



Designation: F 685 – 96

Standard Practice for Determining Toner Usage, Efficiency, and Dusting Nonheat Fixing Copiers Using Single-Component Toner Systems¹

This standard is issued under the fixed designation F 685; 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 toner usage, efficiency of toner deposition on an imaged copy, and dusting in those nonheat fixing copiers utilizing a single-component toner.

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 whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* See Section 8 and 10.19.2 for specific precautionary and cautionary statements.

2. Referenced Documents

2.1 *ASTM Standards:*

F 335 Terminology Relating to Electrostatic Copying²

F 875 Test Method for Evaluation of Large Area Density and Background on Office Copiers²

3. Descriptions of Terms Specific to this Standard

3.1 *single-component toner*—also described commercially as single-component developer.

3.2 *toner usage*—amount of toner (milligrams per copy) removed from the toner hopper during the copying process.

3.3 *efficiency*—the ratio of the weight of toner developed on the image copy to the weight of the toner used.

3.4 *toner dusting*—loss of toner other than to the imaged copies and therefore the difference between toner usage and the weight of the toner developed on the imaged copy. Dusting is usually found deposited either inside the copier components such as cleaning subsystems and filters or surrounding the copier externally, specifically the table top, wall, etc.

4. Summary of Practice

4.1 A full roll or quantity of sheets together with a sample of toner are both weighed and placed into a copier. Copies are imaged to a predetermined end point and weighed. Toner usage, dusting, and copier efficiency are subsequently calcu-

lated from values obtained from the imaged copy weights and initial toner weights.

5. Significance and Use

5.1 Many dry electrostatic developers consist of toners and carriers and only the toner portion of which forms the visible image on the copy. Single-component toner (or developer) does not contain a carrier, and in theory, when properly used, is consumed at a rate proportional to the image area and density. As with all dry developers, single-component toners (or developers) are not 100 % efficient. Some toner is lost to the surroundings (inside or outside of the copiers). This loss is also dependent on copier adjustments and may be significant enough to affect the total number of copies capable of being produced by a specific amount of toner.

6. Apparatus

6.1 *Balance*,³ capable of a precision of ± 0.1 g and readable to 0.1 g.

6.2 *Model Copier*, operated in accordance with the manufacturers instructions.

7. Reagents and Materials

7.1 A supply of specified type or lot of appropriate paper sufficient to complete the test.

7.2 A supply of recommended type or lot of dry single-component toner sufficient to complete the test.

7.3 A black target larger than the size of the test target the user elects to use.

8. Precautions

8.1 This procedure is not applicable to those single component toner copiers utilizing either heat or a combination of pressure and heat fixing methods because of the possible weight loss of the paper due to the heat fixing.

8.2 If any jams or paper roll splices are encountered during this procedure, the test should be discontinued and repeated.

8.3 During this procedure, all copier conditions, specifically line voltage, should be held constant.

8.4 The user should be aware that variables such as relative humidity, supplies (between lots, within lots, or manufacturers

¹ This practice is under the jurisdiction of ASTM Committee F-5 on Business Copy Products and is the direct responsibility of Subcommittee F05.04 on Electrostatic Copy Products.

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

³ A Mettler P5N balance (or equivalent alternative) has been found acceptable and has a reported precision of ± 0.05 g.