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**Information technology — Office  
equipment — Method for measuring  
single photo printing time for digital  
printing devices**

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ISO/IEC 23385:2022

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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](http://www.iso.org/directives)).

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

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

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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](http://www.iso.org/members.html).

## Introduction

In recent years, photo printing devices have become widely available leading to widespread adoption of photo printing. Digital photo printing devices usually produce photoprints in short time.

The existing international standard (ISO/IEC 24734) for measuring printing productivity mainly addresses a method for measuring business documents. These documents may be multiple copies and consist of mixed content of text and graphics, on 8,5" × 11", A4, A3, and 11" × 17" paper typically used in offices. Another existing international standard (ISO/IEC 17629) for measuring first page out time addresses first page productivity of business documents at various states (ready, sleep, off) of devices.

This document provides a method and a procedure for measuring single photo printing time of digital photo printing devices. It allows manufacturers of digital photo printing devices to describe the single photo printing time and it allows buyers to compare various digital photo printing devices with respect to representative photo size and usage.

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# Information technology — Office equipment — Method for measuring single photo printing time for digital printing devices

## 1 Scope

This document specifies a method for measuring single photo printing time of digital photo printing devices on a wide range of print technologies. This document is applicable to digital photo printing devices that can produce photo prints on either 2" × 3" (51 mm × 76 mm), L (89 mm × 127 mm), 4" × 6" (102 mm × 152 mm), A6 (105 mm × 148 mm), A4 (210 mm × 297 mm), 8,5" × 11" (215,9 mm × 279,4 mm), 11" × 17" (279,4 mm × 431,8 mm), A3 (297 mm × 420 mm) or A3+ size sheets. Devices can be connected to either the computer system, media card or mobile devices. This document includes test setup procedure, test runtime procedure and reporting requirements for the digital single photo printing time measurements. Instant photoprint systems, which do not complete image formation at the time of paper ejection from device, are out of the scope of this document.

NOTE Inkjet, thermal transfer, dye-sublimation, electro photo and colour or monochrome thermal activated systems (such as ZINK®<sup>1)</sup>) are typical technologies of the scope.

## 2 Normative references

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 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/>

### 3.1

#### A3+

sheet size similar to A3 but slightly larger than A3

Note 1 to entry: A3+ is slightly larger in each dimension than A3. Examples of A3+ are 329 mm × 483 mm and 320 mm × 450 mm (SRA3).

### 3.2

#### default driver

printing device driver that is selected as the default per the manufacturers' installation procedure

### 3.3

#### full detailed report

presentation of information including device setup and measured test results

Note 1 to entry: An example of full detailed report is shown in [Annex A](#). Also refer to [7.4](#)

1) ZINK is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO or IEC of this product.

[SOURCE: ISO/IEC 24734: 2021, 3.11, modified – "machine" has been replaced by "device", the word "full" before "measured test results" has been removed and the Note 1 to entry has been modified to reference [Annex A](#).]

### 3.4

#### **single photo printing time**

number of seconds between first movement of the media to the full ejection of the media or the number of seconds between the full ejection of a sheet of media and the full ejection of the next sheet of media

### 3.5

#### **ready**

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 operate

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

[SOURCE: ISO/IEC 17629: 2014, 2.8, modified – Term "ready" was added and "to print" was replaced by "to operate".]

### 3.6

#### **test file**

file used for testing as per the test method

[SOURCE: ISO/IEC 24734: 2021, 3.29, modified – "individual files" was replaced by "file" because only a single file is used for the test method in this document and the example was removed.]

## 4 Test parameters and conditions

### 4.1 Test platform test setup procedures

#### 4.1.1 Initial platform setup

The test platform hardware shall be installed as per the manufacturer's instructions. The information of the test platform hardware shall be recorded as listed in the full detailed report; refer to [Annex A](#) for an example presentation. 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 shall be configured for the appropriate connection environment and the information shall be recorded as per full detailed report along with all settings and selections that differ from the installation default configuration.

It shall 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 report.

#### 4.1.2 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. Products that are of the same distinct print system can share testing and reports. Two or more products or bundles may be part of a distinct print system when they use the same print mechanism and operating points, and there are no differences that might be expected to affect performance. Devices with differences that could affect performance are not part of the same distinct print system, and are different print systems, even if they use the same print mechanism, and shall not share testing and reports. Record the method used to establish the initial installation state.



