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Information technology — Office equipment — Method for measuring digital copying productivity for a single one-sided original

Technologies de l'information — Équipement de bureau — Méthode de mesure de la productivité du copiage numérique d'un simple original une face

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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).

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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 second edition cancels and replaces the first edition (ISO/IEC 29183:2010), which has been technically revised.

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

— “Terms and definitions” clause has been modified to add new definitions and removed definitions of terms not used in the text;

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

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

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

— added *sFCOT* from sleep, *sFCOT* from sleep after 15 min, and *sFCOT* from off tests and reporting;

— added minimum declaration examples to Annex A.

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 quality modes, different substrate grammage, different job content and job lengths. The degree to which a change in productivity is experienced depends significantly on other parameters of the job stream. The most dominant of the parameters of the job stream are: (image quality modes selected, job content, B&W and colour reproduction job stream, run length). The existing International Standard (ISO/IEC 24735) only addresses the productivity issues for digital copying devices when using both collation and an ADF (automatic document feeder) and cannot be used for a single one sided original.

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 for a single one-sided original

1 Scope

This document specifies a method for measuring productivity of digital copying devices and multifunctional devices with various copying modes and a single one-sided original. The document is applicable to digital copying devices and multifunctional devices. The 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. This document includes instructions for the creation of test charts, test setup procedure, test procedure, and the reporting requirements for the digital copying productivity measurements.

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
sEFTP
effective throughput
rate at which a device produces pages measured from the initiation of the job through the complete exit of the last *test set* (3.11)

Note 1 to entry: “s” denotes that a single one sided original is used for the measurement.

Note 2 to entry: *sEFTP* is expressed in images per minute (ipm). *sEFTP* can be affected by scan time, digital processing time, and maintenance as well as the run time of the test.

[SOURCE: ISO/IEC 24734:2021, 3.6, modified — The term "EFTP" has been replaced by "sEFTP" and Note 1 to entry has been added.]

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3.2
sESAT
estimated saturated throughput
rate at which a device produces pages measured from the complete exit of the first *test set* (3.11) to the complete exit of the last test set

Note 1 to entry: “s” denotes that a single one sided original is used for the measurement.

Note 2 to entry: *sESAT* is expressed in images per minute (ipm).

Note 3 to entry: There is a different definition called “Continuous Copy Speed” for EP (electrophotographic) copying machine is defined in ISO/IEC 21117.

Note 4 to entry: Since each test set is one page. it is by definition the last page of the test set.

[SOURCE: ISO/IEC 24734:2021, 3.7, modified — The term "ESAT" has been replaced by "sESAT" and Notes 1 and 3 to entry have been added.]

3.3
sFCOT
first copy out time
number of seconds between the initiation of the job to the complete exit of the first copy

Note 1 to entry: “s” denotes that a single one sided original is used for the measurement.

Note 2 to entry: For a single one sided original the first copy is the first set and *sFCOT* equals *sFSOT*.

Note 3 to entry: *sFCOT* can refer to *sFCOT* from ready, *sFCOT* from sleep, *sFCOT* from off. Specific usage will be noted by $sFCOT_{ready}$, $sFCOT_{sleep}$, $sFCOT_{off}$.

Note 4 to entry: *sFCOT* is strongly affected by the scanning time.

Note 5 to entry: There is a different definition called “*FCOT*; first copy out time”. This “*FCOT*” for EP (electrophotographic) copying machine is defined in ISO/IEC 21117.

3.4
full report
<single sided copy> presentation of results including the *first copy out time (sFCOT)* (3.3) from ready, *sFCOT* from sleep, *sFCOT* from off, *estimated saturated throughput (sESAT)* (3.2) and *effective throughput (sEFTP)* (3.1) values as well as the calculated averages for each values

3.5
off state
state from which a device is not capable of making a copy without user intervention to turn on the power

Note 1 to entry: A device may enter off state due to a user turning the device off, or the device may enter off state automatically after a delay.

3.6
performance test
test used to evaluate productivity by providing *first copy out time (sFCOT)* (3.3), *estimated saturated throughput (sESAT)* (3.2) and *effective throughput (sEFTP)* (3.1)

3.7
power management delay time
time that a device waits between the exit of the last page of the last job and being in a lower power state such as sleep state or *off state* (3.5)

Note 1 to entry: The power management delay time corresponding to the setting as shipped is referred to as “default power management delay time” or "default delay time".

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3.8
recovery time
time required by a device to recover from a sleep state given by the difference in the exit timing of the first page of the sleep state job and the exit timing of the first page of the ready state job

Note 1 to entry: Other related terms are “resume time” and “return time”. Other similar terms have been used in industry as well.

3.9
saturated time per copy
average time per copy measured from the complete exit of the first copy to the complete exit of the last copy

3.10
test run
operation of copying one *test target* (3.12), in a particular system configuration, with a particular *test set* (3.11) and page count

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

3.11
test set
test copy
<single sided copy> single page *test target* (3.12)

[SOURCE: ISO/IEC 24735:2021, 3.11, modified — The definition modified for single page.]

3.12
test target
test chart
hardcopy page used for testing per the test method, created from the test file

[SOURCE: ISO/IEC 24735:2021, 3.25, modified — The word "document" has been replaced by "page".]

3.13
warm-up time
time required by a device to recover from *off state* (3.5) given by the difference in *first copy out time (sFCOT)* (3.3) between off state and ready state

Note 1 to entry: Other similar terms, such as "wait time", have been used in industry as well.

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. The machine and all of its necessary supplies shall be acclimated in the test environment prior to conducting the test(s) for at least 8 h. All supplies used in the test(s), including copy paper, shall be those specified by the manufacturer. All image and copying modes shall 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.

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