INTERNATIONAL STANDARD

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Graphic technology — Prints and printing inks — Determination of resistance of prints to acids

Technologie graphique — Impressions et encres d'imprimerie — Détermination de la résistance des impressions aux acides

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11628 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

Annex A of this International Standard is for information only.

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Introduction

This International Standard is in technical conformity with CEI specification 18-77 of the European Committee of the Paint and Printing Manufacturers' Associations.

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Graphic technology — Prints and printing inks — Determination of resistance of prints to acids

1 Scope

This International Standard specifies a method for assessing the resistance of prints to acids.

It is applicable to all printing processes and all printing substrates such as paper, board, plastics and metals (thin metal sheets and plate).

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 105-A03:1993, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining.*

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 resistance of prints to acids: Resistance of a print to a particular acid in a particular concentration over a given period of time.

NOTE 1 A print is estimated to be resistant to the acid when no significant change under the test conditions is observed.

4 Principle

The print is pressed between two sheets of filter paper previously wetted by a solution of the relevant acid.

An assessment is made of any changes to the print and any bleeding of the colour onto the filter paper.

NOTES

2 The type and concentration of the acid and the duration of exposure are not standardized, but should be chosen according to the intended application of the print. Annex A gives a list of commonly used types, concentrations and exposure durations.

3 The test sample includes both printing ink and substrate, because resistance may be affected by ink, substrate or the interaction between them. Test samples may be taken from existing printed material, or may be prepared to be representative of a planned printed product.

5 Apparatus and reagents

5.1 White laboratory filter paper, for chemical analysis, with a very smooth and soft surface. The size of the strips of filter paper should be 60 mm × 90 mm.

5.2 Reference and test samples.

5.3 Acid, to be used for the test.

5.4 Glass plates, 60 mm × 90 mm.

5.5 Grey scale for colour evaluation, (see ISO 105-A03).

5.6 Distilled water.

5.7 1 kg weight.

5.8 Oven, capable of being controlled at (50 ± 2) °C.

6 Environmental conditions

The test should be conducted at a standard temperature.

NOTE 4 According to common laboratory practice, this temperature can be 20 °C, 23 °C, or 27 °C, depending on the climate where the print is used.

7 Test procedure

Immerse two sheets of filter paper to be used for the test totally in the acid being tested and then drain them until no free solution drips from the filter paper.

Place one of the sheets of filter paper on the lower glass plate.

Place a 20 mm × 50 mm sample of the print to be evaluated on the filter paper and cover it with the second piece of filter paper.

Place the upper glass plate on top and place the whole in a moisture-tight wrapper or container. Place a 1 kg load on the glass plates to provide pressure.

After exposing the print to the test acid for the chosen duration (see table A.1), remove it and rinse it in distilled water until a neutral pH is achieved. Dry the print in the oven at (50 ± 2) °C for 30 min.

Dry the sheets of filter paper used for the test in free air. Do not rinse them before examining them.

8 Evaluation

Compare the dried print with an unexposed reference print and examine the filter paper.

The results shall be evaluated in accordance with the following:

1) If the print has changed significantly in appearance it shall not be considered to be acid resistant.

2) If the appearance of the print has not changed but the filter paper shows staining, this shall be reported and evaluated as to intensity. The print is deemed to have bled when the stain on the filter paper reaches step 4 of the grey scale (see ISO 105-A03).

9 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) the acid used for the test;

c) the concentration of the acid in the test solution;

d) the room temperature and the temperature of the test solution;

e) the duration of exposure used for the test;

f) whether or not the colour of the test print has changed, and if so, the description of the changes observed. The colour changes attributable to the substrate must be taken into account and stated clearly;

g) whether or not the filter paper in contact with the test print has become stained;

h) whether or not any changes have occurred on the whole test print, with their description;

NOTE 5 Certain test prints are not acid resistant in accordance with this International Standard. In many cases, they can however still be satisfactory in use even though a slight staining of the filter. Their various degrees of bleeding can be evaluated by comparison with the grey scale.

Annex A
(informative)

Recommended acid solutions

The recommended concentrations and durations of exposure for testing the resistance of prints to the most commonly used acids are given in table A.1.

NOTE 6 These recommended acids, concentrations and durations of exposure should only be used when no other guidelines concerning acids and test conditions are given.

Table A.1

Acids	Concentration % (*V*/*V*)	Duration of exposure	Typical products for which testing of acid resistance can replace testing of resistance against the product itself
Lactic acid 1)	10	1 h	Cheese and cheese products
or 2)	5	24 h	
Citric acid 1)	5	1 h	Juices of citric fruits
or 2)	1	24 h	
Acetic acid 1)	5	30 min	
or 2)	1	24 h	
Hydrochloric acid 1)	5	10 min	Products with a pH-value < 2
or 2)	1	24 h	
Sulfuric acid 1)	5	10 min	
or 2)	1	24 h	

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