Designation: D7733 – 12 (Reapproved 2016)

# Standard Specification for Acrylic Dispersion Ground[1]

This standard is issued under the fixed designation D7733; 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 standard specifies test methods which measure minimum qualities for acrylic dispersion grounds.

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

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings

D3359 Test Methods for Measuring Adhesion by Tape Test

## 3. Terminology

3.1 *Definitions:*

3.1.1 *flash-through, n*—the visible evidence of oil on the opposite side of a support to which it was applied; also referred to as strike-through.

3.1.2 *gesso grounds, n:*

3.1.2.1 calcium hydroxide and water (“slaked lime”).

3.1.2.2 calcium sulfate (“plaster of Paris”) or calcium carbonate (chalk) prepared with a natural protein glue water.

3.1.2.3 in contemporary usage, the term “gesso” is sometimes used by manufacturers of acrylic dispersion products to describe their products in a brand name.

3.1.3 *ground, n*—a surface onto which an artist applies decorative coatings and paints.

3.1.4 *polymer, n*—a long chain synthetic or naturally occurring molecule composed of smaller, repeating units called monomers.

3.1.5 *size, n*—a liquid material that absorbs and penetrates into a substrate preparing the substrate for a primer or ground by at least partially sealing the surface and creating more integrity and less absorption of the surface.

3.1.6 *strike-through, n*—see *flash-through*.

## 4. Significance and Use

4.1 This specification establishes quality and performance requirements and provides a basis for common understanding among producers, distributors and users.

4.2 It is not intended that all grounds meeting this requirement be identical nor have uniform excellence in all respects. Variation in manufacture not covered in this specification may cause some artists to prefer one brand to another, either of which may be acceptable by this specification.

## 5. Labeling Requirements

5.1 Acrylic dispersion products conforming to this standard will include acrylic, polymer, dispersion polymer, or acrylic dispersion in their description to differentiate them from traditional gessoes.

## 6. Quality Assurance

6.1 Conditions not covered in this specification that affect the quality of acrylic dispersion grounds:

6.1.1 *Substrate*—Factors such as the texture, gloss, effective pH, porosity, chemical composition and condition of the substrate will affect gloss, gloss uniformity, drying time, adhesion and the flexibility of the dried ground.

6.1.2 *Environmental Conditions*—Factors such as temperature, humidity, airflow and light conditions affect application properties, film formation, drying time and adhesion.

6.1.3 *Storage*—Factors such as aging and high and low temperatures may cause changes in consistency.

6.2 *Wet Ground Properties:*

6.2.1 *Viscosity/Consistency*—Grounds shall be smooth and consistent except for functional particles that provide tooth. Paste type grounds may not flow or level; ready to brush grounds will flow evenly.

---

[1] This specification is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.57 on Artist Paints and Related Materials.

Current edition approved July 1, 2016. Published July 2016. Originally approved in 2012. Last previous edition approved in 2012 as D7733 – 12. DOI: 10.1520/D7733–12R16.

[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.

6.2.2 *pH*—The pH shall be 7.0 to 10.0.

6.2.3 *Fineness of Dispersion (Grind)*—Grind will vary and may contain coarse particles for adhesion, promoting the functional tooth of the dry ground.

6.2.4 *Freeze-Thaw Stability*—Using a freezer that has a temperature of -7°C (20°F) or lower, subject the ground to five freeze thaw cycles. A freeze thaw cycle shall consist of freezing the ground to a solid state (minimum 18 h) and then thawing the ground (minimum of 5 h) to room temperature, 22 ± 2°C (72 ± 5°F). The ground shall then meet the requirements of 6.2, 6.3, 6.4.

6.2.5 *Drying*—Use a 6 mil film applicator (drawdown bar) to make a uniform drawdown on a lacquer sealed card or panel. At a relative humidity of 50 to 75 % and at a temperature of 18 to 27°C (65 to 80°F) the dust free drying time determined in accordance with Test Methods D1640 shall be not less than 10 min.

6.3 *Dry Properties:*

6.3.1 *Adhesion by Test Methods D3359*—Measuring Adhesion by Tape Test.

6.3.2 *Painting Media on the Ground*—Testing adhesion of artist acrylic and oil paints, and each type of painting media, to the ground shall achieve a classification of 5B when tested in accordance with Test Methods D3359.

