



Standard Test Method for Diffuse Light Transmission Factor of Reinforced Plastics Panels¹

This standard is issued under the fixed designation D 1494; 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 This test method covers the determination of the diffuse light transmission factor of translucent reinforced plastics building panels.

1.2 The values stated in SI units are to be regarded as the standard. The values given in the parentheses are for information only.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in Tables and Figures) shall not be considered as requirements of this standard.

1.4 *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.*

NOTE 1—There are no ISO standards covering the subject matter of this specification.

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics for Testing²
- D 883 Terminology Relating to Plastics³
- D 1600 Terminology for Abbreviated Terms Relating to Plastics³
- E 691 Practice for Conducting an Interlaboratory Study Program to Determine the Precision of a Test Method⁴

3. Terminology

3.1 General—Definitions are in accordance with Terminology D 883 and abbreviations with Terminology D 1600, unless otherwise indicated.

4. Significance and Use

4.1 The purpose of this test method is to obtain the diffuse light transmittance factor of both flat and corrugated translucent building panels by the use of simple apparatus and by employing as a light source a combination of fluorescent tubes whose energy distribution closely approximates CIE Source C.

5. Apparatus

5.1 The apparatus for this test method shall consist of a transmissometer,⁵ Fig. 1, comprising essentially the following:

5.1.1 *Light Source*—The illumination shall consist of twelve 20-W fluorescent tubes⁶ which are assembled in three banks of four tubes each, according to the following schedule: daylight, deluxe cool white, blue, and daylight.

5.1.2 *Photometer*—The photometer shall consist of a photocell and of a galvanometer. The photocell shall be of the barrier-layer type and shall contain a visual correction filter. The assembly preferably should be hermetically sealed into plastic as a protection against moisture. The indicating galvanometer should contain one scale graduated from 0 to 100, and a circuit with sufficient variable resistance so that the sensitivity of the photometer can be adjusted over the range of 50 to 100 footcandles.

5.1.3 *Test Cabinet*, constructed in accordance with the following dimensions.⁷

5.1.3.1 The transmitted area of the test specimen shall be 610 ± 1.6 mm by 610 ± 1.6 mm ($24 \pm 1/16$ in. by $24 \pm 1/16$ in.).

5.1.3.2 The distance from the bottom of the fluorescent tubes to the bottom of the test specimen shall be 203 ± 0.8 mm ($8 \pm 1/32$ in.).

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.24 on Plastic Building Products.

Current edition approved April 10, 1997. Published November 1997. Originally published as D 1494 – 57 T. Last previous edition D 1494 – 92.

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 08.04.

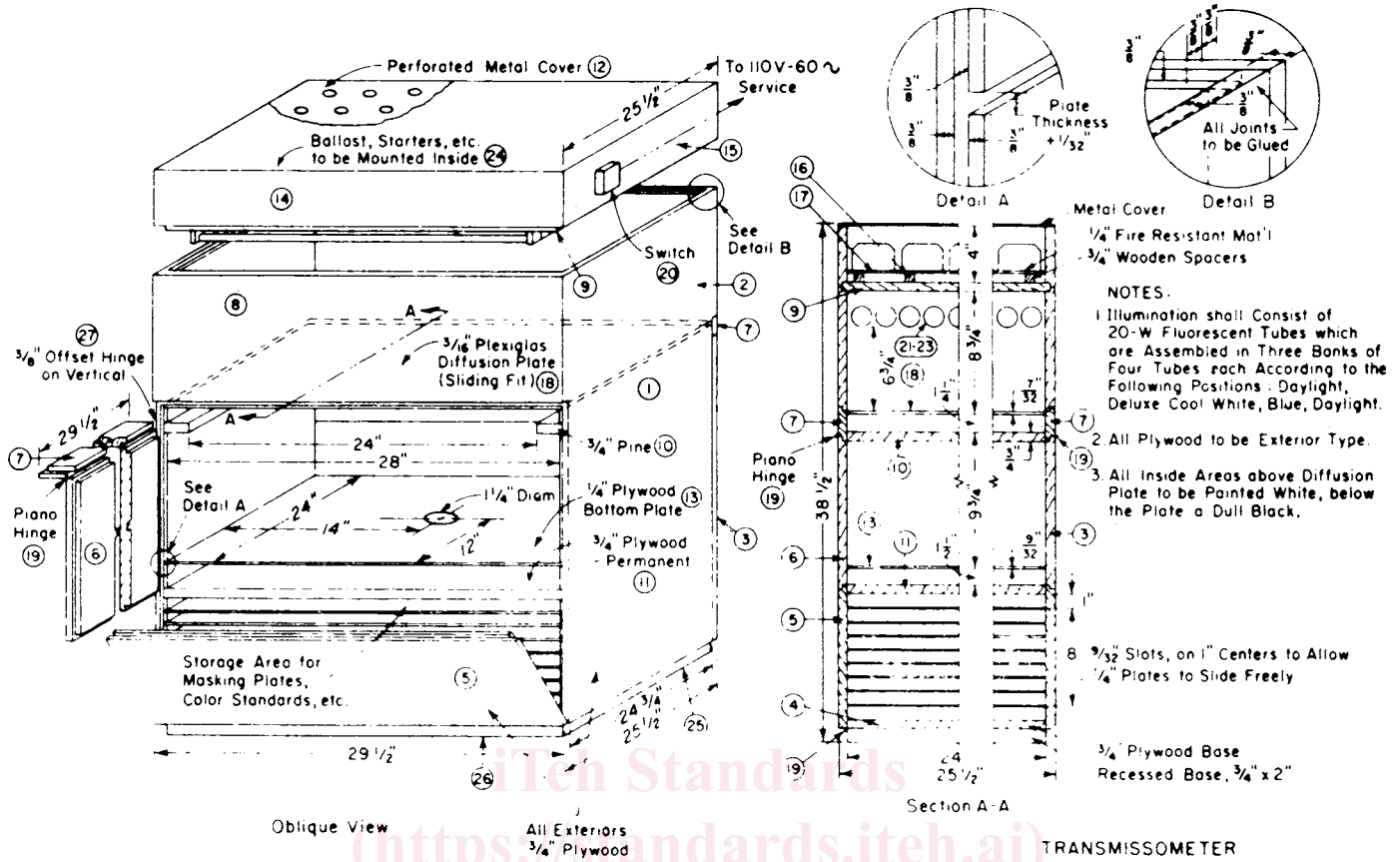
⁴ Annual Book of ASTM Standards, Vol 08.03.

