



Designation: D3891 – 23

Standard Practice for Preparation of Glass Panels for Testing Paint, Varnish, Lacquer, and Related Products¹

This standard is issued under the fixed designation D3891; 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 practice covers the preparation of glass panels for subsequent testing of paint, varnish, lacquer, and related products.²

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

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*³

D1152 Specification for Methanol (Methyl Alcohol) (Withdrawn 2021)⁴

D1193 Specification for Reagent Water

3. Significance and Use

3.1 The procedures described in this practice are designed to provide uniform glass panels for testing of paint, varnish, lacquer, conversion coatings and related products.

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.27 on Accelerated Testing.

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² This practice is intended to be equivalent to Method 2021 of U.S. Federal Test Method Standard 141.

³ 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.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

4. Reagents and Materials

4.1 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type IV of Specification **D1193**.

4.2 *Solvents*—Varnish Makers' and Painters (VM&P) naphtha, xylene, 2-methoxypropanol, and methanol complying with the appropriate specifications (see Specification **D1152**).

4.3 Glass of the following types may be specified in the applicable test methods:

4.3.1 *Window Glass*, (float glass) the surface of which is plain and free of irregularities.

NOTE 1—Float glass is the most common kind of glass used for windows. It is produced by floating a ribbon of red hot glass on a bath of molten tin. The sides of the float glass exposed to tin and to air have somewhat different characteristics. The tin side contains tin diffused into the glass structure. Paint generally releases more easily from the tin side, but it may be contaminated with tin, which could affect chemical analysis. Paint generally adheres better to the air side. The sides can be distinguished by exposing the glass to a UV-A light ("black light"); the air side will appear clear, and the tin side will appear frosted. Depending on the application, the user may want to choose which side is appropriate for that test, and make sure that the same side is coated on every panel. Note however, that if the window glass used is *not* float glass (for example, plate glass), both sides of the glass will be the same.

4.3.2 *Clear Plate Glass*, not less than 5 mm (0.16 in.) thick.

4.3.3 *Plate Glass* that has been ground uniformly on one side with 1F carborundum.

4.3.4 *Black Structural Glass*, one side of which has been polished to a smooth, high-gloss surface.

4.3.5 *White Structural Glass*, one side of which has been polished to a smooth, high gloss.

5. Method of Preparation

5.1 *New Panels*—Using a clean lintless cloth, wipe the panel with a solvent mixture consisting of equal volumes of VM&P naphtha and xylene, or of 3 parts by volume of VM&P naphtha and 1 part of 2-methoxypropanol, or with water. When all soluble and loosely adhering soil has been washed off, flush with clean solvent. Allow panels to dry at room temperature or force dry at a temperature no higher than 150 °C (302 °F). After cooling to room temperature, rub with a clean lintless cloth if necessary.

5.1.1 The surface after cleaning shall be water-break free. This is determined by momentarily immersing in reagent water one panel of each twenty prepared. If a continuous water film is not retained (that is, the water film breaks), immerse the panel in methyl alcohol to obtain a water-break-free surface. After removal, dry at a temperature of 50 °C to 95 °C (122 °F to 203 °F) and allow to cool before coating or storing.

5.1.2 Other combinations or organic reagents that will produce a surface equal in cleanliness to the solvent mixtures mentioned in 5.1 may be used if agreed upon between the purchaser and the supplier.

5.2 *Used Panels*—Remove the old paint, using a paint and varnish remover of the organic solvent type or a suitable solvent mixture. Do not use a spatula, sandpaper, or other instrument of treatment that might scratch or etch the surface. After washing off the residues clean the panels as described in 5.1.

5.3 *Protection After Preparation*—Use panels immediately after preparation or store wrapped in clean, hard surfaced paper to minimize lint on the glass surface. To avoid contamination

by fingerprints, do not touch the surface of the panels after preparation. Handle only by the edges.

5.4 Different glass types have different light absorbing properties, especially in the UV wavelength. For painted glass specimens used for direct sunlight exposure or for laboratory simulations of direct sunlight, expose the glass specimens with the *painted* side toward the light source, so that the glass does not absorb some of the incident light. Painted glass specimens used for simulations of sunlight-through-glass may have the glass side towards the light source, but in that case, take care to match the transmission of the glass panels to the transmission of the glass in the end use application.

6. Keywords

6.1 conversion coatings; glass panels; lacquer; paint; preparation; testing

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