INTERNATIONAL STANDARD

ISO/IEC 10561

Second edition
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Information technology — Office equipment — Printing devices — Method for measuring throughput — Class 1 and Class 2 printers

Technologies de l'information — Équipements de bureau — Dispositifs d'impression — Méthode de mesurage de la capacité — Imprimantes de classes 1 et 2

Contents

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.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10561 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 10561:1991), which has been technically revised.

Annexes A, B, C and D form an integral part of this International Standard. Annex E is for information only.

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ISO/IEC 10561:1999
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Information technology — Office equipment — Printing devices — Method for measuring throughput — Class 1 and Class 2 printers

1   Scope

This International Standard specifies a method for measuring the throughput of class 1 and class 2 printers, as defined in ISO/IEC 11160-1. This International Standard specifies three different test patterns:

- a standard business letter;
- a spreadsheet;
- a graphic pattern.

In addition, this International Standard defines a method for a performance test and one for an endurance test.

These tests are intended to measure only the printer throughput for documents in the same class as the test patterns and not to evaluate any other printer features such as character shaping, print compressions, network/controller performance, colour, etc. The method is relevant to class 1 and class 2 printer types (e.g. dot matrix, daisy wheel, ink jet, thermal transfer printers) and to all configurations (e.g. tractor feed, cut sheet feed, 80-column and over 132-column print width, etc.). It is not the most suitable for comparing performance of other classes of printing devices such as high-speed page-oriented printers or color printers.

This method is intended for use by printer manufacturers and test houses so that a common form of test result presentation shall be obtained. It will also enable a user to make a quick and easy comparison of the printing throughput of different printers.

2   Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11160-1:1995, *Information techology, Office equipment - Minimum information to be included in specification sheets - Part 1: Class 1 and Class 2 printers.*

DIN 32751 - *Büro- und Datentechnik - Drucker - Ermittlung der Druckleistung bezogen auf Prüfvorlagen.*

3   Conformance

Test results claimed to be in conformance with this International Standard shall have been obtained in accordance with the method specified in this International Standard.

4   Test principles

4.1   General

For each test the specified test pattern shall be printed a number of times on the device under test. A test shall be performed under the conditions specified in clause 5. The initial set-up conditions for the printer shall be as described under each individual test. Once started a test shall be performed without interruption.

The performance tests are designed to enable measurement of the printer under typical user application print tasks.

The endurance tests are designed to show any effects of extended high duty print tasks on printing throughput, due to any limiting factors within the printer (for example, dot density limitations, temperature rises, etc.).

For both types of test the throughput unit shall be "printed pages per hour" and shall be calculated by means of the formula:

$$\frac{\text{Number of printed pages x 3600 s/h}}{\text{Measured time in seconds}}$$

4.2   Performance test

In the performance tests the test pattern shall be transmitted from the host system five times, either as a single, five-page document or as five, single-page documents.

The test time measurement shall start from the moment the data arrive at the printer interface. Measurement from the moment the "start" key is depressed on the host computer is permitted, if it can be proved that this does not affect the test time measurement by more than 1 %.

When the test is performed with cut sheet paper the test shall be started with the paper in its normal print mode. For printers pre-loading the paper, the paper path shall be cleared before each test.

The measurement of the time required by the test shall end when the fifth sheet has been ejected.

For a printer operating with continuous paper the test shall start with the paper loaded to the top of form position.

The measurement of the time required by the test shall end after execution of the form feed at the end of printing the fifth page.

The performance figures shall be recorded along with a reference to the matrix used.

4.3   Endurance test

In the endurance tests the test pattern shall be transmitted from the host system repeatedly for 1 h.

The test time measurement shall start from the moment the data arrive at the printer interface. Measurement from the moment the "start" key is depressed on the host computer is permitted, if it can be proved that this does not affect the test time measurement by more than 1 %.

When the test is performed with cut sheet paper the test shall be started with the paper in its normal print mode. For printers pre-loading the paper, the paper path shall be cleared before each test.

For a printer operating with continuous paper the test shall start with the paper loaded to the top of form position.

The measurement of the time requested by the test shall end with the completion (ejection) of the first sheet after 1 h has elapsed (1 h and n seconds) so that a whole number of pages shall be printed.

The 1 h test time shall include any time required to reload paper, change ribbon cassette or replenish ink/toner supplies. It is assumed that the test is commenced with new consumables, loaded to capacity.

The endurance figures shall be recorded along with a reference to the matrix used.

5   Test conditions

5.1   Test environment

The test shall be performed in the following environment.

Temperature: 18 °C to 25 °C
Relative humidity: 30 % to 70 %

The printer, fully enclosed in its normal operating cover set, shall be acclimatized in the test environment in powered condition for at least 1 h.

5.2   Voltage

The printer shall be connected to a voltage supply which remains within ± 10 % of the nominal value of the specified operating voltage for the printer under test.

