



SLOVENSKI STANDARD

SIST EN 12281:2003

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BUXca Yý U
SIST ENV 12281:1997

Tiskovni papir in papirji za poslovne namene - Zahteve za kopirni papir pri uporabi suhega tonerja v prahu

Printing and business paper - Requirements for copy paper for dry toner imaging processes

Druck- und Büropapier - Anforderungen an Kopierpapier für Vervielfältigungen mit Trockentoner

Papier - Papier d'impression et de bureau - Spécifications pour papier pour photocopie pour procédés de reproduction par toner sec

Ta slovenski standard je istoveten z: EN 12281:2002

ICS:

85.080.10 Pisarniški papir Office paper

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English version

Printing and business paper - Requirements for copy paper for
dry toner imaging processes

Papier - Papier d'impression et de bureau - Spécifications
pour papier pour photocopie pour procédés de reproduction
par toner sec

Druck- und Büropapier - Anforderungen an Kopierpapier für
Vervielfältigungen mit Trockentoner

This European Standard was approved by CEN on 17 August 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 12281:2002) has been prepared by Technical Committee CEN/TC 172 "Pulp, paper and board", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This document supersedes ENV 12281:1996.

With regard to ENV 12281:1996 the following changes have been made:

- a) deletion of clause 4 "Principle";
- b) table 1 "Requirements for copy paper" includes now more precise data;
- c) procedure for the "determination of cutting quality" was exchanged and replaced by practical procedure;
- d) transformation from a European Prestandard (ENV) in a European Standard (EN) is intended;
- e) editorial updating.

Annexes A, B and C are normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

EN 12281:2002 (E)**Introduction**

Paper for use in dry toner imaging processes, the common copy paper, represents one of the major grades of the world's paper market. Most copier machines, laser-printers and similar machines work with dry toner imaging. For simplification only the terms "copy paper" and "copier machine" are used.

It is not possible to define performance of a copy paper by physical properties alone. Therefore, CEN/TC 172 has put aside several technical paper characteristics and focused on defining and specifying the equivalents of "printability" and "runnability", as well as those paper properties that appeal directly to the end-user.

Since a standard copier machine does not exist and customer demands on some accommodating and aesthetic aspects will vary, several characteristics were not given a required value. In such cases, though, test methods are provided that will facilitate the making of adequate agreements between supplier and customer.

1 Scope

This European Standard specifies the performance requirements for uncoated cut-size paper for dry toner imaging processes (i.e. copy paper), in 80 g/m² and in A4 format based on EN ISO 216. Other grammages and sizes of the ISO-A series are covered by this European Standard, as long as the requirements specified in this European Standard are fulfilled.

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2 Normative references

[SIST EN 12281:2003](#)

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12283:2002, *Printing and business paper — Determination of toner adhesion.*

EN ISO 186, *Paper and board — Sampling to determine average quality (ISO 186: 2002).*

EN ISO 216, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series (ISO 216:1975).*

EN ISO 536, *Paper and board — Determination of grammage (ISO 536:1995).*

EN 20187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples (ISO 187:1990).*

EN 20287, *Paper and board — Determination of moisture content — Oven drying method (ISO 287:1985).*

EN 20534, *Paper and board — Determination of thickness and apparent bulk density or apparent sheet density (ISO 534:1988).*

ISO 2471, *Paper and board — Determination of opacity (paper backing) — Diffuse reflectance method.*

ISO 11475, *Paper and board — Determination of CIE whiteness, D 65/10 degrees (outdoor daylight).*

ISO 14968:1999, *Paper and board — Cut-size office paper — Measurement of curl in a pack of sheets.*

ISO 15359:1999, *Paper and board - Determination of the static and kinetic coefficients of friction - Horizontal plane method.*

IEC 60093, *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials*

DIN 53109, *Testing of paper and board — Determination of abrasion by the abrasion wheel method.*

NF Q03-055, *Paper and board tests _ Determination of abrasion resistance of paper and board (by the taber method).*

3 Terms and definitions

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

3.1

cut size paper sheet

sheets, cut according to the ISO-A series standard

3.2

dry toner imaging process

imaging method using dry toner, that is generally fixed on paper by heat and/or pressure

[EN 12283:2002]

3.3

dry toner

ink powder used for imaging in printers and copier machines

[EN 12283:2002]

3.4

paper jam

paper induced failure in the copy process path, causing a copier machine shut-down requiring corrective action by the operator. Included are failures in sorter-bins and/or collection-trays, when operating below 80 % of each single bin's maximum capacity, as stated by the copier machine manufacturer. Excluded are control panel actions

3.5

curl

3.5.1

curl

deviation from a flat surface which has three major components: magnitude, direction of curl axis and the side towards which the paper curls

[ISO 14968:1999]

3.5.2

curl in paper machine direction (MD)

curl axis which is parallel to the paper's machine direction

[ISO 14968:1999]

3.5.3

curl in paper cross direction (CD)

curl axis which is perpendicular to the paper's machine direction

[ISO 14968:1999]

3.5.4

diagonal curl

curl axis which is neither parallel nor perpendicular to the paper's machine direction

[ISO 14968:1999]

3.5.5

curl before copy

curl measured directly after opening the package

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3.5.6

curl after copy

curl measured immediately after copying

4 Sampling

Samples shall be taken in accordance with EN ISO 186, unless otherwise agreed upon.

