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Information technology — Office equipment — Method for measuring first print out time for digital printing devices

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National foreword

This British Standard is the UK implementation of ISO/IEC 17629:2014.

The UK participation in its preparation was entrusted to Technical Committee IST/3, IT Printers and Cartridges.

A list of organizations represented on this committee can be obtained on request to its secretary.

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INTERNATIONAL STANDARD

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Information technology — Office equipment — Method for measuring first print out time for digital printing devices

Technologies de l'information — Équipements de bureau — Méthode de mesure de la première page hors délai d'un dispositif d'impression numérique

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Foreword

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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 ISO documents 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).

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 28, *Office equipment*.

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Introduction

Many digital printing devices produce the first printed page at a different rate from subsequent pages. Due to this behaviour, nominal print speeds specified in pages per minute do not generally reflect the time to produce the first page. The degree to which a change in productivity is experienced depends significantly on many 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, host computer, and connection type.

This International Standard provides a general method for measuring first print out time when the above mentioned job stream parameters for digital printing devices are taken into consideration. It allows manufacturers and buyers of digital printing devices to describe the first print out time of various digital printing devices with respect to representative office usage.

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INTERNATIONAL STANDARD ISO/IEC 17629:2014(E)

Information technology — Office equipment — Method for measuring first print out time for digital printing devices

1 Scope

This International Standard specifies a method for measuring first print out time of digital printing devices. The International Standard is applicable to digital printing devices and multifunctional devices. The International Standard is intended to be used for black and white (B&W) as well as colour digital printing devices and multifunctional devices of any underlying marking technology. The International Standard includes instructions for test charts, test setup procedure, test procedure, and the reporting requirements for the digital printing measurements.

2 Terms and definitions

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

2.1
duplex printing
term used to describe uses in which a printing device prints on both sides of a sheet

Note 1 to entry: Another equivalent term is “two sided printing”.

2.2
first print out time
FPOT
number of seconds between the initiation of the job until the complete exit of the first sheet

Note 1 to entry: Other equivalent terms are “first page out time”, “first print out”, “time to first print”, and “time to first page”. Other similar terms have been used in industry as well.

2.3
full detailed report
presentation of information including host computer setup and measured test results

2.4
full report
presentation of measured test results

2.5
off state
state from which a device is not capable of receiving and printing a print job without user intervention on the device

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

2.6
paper feed orientation
whether the long or short edge of the paper is leading in the paper transport mechanism

Note 1 to entry: Typical devices with a maximum paper size of A4 have a paper feed orientation of short edge. Devices with a maximum paper size of A3 could print with A4 paper loaded in either long edge or short edge orientation. Typical devices with a maximum paper size of 8,5” × 11” have a paper feed orientation of short edge. Devices with a maximum paper size of 11” × 17” could print with 8,5” × 11” paper loaded in either long edge or short edge orientation.

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2.7
power management delay time
time that a device waits between the last print job and going into a lower power state such as sleep state or off state

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".

2.8
ready state
state which a device typically enters after completing a print job where the printing engine is in a stable condition, but fully warmed up and prepared to print

Note 1 to entry: While in ready state, systems not directly involved with marking the media may be still in motion. For example, fans may still be spinning.

2.9
recovery time
time required by a device to recover from sleep state given by the difference in FPOT between sleep state and ready state

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

2.10
simplex printing
term used to describe uses in which a printing device prints on only one side of a sheet

Note 1 to entry: Another equivalent term is "one sided printing".

2.11
sleep state
low power state from which a device is capable of receiving and printing a print job without user intervention on the device

Note 1 to entry: Some devices may have multiple low power states. This International Standard focuses only on the lowest power sleep state.

Note 2 to entry: Other equivalent terms are "power save", "low power mode", and "energy save". Other similar terms have been used in industry as well.

2.12
summary report
presentation of results including only average FPOT from ready results

2.13
test file
refers to the digital test file used for testing

2.14
test page
first page or first two pages from a test file

Note 1 to entry: Duplex testing requires using the first two pages from a test file to print on both sides of the first sheet. Simplex testing only requires using the first page from a test file to print on one side of the first sheet.