⁵ The SPI (Society of the Plastics Industry) transmissometer has been found satisfactory for this purpose.

⁶ General Electric fluorescent tubes have been found satisfactory for this purpose.

⁷ Detailed working drawings and a bill of materials for this equipment can be obtained at a nominal charge from ASTM Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428–2959. Order Adjunct: ADJD1494.

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



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Metric Equivalents							
in.	mm	in.	mm	in.	mm	in.	mm
1/32	0.8	3/4	19.1	8 3/4	222	24 3/4	634
3/16	4.8	1 1/4	31.8	9 3/4	248	25 1/2	648
7/32	5.6	1 1/2	38.1	12	305	28	711
1/4	6.4	2	50.8	14	356	29 1/2	749
9/32	7.1	6 3/4	172	24	610	38 1/2	978
5/8	9.5						

FIG. 1 Assembly Drawing of Transmissometer

5.1.3.3 A 4.8-mm (3/16-in.) thick, white, standard outdoor, translucent diffusing plate⁸ shall be placed between the light source and the test specimen so that the distance from the bottom of the diffusing plate to the bottom of the test specimen is 31.8 ± 0.8 mm (1 1/4 ± 1/32 in.).

5.1.3.4 The photocell shall be positioned below the center axis of the test specimen so that the distance from the bottom of the specimen to the top of the cell is 283 ± 0.8 mm (11 1/8 ± 1/32 in.).

5.1.3.5 A masking plate containing a 31.8-mm (1 1/4-in.) diameter hole in its center shall be placed between the test specimen and the photocell so that the distance from the bottom of the test specimen to the bottom of the masking plate shall be 233 ± 0.8 mm (9 3/4 ± 1/32 in.).

⁸ Plexiglas II, W7328, or its equivalent, has been found satisfactory for this purpose.

6. Standardization of Transmissometer

6.1 Center the photocell beneath the 31.8-mm (1 1/4-in.) diameter hole in the bottom masking plate. Place the galvanometer in a flat level position. Ensure that no current flows in the electrical circuit by opening the circuit. Adjust the position of the indicating needle on the galvanometer to read "0" by means of the zero adjustment knob. Close the galvanometer circuit. Turn on the illumination in the transmissometer. Wait a minimum of 20 min to permit the transmissometer to reach equilibrium conditions. Adjust the galvanometer to read "100." The instrument is now ready to be used for measurements of diffuse light transmission factor.

7. Test Specimens

7.1 The test specimens shall consist of translucent reinforced plastic panels having a minimum length of 610 mm (24 in.) and a width greater than 610 mm (24 in.), but not exceeding 711 mm (28 in.).