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Information technology — Office equipment — Method for measuring digital copying productivity

Technologies de l'information — Équipements de bureau — Méthode de mesure de la productivité d'un photocopieur numérique

Reference number
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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

This third edition cancels and replaces the second edition (ISO/IEC 24735:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Clause 3 has been modified to add new definitions and removed definitions of terms not used in the text;

— added “ready delay time” requirement to “test measurement” procedures;

— annex structure has been changed to be consistent with other productivity standards;

— added minimum declaration example to Annex A;

— added Annex D for the procedure to determine the “ready delay time”.

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

Many digital copying devices produce copied pages at a different rate than their nominal speed when running with different modes (simplex, duplex, copying quality modes), different substrate grammage and collating and/or finishing options. The degree to which a reduction in productivity is experienced depends significantly on other parameters of the job stream. The most dominant of the parameters of the job stream are: the number of original pages in a set to be printed, whether output pages are single-sided or double-sided, image quality modes selected, B&W and colour reproduction job stream, number of print sets to be produced, substrate size used, run length and finishing options.

This document provides a general method for measuring productivity when the above-mentioned job stream parameters for digital copying devices are taken into consideration. This document also includes instructions for the creation of test charts. It allows manufacturers and buyers of digital copying devices to describe the productivity of various digital copying devices with respect to representative office usage.

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Information technology — Office equipment — Method for measuring digital copying productivity

1 Scope

This document specifies a method for measuring the digital copying productivity of digital copying devices and multifunctional devices with various copying modes. It is applicable to digital copying devices and multifunctional devices equipped with automatic document feeder (ADF) and collating function. This document is intended to be used for black and white (B&W) as well as colour digital copying devices and multifunctional devices of any underlying marking technology. It allows comparison of the throughput copying rates for a machine operated in various available operating modes (simplex, duplex, size of substrates, 2-up, etc.) and various available digital image processing configurations. This document includes test files, test setup procedures, test procedures, and reporting requirements for digital copying productivity measurements.

This document is not intended to be used for devices which are not able to copy on a media size of A4/8,5" × 11", devices that do not have an ADF, or devices which are not able to collate multiple copies of original prints from a test set.

This document is not intended to replace manufacturer's rated speeds.

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 536, *Paper and board — Determination of grammage*

ISO 2470-1, *Paper, board and pulps — Measurement of diffuse blue reflectance factor — Part 1: Indoor daylight conditions (ISO brightness)*

ISO/IEC 24734, *Information technology -- Office equipment--Method for measuring digital printing productivity*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 24734 and the following apply.

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

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

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

3.1
cpm
copies per minute
copying rate, excluding time to first page copied, measured when producing pages in a continuous copying mode for one minute with a single static document using a nominal grammage substrate

Note 1 to entry: Nominal copying speed is expressed in copies per minute or *images per minute (ipm)* (3.5).

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3.2
duplex
duplex copying
two-sided copying
1:2 mode
2:2 mode
<copy> use of a copying device to make a number of copies with the copying being done on both sides of the sheet

Note 1 to entry: 1:2 mode refers to simplex originals that are copied to 2-sided output.

Note 2 to entry: 2:2 mode refers to two sided originals that are copied to 2-sided output.

3.3
feature performance test
<copy> optional test used to evaluate productivity changes with various copying and finishing features enabled

Note 1 to entry: The feature performance test suite is run with default copying system settings to establish a base line, and then with the selected feature (e.g. stapling) ON, for comparison.

3.4
full report
<copy> presentation of results including the *first set out time (FSOT)*, *estimated saturated throughput (ESAT)* and *effective throughput (EFTP)* values in *general performance tests* (3.6) or the FSOT and ESAT values in *feature performance tests* (3.3) as well as the calculated averages for each value

3.5
ipm
images per minute
copy rate, excluding time to first page copied, as measured when producing pages in a continuous copy mode for one minute with a single static document using a nominal grammage substrate

Note 1 to entry: Nominal copying speed is expressed in *copies per minute (cpm)* (3.1) or images per minute.

3.6
general performance test
test used to evaluate productivity of default features

3.7
simplex copying
one-sided copying
simplex to simplex
1:1 mode
use of a copying device when only a single side of a sheet is copied on

3.8
summary report
presentation of results, including the average overall *first set out time (FSOT)* and *estimated saturated throughput (ESAT)* in *general performance tests* (3.6) or the ratio of the copying performance such as FSOT and ESAT with the subject feature ON versus the copying device default base line performance (without the subject feature ON) in *feature performance tests* (3.3)

3.9
test file
digital file used for creating *test targets* (3.12)

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3.10
test run
operation of copying all pages of targets from a *test file* (3.9), in a particular system configuration, with a particular set and page count

Note 1 to entry: Copy times are recorded for each test run.

3.11
test set
<copy> all of the pages of targets from a *test target* (3.12)

3.12
test target
test chart
hard copy document used for testing per the test method, and created from a *test file* (3.9)

4 Test parameters and conditions

4.1 Copying device setup

Place the copying device on a horizontal surface and set up the copying device according to the manufacturer's recommendations.

The copying device shall be fully enclosed in its normal exterior cover. All image and copying modes should be at their factory preset configuration for the copying device. It is assumed that the settings listed in Table 1 are common to all copying devices. These listed settings shall be set to the manufacturer's default or preset condition for the device. If a device has settings not listed in Table 1, they too shall be set to default settings. For copying devices that have additional print quality and digital image processing features, those features shall be set to match their normal default condition and included in the result reporting.

Multiple copy output shall be collated. If collated output is not included in the default settings, follow the manufacturer’s recommendation for obtaining collated output. In the case that collation settings do affect performance, the faster of the results should be reported. As with other settings, the test report shall disclose the manner in which collation was achieved.

Single and multiple copy output will be ordered according to “default settings”. It is assumed that “default settings” will yield original order output for a dual output order device that supports both original order and reverse order output. If the default settings on a dual output order device yields reverse order output, then testing using original order output is required for the 1 set + 30 seconds test and the 1 set + 4 minutes test runs, optional for 1 set test.

If not the default and if supported, optional original order output on 1 set test may be done by following the manufacturer’s instructions on how to change the copying device for the result of producing original order output. If other settings change automatically as a result of changing to original order output this shall be noted on the test report.

Disabling manufacturer default installed features, routines or applications, is not allowed.

EXAMPLE 1 Examples of routines that may not be disabled include, but are not limited to the following:

— automatic cleaning;

— calibration cycles;

— energy save settings.

If the system has automatic media detect (automatic paper type selection), it can be disabled, and paper used in the test shall be selected manually. This shall be noted in the full detailed report (see Annex B). The following preset values in the test will be noted on this report format. Additional optional tests with non-default settings or configurations may be run.

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