



Standard Test Method for Relative Cure of Energy-Cured Inks and Coatings¹

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1. Scope

1.1 This test method describes the procedure for evaluating the relative cure of printed energy-cured (ultraviolet or electron beam) ink or coating by a mechanical solvent rub test using a motorized Crockmeter.

1.2 This test method is applicable to laboratory and production prints on any flat substrate that is no thicker than 3 mm (0.125 in.), durable enough to withstand the test conditions, and for which a control (reference) sample is available.

1.3 This test method applies to comparisons between energy-cured inks and coatings of the same chemistry and film weight and should not be used to compare different ink or coating chemistries or various applied film weights without first establishing process performance.

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

1.5 *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 to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 Other Standards:

AATCC Test Method 8 Colorfastness to Crocking: AATCC Crockmeter Method²

3. Terminology

3.1 Definitions:

3.1.1 *break-through, n*—the point where the ink or coatings film is penetrated by the solvent rub, causing a loss of density.

3.1.2 *cure, n*—the condition of a test sample after conversion to a dried film as measured by tests generally related to end-use performance and mutually agreeable to supplier and purchaser.

3.1.3 *electron beam (EB) curing, n*—conversion of an ink or coating to its final polymerized state by means of a mechanism initiated by electron beam radiation.

3.1.4 *ultraviolet (UV) curing, n*—conversion of an ink or coating to its final polymerized state by means of a mechanism initiated by ultraviolet radiation.

4. Summary of Test Method

4.1 The Crockmeter is set to a predetermined number of rub cycles. The test specimen is attached to the bed of the instrument. The linen covered rubbing finger is laid on the test print. Solvent is applied and the rub cycle started.

4.2 The test specimen is removed, examined for break-through and rated as less, equal, or more than the control.

5. Significance and Use

5.1 This test method is used as a manufacturing or laboratory process control tool by providing a visual comparison of the ability to resist solvent break-through against an established control. The test method is designed to indicate a potential problem caused by an undercured condition but does not identify what caused the condition.

5.2 This test method does not duplicate the conditions on a printing press but does provide a means to determine whether the test sample meets specifications as agreed upon between supplier and customer.

6. Apparatus

6.1 AATCC Motorized Crockmeter³ equipped with a lightweight aluminum sliding arm that has a nominal weight of 250 g and hollow nylon finger. See Fig. 1 and Fig. 2.

6.2 Ultraviolet or electron beam curing equipment.

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.56 on Printing Inks.

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² Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, <http://www.aatcc.org>.

³ The sole source of supply of the apparatus known to the committee at this time is the Atlas Material Testing Technology LLC, 4114 N. Ravenswood Ave., Chicago, IL 60613 USA. If you are aware of alternate suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at the meeting of the responsible technical committee¹ which you may attend.