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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Lithographic Properties of Imaging Materials¹

This standard is issued under the fixed designation F 550; 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 covers the determination of the capability of various mechanical imaging materials to create reproducing images on paper lithographic masters.

1.2 These materials include:

- 1.2.1 Fabric typewriter ribbons,
- 1.2.2 Film and paper-base typewriter ribbons,
- 1.2.3 Crayons,
- 1.2.4 Ball pens,
- 1.2.5 Preprint inks and stamp pad inks, and
- 1.2.6 Pencils.

1.3 While the method of creating the images from the various materials will vary, the basic requirements for lithographic reproductive ability will be common to all.

1.4 *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:*

F 413 Practice for Preparation of an Offset Duplicator for Use in Functional Testing of Lithographic Copy Products²

3. Summary of Test Method

3.1 The tests described are subjective and comparative in nature and are intended to identify those characteristics that will impart receptivity to lithographic press ink and fidelity of reproduction to an image.

3.2 The methods of testing are based on the ability of a given material to create and maintain ink receptivity on an offset master for a required length of run. Evaluation consists of examining the printed copy for overall image quality.

3.3 Specific characteristics to be tested are:

- 3.3.1 Inherent ink receptivity (oleophilic quality),
- 3.3.2 Edge definition,
- 3.3.3 Resistance of the image to blinding,
- 3.3.4 Resistance of the image to bleeding (lateral growth),
- 3.3.5 Eraseability,

3.3.6 Correctability, and

3.3.7 Image life.

4. Significance and Use

4.1 The tests will permit the user to distinguish between materials that are useful lithographically and like products which are not intended for lithographic applications.

4.2 When more than one item is being tested, the results will also permit the selection of the one with optimum performance characteristics.

5. Apparatus

5.1 *Commercial Office Offset Duplicator.*

5.2 *Electric Typewriter.*

5.3 *Laboratory Oven.*

5.4 *Coated Paper Offset Masters*, direct-image type. (The master used can be short, medium, or long run, depending on the user's requirements.)

5.5 *Offset Grade Eraser* (free of greasy or abrasive components).

5.6 *Press Supplies*—ink, fountain solution, and etch (starting solution).

5.7 *Densitometer.*

5.8 *Parchment Folders.*

6. Sampling

6.1 Sampling should be done by reference to brand identification and manufacturer of the imaging material being tested.

7. Procedures

7.1 The procedures for creating test images for the products are:

7.1.1 *Typewriter Ribbons*—Electric typewriter.

7.1.2 *Pencil, Crayon, and Ball Pen*—Manually.

7.1.3 *Preprint Ink*—Lithographically from another master, or letterpress.

7.2 For testing typewriter ribbons, ten lines of copy is recommended for a test pattern. For other products, the equivalent of 10 lines of typewritten copy (approximately 12 in.²) is recommended.

NOTE 1—For all types of imaging materials, except preprint ink, the master should not be run until 1 h after imaging. In the case of preprint ink, the ink should be dry to the touch before the test run.

7.3 *Preparation of Offset Duplicator*—Prepare the offset duplicator in accordance with Practice F 413.

¹ This test method is under the jurisdiction of ASTM Committee F-5 on Business Copy Products and is the direct responsibility of Subcommittee F05.05 on Lithographic Processes.

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² *Annual Book of ASTM Standards*, Vol 15.09.

7.4 Typewriter Ribbon Testing—Test both fabric and film typewriter ribbons on an electric typewriter. Adjust the typing pressure so as to yield full transfer of the ribbon ink to the master without embossing the surface of the master.

7.5 Imaging a Master:

7.5.1 Typewriter Ribbons—Type 10 lines of test of at least 6-in. (15-cm) length across a master. When more than one ribbon is being tested, type the lines one below the other so as to span the full printing width of the duplicator.

7.5.2 Other Imaging Materials—Handle all other imaging materials in the same manner as typewriter ribbons. The only exception is the erasability of preprinted images, as they cannot be erased once the ink has dried.