5 Conditioning

The sample from which the specimens are taken shall be conditioned under standard atmosphere 23 °/50 % r. h. in accordance with EN 20187, unless specifically stated otherwise.

For the testing of jamming, curl before copy, moisture content and cutting quality, the samples have to be taken directly out of the package.

6 Requirements

The performance requirements for copy paper are listed in Table 1.

Table 1 — Requirements for copy paper

| Property | Unit | Requirements | Test Methods | Remarks |
|--------------------------------|------------------|-------------------------------------|--|---|
| curl before copy | m ⁻¹ | MD : ≤ 2,00 CD : ≤ 1,25 | ISO 14968 | -- |
| runnability | -- | jam rate | annex A, Table A.3 | -- |
| cutting quality | -- | 95% < 5 98% < 6 | annex C | -- |
| abrasion resistance | mg | ≤ 20 mg/100 revolutions | NF Q03-055 or DIN 53109 | use 500 g weight |
| surface resistivity | Ω | 10 ⁸ to 10 ¹¹ | IEC 60093 | use 100 V on isolated base-electrod for 15 s |
| moisture content | % | 3,8 to 5,6 | EN 20287 | -- |
| coefficient of static friction | -- | 0,4 to 0,6 | ISO 15359:1999, clause 9.2 and 10.1 | cross direction to cross direction and machine direction to machine direction of consecutive sheets taken directly from the package |
| toner adhesion | -- | > 0,8 | EN 12283 | -- |
| opacity | % | > 85 | ISO 2471 | for duplex use |
| grammage | g/m ² | nominal ± 4% | EN ISO 536 | -- |
| size | mm | A4, A3 | EN ISO 216 | -- |

7 Migratory substances and contamination

Paper manufacturers shall control the paper's raw materials and production processes in order to keep the presence of any migratory material that could contaminate the imaging systems to the lowest practical level. Dispersed migratory chemicals and spot contaminants have to be considered as migratory materials; in either case all efforts shall be made to avoid their presence at or near the sheet surface.

Examples of migratory substances are talc, wax, sticky resin, dust and glue.

NOTE Too much dust could cause problems during the copying process. At the time of preparation of this European Standard there is no internationally accepted test method to measure dust from copy paper

8 Packaging

8.1 General

To protect the sheets from harmful effects of mechanical forces, atmospheric conditions and contamination during in-house storage and use, the paper shall be packed as specified below. The inner packing, typically a ream, or a box, shall be tightly closed. The inner packaging material must have a moisture barrier.

For transport purposes a second (all-weather) protective packing is necessary.

The packing material is also recommended to have a moisture barrier.

8.2 Absence of contamination (standards.iteh.ai)

Packaging materials (from moisture protective coatings and low melting adhesives) should not contaminate the paper. The maximum number of packages having major contamination defects should not be greater than 2 ‰. A major defect is defined as having at least one dimension ≥ 1 mm.

NOTE Since quality inspection would be destructive to the packages, this quality standard could be met, by providing a certificate from the converting manufacturer, stating that a procedure for prevention of harmful contamination, in line with defined limits, has been used.

EN 12281:2002 (E)**9 Test report**

The testing laboratory shall refer to this European Standard and include in its report the following:

- a) precise identification of the paper lot tested;
- b) date and place of testing (this might be a period of time and more than one laboratory);
- c) type(s) of copier machine(s) or printer(s) used;
- d) thickness as specified in EN 20534;
- e) whiteness as specified in ISO 11475;
- f) the test results obtained when tested as specified in clause 6;
- g) test results of tests agreed upon between customer and supplier if any;
- h) any other observations made that may be of importance for the performance of the paper in a dry toner imaging machine;
- i) a statement that paper meets or fails to meet the requirements of clause 6 of this European Standard. In the later case, the specific reason shall be stated.

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Annex A (normative)

Runnability

A.1 Basis of the procedure

The runnability test comprises a copy/print sequence under defined conditions that are as close as possible to the practice. The nature and the number of performance problems found, enable a judgement for runnability. The requirements differ with the paper volume demand of copier machines and printers. Accordingly, three volume demand categories have been defined using the criterion "image-speed".

Table A.1 — Classification of copier machines

| imaging machine category | low volume | mid volume | high volume |
|---------------------------|------------|------------|-------------|
| image speed in images/min | < 30 | 30 to 49 | ≥ 50 |

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A.2 Preparation of copier machine

The test copier machine shall be clean and set up according to the manufacturer's specifications. All components should have adequate capability and remaining service life to meet the volumes of the test run planned. Replacement of consumables may be required in case a previous test has caused abnormal effects.

It is also compulsory to warm-up the copier machine by running blank sheets (without the image to be printed) for 2 min before testing.

A.3 Test master

For the purpose of the test, a special CEN test master has been designated (see annex B).

A.4 Runnability test conditions

A.4.1 Conditions of test

- the test shall be carried out under initial ambient temperature and humidity conditions as defined in EN 20187. Any deviation during the test shall be reported;
- paper shall be at ambient temperature;
- paper shall be loaded immediately after unwrapping without fanning unless manufacturer instructs otherwise;
- CEN test master to be rotated 180° every 1000 images.

NOTE Tests for curl after copy can be made concurrent with the use of the copier machine or printer, when the copier machine is running at stable conditions.

In order to perform a runnability test that is representative for a printer's or copier machines typical usage, Table A.2 sets out the proportions of paper to be run in available print modes for each imaging machine category.