
Identification cards — Thin flexible cards —

**Part 3:
Test methods**

Cartes d'identification — Cartes flexibles fines —

Partie 3: Méthodes d'essai



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2002

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword.....	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	3
4 Test methods for physical characteristics	4
4.1 General.....	4
4.1.1 Reference	4
4.1.2 Apparatus	4
4.1.3 Sampling, preparation and storage of samples	4
4.1.4 Conditioning and testing environment.....	4
4.1.5 Test report	5
4.2 Dimensions (except thickness).....	5
4.2.1 Reference	5
4.2.2 Principle.....	5
4.2.3 Procedure	5
4.3 Thickness	5
4.3.1 Reference	5
4.3.2 Apparatus	5
4.3.3 Procedure	5
4.4 Separation force	6
4.4.1 Reference	6
4.4.2 Principle.....	6
4.4.3 Apparatus	6
4.4.4 Procedure	6
4.4.5 Expression of result	6
4.5 Reel winding.....	7
4.5.1 Reference	7
4.5.2 Apparatus	7
4.5.3 Procedure	7
4.6 Bursting strength.....	8
4.6.1 Reference	8
4.6.2 Procedure	8
4.7 Stiffness.....	8
4.7.1 Reference	8
4.7.2 Procedure	8
4.8 Folding endurance.....	8
4.8.1 Reference	8
4.8.2 Apparatus	8
4.8.3 Procedure	8
4.9 Ash content	8
4.9.1 Reference	8
4.9.2 Procedure	8
4.10 Smoothness	9
4.10.1 Reference	9
4.10.2 Procedure	9
4.11 Opacity (paper backing) and opacity (700-1 000 nm)	9
4.11.1 Reference	9
4.11.2 Procedure	9
4.12 Coefficient of friction and destacking force	9
4.12.1 Reference	9

4.12.2	Procedure	9
4.13	Reflectance factor	10
4.13.1	Reference	10
4.13.2	Procedure	10
4.14	Air permeance	10
4.14.1	Reference	10
4.14.2	Procedure	10
4.15	Sizing and pen-writing factor	11
4.15.1	Reference	11
4.15.2	Principle	11
4.15.3	Apparatus and reagents	11
4.15.4	Preparation of test pieces	12
4.15.5	Procedure	12
4.15.6	Expression of results	13
4.16	Tear resistance	13
4.16.1	Reference	13
4.16.2	Procedure	13
4.17	Delamination resistance	13
4.17.1	Reference	13
4.17.2	Principle	14
4.17.3	Apparatus	14
4.17.4	Preparation for test	15
4.17.5	Procedure	15
4.17.6	Expression of results	16
4.17.7	Test report	16
4.18	Cold-crack temperature (brittleness)	18
4.18.1	Reference	18
4.18.2	Procedure	18
4.18.3	Expression of results	18
5	Test methods for magnetic stripe physical characteristics	19
5.1	Preparation and storage of samples	19
5.2	Conditioning and test environments	19
5.3	Protrusion	19
5.3.1	Reference	19
5.3.2	Principle	19
5.3.3	Apparatus	19
5.3.4	Procedure	20
5.4	Profile deviation	20
5.4.1	Reference	20
5.4.2	Principle	20
5.4.3	Procedure	20
5.5	Roughness R_a and R_z	21
5.5.1	Reference	21
5.5.2	Principle	21
5.5.3	Procedure	21
5.6	Warpage	21
5.6.1	Reference	21
5.6.2	Procedure	22
5.7	Adherence	22
5.7.1	Reference	22
5.7.2	Apparatus	22
5.7.3	Procedure	22
5.8	Wear test	22
5.8.1	Reference	22
5.8.2	Principle	22
5.8.3	Procedure	22
5.9	Dimensional measurement of the magnetic stripe	23
5.9.1	Principle	23
5.9.2	Procedure	23

6	Test methods for static magnetic characteristics.....	23
6.1	Principle.....	23
6.2	Apparatus.....	23
6.3	Preparation and storage of sample	24
6.3.1	Preparation.....	24
6.3.2	Storage.....	24
6.3.3	Conditioning and testing environment.....	24
6.4	Procedure.....	24
6.4.1	VSM	24
6.4.2	HM	25
6.5	Expression of results	25
6.6	Coercivity, H_{CM}	26
6.6.1	Reference	26
6.6.2	Procedure.....	26
6.7	Squareness, SQ	27
6.7.1	Reference	27
6.7.2	Procedure.....	27
6.8	Switching field distribution, (SF_D)	27
6.8.1	Reference	27
6.8.2	Procedure.....	27
6.9	Test report.....	27
7	Test method for dynamic magnetic characteristics	28
7.1	Principle.....	28
7.2	Reference cards.....	28
7.3	Apparatus.....	28
7.3.1	Measuring instrument for classes L and S	28
7.3.2	Measuring instrument for class H.....	28
7.4	Preparation and preservation of test samples	28
7.4.1	Preparation.....	29
7.4.2	Preservation	29
7.4.3	Conditioning and testing environment.....	29
7.5	Test procedure.....	29
7.5.1	Test densities (D_{max} and D_{min}).....	29
7.6	Expression of results	29
7.6.1	Resolution	29
7.6.2	Modulation.....	30
7.7	Test report.....	30
	Bibliography.....	31

