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**INTERNATIONAL STANDARD**



**2838**

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## **Prints and printing inks — Assessment of resistance to alkalis**

*Impressions et encres d'imprimerie — Évaluation de la résistance aux alcalis*

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**Descriptors** : printing, printing inks, tests, chemical tests, chemical resistance, alkali resistance tests, alkali resistance.

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2838 was drawn up by Technical Committee ISO/TC 130, *Graphic technology*, and circulated to the Member Bodies in August 1972.

It has been approved by the Member Bodies of the following countries :

Australia	France	South Africa, Rep. of
Austria	Germany	Spain
Chile	India	Sweden
Czechoslovakia	Ireland	Switzerland
Denmark	New Zealand	Thailand
Egypt, Arab Rep. of	Poland	Turkey
Finland	Romania	

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Italy  
United Kingdom

# Prints and printing inks – Assessment of resistance to alkalis

## 0 INTRODUCTION

This International Standard is in technical conformity with CEI specification 05-59 of the European Committee of the Paint and Printing Ink Manufacturers' Associations.

It does not apply to glues, products used to coat paper, etc. which nevertheless react like alkalis. (Soaps and detergents react quite differently.)

## 1 SCOPE

This International Standard specifies a method of assessing the resistance to alkalis of prints and printing inks, by giving

- the general test requirements for prints,
- the special test requirements for inks.

## 2 REFERENCES

ISO/R 105/1, *Tests for colour fastness of textiles – First series.*

ISO 2834, *Printing inks – Preparation of standard prints for determination of resistance to physical and chemical agents.*<sup>1)</sup>

## 3 TESTING OF PRINTS

### 3.1 Field of application

This International Standard applies to all printing substrates such as paper, board, metals (thin metal sheets and plate) and plastics materials and to all printing processes: letterpress, lithographic and gravure.

### 3.2 Definition

By **resistance of a print to alkalis** is meant, the resistance of a print, to a solution of sodium hydroxide diluted to a given concentration.

The print is considered to be resistant to alkalis when, under the test conditions and provided that the substrate has undergone no change, any deterioration is only negligible and bleeding is below grade 4 of the grey scale.

### 3.3 Principle

A test piece is pressed with the printed side against filter papers previously dipped in a solution of sodium hydroxide.

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

### 3.4 Apparatus

**3.4.1 Filter paper** for quantitative analysis, with a very smooth, non-hardened surface. The size of the strips of filter paper should be 60 mm × 90 mm.

**3.4.2 Glass slides**, 60 mm × 90 mm.

**3.4.3 Grey scale** for assessment of bleeding (according to ISO/R 105/1 – Part 3).

### 3.4.4 Alkalis used.

**3.4.4.1** Chemically pure solution of sodium hydroxide titrated with standard acid and using methyl orange indicator to check the concentration given below :

- for letterpress, lithographic, offset and silk screen prints : sodium hydroxide concentration 2,5 % (*m/m*) of the solution;
- for flexographic and photogravure prints : sodium hydroxide concentration 1 % (*m/m*) of the solution.

**3.4.4.2** Any other alkalis provided that it is mentioned in the test report.

1) At present at the stage of draft.

### 3.5 Procedure

Place a 20 mm X 50 mm test piece with its printed side on a layer of at least three thicknesses of filter paper, previously immersed in the sodium hydroxide solution then allowed to drip so that it is completely saturated with the reagent, and arranged on a glass slide.

Cover with a second glass slide and leave under a 1 kg weight for 10 min.

Remove and rinse the test piece in deionized water until the latter shows a neutral reaction to phenolphthalein. Then dry the test piece in an oven for 30 min at a temperature of about 50 °C.

Allow the strips of filter paper to dry naturally without rinsing.

### 3.6 Assessment of results

Compare the rinsed and dried test piece with an untreated test piece of the print.

Examine for any staining of the filter paper which has been in contact with the test piece. Bleeding is considered to have occurred if grade 4 of the grey scale is reached. Examine whether the ink film is completely intact and if its adhesion is maintained.

### 3.7 Test report

Quoting this International Standard, state :

- the alkali used for the test;

- any alterations noted, if the print colour has changed and give precise details of changes attributable to the substrate;

- the coloration – or absence of coloration – of the filter paper in contact with the print.

NOTE – Some printing inks are not resistant to alkalis in the meaning of this International Standard; nevertheless they show only slight colour deterioration or change; they can in most cases, however, prove quite satisfactory.

In these instances, an evaluation of the different degrees of resistance to alkalis can be noted by comparison with the step in the grey scale.

## 4 TESTING OF INKS

### 4.1 Definition

By **resistance of an ink to alkalis** is meant the resistance of a standard print assessed according to the instructions given in this International Standard relating to prints.

### 4.2 Preparation of the standard print

Prepare the standard print according to the instructions given in ISO 2834.

### 4.3 Test method

Follow the instructions given in clause 3.

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