
**Colour test pages for measurement of
office equipment consumable yield**

*Pages d'essai en couleur pour le mesurage du rendement des
consommables des équipements de bureau*

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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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

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.

ISO/IEC 24712 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 28, *Office equipment*.

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Introduction

The purpose of this international standard is to provide a set of test pages in a common file format that are used in the testing of cartridge yield for colour toner and colour ink. The focus of this test suite is not for printing of photographs, but is intended to be a sampling typical consumer pages. This international standard provides the procedure for using these pages are detailed in ISO/IEC 19798 and ISO/IEC 24711.

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Colour test pages for measurement of office equipment consumable yield

1 Scope

The scope of this International Standard is to define colour test pages for the measurement of consumable yield. The test page suite includes four “customer” type documents and one “diagnostic” page that is used to determine end of ink or toner consumable life. These pages can be used for electro-photographic, inkjet printers and multi-function devices that have a digital printing path, i.e. an all-in-one electro-photographic machine that has digital printing capabilities.

This International Standard provides a set of test pages in a common file format that would be used in the testing of consumable yield. The procedure for using these pages is detailed in ISO/IEC 19798 and ISO/IEC 24711.

These pages are intended to represent some of the types of documents that are used in the office and home. They are not intended to represent special applications such as photo printing.

2 Normative references

The following referenced documents are indispensable for the application 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/IEC 19798, *Method for the determination of toner cartridge yield for colour printers and multi-function devices that contain printer components*

ISO/IEC 24711, *Method for the determination of ink cartridge yield for colour inkjet printers and multi-function devices that contain printer components*