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 15457 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 15457-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

ISO/IEC 15457 consists of the following parts, under the general title *Identification cards — Thin flexible cards*:

- *Part 1: Physical characteristics*
- *Part 2: Magnetic recording techniques*
- *Part 3: Test methods*

Identification cards — Thin flexible cards —

Part 3: Test methods

1 Scope

Thin flexible cards, the subject of this International Standard, are used to automate the controls for access to goods or services such as mass transit, highway toll systems, car parks, vouchers, stored value, etc.

For these applications, data can be written and/or read by machines using various recording techniques such as magnetic stripe, optical character recognition (OCR), bar code, etc.

This part of ISO/IEC 15457 specifies the test methods and procedures required to carry out measurements of the magnetic stripe and encoding characteristics of thin flexible cards.

Many of the standard methods available for checking physical properties of base materials are intended to be applied to samples cut from continuous material or large sheets. However, all test methods given herein, unless explicitly stated otherwise, apply to finished cards.

The test methods described are to be performed on separate samples. It is not intended that any individual card should pass through more than one test procedure, unless explicitly stated.

Acceptance criteria do not form part of this standard.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 15457. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 15457 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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 284, *Conveyor belts — Electrical conductivity — Specification and method of test*

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets*

ISO 534, *Paper and board — Determination of thickness and apparent bulk density or apparent sheet density*

ISO 1831, *Printing specifications for optical character recognition*

- ISO 1924-2, *Paper and board — Determination of tensile properties — Part 2: Constant rate of elongation method*
- ISO 2144, *Paper, board and pulps — Determination of residue (ash) on ignition at 900 °C*
- ISO 2409, *Paints and varnishes — Cross-cut test*
- ISO 2471, *Paper and board — Determination of opacity (paper backing) — Diffuse reflectance method*
- ISO 2758, *Paper — Determination of bursting strength*
- ISO 3274, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments*
- ISO 4094, *Paper, board and pulps — International calibration of testing apparatus — Nomination and acceptance of standardizing and authorized laboratories*
- ISO 4287-1, *Surface roughness — Terminology — Part 1: Surface and its parameters*
- ISO 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*
- ISO 5626, *Paper — Determination of folding endurance*
- ISO 5627, *Paper and board — Determination of smoothness (Bekk method)*
- ISO 5629, *Paper and board — Determination of bending stiffness — Resonance method*
- ISO 5636-3, *Paper and board — Determination of air permeance (medium range) — Part 3: Bendtsen method*
- ISO 6383-2, *Plastics — Film and sheeting — Determination of tear resistance — Part 2: Elmendorf method*
- ISO 8226-2, *Paper and board — Measurement of hygroexpansivity — Part 2: Hygroexpansivity up to a maximum relative humidity of 86 %*
- ISO 8295, *Plastics — Film and sheeting — Determination of coefficients of friction*
- ISO 8570, *Plastics — Film and sheeting — Determination of cold-crack temperature*
- ISO/IEC 7811-2, *Identification cards — Recording technique — Part 2: Magnetic stripe — Low coercivity*
- ISO/IEC 7811-6, *Identification cards — Recording technique — Part 6: Magnetic stripe — High coercivity*
- ISO/IEC 10373-1, *Identification cards — Test methods — Part 1: General characteristics tests*
- ISO/IEC 10373-2, *Identification cards — Test methods — Part 2: Cards with magnetic stripes*
- ISO/IEC 15457-1, *Identification cards — Thin flexible cards — Part 1: Physical characteristics*
- ISO/IEC 15457-2, *Identification cards — Thin flexible cards — Part 2: Magnetic recording technique*
- IEC 60050-221, *International Electrotechnical Vocabulary — Chapter 221: Magnetic materials and components*
- IEC 60454-2, *Specifications for pressure-sensitive adhesive tapes for electrical purposes — Part 2: Methods of test*