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Paper, pulp, and recycling — Decolouration test of dye coloured paper products and paper products printed using dye inks

Papier, pâte et recyclage — Essai de décoloration des produits papier colorés en masse et des produits papier imprimés au moyen d'encres à colorants

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 6, *Paper, Board and Pulps.*

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

Large scale recycling of paper and board is now used worldwide since recycled fibres make up approximately half of the fibre resources needed for global production.

Graphic paper products, such as newspapers, magazines, office paper, etc., are approximately one third of the paper recycled in Europe, being about to 15 million tons. They are normally recycled by using a deinking process, for removal of printing inks. The basic feature is the detachment of the ink film from the substrate, its fragmentation into a suitable particle size and its removal from the pulp slurry. The latter is done predominantly by flotation, in special cases substituted by a washing process. For higher qualities of the deinked pulps, deinking is complemented by oxidative and/or reductive bleaching in order to further enhance the optical properties.

The quality of the pulp obtained is characterized by its brightness/colour, cleanliness, mechanical properties and ash content. It depends both on the type of paper and board for recycling being recycled and the treatment applied.

A very small percentage of graphic paper products is produced using dye inks and dyed papers, which are typically not able to be removed by deinking, but can be brightened and decoloured in the bleaching stage(s).

This document provides a laboratory test method for the decolouration capability of products, thus allows assessing a dyed paper or a graphic product printed with dye inks. On industrial scale, bleaching can act as a supplement to deinking but not as a substitute. The major reason is that raw material for deinking is nearly always a mix of paper grades and printing as well as converting technologies. Bleaching is only effective for a small portion of it.

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1 Scope

This document defines a method for measuring the decolouration capability of commercial products, produced using paper and board dyed in mass and/or printed with dye inks.

This document does not apply to paper printed with pigment inks.

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 638, *Paper, board and pulps — Determination of dry matter content — Oven-drying method*

ISO 2469, *Paper, board and pulps — Measurement of diffuse radiance factor (diffuse reflectance factor)*

ISO 5269-2, *Pulps — Preparation of laboratory sheets for physical testing — Part 2: Rapid-Köthen method*

ISO 5635, *Paper — Measurement of dimensional change after immersion in water*

ISO 5637, *Paper and board — Determination of water absorption after immersion in water*

ISO 8787, *Paper and board — Determination of capillary rise — Klemm method*

ISO/TR 10688, *Paper, board and pulps — Basic terms and equations for optical properties*

ISO 11475, *Paper and board — Determination of CIE whiteness, D65/10 degrees (outdoor daylight)*

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/

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