



Standard Practice for Determining Yield of Solid Ink Sticks¹

This standard is issued under the fixed designation F2406; 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 a procedure to determine the yield in number of pages per solid ink stick used in a solid ink/phase change printer for printing an 8 by 10 in. image area on a letter size page at $50 \pm 0.5\%$ fill of each individual color. This practice requires an accurate gram scale to weigh the solid ink sticks and the printed pages, a personal computer able to print a $50 \pm 0.5\%$ fill of each color, as well as a test printer.

1.2 *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. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *ink stick yield (Y)*—amount of pages that can be printed from one ink stick.

2.1.2 *solid ink stick*—consumable used in a hot-melt printing device to apply color to a page.

3. Summary of Practice

3.1 A solid ink/phase change printer utilizing a solid ink stick is set up to determine yield in number of pages per solid ink stick used in a solid ink/phase change printer. A test page with $50 \pm 0.5\%$ print output of each color for control is used. The solid ink stick is weighed. A specified number of prints are created on the printer using the solid ink stick. The amount of ink used to print the specified number of sheets is calculated. The results can be used to estimate the total page yield per solid ink stick at various percent coverages. A comparison can be made between the solid ink stick used for the control and any other solid ink stick tested using this practice.

4. Significance and Use

4.1 This practice can be used for the evaluation of OEM and compatible ink sticks.

4.2 This practice is suitable for research and development and quality acceptance evaluations.

4.3 This practice is suitable to extrapolate ink yield (Y_e) of each color at other percent coverages (C_e) from the calculated yield (Y) using the following formula (see [Table 1](#)):

$$\begin{aligned} 50\% \text{ Coverage}/C_e &= Y/Y_e \\ \text{or} \\ Y_e &= Y(C_e)/50\% \text{ Coverage} \end{aligned}$$

5. Interferences

5.1 This practice does not consider the effects of the cleaning mechanism and its use of ink in lowering the effective yield of the solid ink. During normal use the printer may require the use of a cleaning cycle which will reduce the effective yield of the solid ink stick. During this test the use of the cleaning cycle during the printing should be avoided.

5.2 Changes in humidity and temperature will have an effect on the measurements of the paper being weighed. Every effort should be made to run the test in a controlled environment.

5.3 When changing ink sticks from one test of the same color to another test of the same color, at least three times the amount of ink normally stored in the reservoir should be run through the printer to insure that ink is purged from the system.

6. Reagents and Materials

6.1 Sufficient quantities of same lot paper, ink and other printer specific consumables should be available for consistency.

6.2 A reference target that can be verified to print at $50 \pm 0.5\%$ coverage on an 8 by 10 in. image area on a letter size page.

6.3 A gram scale with 0.1 g readability, 6000 g capacity, 0.1 g repeatability, ± 0.2 g linearity and 8.5 by 11 in. platen area is required.

7. Hazards

7.1 There exist no unusual hazards related to this practice.

8. Procedure

8.1 Testing will be done with one color ink stick at a time.

8.2 Select and weigh the solid ink stick to be tested.
Weight = W_{is} .

¹ This practice is under the jurisdiction of ASTM Committee F05 on Business Imaging Products and is the direct responsibility of Subcommittee F05.03 on Research.

Current edition approved Oct. 1, 2012. Published November 2012. Originally approved in 2004. Last previous edition approved in 2004 as F2406-04. DOI: 10.1520/F2406-04R12.