## 4.2 Printing device system setup

Place the printing device on a horizontal surface and setup the printing device according to the manufacturer's recommendation.

The standard test shall be conducted using the manufacturer's default setup for the given photo-printing device. All image, print quality, mode and speed modifiers shall be at their factory preset configuration for the photo-printing device and default installed condition. 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 tests. Other modes that may need to be modified for specific tests include photo mode, paper size, paper scaling, and collation. It is allowable to select photo paper. All changes to the default settings shall be recorded in the full detailed report.

If the content type of photo is available, it shall be set to photo. Print quality level for the photo printing shall be at factory preset configuration. Any user-selectable draft modes shall not be used.

Sheet selection shall be set to photo sheet. In case of multiple choices are available for photo paper setting, selection made for testing shall be included in the test report. If user-selectable automatic paper type detection is available on the device, it shall be disabled.

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.

## 4.3 Printing device connection

A printing device may be connected via a wired network connection (such as Ethernet), direct connection (such as USB) or wireless connection (such as Wi-Fi, Bluetooth) with which the printing device is equipped. The connected connection type and version shall be recorded and reported.

## 4.4 Printing device condition

All supplies used in the test(s), including sheet and printing device consumables, shall be only those specified as acceptable for use by the manufacturer (or otherwise noted). If available, 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. The device and all of its necessary supplies shall be acclimated in the test environment prior to conducting the test(s) at least 8 h.

## 4.5 Sample size

The test file shall be tested and measured at least twice for repeatability. All required tests shall be run using one device.

## 4.6 Sheet size and print mode

Size of sheet shall be chosen among 4" × 6", A6 and L sized sheets that the device is capable of printing. If a device under testing is not capable of printing on 4" × 6", A6 or L sized sheet, at least one of 2" × 3", A4 and 8,5" × 11" sized sheet shall be chosen for the required tests.

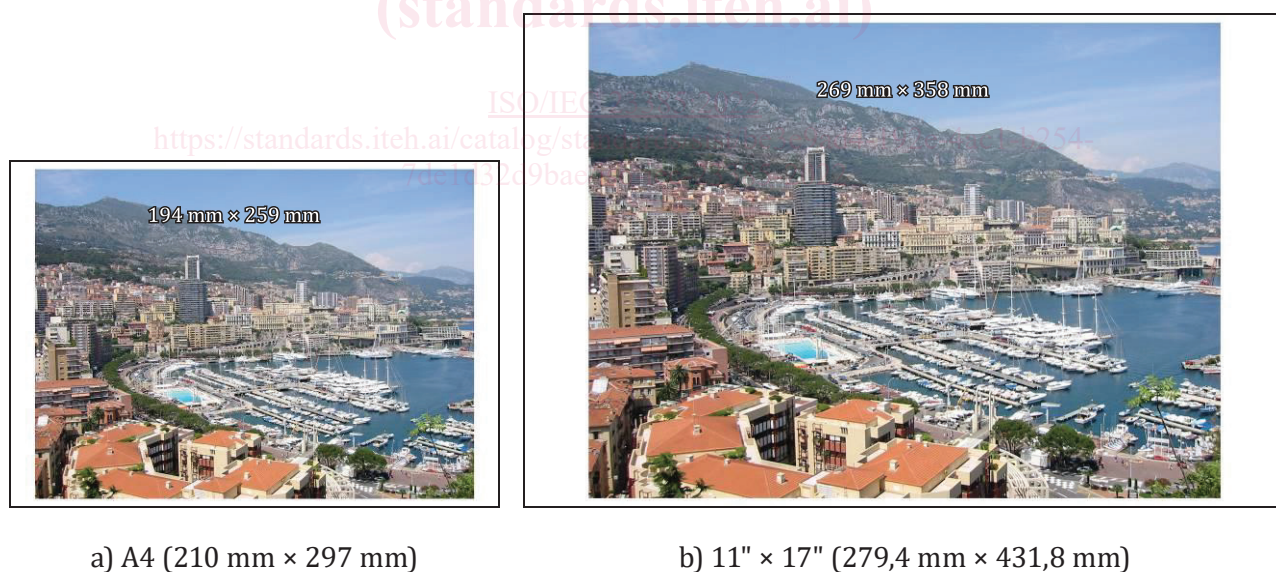
In all cases the sheet size used shall be indicated in the report as required in Table 2 and as shown in Table A.1. In the case of bordered printing, the printed image size shall be indicated in the report as required in Table 2 and as shown in Table A.1. The sheet feed orientation shall be noted in the full detailed report as shown in Table A.3. When a comparison is made between the single photo printing time of one device with that of other devices, the measurements shall be done with the same sheet sizes, the same sheet feed orientation, the same test method and the same testing conditions.