2.15
test platform
set of hardware and software system components configured to perform the collection of digital printing FPOT tests, including, but not limited to a computer installed with an operating system and applicable application software, installed printing device software, hardware and software interfaces, and timing devices (stopwatch or automated)

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2.16
test run
refers to the operation of printing a test page or multiple test pages, in a particular system configuration

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

2.17
test suite
refers to the combination of test files used to measure FPOT

2.18
warm-up time
time required by a device to recover from off state given by the difference in FPOT between off state and ready state

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

3 Test Parameters and Conditions

3.1 Test Platform

Due to the rapid change of computer technology, a common test platform (hardware and software) that can be used for FPOT testing over time is considered to be not practical. Instead, when a test platform is used, the test platform system parameters that may affect digital printing productivity measurements (see Annex A) shall be recorded.

3.2 Test Platform Test Setup Procedures

3.2.1 Initial Platform Setup

The test platform hardware should be installed as per the manufacturer's instructions. The test platform hardware information shall be recorded as listed in Annex A. The test platform operating system and applications should be installed as per the manufacturer's instructions. The test platform operating system and application information shall be recorded as per Annex A. All settings or selections made during installation that differ from the application's default settings or operating system's default settings shall be recorded.

— The test platform should be configured for the appropriate connection environment, such as direct USB connection or network Ethernet connection, and the information shall be recorded as per Annex A along with all settings and selections that differ from the installation default configuration.

— It should be verified that the test platform is configured for optimal performance by evaluating system parameters such as hard disk fragmentation and compression, swap memory size, etc. Any settings, changes or optimizations made that differ from the installation default condition shall be recorded.

— The test platform is now in the Initial Installation State. All recorded settings shall be included in the Full Detailed Test report.

3.2.2 Creation of Disk Image of Test Platform (optional)

Disk imaging software may be used to enable the system to be restored to the Initial Installation State. Create the disk image after the test platform has been configured and before the print driver for the printing device is installed. Record the disk imaging software used and all settings that differ from the imaging software's installation default condition.

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3.2.3 Initial Test State

The test platform shall be restored to the Initial Installation State before beginning the sequence of tests for each new printing device. Each printing device product bundle or printing device hardware configuration that might be expected to result in a difference in performance should be considered a 'different printing device'. Record the method used to establish the Initial Installation State.

3.3 Printing Device System Setup

Place the printing device on a horizontal surface and setup the printing device according to the manufacturer's recommendation. Install the software (driver, port, etc.) recommended by the manufacturer. Use the most recent print driver available from the manufacturer. The driver and driver version shall be recorded on the test report.

The standard test shall be conducted using the manufacturer's default driver for the given printing device. If a default driver is not installed/selected automatically by the manufacturer's installation procedure, consult the manufacturer's documentation and use the recommended driver. All image, print quality, mode and speed modifiers shall be at their factory pre-set configuration for the printing device and default installed condition for the driver. If the printing device and driver differ, then the driver defaults shall be used. Disabling manufacturer default installed features, routines or applications, is not allowed. Examples include, but are not limited to the following: automatic cleaning or calibration cycles, bi-directional communications and energy save settings.

Testing shall be carried out in the specified modes, regardless of whether they are default settings or not. For example, if the default driver setting is duplex, the setting shall be changed to simplex for the simplex tests. Other modes that may need to be modified for specific tests include B&W mode on colour devices, paper size, paper scaling, and collation. It is allowable to disable automatic media detect and select plain paper. All changes to the default settings shall be recorded in the Full Detailed Report.

The file shall be rendered on the page in a size corresponding to the dimensions in the test page description. For example, when testing an A4 sized document, the media settings shall be set to A4, and when testing a 8,5" × 11" size document, set to 8,5" × 11", and so forth. Verify the printing device and print driver default page margin settings are not larger than 12,7 mm (0,5 inches). Adjust the settings as necessary to ensure the test page printable area is rendered correctly. Adjust the settings as necessary to ensure the test pages printable area is rendered to cover the paper page area as shown in the softcopy display of the test file. Any modifications to the printing device or print driver settings shall be recorded. Page placement modifiers such as page centering and auto-rotation can be used to place the image properly on the page. Any change from the printing device defaults shall be recorded in the Full Detailed Report.