5.3   Data input

Data shall be sent to the printer at such a rate that the printer is never waiting for data to arrive and therefore producing a misleading (lower) throughput figure.

5.4   Test sequence

Each test sequence shall be completed without stopping.

After each test sequence the printer shall be allowed to re-stabilize (cool down) to its normal powered up ambient state.

5.5   Print paper

The paper used shall have the following weight

- cut sheet: 60 g/m2 to 90 g/m2
- fanfold single ply: 60 g/m2 to 80 g/m2
- fanfold multiply: according to the manufacturer's specification.

For testing with fanfold multiply paper an original plus two copies shall be used. The manufacturer shall specify the type of the paper and carbons.

A printer configured for continuous paper (tractor, pin wheel or friction feed) shall preferably be loaded with 304,8 mm (12 in) form length paper. If this is not possible any near equivalent length may be used but the test patterns can then be printed over more than one page. Any "skip over perforation" feature in the printer shall be disabled.

A printer configured for cut sheet paper shall be operated in automatic mode, not in manual single sheet feed mode. A4 size paper or near equivalent shall be used. If a size other than A4 is used, the size shall be so recorded in the test results.

The printer shall be tested with single ply paper and also with three-ply paper (original plus two copies). The multiply test shall only apply if the printer can handle at least three-ply paper (original plus two copies, with or without carbon interleaves).

6   Letter test

6.1   General

This test simulates a typical user application of printing a letter.

6.2   Test patterns

Two test patterns are defined in annex B. The first one (pattern A) is the standard letter defined in DIN 32751. The second pattern (pattern B) is a letter in English to be used for printers not printing diacritical signs. The results of the two test patterns are not comparable, and the test patterns used shall be declared in the test results.

The printer shall be set up for 0,4 characters per millimetre (10 cpi)[1] and 0,24 lines per millimetre (6 lpi)[2] operation.

If the manufacturer declares more than one print quality mode, test 1 shall be made with the printer set to the lowest quality mode, and tests 2 and 3 with the printer set to the highest quality mode.

6.3   Test 1 - performance

Set the printer to the lowest quality mode.

6.4   Test 2 - performance

Set the printer to the highest quality mode.

6.5   Test 3 - endurance

Set the printer to the highest quality mode.

7   Spreadsheet test

7.1   General

This test simulates a typical user application of printing a spreadsheet.

If the manufacturer declares more than one print quality mode, the test shall be made with the printer set to the lowest quality mode and for 0,24 lines per mm (6 lpi).

7.2   Test pattern

The test pattern shall be the 132-column spreadsheet shown in annex C.

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[1]   cpi = characters per inch

[2]   lpi = lines per inch

7.3 Test 1 - performance

The printer shall be set up for 0,4 characters per millimetre (10 cpi). This test shall not be performed on printers having a print line length of less than 33,5 cm (13,2 in).

7.4 Test 2 - performance

The print density mode shall be set to the compressed mode, normally 0,67 characters per millimetre (17 cpi). If this is not available then a compression in the range 0,65 characters per millimetre to 0,71 characters per millimetre (16,5 cpi to 18 cpi) shall be selected.

8 Graphics test

8.1 General

The test pattern sent to the printer shall utilize graphics mode printing (e.g. vectors, bit map) and shall not use character mode printing (e.g. block graphic characters).

The dimensions defined are minimum dimensions. Any minor size deviations are permitted if they yield a larger but not a smaller image.

This graphic test shall only apply to the class 2 printers.

8.2 Test pattern

The test pattern shall be that reproduced in annex D.

8.3 Test 1 - performance

The minimum density to be tested is 2,63 horizontal x 2,83 vertical dots per millimetre (60 horizontal and 72 vertical dots per inch).

9 Test report

Results recorded from the tests specified in clauses 6 to 8 shall be presented in the tabular format specified in annex A. The configuration used for the test shall be reported.

It is recommended that this presentation format be used in all technical specifications, sales leaflets and information made available to printer users.

4

Annex A

(normative)

Presentation of test results

Printer type :

Configuration :

Letter test pattern:

		Matrix used	Cont. One ply	Cont. multiply	Cut sheet
Letter-Performance five pages, 0,4 cpmm (10 cpi)	Lowest quality				
	Highest quality				
Letter-endurance 1 h, 0,4 cpmm (10 cpi)	Highest quality				
Graphics, five pages Performance					
Spreadsheet, five pages Performance 203,2 mm (8 in) Print width	0,67 cpmm (17 cpi) lowest quality				
Spreadsheet, five pages Performance 355,3 mm (13,2 in) Print width	0,4 cpmm (10 cpi) lowest quality				

Results are given in printed pages per hour (pph).

The matrix used is indicated by the number of dots (horizontal x vertical) per millimetre (inch).

Results boxes may be left empty depending on the printer type.