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Minimalne zahteve za združljivost zamenljivih kartuš s sistemom z elektrofotografskim tiskalnikom ali večfunkcionalnimi napravami s tiskalnikom - 1. del: Enobarvni

Minimum requirements for remanufactured and compatible user replaceable cartridges to safeguard proper interaction with electro photographic printer systems or multi-functional devices that may contain printer components - Part 1: Monochrome

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English Version

Minimum requirements for remanufactured and compatible user replaceable cartridges to safeguard proper interaction with electro photographic printer systems or multi-functional devices that may contain printer components - Part 1: Monochrome

Exigences minimales relatives aux cartouches d'encre remplaçables par l'utilisateur, remanufacturées et compatibles, pour garantir la bonne interaction avec les systèmes d'imprimantes électrophotographiques ou les dispositifs multifonctions qui peuvent contenir des composants d'imprimantes - Partie 1 : Monochrome

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/SS H99.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 15462-1:2006) has been prepared by Technical Committee CEN/BT/TF 165 “Remanufactured and compatible toner and inkjet cartridges”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This European Standard comprises the following parts, under the general title "Properties and test methods for remanufactured and compatible user replaceable cartridges containing toner used in electro photographic printer systems and multi-functional devices that may contain printer components"

Part 1: Monochrome

Part 2: Colour

Introduction

This document describes a basis for the assessment of reprocessed and compatible toner cartridges.

1 Scope

This document applies to remanufactured and compatible toner cartridges for operation in a typical office environment.

The objective of the standard is to provide two areas for common testing:

1) Provide test methodologies to asses cartridge interactions with the printer and to safeguard the continuous functioning of the printer

2) Measurement of yield

No other claims can be made from this testing regarding image quality, reliability, etc.

In general throughout the text, only printers and prints are mentioned for the purpose of simplification. Nevertheless this standard also applies to copiers, fax machines and multifunction machines as well as to the copies and facsimiles produced by them however the methods described in this standard are for use on the digital input printing part of any of these systems.

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 19752, *Method for the determination of toner cartridge yield for monochromatic electrophotographic printers and multi-function devices that contain printer components*

EN 12281, *Printing and business paper – Requirements for copy paper for dry toner imaging processes*

EN ISO 780:1999, *Packaging – Pictorial marking for the handling of goods (ISO 780:1997)*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply:

3.1
Typical Office Environment (TOE)
For the purpose of this standard the typical office environment is defined as:

Temperature: Testing room average 23.0ºC ± 2ºC

Readings to be made with a running average of one hour with readings recorded at least every 15 minutes, all running average temperatures are to be between 20.0°C and 26.0°C.

Relative Humidity: Testing room average 50% ± 10% RH

Readings to be made with a running average of one hour with readings recorded at least every 15 minutes, all running average RH's are to be between 35% and 65%.

3.2
Remanufacture
Remanufacturing is the process of disassembly of products during which time parts are cleaned, repaired or replaced then reassembled.

3.3
Toner
Powder for the electro photographic print process, consisting of pigments and additional materials, which are embedded in synthetic thermoplastic polymers.

3.4
Toner Adhesion
Property, that describes the adhesion of a toner once fused on paper.

3.5
Toner cartridge
Complex module (of a printer, copier or fax machine), that can contain a photoconductor, corona, loading unit, cleaning unit and waste toner hopper as well as the toner hopper complete with toner.

3.6
Original toner cartridge
Unused toner cartridge put on the market by the printer manufacturer.

3.7
Remanufactured toner cartridge
Used toner cartridge which has been cleaned and refilled and that can be used as an alternative to the printer manufacturer's original toner cartridge.

3.8
Compatible toner cartridge
Newly manufactured toner cartridge which can be used as an alternative to the printer manufacturer's original toner cartridge.

3.9
Yield
Number of prints determined by ISO/IEC 19752.

3.10
Toner offset
The soiling of prints caused by the fuser unit.

3.11
Lightness L*
The lightness L* is measured with a colour-measuring instrument using CIELAB colour space.

3.12
Predicted shelf life of toner cartridges
Anticipated storage life of an unused cartridge before performance degradation occurs as determined by accelerated ageing tests.

3.13
Start-up behavior
Start-up printing behavior of the test machine after installation of an unused toner cartridge.

4 Process assurance

The process shall be designed, validated, documented and audited to ensure that the product reproducibility meets the test specifications and other requirements as set out in this document.

5 Labelling

The toner cartridge and package marking must inform the user clearly, that this is a remanufactured or compatible toner cartridge.

The durable marking of the toner cartridges and boxes according to this standard has to include at least:

a) Name and contact details of the remanufacturer or compatible manufacturer or trade mark;

b) Type/model of the toner cartridge;

c) Information that the toner cartridge is processed and prepared according to CSH 99012;

d) "use before" date clearly readable or coded date of manufacture. The coded date shall consist of three digits, the first digit giving the year (0 to 9) and the last two digits representing the calendar week (01 to 52) (503, for example, stands for the year 2005 and the third calendar week).

The outer packaging has to be clearly readable and durable marked, corresponding to the specifications of 5a) - d) and must contain:

— page yield according to ISO/IEC 19752;

— Application range (printing systems);

— Storage and transportation conditions (symbols according to EN ISO 780:1999).

The packaged cartridge shall contain installation instructions.

6 Warranty Statement

A Warranty Statement shall be made available to consumer indicating the conditions of the warranty in relation to the cartridge as well as to the printer.

7 Test preparation and equipment

7.1 Test conditions

All tests have to be performed under "typical office environment" conditions defined as:

— Temperature: Testing room average 23,0° C ± 2° C;

— Relative Humidity: Testing room average 50% ± 10% RH.