If a device has capability to print both borderless and bordered, the 2" × 3", 4" × 6", A6 or L sized sheet sizes that are supported for borderless printing on the device shall be printed borderless. Scaling for borderless printing shall be done with the smallest amount of cropping possible by the system and result in the minimum overspray supported by the device. If borderless printing is not allowed for a device under testing, 2" × 3", 4" × 6", A6 or L sized sheet that are not supported for borderless printing shall be printed with a border. Scaling for bordered printing shall be done with the smallest amount of cropping possible by the system and result in the minimum borders on all four sides supported by the device. If bordered printing is done, it shall be noted in the test report as described in 7.3.

A4, 8,5" × 11", 11" × 17", A3 and A3+ sized sheet shall be printed with border and the test image shall be printed without cropping and shall cover the full image of the test file. Scaling for bordered printing shall be done by the system. The dimension of the printed image shall be equal or larger than 194 mm × 259 mm for A4 and 8,5" × 11" sized sheet, and 269 mm × 358 mm or larger for 11" × 17", A3 and A3+ sized sheet. See Figure 1.

NOTE 1 When a 194 mm × 259 mm sized image is placed on the centre of an A4 sheet, the narrower margin (the long edge) becomes 8 mm for both sides.

NOTE 2 Examples of "system" are operation system of the host, the application, device driver, device, and the test procedure.



**Figure 1 — Minimum dimension of printed image**

This document is not intended to be used for measuring single photo printing time on sheet sizes beyond A3/A3+ size.

#### 4.7 Maintenance

Print engine maintenance shall be performed throughout testing per the manufacturer's recommendations on an as needed basis.

EXAMPLE Cleaning routines or consumables replacement.

## 4.8 Test file

The tests shall be conducted using the standard official electronic test file as specified in [Annex B](#) as the input. Failure to use the exact file as specified shall invalidate test results.

## 4.9 Environment

The test environment, including temperature and humidity, shall be within the ranges recommended by the manufacturer for operating the device. If no recommendation is available, the following ranges shall apply:

- temperature: 18 °C to 25 °C;
- relative humidity: 30 % to 70 %.

The temperature and humidity of the test environment shall be recorded in the full detailed report as described in [7.4](#).

## 4.10 Voltage

For a non-battery powered device, the printing device shall be connected to a voltage supply within the manufacturer-specified operating voltage range for the printing device under test. The line voltage shall be measured under no-load condition prior to each test and recorded in the full detailed report. For battery powered devices, the device shall use the manufacturer's recommended battery, and be charged with the manufacturer's recommended charger to full capacity prior to testing. Battery and charger used shall be recorded in the full detailed report as described in [7.4](#).

# 5 Test method

## 5.1 Overview

The test file, as specified in [Annex B](#), shall be printed to measure single photo printing time.

Requirements of the "Test matrix" are shown in [Table 1](#) below. Optional tests are shown as "O", required as "R".

**Table 1 — "Test matrix"**

| Printer   | Sheet size                     |   |                                    |
|---|--------------------------------|---|------------------------------------|
|   | 4" × 6", A6 or L <sup>a)</sup> | 2" × 3", A4 or 8,5" × 11" <sup>a)</sup> | 11" × 17", A3 or A3+ <sup>a)</sup> |
| Capable of printing on either 4" × 6", A6 or L  | R                              | O                                       | O                                  |
| Capable of printing on neither 4" × 6", A6 nor L  | not applicable                 | R                                       | O                                  |
| Capable of printing on neither A4 nor smaller than A4   | not applicable                 | not applicable                          | R                                  |
| Key<br>Optional tests are shown as "O".<br>Required test are shown as "R".<br><sup>a)</sup> At least one of these sheet sizes shall be selected. Additional sizes may be optionally tested. |                                |   |                                    |