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Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments —

Part 4: Procedure for testing performance when cleaning and finishing using simulated wetcleaning

Textiles — Entretien professionnel, nettoyage à sec et nettoyage à l'eau des étoffes et des vêtements —

Partie 4: Mode opératoire pour évaluer la résistance au nettoyage et à la finition lors d'un nettoyage à l'eau simulé

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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 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 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 38, *Textiles*, Subcommittee SC 2, *Cleansing, finishing and water resistance tests*.

This second edition cancels and replaces the first edition (ISO 3175-4:2003), which has been technically revised. It also incorporates the Technical Corrigendum ISO 3175-4:2003/Cor 1:2009. The main changes compared the previous edition are as follows:

— restriction of the scope to fabrics and garments that cannot be washed and need professional finishing;

— 6.1: addition of a reference to the technical specifications of the apparatus as described in ISO 6330 and withdrawal of the reference to Annex A;

— 9.1: clarification of the normal process steps;

— Table 1: updating of some settings in processes;

— Annex A: updating of some specifications of the tumble dryer (humidity control and cage outlet temperature);

— Annex B: withdrawal of the programming washing instructions, replaced by Table 1, and addition of an informative part dealing with an alternative procedure for Type C washing machines.

A list of all parts in the ISO 3175 series can be found on the ISO website.

This corrected version of ISO 3175-4:2017 incorporates the following corrections:

— in 8.2, the test specimen dimensions have been corrected.

Introduction

Professional wetcleaning is used by professionals for cleaning textiles in water. It uses specialized equipment, programming, detergent and other additives to minimize adverse effects on textiles such as mechanical action and temperature. It is followed by drying and restorative finishing procedures, in most cases by steam treatment and/or hot pressing.

The professional wetcleaning process takes place without the intense mechanical action associated with washing.

Properties of the textile or garment can change progressively on professional wetcleaning, steaming and/or pressing. In some cases, a single treatment can give little indication of the extent of dimensional and other changes that can arise after repeated treatments and affect the useful life of the article. Generally, most of the potential change becomes apparent after three to five of the simulated professional wetcleaning and finishing treatments specified in this document. This progressive change should be borne in mind when determining the number of repeated cycles which is given (see Clause 4).

The properties that should be considered in an assessment for professional wetcleaning together with the methods for their assessment are given in ISO 3175-1.

Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments —

Part 4:
Procedure for testing performance when cleaning and finishing using simulated wetcleaning

1 Scope

This document specifies simulated professional wetcleaning procedures, using a reference machine for fabrics and garments. It is intended for fabrics and garments that cannot be washed and need professional finishing. It comprises a normal process for normal materials, a mild process for sensitive materials and a very mild process for very sensitive materials.

Localized staining and stain removal fall outside the scope of this document.

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 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 3175-1, *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments — Part 1: Assessment of performance after cleaning and finishing*

ISO 6330:2012, *Textiles — Domestic washing and drying procedures for textile testing*

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
material
garment, composite test specimen or fabric

[SOURCE: ISO 3175-2:2017, 3.1]

3.2
composite test specimen
test specimen consisting of all component parts used in the finished item, and combined in a representative assembly

[SOURCE: ISO 3175-1:2017, 3.1]

3.3
normal material
material that is able to withstand a *normal simulated professional wetcleaning process* (3.6)

Note 1 to entry: Normal material is related to the care symbol Ⓦ from ISO 3758:2012, Table 6.

3.4
sensitive material
material that is able to withstand a *mild simulated professional wetcleaning process* (3.7)

Note 1 to entry: Sensitive material is related to the care symbol Ⓦ from ISO 3758:2012, Table 6.

3.5
very sensitive material
material that is able to withstand a *very mild simulated professional wetcleaning process* (3.8)

Note 1 to entry: Very sensitive material is related to the care symbol Ⓦ from ISO 3758:2012, Table 6.

3.6
normal simulated professional wetcleaning process
cleaning procedure in water at 40 °C, followed by tumbler drying at 60 °C to residual moisture less than 3 %

Note 1 to entry: See Table 1 for the requirements of this cleaning procedure.

3.7
mild simulated professional wetcleaning process
cleaning procedure in water at 30 °C followed by tumbler drying at 60 °C to residual moisture of approximately 15 %

Note 1 to entry: See Table 1 for the requirements of this cleaning procedure.