3 Terms and definitions

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

3.1

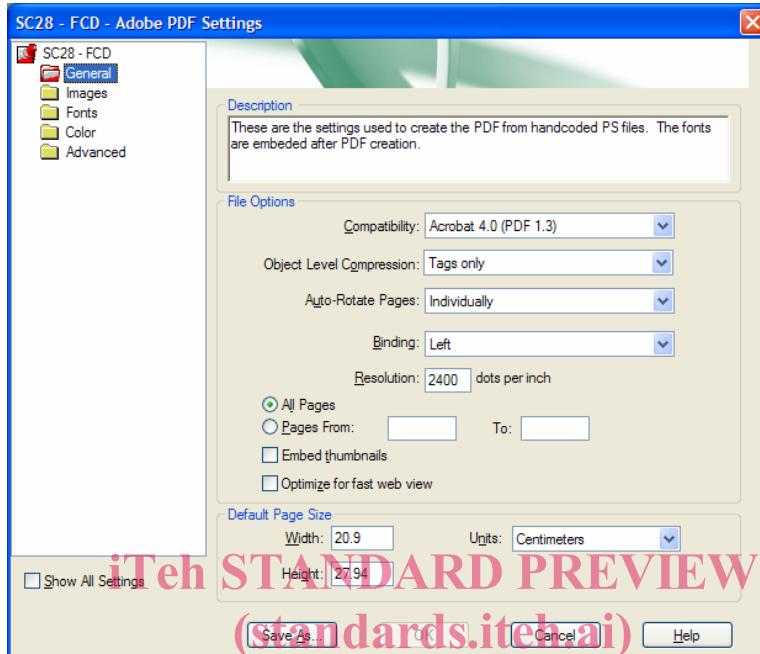
test page suite

collection of the five documents defined in this international standard

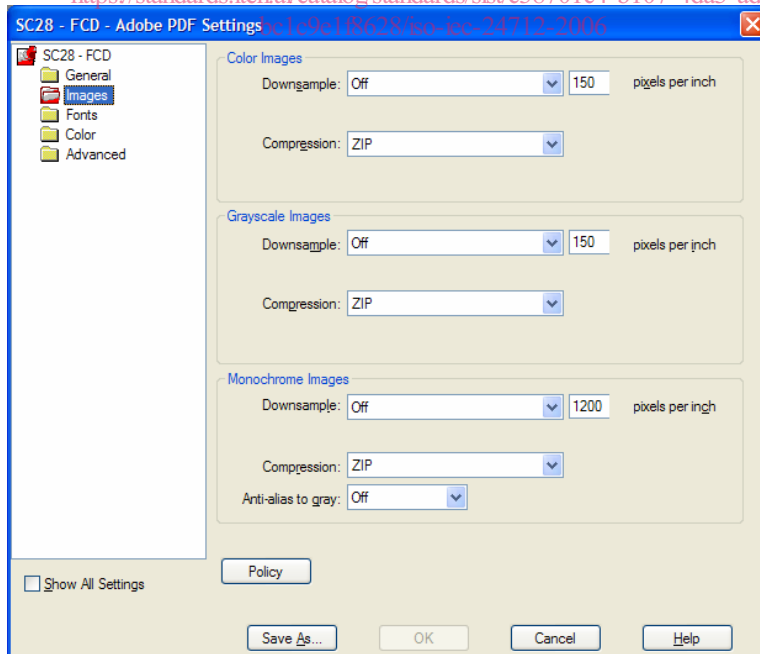
NOTE There are four customer type documents and a diagnostic page to assess ink/toner out. They are meant to be printed as a single five page job.

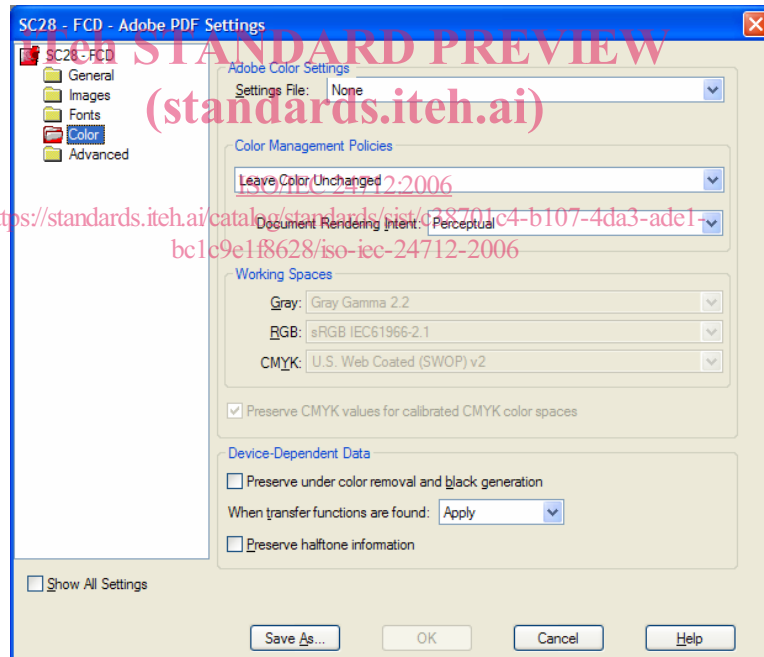
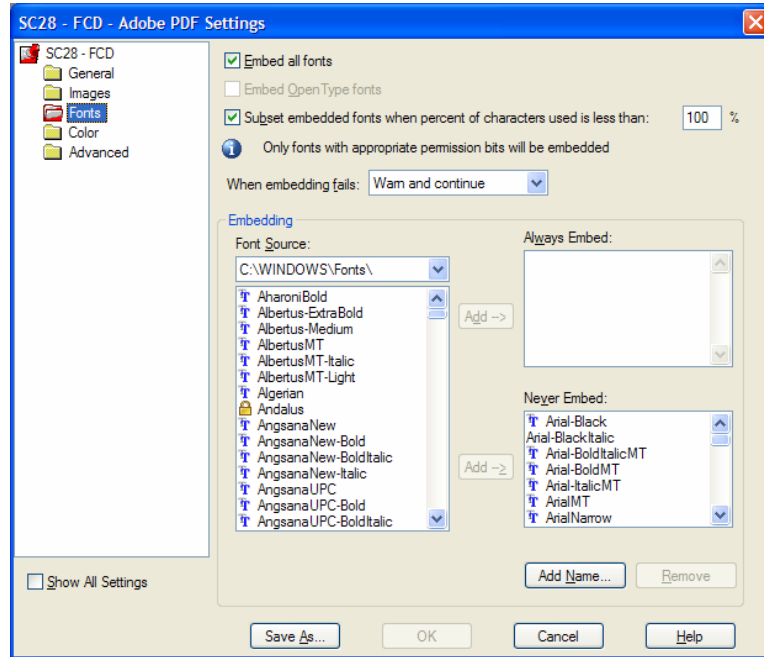
4 Conversion from PostScript to PDF

