TECHNICAL REPORT

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Identification cards — Laundry testing of ID Cards

Cartes d'identification — Essai en blanchisserie des cartes d'identification

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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

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Foreword

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 17, *Cards and personal identification*.

Introduction

Test methods developed in ISO/IEC 24789 are intended to reflect the factors affecting the life of a card in normal use. Accidental exposure such as laundering is not considered to be normal use. Nevertheless, many card specifiers and users are concerned that a test procedure should be drawn up and published as a recognised method. SC 17 agreed at meeting No 62 that this Technical Report was the most appropriate format for such a test. It can be used in conjunction with tests described in the base standard.

The risk of cards being laundered varies according to geographical region and national norms. In the US, for example, it is thought that most people carry their cards in a trouser pocket giving the possibility that cards are laundered with clothing. In Japan and northern Europe, cards are mainly carried in wallets with a lower risk of laundering damage.

There are a number of factors that can potentially affect cards during laundering:

— exposure to water plus detergent solution for a period of up to 2,5 hours;

— exposure to washing cycle temperatures of up to 90 °C for part of that time;

— exposure to dryer temperatures of up to 80 °C.

During the process, most cards will remain within the pocket of the garment so there is likely to be some minor physical stress due to tumbling or spinning.

In seeking to propose a test that may be considered representative of the range of conditions a card may encounter, some statistics were obtained on the current trends in laundering.

Globally, 38% of laundry loads are done with cold water (source: P&G). This proportion has not increased in spite of the introduction of new cold water detergents, although there is a trend towards the use of lower temperatures for environmental reasons.

In the USA, most users still use hot washes. Cold water detergent represents less than 15 % of US detergent sales.

Washing machines are commonly programmed to work at 30 °C, 40 °C, 60 °C, and 90 °C

The most common washing temperature used in the UK is 40 °C. 60 °C is used for heavily soiled items and 90 °C is used only rarely (source: Which magazine).

Identification cards — Laundry testing of ID Cards

1 Scope

This Technical Report gives guidance on the principles and methods of testing ID cards to simulate accidental exposure to conditions encountered during the washing and drying of clothing. The physical properties of a card may degrade after exposure and the test methods described may be useful for comparing different card materials or types.

Although there are many variations in the design and operation of washing machines, the operation of washing, rinsing, and water removal is common to all types of machine. For simplicity, one washing and drying cycle is specified, which is thought to be typical, according to industry sources. Additional wash cycles and/or different temperature conditions can be used for comparative purposes if desired.

2 Terms and definitions

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

2.1
ballast
quantity of textile material (cotton towels or denim jeans) used to fill the space left in the automatic washing machine after the test material has been added

2.2
water softener
chemical solution based on polycarboxylates for the purpose of binding calcium ions, preventing hard water scale from forming, and allowing detergents to act as if the water were 'soft'

3 Apparatus and reagents

3.1 Washing machine

An automatic domestic washing machine. This may be a front loading, horizontal drum type, or a top-loading, agitator type.

NOTE Reference [2] describes the characteristics of some machines specifically used for the testing of textiles.

These characteristics may be useful for guidance in selecting a machine for test purposes.

3.2 Detergents

A commercial, non-biological detergent in common use in the test location or a reference detergent in the test location may be used.

Examples of reference detergent are as follows.

— ATCC 1993 reference detergent WOB (without optical brightener) as defined in Reference [8]. This is obtainable from the American Association of Textile Chemists and Colorists. This detergent can only be used in top-loading washers.

— Non phosphate ECE reference detergent A (without optical brightener) as defined in Reference [2]. This detergent is obtainable from SDC Enterprises Limited, Unit 29 Pitcliffe Way, Upper Castle Street, Bradford, BD5 7SG, UK. This detergent can be used in all machines.

— Non phosphate IEC reference detergent A (with optical brightener) as defined in Reference [2]. This detergent is obtainable from SDC Enterprises Limited, Unit 29 Pitcliffe Way, Upper Castle Street, Bradford, BD5 7SG, UK. This detergent can be used in all machines.

— Attack Laundry Powder (weak alkaline synthetic detergent) manufactured by Kao Corporation. This detergent is the reference detergent used in QTEC (Japan Textile Products Quality and Technology Center).

3.3 Water

Water of hardness not exceeding 0,002 % (20 ppm), expressed as calcium carbonate, when determined in accordance with ISO 6059. Note that where the water supply exceeds this hardness level, the use of a commercial water softening agent (e.g. Calgon) is permitted. Note that where commercial detergents already contain water softening agents, additional water softening is not necessary.

3.4 Test garment

Test garment to contain cards under test: Test garment should be at least one pair of blue denim jeans having at least four pockets at least 20 mm × 30 mm in size.

3.5 Label

Waterproof irreversible temperature indicator label[1)] should be attached to at least one card.

3.6 Ballast

Ballast should be added to make up the total load.

3.7 Dryer

A domestic rotary tumble dryer having an automatic heating and cooling cycle programme.

4 Test procedure

4.1 Check that the cards under test are testably functional as defined in ISO/IEC 10373-1.

Any other function that is to be measured following testing (for example barcode readability) should be verified prior to the test.

Place the test cards in the pockets of the trousers, one card per pocket, and close the pocket with a safety pin or thread to prevent cards falling out. Test a minimum of four cards per garment and make sure that cards are not in contact with each other during testing. No metal zippers or metal buttons are to be in contact with cards.

Add machine manufacturers recommended quantity of detergent, or 40 g of powder/liquid to the drum.

Weigh the dry load and using ballast adjust the weight to 2 kg ± 0,1 kg.

Place the load in the machine and set to a normal wash for synthetics or cotton. The wash cycle should fulfil the following conditions.

— For cold fill machines, the nominal wash temperature should be 40 °C ± 5 °C. For hot fill machines, the water entering the washer should be 40 °C ± 5 °C.

— Washing cycle time should be 1 hr ± 0,5 hr.

— Hot wash time (i.e. time the load is in contact with hot water) should be 25 min ± 5 min.

1) Temperature indicator labels may be purchased from RS Components (http://www.rs-components.com).

4.2 Start the machine.

On completion of wash cycle, record the following information:

— maximum washing temperature (take a reading from a temperature indicator label);

— hot wash time;

— total washing time.

4.3 Transfer the load to the dryer and operate the synthetics or permanent press cycle.

Note that a drying cycle normally ends with a short cooling cycle and the load may not be fully dry. Remove the load and record the maximum card temperature after drying by reading from the temperature indicator label. This should not exceed 60 °C.

Remove cards from the pockets and place in a default test environment as defined in ISO/IEC 10373-1 for at least four hours before evaluation.

4.4 Compare test cards with untested cards, noting any changes in visual appearance, for example whether text is still legible and the portrait is still recognizable.

If the card is damaged or warped, check if the card is still compliant with relevant parts of ISO 7810.

For cards containing an IC, magnetic stripe, or optical memory, check whether the card remains testably functional as defined in ISO/IEC 10373-1. Also, check the cards containing any other functionality tested prior to the washing procedure.

Report any visual or physical changes to the cards under test.

Also, report the following:

— the manufacturer and model number of machine(s) used;

— the type and quantity of detergent and softening agent (if used);

— water temperature (nominal and/or actual);

— hot wash time;

— total wash cycle time;

— dryer cycle time;

— maximum card temperature after washing;

— maximum card temperature after drying.