



Standard Test Method for Estimating Toner Usage in Full-Color Copiers Utilizing Dry Mono- or Dual-Component Toners¹

This standard is issued under the fixed designation F1424; 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 test method describes a procedure for estimating the number of copies that can be produced for a given unit of toner in a full-color copier using dry mono- or dual-component development.

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.* For specific hazards, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:²

D5039 [Test Methods for Identification of Wire Side of Paper](#) (Withdrawn 2009)³

[F335 Terminology Relating to Electrostatic Imaging](#)

[F875 Test Method for Evaluation of Large Area Density and Background on Office Copiers](#)

2.2 ASTM Adjuncts:

Density Target Test Sheet ([F875](#))⁴

Toner Yield Test Target ([F1424](#))⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *dual-component development*—a mixture of dry toner and iron oxide developer that is used for developing electrostatic images in copiers (see Terminology [F335](#)).

3.1.2 *full-color copiers*—copiers that can reproduce color originals containing gradations of color. Full-color copiers may have up to four individual color developing units containing four different color toners. These colors are frequently cyan, magenta, yellow, and black. The original is scanned by means of an analog system using a series of color filters or by means of a digital scanning process. The full-color copier may require up to four scans to read the original. The copier individually applies one or more color toners to a transfer drum/belt or photoconductor, or both, which is in turn deposited on the paper.

3.1.3 *mono-component development*—a single component dry toner used for developing electrostatic images in copiers (see Terminology [F335](#)).

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

4. Summary of Test Method

4.1 A full-color 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 (see [Fig. 1](#)). A known, or estimated quantity of toner is used 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.

4.2 A full-color copier may have up to four individual developing units containing up to four different color toners (usually cyan, magenta, yellow, and black). In some cases, the black developing unit may be dual-component while the color developing units may be mono-component (or vice versa). This test method is intended to address the toner yield of each type of development systems (mono- or dual-component).

5. Significance and Use

5.1 This test method can 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 cost-per-copy comparisons.

5.2 This test method provides only a point of estimate that is subject to a significant number of variables that are not easily

¹ This test method 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 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.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from ASTM International Headquarters. Order Adjunct No. [ADJF0875](#). Original adjunct produced in 1994.

⁵ Available from ASTM International Headquarters. Order Adjunct No. [ADJF1424](#). Original adjunct produced in 1992.