The base files for the test pages are created in hand coded PostScript (PS). All five pages are included in a single PS file. This file is then converted to PDF version 1.3 and the fonts are embedded using Acrobat®. The screen shots below show the configuration that is used to generate the final PDFs using Adobe Acrobat® Standard version 7.0.

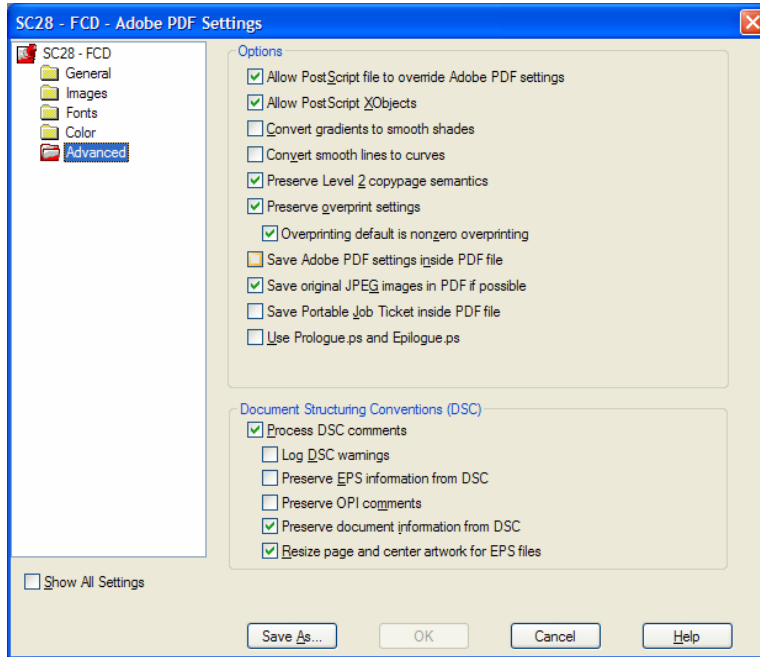


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5 Conversion from CMYK to RGB

All of the colours within the hand coded PS files are defined using setcmyk and a set of CMYK values to simplify colour balancing during test suite development. Most office work flows are RGB and the final PDF files are intended to represent average office environments. To make sure that a well defined conversion from CMYK to RGB occurs, the conversion from CMYK to RGB is defined within the PS file. In some cases the internal conversion from CMYK to RGB can result in black elements being printed in a composite black instead of black colourant only. For this reason a defined method was established to convert from CMYK to RGB and preserve black only elements. There are three cases that are considered:

- Case 1: C=Y=M=0; K<>0 -> R=G=B=K K is the only colour used, set RGB all to an equal value.
- Case 2: C=Y=M<>0; K=0 -> R=G=B=C C, M and Y are equal (composite black) set RGB all to an equal value.
- Case 3: C, Y, M & K are all non-zero and not equal -> In this case:

$$R = 1.0 - \min(1.0, C + K)$$

$$G = 1.0 - \min(1.0, M + K)$$

$$B = 1.0 - \min(1.0, Y + K)$$

This represents the majority of colour conversions.

NOTE These color conversions are simplified for the purpose of clarity in the context of ISO-IEC 24712. These test pages are NOT recommended for use in color quality evaluations.