7.6 Copy Evaluation—Evaluate the following qualities of printed copy on both subjective and comparative bases:

- 7.6.1 Print density,
- 7.6.2 Edge definition,
- 7.6.3 Line-width growth, or shrinkage,
- 7.6.4 Receptivity to duplicator ink, and
- 7.6.5 Freedom from voids.

7.7 Resistance to Blinding:

7.7.1 Image the master in the prescribed manner.

7.7.2 Store the master at ambient conditions in a parchment folder for 7 days.

7.7.3 Remove the master from the folder. In the case of typewriter ribbons, pens, pencils, and crayons, add a block of copy which is identical to the original copy.

7.7.4 Run the master for 100 copies on the duplicator.

7.7.5 Examine the 100th copy. Compare the original and added copy for image density and completeness of reproduction. There should be no loss of either as a result of the time delay between imaging and running. Also, the original and added blocks of copy should be equally receptive to the duplicator ink at any copy level throughout the run.

7.8 Resistance to Bleed of Image:

7.8.1 Image the master in the prescribed manner.

7.8.2 Put the master, image side up, in the laboratory oven at 130°F (69°C) for 24 h. Protect the master from contact with metal shelves, etc. in the oven by placing 6 sheets of bond paper between the master and the shelves.

7.8.3 Remove master from the oven and allow 1 h for it to stabilize at room temperature.

7.8.4 Add a block of copy that is identical to the original copy.

7.8.5 Run 100 copies on the duplicator. Examine the 100th copy. There should be no detectable difference in the width or sharpness of the printed copy between the original and added text. Compare both blocks of copy for edge definition and print density.

7.9 Erasability and Correctability (not applicable to pre-printed copy):

7.9.1 Test Format—Type the following on the master:

7.9.1.1 “Original Copy”—This is the control copy.

7.9.1.2 “Erased Copy”—Erase this line; do not add typing.

7.9.1.3 “Erased Copy”—Erase this line and type the word “Correction” over the erased area.

7.9.1.4 “Correction”—Do not erase this word; it is the control copy for the third line.

7.9.1.5 In addition to the above, erase a like area where there is no typing. Circle this area with a pencil or the like so that it can be examined after the duplicator run for any sensitivity imparted by the eraser.

7.9.2 Technique of Erasing—Continue erasing to the point where the image-forming material is removed substantially. It is not necessary to remove the final shadow of the image, as this will not reproduce.

7.9.3 Run the master for 100 copies on the duplicator. Examine the 100th copy for:

7.9.3.1 Residual ink sensitivity (toning) in the erased areas of lines 2 and 3. If toning is present, check the area of 7.9.1.5 to determine if the eraser is sensitizing the master. If this is not the case, the problem can be attributed to difficulty in removing the original copy.

7.9.3.2 Print density and copy quality of the word “Correction” on line 3 should be equivalent to the word “Correction” on line 4.

7.9.3.3 Comparison of image width and edge density of copy on line 3 with the control on line 4.

7.10 Image Life:

7.10.1 Image a master as described in 7.5. Add corrected copy as described in 7.9.1.3.

7.10.2 Run the master for its rated length of run on the duplicator, or until the test copy has lost legibility, whichever occurs first. (The manufacturer of the master will ordinarily specify the maximum number of usable copies the master is capable of delivering.)

7.10.3 Using the 100th copy as a standard, compare the quality of the copy at each 100-copy increment to determine the point at which copy density, edge definition, or completeness of the individual characters begin to degrade; and also the point at which general legibility is lost for both original and corrected copy. Record each value for each sample tested.

8. Precision and Bias

8.1 Results obtained in the tests described are considered reliable with the specific test conducted. However, the results will vary, depending on the characteristics of all the components (duplicator, master, etch, fountain solution) so that reproducibility between testing locations cannot be anticipated.

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