Designation: F 129 – 97 (Reapproved 2008)

Standard Practice for Amount of Ink Deposit on Carbon Paper and Inked Ribbons, Other Than Fabric Type[1]

This standard is issued under the fixed designation F 129; 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 determination of the amount of ink deposit on carbon paper and inked ribbons, other than fabric type.

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.* See specific warning statements in 6.1 and 9.3.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 685 Practice for Conditioning Paper and Paper Products for Testing

F 221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom

3. Terminology

3.1 For definitions of terms used in this practice, refer to Terminology F 221.

4. Summary of Practice

4.1 The amount of ink deposit is gravimetrically determined by analytically weighing a conditioned test specimen. The ink deposit is removed by the use of a suitable solvent in an ultrasonic cleaner. The sample with the coating is conditioned and reweighed. The amount of ink deposit is calculated.

5. Apparatus

5.1 *Analytical Balance*, with a sensitivity to 0.1 mg.

5.2 *Ultrasonic Bath*, with or without heater.

5.3 *Template or Cutter* (Note 1), for ease in calculating ream weight of carbon paper and coated film. The size of this template should be 2.2 by 3 in. (56 by 76 mm). However, any size sample is suitable if the proper conversion factor and an appropriately sensitive balance are employed.

NOTE 1—The template is prepared from flat steel stock. The thickness depends on the amount of use and should be thick enough to lie flat.

6. Reagent

6.1 Care should be taken to select the extraction solvent so that only the ink is removed from substrates. (**Warning**—Vapors from solvents can be toxic when inhaled over prolonged periods. Some solvents commonly used may be listed as carcinogenic. Other are flammable and suitable precautions should be taken. Handle with care and use only in properly ventilated area to avoid breathing vapors. A fume hood is recommended.)

7. Test Specimen

7.1 Cut a representative test sample of the desired size from the conditioned specimen using a template. The use of a punch and die system is strongly recommended.

8. Conditioning

8.1 Allow the test specimen to stabilize under room conditions for 15 min for routine testing.

8.2 Allow the test specimen to condition 1 h at 23.0 ± 2.0°C and 50 ± 2 % relative humidity for a more precise determination (see Practice D 685).

9. Procedure

9.1 Place the sample coating on a sheet of flat, smooth cardboard and accurately cut a sample 2.2 by 3 in. (56 by 76 mm) or an equivalent area of the carbon paper or film coating that has been conditioned in accordance with 8.1 or 8.2.

9.2 Weigh the sample on an analytical balance. Record this weight to the nearest 0.1 mg as coated weight.

9.3 Set up the ultrasonic bath by first filling the tank with a transfer medium (for example, warm tap water plus a wetting agent/detergent). Place two glass beakers (400 or 600 mL suggested) of the desired solvent in a beaker positioning cover

[1] This practice is under the jurisdiction of ASTM Committee F05 on Business Imaging Products and is the direct responsibility of Subcommittee F05.02 on Inked Transfer Imaging Products.

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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.

to suspend the beakers in the bath. Plug in the ultrasonic bath and turn power ON. If using a bath with a heater, turn the heat switch to ON and allow the bath to stabilize to desired temperature. Heat may be necessary to remove some coatings. (**Warning**—Temperature of the bath should not exceed the boiling point of the solvent.)

9.4 Place the conditioned sample into a beaker of the desired solvent. Remove as much of the coating as possible by this method. If necessary to remove any remaining ink deposit, carefully clean with solvent on a cloth. (The use of protective gloves is recommended.) Rinse the sample in the second beaker of clean solvent. Allow the sample to condition in accordance with 8.1 or 8.2.

9.5 Weigh the sample and record the result to the nearest 0.1 mg. Record as decoated weight.

10. Calculation

10.1 Calculate the difference between the initial weight and the weight after the ink deposit has been removed.

10.2 The above calculated weight times 100 will give the pounds per ream of the ink deposit for a ream size of 20 by 30 in. by 500 sheets (20 × 30 – 500). To convert the deposit weight in pounds per ream (20 × 30 – 500) to grams per square metre, multiply the deposit weight by 2.34.

10.3 If a sample size other than 2.2 by 3.0 in. (56 by 76 mm) is used, the following formula can be used to calculate the weight: Weight of ink deposit in pounds per ream (20 × 30 – 500) is equal to 661 times the ink deposit in grams divided by sample size in square inches.

NOTE 2—Use of a sample of 6.34 in.^{2} (40.90 cm^2), usually cut 2.0 by 3.17 in. (50.8 by 80.5 mm) will provide a direct reading for a 20 by 30 in. by 480 sheets (20 × 30 – 480). Cutting the samples to provide exact ream weight data provides an automatic check on the tissue or paper weight from the uncoated sample data.

11. Report

11.1 Report the amount of ink deposit in pounds per ream based on a 20 by 30 in. by 500 sheet (20 × 30 – 500) ream size (or grams per square metre, see 10.2).

11.2 Report the solvent used.

APPENDIX

(Nonmandatory Information)

X1. BASIS FOR ESTABLISHMENT OF PRACTICE

X1.1 The current practice is designed to measure the amount of ink deposit on carbon paper and inked ribbons other than fabric using a single solvent or a combination of solvents.

X1.2 The solvent used for years in the industry has been 1,1,1-trichloroethane. Since this solvent is considered an Ozone Depleting Substance (ODS), production of this material ceased at the end of 1995. Another solvent used, but not on the ODS list, is 1,1,1-trichloroethylene. This material, however, is considered more toxic than 1,1,1-trichloroethane.

X1.3 Due to the demand for solvents to replace ODS and other solvents considered hazardous, many alternate solvents have been developed. In order to check the effectiveness of alternate solvents on an inked piece of fabric, 1,1,1-trichloroethane if still available, or 1,1,1-trichloroethylene would need to be used as the standard solvent.

X1.4 *Suggested List of Alternate Solvent(s):*

X1.4.1 The following list of solvents is not an attempt to list solvents that are considered non-hazardous but solvents that have been found to remove ink to a degree from the fabric individually or by using a solvent in one beaker and a different solvent in a second beaker.

methyl ethyl ketone
2-Pyrrolidinone-1-methyl
mineral spirits
isopropyl alcohol
alcohol and glycol ether

X1.4.2 It is recommended that the extraction solvent selected be agreed to by interested parties when applicable.