6 Page Descriptions

Only the PDF versions of the documents will be used for yield testing. The fonts used in the documents have been uniquely named to try to prevent font substitution from occurring. The font names included in the definitions below are abbreviations of the font names used in the PDF file. This was done to simplify the printed definitions. If font substitution does occur, the LSA logo will not be properly reproduced. The page size for all of the pages is 209 mm x 279 mm. This allows the documents to be printed on either letter or A4 paper. The distance between the "L" shaped marks in the corner of each page are 170 mm for the short edge and 250mm for the long edge. A measurement must be made for short edge feeding paper and the distance be 170.0mm±1%. For long edge feeding paper this measurement shall be 250.0mm ±1%. This is done because image stretch can occur in the feeding direction that does not affect the use of toner.

For the testing to be valid, the files shall be printed as a complete five page suite as a single job. The suite is designed to use approximately equal amounts of C, M, Y and K colourants. In practice, each printer will use unequal amounts after the documents are processed through the unique colour conversions of the printer under test.

The test must be conducted using the most recent official electronic test file as the input. The most recent official file can be located at http://www.iso.org/jtc1/sc28*. Failure to use the correct file will invalidate the test results.

* To be published

6.1 Business Letter

The first page in the test suite is an example of a business letter. There are multiple fonts and type sizes used in the document. A colour logo graphic is presented along with a coloured bar chart. In each corner of the page are cross marks for measurement of the page size. In the long direction the distance between these marks shall be 250 mm +/- 1%. In the short direction the distance between marks should be 170 mm +/- 1%. A detailed description of the page is given below:

Number	Feature	Position		Colour	Font	Comments
		X	Y			
1	Fiducial	0.00	0.00	0 0 0 1 setcmyk		5mm x 5mm tic at 0° angle 0.3 mm linewidth
2	Fiducial	0.00	250.00	0 0 0 1 setcmyk		5mm x 5mm tic at 90° angle 0.3 mm linewidth
3	Fiducial	170.00	0.00	0 0 0 1 setcmyk		5mm x 5mm tic at -90° angle 0.3 mm linewidth
4	Fiducial	170.00	250.00	0 0 0 1 setcmyk		5mm x 5mm tic at 180° angle 0.3 mm linewidth
5	LSA Logo	95.00	213.00	0.0 1.0 1.0 0.0 setcmyk		Definition given in Apendix F all but the vector graphic specified in 0.0 0.0 0.0 1.0 setcmyk
6	Line	12.00	226.50	0 0 0 1 setcmyk		0.5 mm wide 79 mm long 0 degree
7	Text	12.00	212.00	0 0 0 1 setcmyk	Serif 10 pt	12pt spacing between lines "Stephen J. Singel" // "Fabanda Sinpat Abarress" // "Tendar, BSF" // "URANGLE"
8	Text	12.00	188.50	0 0 0 1 setcmyk	Serif 10 pt	"16 December 2004"
9		12.00	180.00	0 0 0 1 setcmyk	Serif 10 pt	"Johnathan Q. Maderia"
10		12.00	172.00	0 0 0 1 setcmyk	Serif 10 pt	12pt spacing between lines "Inpert Mampem Abareess" // "2343 Stantin Dawer Lank" // "Benhibe, SDF"
11		12.00	152.50	0 0 0 1 setcmyk	Serif 10 pt	"Mr. Maderia:"
12	Paragraph	12.00	145.50	0 0 0 1 setcmyk	Serif 10 pt	12pt spacing between lines 150 mm wide text "Nam liber tempor cum soluta nobis eleifend ption cogue nihil consequat, velillum. Dolore eu zril feugiat nulla acilisis at vero eros accumsan et iust odio dignis sim qui blandit praesent lutatum ril lobortis nisl ut aliquip exea commodo consequat. Duis autem vel eum irure dolor in hendreritin ulputate velit esse molestie tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim vhniam, quis nostrud exerci tation ullam corpersus cipit tis nisl"
13	Paragraph	56.00	122.00	0 0 0 1 setcmyk	Serif 10 pt	12pt spacing between lines 115 mm wide text

