



Standard Practice for Testing Ink Jet Cartridge Latency (Start-Up)¹

This standard is issued under the fixed designation F2760; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This practice describes how to determine the ability of an all-in-one ink jet cartridge to print reliably during the life of the ink jet cartridge.

1.2 This practice can be used to evaluate the reliability of an all-in-one ink jet cartridge as it would be used under daily use conditions.

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

[F909 Terminology Relating to Printers](#)

[F1174 Practice for Using a Personal Computer Printer as a Test Instrument](#)

[F1857 Terminology Relating to Ink Jet Printers and Images Made Therefrom](#)

[F1944 Practice for Determining the Quality of the Text, Line- and Solid-Fill Output Produced by Ink Jet Printers](#)

3. Terminology

3.1 See Terminologies [F909](#) and [F1857](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *latency, n*—the delay or inability of an ink jet ink cartridge to begin printing without voids in the print.

4. Summary of Practice

4.1 The day-to-day ability of an all-in-one ink jet ink cartridge to perform properly is important to the end user. This practice can be used to determine if, after an ink jet cartridge has not been used for a period of time, the ink jet ink cartridge

will start printing right away or if the ink jet ink cartridge will have printing start-up problems.

4.2 Two tests are conducted to determine the start-up capabilities of an ink jet ink cartridge. The first test determines if the ink jet ink cartridge will print if left in the ink jet printer. If the cartridge passes this initial test, a second test with the cartridge left outside of the printer can be conducted. This test emulates a condition when the end user removes the ink jet cartridge from the printer, leaving it out of the printer for a period of time.

5. Significance and Use

5.1 This practice can be used to determine the degree to which an ink jet cartridge fails to print. This may be due to drying of ink jet ink, precipitation of an ink ingredient during periods of inactivity, or improper filling of the ink jet cartridge.

5.2 This practice can be used for the evaluation of an OEM (original equipment manufacturer) cartridge compared to a refilled or remanufactured ink jet printer cartridge when this practice is performed on the same printer.

5.3 This practice is applicable to all-in one ink jet cartridges, whether single or multicolor.

5.4 This practice can be used to assess design goals of manufacturers or remanufacturers of ink jet printer cartridges for ink capability, ink filling effectiveness, and the manufacturing or remanufacturing process.

5.5 This practice can be used to determine the reliability of a development, production, or competitive ink jet ink.

5.6 This practice may be used for research and development and for quality acceptance evaluation.

6. Interferences

6.1 Printer-related controls such as print quality settings and media/paper settings can affect the quality of the printing. Printing in draft print setting or fast print setting may be a more stressful condition for the ink jet ink cartridge.

6.2 The test should be performed at a controlled temperature and humidity within the operating range of the printer. All equipment and materials should be conditioned in the test atmosphere for at least 24 h prior to testing.

¹ This practice is under the jurisdiction of ASTM Committee [F05](#) on Business Imaging Products and is the direct responsibility of Subcommittee [F05.07](#) on Ink Jet Imaging Products.

Current edition approved Feb. 1, 2009. Published February 2009. DOI: 10.1520/F2760-09.

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.

6.3 Test printers should be in good mechanical and electrical condition. Any printer failures can invalidate the test.

6.4 Initial test cartridges must function properly without any defects in the print.

7. Equipment and Materials

7.1 *Ink jet test printer(s)*, suitable for testing purposes, following the guidelines as stated in Practice **F1174**.

7.2 *Test reference cartridge*, (OEM printer specified) for a comparative test.

7.3 *Test cartridge*, designed for use in the test printer.

7.4 *Conditioned paper*, meeting the requirements of the printer. The same paper type and manufacturer should be used for all comparative tests.

7.5 *Test image*.

8. Procedure

8.1 Before beginning the test, install a reference cartridge (OEM printer specified) in accordance with the instructions of the printer user's manual. Print a test page, either self-test or PC-controlled, to ensure the test printer is working properly. Remove cartridge.

8.2 The test ink jet cartridge should be filled to proper capacity. Install the test cartridge in a properly working test printer and perform the same routine as **8.1** to ensure the test cartridge is working properly. If the test cartridge is not working properly, perform the cartridge cleaning function of the printer. If the test cartridge is still not printing properly, replace with another cartridge and repeat this step.

8.3 Program the test printer with the desired test image; then print the test image. This test image may be generated with personal computer word processing, drawing/graphics, or page layout software. The test image should consist of text, lines, and images in black and color.

8.4 Check the test image for print defects in accordance with Practice **F1944**. If there are no print defects, leave the

cartridge in the printer. Do not turn the printer off. Most printers will perform a cleaning cycle when turned off and on. This will invalidate this test. Make sure the cartridge is in the "home" position while the printer is idle.

8.5 Let the printer sit idle overnight, then make another print. Check for print defects due to latency in accordance with Practice **F1174**. If there are no print defects, repeat this test at 7, 14, and 21 days. Check for print defects at each interval.

8.6 A more severe test to determine start-up ability is to remove the fresh test cartridge from the printer after the initial print test. Label the cartridge as to time and start date of storage.

8.7 Follow steps **8.1-8.4**.

8.8 Remove the cartridge from the printer, and set it aside in normal position (print head face down) on a nonabsorbent surface. Leave undisturbed overnight and check for print defects.

8.9 Repeat the print test at seven days. If free of print defects, repeat above and retest at 14 days.

9. Report

9.1 Test date and location.

9.2 Identification of printer used and setup conditions.

9.3 Identification of reference ink jet cartridge (OEM printer specified).

9.4 Identification of evaluated ink jet cartridge. This may include variables such as ink design, manufacturing process, and so forth.

9.5 Test image name.

9.6 Presence or absence of print defects at specified intervals.

10. Keywords

10.1 ink jet; ink jet cartridge; ink jet printer; latency; remanufactured; start-up

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the ASTM website (www.astm.org/COPYRIGHT/).