



Standard Practice for Estimating Toner Usage in Copiers Utilizing Dry Two- Component Developer¹

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1. Scope

1.1 This practice describes a procedure for estimating the number of copies that can be produced for a given unit of toner in a copier using dry two-component developer.

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 9 for specific precautionary 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. Terminology

3.1 Descriptions of Terms Specific to this Standard:

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

3.1.2 *two-component developer*—a mixture of dry toner and carrier used for developing electrostatic images in copiers (See Terminology F 335.)

4. Summary of Practice

4.1 A copier is set up to standard operating parameters and operated under a controlled job stream and environment for a length of time sufficient for stable performance. A known, or estimated, quantity of toner is used to replenish the developer over the length of the test and this result, along with the total number of copies generated, is used to estimate the number of copies produced per unit of toner.

5. Significance and Use

5.1 This practice may be used to evaluate the performance of different toners in a common machine. It can also be used to

evaluate the economics of toner usage when making machine-to-machine comparisons.

5.2 The practice provides only a point estimate that is subject to a significant number of variables that are not easily measured. As with all dry developers, two-component developer systems are not 100 % efficient. Some toner is lost to the surroundings (inside or outside the copier). 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. Anyone making a decision based on the results of this practice should carefully consider the accuracy of the results and other pertinent data.

5.3 Actual use of the copier in normal operating conditions will most likely result in toner usage values different from those generated in this practice.

6. Interferences

6.1 Variations in toner usage will occur for many reasons, among them:

- 6.1.1 Machine adjustments,
- 6.1.2 Operating environment,
- 6.1.3 Varying use of special copy controls,
- 6.1.4 Number of copies on the photoconductor and developer,
- 6.1.5 Variations in copy paper,
- 6.1.6 Operator variability,
- 6.1.7 Batch-to-batch toner and developer variability,
- 6.1.8 Machine-to-machine variability, and
- 6.1.9 Variation in document area coverage.

7. Apparatus

7.1 *Balance*, reading to the nearest 1 g.

7.2 Refer to Test Method F 875 for other required instruments.

8. Reagents and Materials

8.1 Sufficient quantities of paper, toner, developer, and photoconductor to run the test (Refer to 11.6.)

8.2 Test Targets:

8.2.1 *Density and Background Test Sheet*—As shown in Fig. 1 of Test Method F 875.³

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

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

³ Available from ASTM International Headquarters. Order PCN 12-608750-11.