				0 0 0 1 setcmyk	Serif 10 pt	"Amet, Amet, consectetur adipiscing elit, sed diam nonummy nibh veniam, eceps adipiscing elit, sed diam nonummy nibhil laoreet dolore magna aliam erat volutpat. Ut wisi enim minim veniam, quisient nostrud. Solyom uta nobis eleifendoptn cogue nihil imerdiet domg id quod mzym plerat facer posim aum. Lorem ipsum dolor sit amet, consectetur. Duis autem vel eum iriure dolor in hendreritin vulputate velit cesse ea commodo molestie." // " Nam liber tempor cum soluta nobis eleifend option cogue nihil consequat, velillum. Dolore eu zril feugiat nulla facilisis at vero eros accumsan et iusto odio dignissim qui blandit praesent domg id quod mzym plerat facer posim aum."
14	Paragraph	12.00	83.5			12pt spacing between lines 150 mm wide text
				0 0 0 1 setcmyk	Serif 10 pt	"Integer sagittis lacus vel nulla. Morbi convallis hendrerit risus. Nullam interdum, enim non gravida feugiat, quam ante consequat metus, sed molestie dolor tortor eu ipsum. Phasellus semper risus sit amet diam. Cras wisi arcu, pulvinar nec, molestie fringilla, vestibulum iaculis, mi. Praesent nonummy pulvinar odio."
15	Paragraph	12.00	37.5			12pt spacing between lines 150 mm wide text
				0 0 0 1 setcmyk	Serif 10 pt	"Duis vitae eros. Fusce suscipit. Etiam justo massa, semper feugiat, porttitor sit amet, nonummy in, quam. Aenean nulla magna, elementum ut, eleifend ac, aliquam ut, risus. Morbi laoreet elementum dui. Vestibulum nibh sapien, rhoncus non, lobortis nec, ullamcorper a, enim. Praesent ultricies enim non lorem. Curabitur consectetur, diam et nonummy convallis, quam quam tristique nulla, pulvinar blandit ipsum arcu a tellus. Phasellus dolor. Ut ullamcorper venenatis quam. Quisque egestas erat."
16	Text	12	38	0 0 0 1 setcmyk	Serif 10 pt	"Singabet,"
17	Text	12	19			12 pt spacing between lines
18				0 0 0 1 setcmyk	Serif 10 pt	"Stephen J. Singel" // "Demperta Aminerimum" // "Fabanda Sinpat Abarress"
19	Text	12	4.5	0 0 0 1 setcmyk	Serif 10 pt	"SJS:dwg"
20	Graph	12	91			
21	x Fill	0	0	0 0 0 0 setcmyk		7mm x 34mm solid fill
22	x Fill	7	0	0 0 0 1 setcmyk		7mm x 28.5mm solid fill
23	x Fill	14	0	0 0 0 0 setcmyk		7mm x 19mm solid fill
24	x Fill	21	0	0 0 0 1 setcmyk		7mm x 10.5mm solid fill
25	x Fill	28	0	0 0 0 0 setcmyk		7mm x 4mm solid fill
26	x Box	0	0	0 0 0 1 setcmyk		7mm x 34mm 0.25 mm line thickness rectangle
27	x Box	7	0	0 0 0 1 setcmyk		7mm x 28.5mm 0.25 mm line thickness rectangle
28	x Box	14	0	0 0 0 1 setcmyk		7mm x 19mm 0.25 mm line thickness rectangle
29	x Box	21	0	0 0 0 1 setcmyk		7mm x 10.5mm 0.25 mm line thickness rectangle
30	x Box	28	0	0 0 0 1 setcmyk		7mm x 4mm 0.25 mm line thickness rectangle
31	x Text	2.5	-3	0 0 0 1 setcmyk	SanSerif 8pt	"A"
32	x Text	9.5	-3	0 0 0 1 setcmyk	SanSerif 8pt	"B"
33	x Text	16.5		0 0 0 1 setcmyk	SanSerif 8pt	"C"
34	x Text	23.5		0 0 0 1 setcmyk	SanSerif 8pt	"D"
35	x Text	30.5		0 0 0 1 setcmyk	SanSerif 8pt	"E"
36	x Text	15	30	0 0 0 1 setcmyk	SanSerif 8pt	"Stnecerp Balrecneps"

NOTE: x denotes that the given coordinate system is zeroed on the last given paper position