



BSI Standards Publication

**Graphic technology and deinked pulp —
Guidance for assessing the deinking
performance of printed paper products**

National foreword

This Published Document is the UK implementation of ISO/TS 21331:2020.

The UK participation in its preparation was entrusted to Technical Committee PAI/11, Methods of test for paper, board and pulps.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 580 95624 9

ICS 85.040

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 December 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL
SPECIFICATION

ISO/TS
21331

First edition
2020-11-30

**Graphic technology and deinking
pulp — Guidance for assessing the
deinking performance of printed
paper products**

*Technologie graphique et pâte désencree — Lignes directrices
pour l'évaluation de la performance de désencrage des produits en
papier imprimé*



Reference number
ISO/TS 21331:2020(E)

© ISO 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020. Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Terms related to material.....	1
3.2 Terms relating to paper recycling and deinking.....	2
3.3 Terms relating to quality requirements.....	2
4 How deinkability contributes to recyclability in support of the circular economy	3
4.1 What is circular economy? The importance of recyclability.....	3
4.2 Specific recommendations for printing.....	4
4.3 Specifics recommendations for converting.....	5
5 Relevant deinking processes	5
5.1 General.....	5
5.2 Pulping.....	6
5.3 Flotation.....	6
5.4 Washing.....	6
5.5 Dispersing.....	6
5.6 Bleaching.....	7
6 Deinking performance	7
6.1 Principles for assessment of deinking performance of printed products.....	7
6.2 General experience.....	7
7 Quality characteristics of industrial deinked pulps	9
7.1 General.....	9
7.2 Pulp Brightness.....	9
7.3 Pulp Colour.....	9
7.4 Dirt Particles.....	9
8 Possible usages of industrial deinked pulps (based on Clause 7 characteristics)	10
9 Reporting	11
Annex A Deinking methods	12
Bibliography	15

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*, and ISO/TC 130, *Graphic Technology*.

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.

Introduction

Printed graphic paper products play a key role in society. They are conveyers of information through newspapers and magazines and of culture through books. They therefore contribute to promote democratic debate and culture but also education and social inclusion:

Paper products are good examples for the circular economy since they are recycled after use already to a high extent, higher than any other post-consumer material. The recycling of paper products is beneficial because it allows the fibre to be used several times. However, a good balance between virgin and recycled fibres is necessary to compensate for losses of material within the paper loop and to avoid any forest depletion.

Within the paper value chain there are two main material loops – graphic products and packaging products. Optimum circularity is given if graphic paper products can be kept within the graphic loop. This document describes the common recycling processes for graphic paper for recycling and addresses the influencing factors from the product design. Further influencing factors – which are out of this document's scope – are collection and handling of used paper products.

Common recycling processes for graphic paper for recycling include deinking, the removal of ink from the pulp. The majority of paper for recycling that are deinked originate from households and is therefore a blend of various print products made with different printing and finishing technologies as well as a variety of paper types. The common deinking processes therefore have to be capable to treat this blend of paper products for producing quality pulp in an ecological and economical way.

This document mainly addresses stakeholders in the value chain of printing in order to make them aware about the life of their products after intended use and how they can contribute to the functioning of the cycle.

Graphic technology and deinked pulp — Guidance for assessing the deinking performance of printed paper products

1 Scope

This document provides guidance for representatives of the paper value chain for the design of printed paper products, with a view to deinkability contributing to recyclability in support of the circular economy.

It describes relevant deinking processes, and the deinking performance of printed paper products produced with different printing, finishing and converting technologies in those deinking processes.

It provides a list of relevant quality characteristics of industrial deinked pulps and a list of their possible usages based on those characteristics.

This document does not include guidance for paper-based products which are not intended to be deinked.

2 Normative references

There are no normative references in this document.

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 Terms related to material

3.1.1

recycled paper

paper incorporating fibres obtained from paper recovered after use

[SOURCE: ISO 127, 3.3.5.2.10]

3.1.2

pulp

fibrous material, generally of vegetable origin, made ready for use in further manufacturing processes

[SOURCE: ISO 4046-2, 2.46]

3.1.3

deinked pulp

DIP

pulp (3.1.2) made from paper and board for recycling from which inks and other contaminants have been removed