Before start testing, the test paper, cartridges and the test machine need to be acclimatized in the office environment. Deviations from these conditions have to be noted in the test report.

7.2 Sample Taking

Sample size is indicated in the various testing procedures. For several tests the same cartridge can be used as indicated.

7.3 Test machines

The test machine shall be selected to provide the most stressful test environment in terms of speed of printing. The test machine used for producing the prints shall be in accordance with the series type for which the toner cartridge is produced ("original machine"). The toner cartridges shall be installed in the original machine in accordance with the instructions of the printer manufacturer (and additionally if applicable according to instructions of cartridge remanufacturer). The test machine has to be serviced and used in the standard setting according to the conditions determined by the manufacturer. (If the test machine is a new one use the cartridge delivered with the printer to be installed and print until the end of life of the cartridge.)

The test machine shall be operated using the default settings given by the printer manufacturer during initial installation of the printer driver; it shall be maintained in specified and documented intervals in a way that it can be guaranteed that the original print quality of the new test machine with the delivered original cartridges is still reached before the current test starts.

7.4 Procedure for handling a defective cartridge or printer

Testing will be done in three steps if a problem occurs in printing:

— Remove the remanufactured cartridge and place an original one to see if error still occurs:

  - if no, reject remanufactured toner;
  - if yes, go to the next step.

— Replace long life supplies and print with original toner cartridge to insure good printing quality is reached, if good printing then test the remanufactured toner. If bad printing then reject remanufactured toner, if good printing is back this is a first indication of early wear of the long life supplies;

— Note the End of Life Time of the long life supplies reached in the report - and if lower than the End of Life Time given by the OEM - then make an additional note in the report.

If a printer failure occurs, use another printer for testing.

7.5 Test paper

The test paper is standard white paper according to EN 12281. Printed is that side of the page as recommended on the packaging.

7.6 Visual inspection conditions for printouts

For visual inspection of printouts the following conditions are to be met when testing:

— Lighting of the testing object under 45° with a minimum of 1000 lux nominal illumination

— Care should be taken to chromatic illuminants that would result in pure judgment of defects.

— Observation of the testing object on an opaque white base (5 sheets of white paper underneath the testing object) at a distance of about 50 cm.

— The testing persons must have normal color vision and visual acuity.

7.7 Visual inspection conditions for printer and cartridge components

For visual inspection of printer and cartridge components the following conditions are to be met when testing:

— Inspection of removable test objects (e.g. fuser, transfer unit) shall be conducted with a minimum of 1000 lux nominal illumination;

— Inspection of non removable parts shall be conducted under sufficient illumination (e.g. paper path);

— The testing persons must have normal colour vision and visual acuity.

7.8 Test charts

The test charts, shown in Annex A, are available from a server[1)] in digital form. The covering level of chart 1 is 5 % and this test chart is reproduced many times during the output.

7.8.1 Test chart 1 (black rectangles page)

The test chart 1 consists of geometrically arranged throughout black rectangles.

7.8.2 Test chart 2 (black blocks page)

The test chart 2 consists of a design of black blocks around.

8 Cartridge Testing

All testing will be performed under the same conditions and with the same printer. For the pass fail tests, if the remanufactured cartridge fails the test, the test will be performed with an original cartridge. If the original cartridge also fails, this will be noted on the test report. If both cartridges fails, the test will be passed. This will be noted in the report.

All samples should be printed with the printer at the factory default printer and driver settings.

All versions of the printer drivers, printer model and PDF Reader should be recorded and should be the same for all tests.

8.1 General test methods

8.1.1 Visual inspection (pass/fail)

Goal: Detect visible failures.

NOTE: : This test is not performed in isolation. The method is used in conjunction with other test procedures.

Sample size: The number of cartridges used for the ISO/IEC 19752 yield test, according to 8.1.3 and the number of cartridges used for the printer safeguard test according to 8.2.2.

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1) BAM server: http://www.ps.bam.de/CEN

Procedure:

— Remove cartridge from packaging;

— Inspect all visible parts of the cartridge.

This test should be performed after complete manufacture/remanufacture. If defects are observed it should be noted in the test report (e.g. damaged parts, leakage, missing components,..).

8.1.2 Start-up behaviour (pass/fail)

Goal: After installation the cartridges should print

NOTE: : This test is not performed in isolation. The method is used in conjunction with other test procedures.

Sample size: The number of cartridges used for the ISO/IEC 19752 yield test, according to 8.1.3 and the number of cartridges used for the printer safeguard test according to 8.2.2.

Procedure:

— Remove all packaging and seals;

— Install the cartridge in the original machine in accordance with the instructions of the printer manufacturer (and additionally if applicable according to the instructions of the cartridge (re)manufacturer).

— After successful installation activate the diagnostic test page of the printer. If the diagnostic test page is not available use test chart 1. Print 10 samples.

— Inspect the printout for major defects such as missing black or stripes.

— If major defects occur a shaking procedure is allowed as stated by the printer manufacturer.

— If on the second printout the same defects occur the cartridge fails.

— All other defects have to be documented.

— Remove all cartridges from all printers.

8.1.3 Determining Toner Cartridge Yield according to ISO/IEC 19752

The toner cartridge yield will be determined according to ISO/IEC 19752.

The results of the test according to ISO/IEC 19752 will be included in the report data sheet of this document and marked as results according to ISO/IEC 19752 (see Annex B).

It should be taken into account, that all regulations from ISO/IEC 19752 for the declaration of the cartridge yield should be pointed out (labelling etc.).