

DRAFT INTERNATIONAL STANDARD

ISO/DIS 2834-1

ISO/TC 130

Secretariat: SAC

Voting begins on:
2020-02-12

Voting terminates on:
2020-05-06

Graphic technology paper and ink — Laboratory preparation of test prints —

Part 1: Paste inks

ICS: 87.080

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/b1b19035-9b08-4d51-a122-ab03421859f2/iso-dis-2834-1>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

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.

This document is circulated as received from the committee secretariat.



Reference number
ISO/DIS 2834-1:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/b1b19035-9b08-4d51-a122-ab03421859f2/iso-dis-2834-1>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Apparatus	3
4.1 Inking Device.....	3
4.2 Printing form.....	4
4.2.1 IGT-type.....	4
4.2.2 prüfbau-type.....	4
4.2.3 Ink pipette.....	5
4.2.4 Top roller.....	5
4.2.5 Substrate carrier.....	5
4.3 Printability tester.....	5
4.3.1 IGT-type.....	5
4.3.2 prüfbau type.....	6
4.3.3 homogeneity.....	6
4.4 Packing (IGT-type testers only).....	6
4.4.1 Rubber packing.....	6
4.4.2 Paper packing.....	6
4.5 Additional Materials and aiding devices.....	7
4.5.1 Cleaning aids.....	7
4.5.2 Solvents.....	7
4.5.3 Ruler.....	7
4.5.4 Timer.....	7
4.5.5 Analytical balance.....	7
4.5.6 Reference materials.....	7
4.6 Substrate.....	8
4.7 Inks.....	8
5 Principle	8
6 Preparation	8
6.1 Sampling.....	8
6.2 Conditioning.....	8
6.3 Sample preparation.....	9
7 Procedure	9
7.1 Preparation and instrument settings.....	9
7.1.1 Standard test settings.....	9
7.1.2 Settings for specific tests not covered by a test set.....	9
7.2 Inking of the printing form.....	10
7.3 Printing.....	11
7.3.1 Standard procedure.....	11
7.3.2 Procedure to reach the target ink coverage in g/m ²	11
7.3.3 Procedure to reach the target optical density.....	11
7.4 Drying.....	11
8 Evaluation	12
8.1 Evaluation of the transferred ink coverage in g/m ²	12
8.2 Optical characterization.....	12
8.2.1 Evaluation of optical density.....	12
8.2.2 Evaluation of colour.....	12
9 Report	13

Annex A (informative) Precision statement	14
Annex B (informative) Reference Tests	15
Annex C (normative) Breaking-in of elastomer rollers	16
Annex D (normative) Maintaining elastomer rollers and other materials	17
Bibliography	20

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/b1b19035-9b08-4d51-a122-ab03421859f2/iso-dis-2834-1>

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2834-1 was prepared by Technical Committee ISO/TC130/-Graphic Technology in cooperation with ISO/TC6/SC2/JWG 39 *Printability*.

ISO 2834 consists of the following parts, under the general title *Graphic Technology, Paper and Board — Laboratory preparation of test prints* :

- *Part 1: Paste inks*
- *Part 2: Liquid inks*
- *Part 3: Screen print inks*

PREVIEW
iTech STANDARD
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sis/9b08-4d51-a122-ab0342185912/iso-dis-2834-1>

Introduction

This document exclusively describes the laboratory test print preparation for paste inks. The methods described in this document can be used in several other International Standards, such as ISO 2846, parts 1 and part 2 and ISO 2836 and will be the basis for several printability standards to be developed by ISO/TC6/SC2/JWG39 with TC130/WG4. This International Standard provides the tools to make uniform prints with a well-defined ink film thickness which can be used for analysis of the printed surface properties, fastnesses and which can be used for subsequent tests on the substrate or the printed image.

This document describes the procedure to be adopted when using IGT-type and prüfbau-type printability testers to prepare prints on papers and boards for the main targets: reference optical density and reference ink film in g/m^2 on the substrate. For other inks, e.g. liquid inks for gravure or flexographical printing part 2 and for screen print ink part 3 are developed similar in structure with this part.

In this method a procedure has been added to perform a periodic test with reference material to check deterioration of the used materials like rubbers and inks.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/b1b19035-9b08-4d51-a122-ab03421859f2/iso-dis-2834-1>

Graphic technology paper and ink — Laboratory preparation of test prints —

Part 1: Paste inks

1 Scope

This document specifies a test procedure for preparation of test prints on paper, board, metals, foils and other suitable substrates using paste inks, such as for offset and letterpress printing, using electrically driven IGT-type and Prüfbau-type printability testers. The test prints serve for optical tests, such as colorimetry, transparency, gloss and optical density as well as for testing other print related paper and ink properties, such as striking-in/setting, mottling, ink transfer, picking etc., where a well-known ink coverage in g/m² or in optical density on the substrate is required before any other evaluations or further testing can take place. For different test purposes different ink film thicknesses or optical densities and other test specifications will be specified in the referring standard, this document describes only the procedure used to print the sample. For further evaluations other standards may be required.

This standard describes the procedure for reference optical density and reference ink film thickness.

Note - This standard describes the method as used on the current models of testers, most of the described procedures will also be applicable in analogy to the older models but may require additional steps to be executed or recalculation of the settings to make them conform to this standard. It is important to contact the supplier to confirm compliance with this document before using it for inking and testing. Devices of (very) old age or of non-standard construction.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 186, *Paper and board — Sampling to determine average quality*

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 13655, *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*

ISO 5-4, *Photography and graphic technology — Density measurements — Part 4: Geometric conditions for reflection density*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

**3.1
breaking-in**

roller conditioning
preparation process for new rollers or before using another ink system

Note 1 to entry: Note to entry: Run rollers in an (or another) ink system to condition the elastomer until constant readings are achieved. See [Annex C](#) for the procedure.

