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StandardTest Method for Relative Setting of Heatset Printing Inks[1]

This standard is issued under the fixed designation D6073; 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 describes the procedure for determining the relative setting speed of heatset inks using a tester consisting of a forced hot air oven and print delivery system.

1.2 This test method is applicable to printing inks intended to be dried by the application of heat and for which a suitable reference standard is available.

1.3 Although heatset inks are normally printed by the offset process, this test method specifies the direct letterpress mode because the higher ink film thicknesses obtained tend to amplify subtle differences in ink setting speed. Prints are prepared by a flatbed printing apparatus using a constant depth printing gage.

1.4 This tester reads temperature and belt speed in nonmetric terms; therefore, instrument settings in this test method are stated first in U.S. Customary Units (inch pound units of measurements). The values given in parentheses are for information only.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *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]

D6846 Practice for Preparing Prints of Paste Printing Inks with a Printing Gage

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *heatset printing ink, n*—an ink typically containing aliphatic hydrocarbon solvents that evaporate at elevated temperatures.

4. Summary of Test Method

4.1 A printing gage is used to prepare a laboratory print containing both the test sample and a standard ink. The freshly prepared print is immediately subjected to forced hot air in the tester, which is initially set at 350°F (177°C) and a belt speed of 30 fpm (0.15 m/s).

4.2 The print is cooled, overlaid with a clean sheet of stock, passed through the printing apparatus, and examined for setoff.

4.3 The process is repeated at different belt speeds or temperatures until either the test sample or the standard exhibits setoff and the other does not, or it is established that both are the same. The sample is then reported to dry faster than, slower than, or equal to the standard.

5. Significance and Use

5.1 The setting speed of heatset printing inks is important because it influences the efficiency of the drying process. This test method provides a means for comparing the setting of a heatset ink directly against a standard at the same conditions of temperature and exposure time. While the method does not determine the setting speed of an ink on a production press, it is useful for specification acceptance between the supplier and the customer.

5.2 The setting speed of a printing ink depends on a number of variables such as the substrate on which it is printed, the film thickness on the print, the temperature of the forced air, the rate of air flow, and the time that the print is subjected to heat. For these reasons, it is important to conduct the tests under conditions that are controlled and as realistic as practical.

6. Apparatus

6.1 *Tester,* equipped with a forced hot air oven and print carrier system consisting of heat resistant revolving belts that act as the print delivery system. The air temperature is adjustable between 100 and 600°F (38 and 315°C) and the speed of the print delivery unit between 0 and 100 fpm (0 and

[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] 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.