6.3.3 *Ground on Substrate*—Testing adhesion of the ground/substrate interface shall achieve a classification of 5B when tested in accordance with Test Methods D3359.

6.4 *Oil Hold Out by Described Method:*

6.4.1 *Scope:*

6.4.1.1 This test method is to determine oil absorption and penetration into an acrylic dispersion ground. The procedure is qualitative and the test will result in a pass/fail determination.

6.4.2 *Significance and Use:*

6.4.2.1 The oxidation of drying oils used in artists' media contributes to the embrittlement and degradation of natural fibered substrates. One attribute of the acrylic dispersion ground is to prevent the penetration of oil into the substrate while also providing adequate absorbency to promote adhesion of the oil media.

6.4.3 *Apparatus:*

6.4.3.1 *Eye-dropper*.

6.4.4 *Reagents and Materials:*

6.4.4.1 Unless otherwise indicated, references to oil shall be understood to mean raw alkali-refined linseed oil.

6.4.5 *Procedure:*

6.4.5.1 Test substrates shall be untreated stretched #10 cotton duck canvas on stretcher bars that allow for open back access to the canvas. Prepare the stretched canvas by even brush application of the ground. Create a matrix of layers that allow a 15 by 15 cm (6 by 6 in.) test area of single, double and triple coats of the ground. Each coat shall dry for a minimum of 24 h before application of the subsequent coat.

6.4.5.2 Apply three drops of raw alkali-refined linseed oil via eyedropper to the center of each of the 15 by 15 cm (6 by 6 in.) test areas. Each drop shall be .025 ± .00125 ml, with total volume for the three drops equaling .075 ± .00375 ml. The eyedropper can be any type, available in any pharmacy.

6.4.5.3 *Oil Penetration*—Six week after the oil has been applied, observe the oil drops. For penetration, observe the back side of the canvas. There must be no evidence of the oil flashing through the three-coat section.

6.4.5.4 *Oil Absorption*—Six weeks after the oil has been applied, observe the front side of the canvas. The oil drops must not be dried as a bead on the surface: there should be some absorption of the oil into the surface, leaving the surface slightly glossier than the ground and having some visual evidence of the oil still remaining on the surface. The oil shall not have wicked or bled more than five times the original drop's area (5 to 7 cm).

6.4.6 *Report:*

6.4.6.1 Report the following information:

6.4.6.2 The evidence or lack of evidence of flash-through.

6.4.6.3 The evidence or lack of evidence of the oil drop having dried as a bead on the surface.

6.4.6.4 The evidence or lack of evidence of oil spread within or beyond the proscribed area.

6.4.7 *Precision and Bias:*

6.4.7.1 No information is presented about either the precision or bias for measuring oil hold out by described method since the test results are nonquantitative.

6.5 *Flexibility by Described Method:*

6.5.1 *Scope:*

6.5.1.1 This test method is to determine adequate flexibility and resistance to cracking of the acrylic dispersion ground on canvas. The procedure is qualitative and the test will result in a pass/fail determination.

6.5.2 *Significance and Use:*

6.5.2.1 Canvas coated with acrylic dispersion grounds are expected to resist cracking when placed under stress and strain during preparation, storage, and handling.

6.5.3 *Procedure:*

6.5.3.1 Test substrates shall be untreated stretched #10 cotton duck canvas on stretcher bars that allow for open back access to the canvas. The cotton duck may *not* be sized after stretching. Prepare the stretched canvas by even brush application of two coats of the ground allowing adequate drying time between coats.

6.5.3.2 After the canvas has dried for a minimum of two weeks, carefully remove the canvas from the stretcher bars. Allow the canvas to acclimate for a minimum of 1 h in an environment of 20 to 22.2°C (68 to 72°F) and 25 to 35 % RH, carefully take the acclimated canvas and bend it over a sharp 90-degree corner. Repeat this test ten times, using a new area of the prepared canvas and being careful not to handle the areas of the canvas intended to be bent for testing. There shall be no cracking of the ground in all ten attempts.

6.5.4 *Report:*

6.5.4.1 Report the following information:

6.5.4.2 The evidence or lack of evidence of cracking of the ground.

6.5.5 *Precision and Bias:*

6.5.5.1 No information is presented about either the precision or bias for measuring flexibility by described method since the test results are nonquantitative.

## 7. Keywords

7.1 acrylic; dispersion polymer; gesso; ground; oil hold out; polymer; primer