0.04 -in. (10 ± 0.1 -mm) thickness.

5.6 *AC Exterior Glue Fir Plywood (as Base)*, one piece 36 ± 0.4 -in. (914 ± 10 -mm) square sheet, 1.0 ± 0.1 -in. (25 ± 0.3 -mm) thickness.

5.7 *Poly(Methyl Methacrylate)*, one piece 36 ± 0.4 -in. (914 ± 10 -mm) square sheet, 0.25 ± 0.03 -in. (6 ± 0.1 -mm) thickness.

5.8 *Polypropylene Microfoam*, one piece 36 ± 0.4 -in. (914 ± 10 -mm) square sheet, 0.7 ± 0.01 -lb/ft³ density and 0.13 ± 0.01 -in. (3 ± 0.03 -mm) thickness.

5.9 *Rear Leg Testing Block*—One block of suitable wood material, 36 in. (914 mm) in length, and 3 ± 0.03 in. (76 ± 0.8 mm) in height, and 6 in. (150 mm) or greater in width.

5.10 *Rear Leg Testing Block*—One block of suitable wood material, 36 in. (914 mm) in length, and 3.75 ± 0.04 in. (95 ± 0.95 mm) in height, and 6 in. (150 mm) or greater in width.

5.11 *Rear Leg Testing Block*—One block of suitable wood material, 36 in. (914 mm) in length, and 4.5 ± 0.05 in. (114 ± 1.1 mm) in height, and 6 in. (150 mm) or greater in width.

6. Conditioning

6.1 Precondition all chairs for a minimum of 48 h at 65 to 75°F (18 to 24°C) and a relative humidity of 50 ± 5 % and test subsequently under the same conditions.

7. General Requirements

7.1 All plastic chairs meeting the performance requirements shall be made from polymeric materials that meet the requirements for outdoor weathering in Section 8 for Class A (residential) or Section 9 for Class B (nonresidential).

8. Test Procedure—Class A (Residential)

8.1 *Initial Inspection*—Inspect each chair thoroughly for breaks, fractures, cracks, or other structural damage prior to testing. Any chairs exhibiting structural damage shall not be tested.