



Designation: D 4942 – 89 (Reapproved 2001)

## Standard Test Methods for Water Pickup of Lithographic Printing Inks and Vehicles in a Laboratory Mixer<sup>1</sup>

This standard is issued under the fixed designation D 4942; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 These test methods cover two procedures for determining the amount of water picked up by lithographic printing inks in a laboratory mixer.

1.2 Test Method A covers single-point water pickup; Test Method B covers the rate of water pickup. Both test methods are applicable to any printing ink and vehicle intended for the lithographic printing process.

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. Summary of Test Methods

2.1 These test methods utilize a laboratory mixer for beating water or other agreed upon fluid into the test ink.

2.2 For single-point water pickup (Test Method A), 50 mL of water is normally added to 50 g of ink and mixed in for 5 min. The water picked up is determined from volumetric measurements of free water.

2.3 For rate of water pickup (Test Method B), water is added to 50 g of ink in increments of 20 mL and mixed in for 1 min or more over a cumulative time period totaling 10 min. The water taken up by the ink after each mixing interval is determined gravimetrically.

### 3. Significance and Use

3.1 The lithographic printing process requires that some dampening solution be emulsified into the ink. These test methods provide a rapid means for determining water pickup under laboratory conditions. Test results may be useful for specification acceptance between the supplier and the customer.

3.2 In order that results be comparable, the tests must be run at the same temperature and with the same type and quantity of liquid added prior to mixing.

3.3 The emulsions obtained in these test methods are of larger particle size than those typically produced in printing nips. Because of these and other variables in the printing process, water pickup results do not by themselves predict lithographic printing performance.

### 4. Apparatus

4.1 *Laboratory Mixer*,<sup>2</sup> such as a Duke Ink-Water Emulsification Tester<sup>2</sup> equipped with a stainless steel specimen bowl 83 mm wide and 88 mm high, mixer blades that rotate at 90 r/min, and a timing device.

4.2 *Balance*, accurate to 0.1 g, 600-g capacity.

4.3 *Palette knives*, two.

4.4 *Thermometer*, quick response.

4.5 *pH Meter* (optional).

4.6 *Conductivity Meter* (optional).

4.7 *Graduated Cylinder*, 50 or 100-mL.

### 5. Reagents and Materials

5.1 *Water*—Deionized or distilled water, preferably having a pH of 5.0 to 7.0 (100 to 200 mL per sample); alternatively, fountain solution or other aqueous medium as agreed upon between the supplier and the customer may be used.

5.2 *Cleanup Materials*—Naphtha and rags or tissues.

### 6. Test Specimen

6.1 A minimum of 100 g is sufficient for two determinations. Before removing ink from the can, stir or otherwise ensure that the ink specimen is representative. Close the can and replace sealing tape immediately after each ink removal.

### 7. Conditioning

7.1 Condition the instrument, water, and ink samples in a constant temperature room or bath, preferably at  $23 \pm 1^\circ\text{C}$ .

7.2 Prior to use, check the alignment of the mixer blades. With the power switch of the mixer in the off position, set the clean bowl into the turntable and engage the locking pin firmly into the slot in the side of the turntable. Tilt the mixer head back and insert the blades, marked left and right, into their

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<sup>2</sup> Available from Duke Custom Systems, 8371 Highway 49, Pleasant View, TN 37146.