International Standard

ISO/IEC 19798

Information technology — Office equipment — Method for the determination of toner cartridge yield for colour printers and multi-function devices that contain printer components

Technologies de l'information — Équipements de bureau — Méthode pour la détermination du rendement de cartouche de toner pour les imprimantes couleur et pour les dispositifs multifonctionnels qui contiennent des composants d'imprimantes

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology,* Subcommittee SC 28, *Office equipment*.

This fourth edition cancels and replaces the third edition (ISO/IEC 19798:2017), which has been technically revised.

The main changes are as follows:

— the note to the term 3.6 “test files” has been moved to 5.1 f);

— the link address of the test files in 4.7 has been updated.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

The purpose of this document is to provide a process for determining the cartridge page yield for a given colour electrophotographic print system (i.e. all-in-one toner cartridges and toner cartridges without a photoconductor) using a standard office consumer type test suite. This test suite is not focused on printing of photographs, but is intended to be a sampling of typical office consumer pages. In the case where a cartridge set can be used in multiple printer models, only one yield test is performed as long as the difference between printer models does not impact yield.

NOTE A cartridge supplier can choose to use more than one market identifier for a single physical cartridge. In this case, only one yield test is performed as long as there are no differences in the cartridges other than market identifiers.

This document prescribes the following:

— the test method that manufacturers, test laboratories, etc. used to determine cartridge yield;

— the method for determination of declared yield values from the test results;

— the appropriate method of describing the yield of cartridges in the documentation supplied to the consumer by the manufacturer.

The cartridge yield is determined by an end of life judgment, or signalled with either of two phenomena: fade caused by depletion of the useable toner in the cartridge or automatic printing stop caused by a toner out detection function.

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Information technology — Office equipment — Method for the determination of toner cartridge yield for colour printers and multi-function devices that contain printer components

1 Scope

This document is limited to the evaluation of toner cartridge page yield for toner-containing cartridges (i.e. all-in-one toner cartridges and toner cartridges without a photoconductor) for colour electrophotographic print systems. This document can also be applied to the printer component of any multifunctional device that has a digital input printing path, including multi-function devices that contain electrophotographic printer components.

This document is only intended for the measurement of toner cartridge page yield when printing on plain paper using cyan, magenta, yellow and black toner cartridges. No other claims can be made from this testing regarding quality, reliability, etc.

This document is not for use with printers whose minimum printable size is equal to or greater than A3 or for photo-only printers.

Application of this document for yield measurement of toner replenishment systems (i.e. toner cartridge and bottle type systems where the toner reservoir is internal to the printing system and not user-replaceable) implies some procedural modifications specifically noted herein. This document is intended for equipment used in the office space and does not apply to production volume or large format printing machines where the major cost of ownership is not caused by the consumable yield measured in this document.

NOTE 1 An all-in-one toner cartridge is a cartridge that includes at least: a toner containment part, a photoreceptor part and a developer part (see ISO/IEC 29142-1).

NOTE 2 This document will be used for the measurement of one of the contributions to cost per page (CPP). This document does not directly measure CPP, only the yield of the magenta, cyan, yellow and black toner cartridges. In most cases, these are not the only contributors to the CPP. It is beyond the scope of this document to provide a methodology for calculation of CPP.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19752, *Information technology — Method for the determination of toner cartridge yield for monochromatic electrophotographic printers and multi-function devices that contain printer components*

ISO/IEC 24712, *Colour test pages for measurement of office equipment consumable yield*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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3.1
fade
phenomenon whereby a noticeable reduction in density uniformity in the bars around the sides of the diagnostic page occurs

Note 1 to entry: This does not have to be a distinct gap.

Note 2 to entry: In this test, fade is defined as a noticeably lighter area, 3 mm or greater, located in the bars around the diagnostic page of the test suite. Generally, the lightening will occur parallel to the paper movement direction during printing. The determination of the change in lightness is to be made referenced to the 100th page (diagnostic page) printed for each cartridge in testing. For examples of fade, consult Annex A.

3.2
shake procedure
specified method to carry out the shaking of a cartridge according to the user manual

3.3
toner low
signal generated by the printer when it has been detected that the amount of toner is such that a toner change will be required soon

Note 1 to entry: It does not indicate that the system is out of toner.

3.4
toner out
signal generated by the printer when the toner in the system is depleted and the printer is incapable of reliable printing without user intervention

Note 1 to entry: For the purpose of this test, the toner out signal will only be used if it causes the printer to stop printing and requires toner replacement to continue printing.

3.5
end of life
point when the printer declares *"toner out"* (3.4) or when *fade* (3.1) is observed

3.6
individual cartridge yield
value determined by counting the number of diagnostic pages (page 5 of the ISO/IEC 24712 test suite) printed between the cartridge installation and *end of life* (3.5) and multiplying by five

3.7
declared cartridge yield
value at or below the lower 90 % confidence bound

Note 1 to entry: Detail of the value is described in 6.1. and 6.3.

4 Test parameters and conditions

4.1 Set-up

Place the printer on a horizontal surface and set up the printer according to the installation guide provided in the printer user's manual. Use the most recent printer driver available from the manufacturer's website or the supplied driver with the printer. The driver version shall be specified on the test report. Cartridge installation shall be completed following the instructions in the cartridge installation guide. If there is a contradiction between the printer and cartridge manuals for the cartridge installation, the cartridge manual will take precedence except if changes are recommended for printer or driver settings.

If the cartridges used in testing are toner replenishment or toner bottle types, then one set of toner cartridges will be used until reaching the end of life in each printer before the start of the test. The pages

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