**3.2
ink (printability)**

fluid to be printed under the conditions of this document

Note 1 to entry: Note to entry: it can be a commercial printing ink, a modified ink for the purpose of the test, a simulant like pick test oil, a varnish and other materials which create a print under the conditions as specified in this document

**3.3
inking device**

separate or integrated part of the printability tester used to distribute the ink in an uniform way on a roller system from where the printing form can be inked with a known amount of ink

**3.4
ink system**

a range of inks which are comparable with regards to varnish system and liquid base

Note 1 to entry: Note to entry: for paste inks there are e.g. oxidative, setting and UV curing systems.

**3.5
packing**

underlayment under the sample to be printed

Note 1 to entry: Note to entry: This is used for mechanical protection or to simulate the hardness of the impression in printing practice or to accentuate the effects of the test on the printed image.

**3.6
printability tester**

printing device, with or without integrated inking device, able to print the inked printing form in conformance with the requirements of the test

Note 1 to entry: Note to entry: depending on the type of test the speed may be constant over the full print or may have to follow a specified speed profile.

**3.7
printing disc
printing form**

roller with metallic, elastomer or rubber blanket coverage, used to transfer the ink film to a substrate to create a print

Note 1 to entry: Note to entry: The print may contain a solid tone or an image or halftone pattern.

**3.8
reference material**

ink or substrate with well-known properties

Note 1 to entry: used to execute a reference test on a regular basis or for comparative testing. Inks and rubbers change properties in time, to prevent jumps in results between current and new materials; they should be tested at least once together.

Note 2 to entry: A distinction can be made between reference material, as material with well-known and publicly available specifications, and control material which is kept for comparison only and for which the absolute values do not have to be known.

3.9 rubber elastomer

elastomeric materials covering printing forms, top rollers, packings and substrate carriers

Note 1 to entry: Note to entry: In practice some of the materials are not rubber.

3.10 substrate

material to be printed on

3.11 substrate carrier

a mounting plate for the sample to be printed

Note 1 to entry: Note to entry: with on top a specific material for mechanical protection or to simulate the hardness of the impression in printing practice or to accentuate the effect of the test on the printed image

3.12 top roller

a soft, elastomer covered roller

Note 1 to entry: Note to entry: used in a three-roller inking system for ink distribution and as ink transfer roller to the printing form.

4 Apparatus

4.1 Inking Device

An electrical driven device, to generate a uniform ink film on the printing form, consisting of two inking drums or rollers having contact with a top roller covered with a rubber or other elastomer with specific quality for the test and the ink system. At least one of the inking drums shall oscillate to induce a sideways distribution of the ink. The ink distributing surface area A of the rollers shall be known to the nearest $0,1 \text{ cm}^2$. Each inking arrangement shall incorporate one or more holders on which the printing form can be mounted to be inked.

The distributing surface area A is calculated as:

$$A = \sum_{1}^{n} (\pi \times d_n \times l_n) \quad (1)$$

where

d_n is the diameter of roller or drum number (n);

l_n is the effective (ink containing) length of roller or drum number (n);

n is the number of rollers excluding the printing disc.

NOTE The terms "inked" and "ink" are used here to conform to general usage even when a pick test oil or other simulant is used instead of an ink.

4.2 Printing form

4.2.1 IGT-type

4.2.1.1 Aluminium

One or more aluminium **printing forms**, of specified width, with smooth edges, a diameter of $(65,0 \pm 0,2)$ mm and a temperature-insulating handgrip. The weight of the disc shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg. An aluminium printing form shall always be used in combination with a packing.

4.2.1.2 Elastomer

One or more rollers with a specific elastomer covered printing form, of specified width, a diameter of $(67,0 \pm 1,5)$ mm, a hardness of the covering of $(80+/-7)$ Shore A and a temperature-insulating handgrip. The weight of the disc shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg. An elastomer covered printing form shall not be used in combination with a packing. Different rollers/elastomers for conventional or energy curing applications are required.

Note 1: Under certain circumstances it may be required to use a dedicated type of printing form, e.g. coated, to prevent penetration of ink into the elastomer or with lower shore hardness, to get a good print quality of the ink on the substrate to be used. In this case this must be mentioned in the report.

See [Annex D](#) for maintenance of elastomer printing forms.

4.2.1.3 Rubber blanket

One or more rollers with a specific rubber blanket covered printing form of specified width, a diameter of $(67,0 \pm 1,5)$ mm and a temperature-insulating handgrip. The weight of the disc shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg. A rubber blanket printing form shall not be used in combination with a packing.

See [Annex D](#) for maintenance of rubber blanket printing forms.

4.2.2 prüfbau-type

4.2.2.1 Aluminium

One or more aluminium **printing forms**, of specified width and a diameter of $(65,0 \pm 0,2)$. The weight of the disc shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg.

4.2.2.2 Elastomer

One or more rollers with a specific elastomer covered printing form, of specified width, with a diameter of $(65,0 \pm 0,2)$ mm and a hardness of the covering of 85 Shore A. The weight of the printing form shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg. Different rollers/elastomers for conventional or energy curing applications are required.

See [Annex D](#) for maintenance of elastomer printing forms.

4.2.2.3 Rubber blanket

One or more rollers with a specific rubber blanket covered printing form, of specified width and a diameter of $(65,0 \pm 0,2)$. The weight of the disc shall be low enough to weigh it on an analytical balance with an accuracy of 0,1 mg. Different rollers for conventional or energy curing applications are required.

See [Annex D](#) for maintenance of rubber blanket printing forms.