



Designation: F 506 – 77 (Reapproved 1998)

AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

Standard Practice for Assessing the Quality of Direct-Image Paper Offset Masters¹

This standard is issued under the fixed designation F 506; 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 The practice covers all commercially available direct-image paper offset masters.

1.2 Test assemblies prepared in accordance with this practice may be used to assess quality variation from shipment to shipment of the same commercial brand, or to compare various commercial brands with each other.

1.3 This practice covers only the “direct” imaging aspect of paper offset masters. Imaging of such products by means that involve the transfer of an image in its entirety, as by proof press, offset press, duplicator, or copying machines, will be covered in a separate recommended practice.

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.* See 7.3 for specific precautionary statements.

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 Practice

3.1 Instructions are given for preparing sample assemblies in various ways useful for making test duplicator runs. A composite master is made of two different brands or of two different shipments of the same brand to facilitate the comparison of characteristics considered essential to direct-image paper offset masters.

3.2 Examples of characteristics to be tested for are as follows:

3.2.1 Ability to reproduce precisely images placed upon the master with various imaging devices,

3.2.2 Endurance of these images in terms of the number of copies obtainable,

3.2.3 Ability of the master to withstand erasure abrasion that

is, accept a corrected image in the erased area and reproduce the corrected image with the same quality as in image from a nonerased area,

3.2.4 Resistance of the master to “stretch” induced by absorption of water from the duplicator fountain solution, and

3.2.5 Ability of the master to preferentially accept and hold desirable images from standard imaging devices, but reject unwanted extraneous images from body oils, hand lotions, etc.

3.3 The comparative quality is determined by means of a duplicator run on an offset duplicator. The duplicator run duration will be either to an end point in terms of a prescribed number of copies or to a point where a recognizable difference is apparent in the reproduced copy quality of the products being compared.

4. Significance and Use

4.1 Use of these procedures will make it possible for relatively inexperienced personnel to recognize functional differences between shipments, grades, and brands of paper offset masters.

5. Apparatus and Materials

5.1 *Standard Office Offset Duplicator and Supplies.*

5.2 *Standard Electric Typewriter.*

NOTE 1—Standard (as referred to in 5.1 and 5.2) refers to a controlled offset duplicator and supplies, and controlled typewriter(s) under controlled conditions and *not* a randomly selected offset duplicator and supplies and typewriter(s). There may be more than one brand of standard typewriter used in the test.

5.3 *Fabric, Film, and Paper-Based Lithographic Typewriter Ribbons.*

5.4 *Lithographic Wax Crayons.*

5.5 *Lithographic Ball Point Pens.*

5.6 *Lithographic Pencils.*

5.7 *Cellophane or Plastic Film Pressure-Sensitive Tape.*

6. Sampling

6.1 Sampling may be as simple a matter as receiving a number of masters from a salesman or as involved as taking a percentage of the product from a large shipment by random selection. In the first case, the test would probably involve the comparison of a new or competitive product to one already in use. In the latter, the general quality level of a shipment would

¹ This practice is under the jurisdiction of ASTM Committee F-5 on Business Copy Products and is the direct responsibility of Subcommittee F05.05 on Carbonless Copy Paper.

Current edition approved May 27, 1977. Published August 1977.

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

be compared to a shelf standard.

7. Test Specimen

7.1 *Comparison Split Master in the Direction of the Duplicator Cylinder Rotations* (see Fig. 1):

7.1.1 Preparation:

7.1.1.1 Trim each specimen to a size one half the width of the plate cylinder of the duplicator by 3 in. (76.2 mm) less than the distance from the lead grippers to the end clamp.

7.1.1.2 Trim a “leader” master from either sample. The size should be the full width of the cylinder by 3 in. (76.2 mm). If the duplicator requires pin bar punched masters, the “leader” should be made from such a master.

7.1.1.3 Lay the three sections of the assembly face side down and fit them together to form a composite that is approximately the size of the master cylinder face.

7.1.1.4 Overlap the top edge of each test specimen on the leader by about ¼ in. (6.4 mm). The long edges of the test specimen should be butted together but not overlapped.

7.1.1.5 Apply a strip of pressure-sensitive tape to the overlapped edges. Do not tape the long edges.

7.1.1.6 Prepare at least two assemblies, one with Specimen A on the left and Specimen B on the right, and another with Specimen B on the left and Specimen A on the right.