Adjust the settings such as turning off 'page scaling' setting to ensure the test page printable area is rendered correctly.

For colour and B&W printing devices, printing the three files in the 'Office Category' test suite is required. The output of the three files on a colour device shall be in colour, whereas the output of the three files on a B&W device shall be B&W. For colour printing devices, an optional B&W result may be reported by using the same three colour files, changing the printing device or driver to produce B&W output, but maintaining the default quality or resolution setting.

Procedurally, the optional B&W output on a colour device test shall be done as follows: Select the printing device or driver options which are intended to produce B&W only output. Follow the manufacturer's instructions on how to change the printing device or driver for the result of producing B&W output utilizing only the black cartridge. If other settings change automatically as a result of changing to B&W mode, such as quality mode, this shall be noted on the test report. If B/W printing is performed by composite black, it shall be reported

NOTE Common means of setting a printing device in B&W include, but are not limited to, selecting a B&W option in the driver. In the driver, this might appear as: "print in B&W", "print in grayscale" or "print in black only". The selection of B&W printing can occur in several places in the driver and printing device. When the best method to set the printing device to print in B&W only is in question, it is best to contact the manufacturer regarding the best method to change this setting.

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The device and all of its necessary supplies shall be acclimated in the test environment prior to conducting the test for at least eight hours.

Additional tests may be conducted using other, non-default, drivers or printing device description languages provided by the manufacturer for the printing device. Additional tests may also be conducted using other settings available with the device. Such settings may be, but are not limited to, print quality and speed modifier choices available in the driver. The results of such additional tests will be documented as having system parameters that differ from the factory defaults and shown in comparison to the default system parameter results.

3.4 Printing Device Connection

Connection to the test platform should be determined by the manufacturer's targeted usage. A printing device intended to be shared by several users should be connected via the network connection with which the printing device is equipped from the manufacturer. A printing device intended to be personal or desktop should be connected direct to the test computer (such as USB). The connection type, version shall be recorded and reported. In addition, all settings that differ from the system or printing device defaults shall be recorded and reported.

3.5 Printing Device Condition

All supplies used in the test(s), including paper and printing device consumables, shall be only those specified as acceptable for use by the manufacturer (or otherwise noted). If possible, the number of pages printed on the engine and printed on the consumables prior to the start of the test shall be recorded and reported.

3.6 Sample Size

For FPOT measurement, one device shall be tested. Each file shall be tested and measured at least twice for repeatability.

3.7 Paper

The paper used in this test shall be within the range of, and/or not violate, specific written attribute guidelines and recommendations provided by the printing device manufacturer, which may include but are not limited to: size, weight, composition, paper manufacturer(s), paper type, part number and other physical characteristics. Care must be taken to use a paper that conforms to the printing device manufacturers' paper specifications for the default printing devices settings. The paper used shall be cut-sheet, A4 and/or 8,5" × 11" size. The paper manufacturer, weight, size and paper type/name used in each test shall be noted on the report.

In all cases the paper size used shall be indicated in the measurement results tables, and the paper feed orientation shall be noted in the test report. When a comparison is made between the productivity of one device with that of other devices the measurement shall be done with the same paper sizes and paper feed orientation.

3.8 Maintenance

Print engine maintenance shall be performed throughout testing per the manufacturer's recommendations on an as needed basis. (For example, cleaning routines or consumables replacement).

3.9 Test Files, Test Suites and Software Applications

The ISO/IEC 24734 'Office Category' test suite and test files are specified in Annex B. The tests shall be conducted using the standard official electronic test files as the input. The most recent official files can be located at http://standards.iso.org/ittf/PubliclyAvailableStandards/SC28_Test_Pages/. The 'Office Category' test files are part of the ISO/IEC 24734 test pages, and may be found inside the 'Office_Final.

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