



Standard Practice for Determining Toner Usage for Printer Cartridges¹

This standard is issued under the fixed designation F1856; 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 weight of toner used for printing a single page derived from an electrophotographic process. The practice uses a printer text target specifically developed for each printer for a page coverage of $5 \pm 0.5\%$ of the printable area. This practice requires specific tools and skills for disassembling and reassembling printer cartridges.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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. Referenced Documents

- 2.1 *ASTM Standards*:²
F335 [Terminology Relating to Electrostatic Imaging](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *toner usage*—amount of toner (milligrams per print) removed from the toner hopper during the printing of one page.

4. Summary of Practice

4.1 An electrophotographic printer utilizing an all-in-one supply cartridge is set up to determine the toner used for a single page of print. A test page with $5 \pm 0.5\%$ text print output for the control cartridge is used. 5% text coverage of the printable area is the industry accepted average page coverage for office printers. The all-in-one cartridge is dis-

sembled to separate the toner hopper from the waste toner collection bin. The weight of the full toner hopper is measured. A specified number of prints are created on the printer using this cartridge and the weight of the used toner hopper is measured. The toner used for one print is calculated. In addition, the results can be used to estimate the total page yield of the toner cartridge. A comparison can be made between the toner used for the control cartridge and any other cartridge tested using this practice.

5. Significance and Use

5.1 This practice can be used for the evaluation of new and remanufactured toner cartridges and their respective components used in an electrophotographic process.

5.2 This test is suitable for research and development, and quality acceptance evaluations.

6. Interferences

6.1 Relative humidity can impact test results. The test should be performed at a controlled temperature and humidity within the operating humidity range of the printer. This is usually between 20 and 80 % RH. All equipment, and materials should be conditioned in the same temperature and relative humidity for at least 24 h prior to testing.

6.2 In comparative cartridge test the same test target (data) and printer must be used. The number of characters and the type of characters, font and font size have a direct affect on toner consumption.

6.3 The test pattern should not produce uneven wear on the cartridge components as this will affect the test results.

6.4 Printer related items such as the power supply, density control settings, resolution enhancements, toner saver settings, economy mode settings, and laser optics may impact image quality and toner consumption.

6.5 Test printers should be in good mechanical and electrical condition. Preferably, printers with a continuous history of preventative maintenance should be used. Any printer failures can invalidate the test.

6.6 A calibrated balance must be used to obtain weights.

6.7 The techniques used for cartridge disassembly should avoid toner spillage and ensure accurate toner weight measurements.

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.

Current edition approved Oct. 1, 2009. Published October 2009. Originally approved in 1998. Last previous edition approved in 2004 as F1856 – 04^{e1}. DOI: 10.1520/F1856-04R09.

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.