Designation: D 6487 – 01

Standard Practice for Preparing Prints of Paste Printing Inks With an Offset Color Proofing Press[1]

This standard is issued under the fixed designation D 6487; 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 practice covers the procedure for preparing laboratory prints of paste inks utilizing an offset color Proofing Press. The initial method was developed by the National Printing Ink Research Institute[2].

1.2 This practice is applicable to the preparation of single-color solid-area prints by the dry offset process on a flat substrate such as paper or metal. It can readily be adapted to print by direct letterpress.

1.3 This practice is applicable primarily to lithographic and letterpress inks that dry by oxidation or penetration. With the addition of appropriate drying or curing equipment, it is also applicable to other systems such as heat-set or energy-curable.

1.4 The instructions in this practice are intended to minimize the within-print and among-operator variability inherent in hand operations.

1.5 This practice does not measure the actual film thickness on the print, but evaluates film thickness equivalence by visual or instrumental comparisons of optical density.

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

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautions are given in Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*

D 6073 Test Method for Relative Setting of Headset Inks by the Sinvatrol Tester [3]

2.2 *ANSI Standards*[4]*:*

PH 2.17 Geometric Conditions for Reflection Density

PH 2.18 Spectral Conditions for the Measurement of Optical Density

PH 2.30 Viewing Conditions for Graphic Arts and Photography—Color Prints, Transparencies and Photomechanical Reproductions

CGATS.4 Graphic Technology–Graphic Arts Reflection Densitometry Measurements—Terms, Equations, Image Elements and Procedures

CGATS.5 Graphic Technology–Spectral Measurements and Colormetric Computation for Graphics Arts Images

3. Summary of Practice

3.1 The equipment is set up as described in Annex A1. In order to make a print, the test ink is metered onto a brayer, rolled out evenly on the distribution plate according to a specified pattern, and then transferred to the printing plate. The appropriate stock is clipped onto the impression plate, and the blanket cylinder is rolled over the inked plate six times followed by once over the stock.

3.2 After the print is set, it is checked against the target optical density instrumentally or by visual comparison with a standard print. Subsequent prints are made until the target optical density has been achieved.

4. Significance and Use

4.1 Laboratory proofing of ink is necessary to establish a reproducible prediction of print appearance and performance properties, most of which are highly sensitive to ink film thickness. The apparatus described in this practice has found wide use for routine control proofing because it provides an economical method for producing reasonably large prints at film thicknesses comparable to those obtained on production presses.

[1] This practice 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.

Current edition approved Dec. 10, 2001. Published February 2002. Originally published as D 6487 - 99. Last previous edition D 6487 - 99[ε1].

[2] "The NPIRI Standard Procedure for Preparing Little Joe Prints," *American Ink Maker*, March 1994, pp. 42-50.

[3] *Annual Book of ASTM Standards*, Vol 06.02.

[4] Available from American National Standards Institute, 13th Floor, 11 W. 42nd Street, New York, NY 10036 or Committee on Graphic Arts Technical Standards, 1899 Preston White Drive, Reston, VA 20191-4367.

4.2 This practice does not duplicate the dynamics of a high speed press, nevertheless, it is useful for quality control and for specification acceptance between the producer and the user.

5. Apparatus

5.1 *Offset Color Proof Press*[5], having a press bed approximately 914 mm (36 in.) long and 260 mm (10 ¼in.) wide, and a blanket[6] (impression) cylinder having a circumference of approximately 370 mm (14 ½in.) such that the cylinder can make two revolutions down the length of the bed. Integral components include a distribution plate, printing plate, inking track guides, and impression plate, (see Fig. 1). The standard printing plate is 100 by 152 mm (4 by 6 in.).

5.2 *Ink Pipet*, or balance accurate to 0.001 g ink.

5.3 *Torque Screw Driver*.

5.4 *Ink Knives*.

5.5 *Brayer*[5,6], with a 63.5-mm (2½-in.) diameter and 152-mm (6-in.) length.

5.6 *Standard Daylight*, preferably a D 50 light source conforming to ANSI Standard PH 2.30.