7.2 *Comparison Split Masters Across the Direction of the Duplicator Cylinder Rotation* (see Fig. 2):

7.2.1 Preparation:

7.2.1.1 Trim each specimen to a size equal to the width of the plate cylinder by ½ the length of the master’s cylinder face.

7.2.1.2 In this case, no “leader” is required. The lead end specimen acts as a leader.

7.2.1.3 Lay the two sections face down, with Specimen B overlapping Specimen A by approximately ¼ in. (6.4 mm).

7.2.1.4 Apply pressure-sensitive tape across the assembly to combine the two specimens into one test assembly. When turned over, the trailing end of the A or lead edge specimen will be overlapping the B or trailing specimen.

7.2.1.5 Prepare at least two assemblies, one with Specimen A on the top and Specimen B on the bottom and another with Specimen B on the top and Specimen A on the bottom.

7.3 Precautions:

7.3.1 In all split master tests, it is assumed that comparative quality specimens are being tested. If the masters vary either in respect to caliper or coating chemistry to the degree that these properties would interfere with a correct interpretation of the test data, precautions should be taken to neutralize them. In the case of a caliper variation of more than 1 mil (0.02 mm) on the average, each split master should be “cross underlaid” with the other, thus equalizing the thickness for both sides of the split assembly. Master etches and fountain etches recommended for each product should be used in sequential tests. If one master of a split assembly is found to be incompatible with the supplies recommended for the other, testing by the consecutive run technique may be the only valid procedure.

7.4 *Comparison by Consecutive Run Technique* (see Fig. 3):

7.4.1 *Preparation*—No preparation is required but extra precautions must be observed in running comparisons by the consecutive masters comparison technique. See 9.3.4.

8. Preparation of Apparatus

8.1 See Practice F 413, for the preparation of the offset duplicator.

9. Procedures

9.1 There is no single procedure that covers all properties to be tested. Although an operator experienced in the use of offset masters will find ways to combine the tests for many functions in one test run, the functions are treated separately to avoid confusion. It is assumed that the offset duplicator on which the testing is to be done has been prepared for use in accordance with Practice F 413.

9.2 General Hydrophilicness Test:

9.2.1 The dry functional surface of a paper offset master will not preferentially accept fountain solution instead of oil (ink). It has to be chemically treated at the time of use to make the background (nonimaged areas) repel ink and produce copies free of scum or tint. This test will establish the comparative freedom from scum or tint from split master specimens without the necessity of imaging them.

9.2.2 Bench Etch Technique:

9.2.2.1 Using a “master etch” designed for paper offset

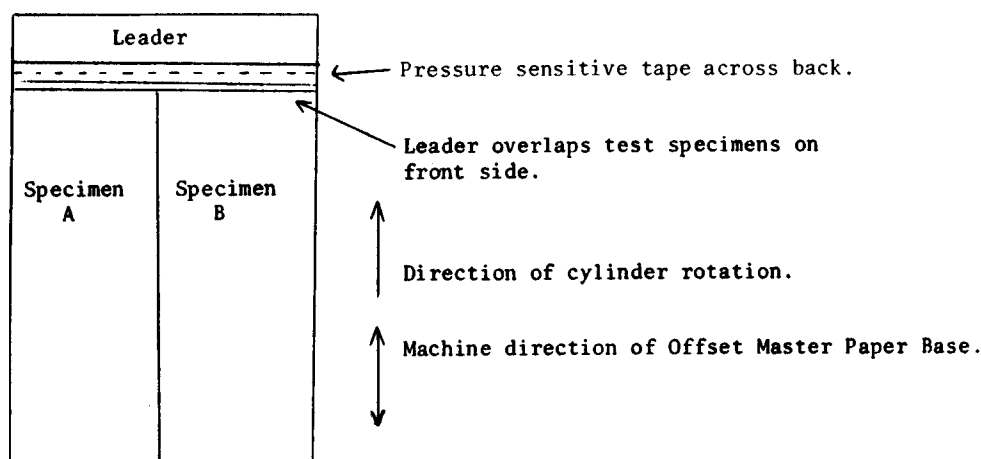


FIG. 1 Comparison Split Plate—Split in Direction of Duplicator Cylinder Rotations