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Paper, board and printing inks — Printability — Laboratory test method for offset ink setting

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National foreword

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Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document describes a test method to evaluate the ink setting characteristics of a specific ink/substrate combination in offset lithographic printing.

Set-off is the transfer of ink from the front of one sheet to the back or the front of the next sheet.

Setting is the process of penetration of liquid ink components of low viscosity into the penetrable substrate. These low-viscosity liquids within the ink are mineral oils, vegetable oils or esters of vegetable oils. By separation from those low-viscous liquids, the remaining ink film solidifies. This is combined with a varying change in the surface tack depending on the inks-varnish system and the time. The surface tack usually increases at the begin of the setting and later-on drops to zero. Setting is either the main drying mechanism for ink systems (e.g. news inks) or part of a multi-channel drying mechanism (e.g. conventional sheet fed offset inks or heatset inks). The laboratory test for setting performs a set-off print of the fresh print to a non-printed substrate at defined times. The ink transfer to the non-printed substrate not only depends on the degree of solidification of the ink by setting, but also on the actual level of tack of the original ink film. Thus, the test result is a combined measure.

The absorption properties of the paper are of great influence in offset lithography printing. Inappropriate absorption can lead to numerous printing problems such as ink set-off, bad adhesion, mottling, unpredictable tone value increase, poor rub resistance, damaging of first printed side on perfecting presses after perfecting and others.

The more absorbent the paper is, the less time will be needed for the ink to set sufficiently for further processing, but other properties can be affected adversely by fast ink setting. Very short times should be used when testing the processing of wet sheets, e.g. in a perfector press. Longer times are used for paper handling right after printing, and very long times are used for further processing such as folding and cutting.

Depending on the purpose of the test, there are three options for the paper-ink combination:

— Reference ink on production paper;

— Production ink on reference paper;

— Production ink on production paper, which can be divided into the following, depending on the application of the print:

  — Set-off face-to-face (e.g. set-off after folding);

  — Set-off face to back (e.g. set-off in a stack of paper).

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TECHNICAL SPECIFICATION **ISO/TS 19857:2021**

Paper, board and printing inks — Printability — Laboratory test method for offset ink setting

1 Scope

This document describes a laboratory test method, using an IGT[1)]-type or a prüfbau[2)]-type printability tester, for the preparation of specimens to evaluate the absorption rate of an ink on a substrate in offset lithography by setting-off the printed surface to an unprinted surface.

This method describes testing with an amount of ink simulating either single colour or multi-colour printing. The print and the set-off print (counter print) are made with interval times, between print and set-off, common for the target process.

This method evaluates a particular ink and substrate combination.

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

ISO 2834-1, *Graphic technology — Laboratory preparation of test prints — Part 1: Paste inks*

ISO 2846-1, *Graphic technology — Colour and transparency of printing ink sets for four-colour printing — Part 1: Sheet-fed and heat-set web offset lithographic printing*

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
ink setting
process by which the ink dries by absorption and/or oxidation

3.2
set-off
effect produced when the ink on a print is transferred from the printed surface to another surface

1) These materials are available from IGT Testing Systems, www.igt.nl. This information is given for the convenience of the users of this document and does not constitute an endorsement by ISO of the products. Equivalent products may be used if they can be shown to lead to the same results.

2) These materials are available from prüfbau, Dr.-Ing. H. Dürner GmbH, www.pruefbau.de. This information is given for the convenience of the users of this document and does not constitute an endorsement by ISO of the products. Equivalent products may be used if they can be shown to lead to the same results.

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