5.7 *Reflection Densitometer*, (Optional), conforming to ANSI Standard PH 2.17, having a set of Status T filters conforming to ANSI Standard 2.18, and used according to CGATS.4.

NOTE 1—The filter systems in typical densitometers are suitable only for use with black, white, and the three process colors (yellow, magenta and cyan).

5.8 *Spectrophotometer*, (Optional), hand-held, calibrated according to manufacturer's instructions and used according to CGATS.5.

6. Materials

6.1 *Ink Sample*.

6.2 Specification for the target optical density; alternatively, a reference print to be matched.

6.3 *Printing Substrate* such as paper or paperboard cut to approximately 140 by 210 mm (5½ by 8½ in.).

6.4 *Solvent*, appropriate to ink system.

6.5 *Lint-free Rags or Tissue*.

6.6 *Shim Stock*, metal or plastic, the same size as the printing plate and 0.5, 1, 2, 5 or 10 mils in thickness.

7. Hazards

7.1 **Warning**—Since solvents may be hazardous to the skin and eyes, wear rubber gloves and safety glasses during cleanup to avoid solvent contact with skin and eyes. In case of contact, wash skin with water; flush eyes for 15 min with water and call a physician. See supplier's Material Safety Data Sheets for further information on each solvent used.

7.2 *Equipment Cautions*—Avoid any operation that will scratch the metal distribution and printing plates or damage the rubber blanket on the impression cylinder.

8. Procedure for Dry Offset Printing

8.1 Prepare the Offset Proofing Press as described in Annex A1.

8.2 Clean press with appropriate solvent and lint-free rag or tissue. Remove lint from blanket and printing plate using a camel hair brush.

8.3 Place guide tracks against printing plate and place a 140 by 210-mm (5½ by 8½-in.) piece of test stock on the impression plate.

8.4 Determine the approximate amount of ink that will give the proper density. If uncoated stock, start with 0.6 mL or 0.6 g of ink. For coated stock, start with 0.4 mL or 0.4 g of ink.

8.5 Using an ink knife or a pipet, apply the ink to the brayer evenly across the roller.

8.6 Roll the ink on the distribution plate with the brayer until a uniform ink film is created and the entire distribution plate has been used.

8.7 Once a uniform film exists, roll the brayer from corner to corner of the ink distribution plate to make a single "*X*" pattern. Then move the brayer from top to bottom and bottom to top without lifting (2 passes) along the middle of the

[5] The apparatus used to develop this method was the Little Joe Offset Color Proofing Press.

[6] For printing ultra violet (UV) systems, use a special blanket and brayer formulated for the purpose.

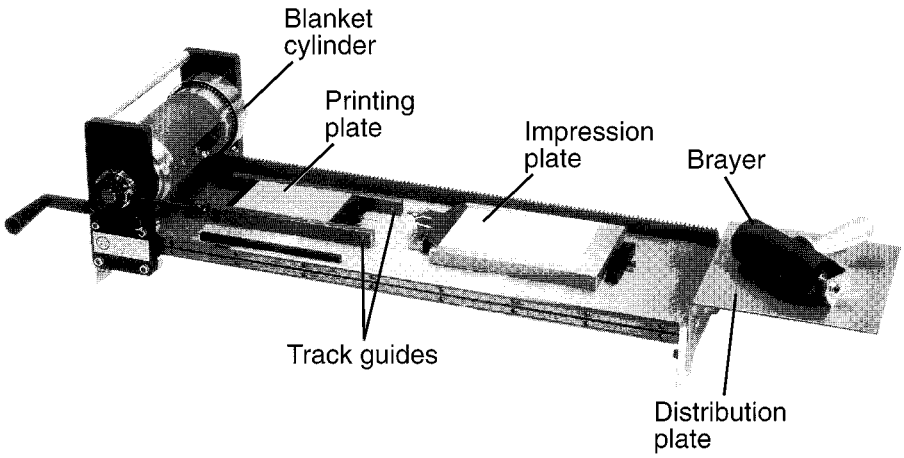

FIG. 1 Offset Printing Press