3.8
very mild simulated professional wetcleaning process
cleaning procedure in water at 30 °C followed by 2 min tumbler drying at 40 °C as a maximum and followed by air-drying

Note 1 to entry: See Table 1 for the requirements of this cleaning procedure.

Note 2 to entry: After giving careful consideration to the comments on progressive change in the Introduction, textile items that perform satisfactorily for purpose in the procedures intended for sensitive and very sensitive materials in Table 1 may be labelled as appropriate with the Ⓦ or Ⓦ symbol.

4 Principle

Specimens are cleaned in a reference washing machine (6.1), dried in a tumble-dryer (Annex A) and finished to one of the specified procedures.

The process simulates the effect of professional wetcleaning, drying and finishing.

Testing is an iterative process since

a) changes to the test specimens can be progressive, and

b) alternative processes of varying severity can be used.

In selecting the number of cycles to be given, it should be borne in mind that test specimens can become unacceptable after single or multiple processes.

5 Reagents

5.1 Water, for which the hardness is less than 0,1 mmol Ca/Mg per litre.

5.2 Non-ionic detergent, of the type C13 oxoalcoholethoxylate (7EO).

6 Apparatus and materials

6.1 Reference washing machine, meeting the technical specifications given in ISO 6330:2012, Table A.1, using a Type A1 machine.

NOTE 1 The reference washing machine is intended for a simulation of a professional wetcleaning process.

Both the reference washing machine and the tumble dryer (6.2) shall have approximately the same load capacity.

NOTE 2 An alternative procedure based on a Type C washing machine is described in Annex B.

6.2 Commercial, reversibly rotating tumble dryer, with a drum volume as specified in Table A.1, electrically heated and with a temperature control of incoming or outgoing air.

NOTE The tumble dryer is intended for a simulation of a professional wetcleaning process.

6.3 Iron, with an approximate mass of 1,5 kg and a sole surface area of 150 cm^2 to 200 cm^2.

6.4 Steam press, consisting of two bucks, one fixed and the other movable, each buck having a surface area of approximately 0,35 m^2.

Steam conducted to the bucks shall be released under a pressure of approximately 500 kPa. The pressure exerted by the bucks shall be approximately 350 kPa.

6.5 Steam table, having a shape and dimensions suited to the dimensions of the specimens.

The steam shall be released at a pressure of approximately 500 kPa.

6.6 Steam cabinet, specific for garments.

The steam shall be released at a pressure of approximately 500 kPa.

6.7 Steam former (e.g. manikin, trouser topper), the shape of which can be specific for garments.

The steam shall be released at a pressure of approximately 500 kPa, followed by blowing warm air.

6.8 Ballast, consisting of dry, clean textile pieces which are either white or of a light colour and consist of polyester-cotton (50-50) with a mass per unit area of 155 g/m^2 ± 10 g/m^2.

Each piece shall comprise two layers of fabric sewn together at the edges and shall be (92 ± 2) cm × (92 ± 2) cm square (as specified in ISO 6330:2012, for Type II).

If an alternative ballast is used, ensure that the ballast and the test specimens have similar moisture retention properties for an effective drying control.

7 Conditioning

The specimens and the ballast shall be conditioned for at least 16 h in one of the standard atmospheres for conditioning and testing textiles specified in ISO 139. Specimens shall either be

tested immediately after removal from the conditioning atmosphere or placed in sealed plastic bags and tested within 30 min.

8 Test specimen

8.1 **Garments**, tested in the as-received condition.

8.2 **Fabrics**, cut into test pieces, preferably not smaller than 500 mm × 500 mm and stitched on all sides with polyester thread to prevent unravelling.

8.3 **Composite test specimens** (3.2), prepared as for fabrics (8.2) or tested in the as-received condition.

If assessments/comparisons are required in accordance with ISO 3175-1, at least two identical test specimens shall be required (one for comparison, one for testing).

It is advisable to obtain sufficient specimens for all the testing which can be required.

9 Procedure

9.1 General

The selection of the procedure to be used (mild or very mild) depends on the textile item. It shall also take into consideration the end use to which the item will be put since this will have a bearing on the likely type and degree of soiling.

NOTE Generally, the less severe the process is, the less effective the cleaning is.

9.2 Procedure for normal materials and label Ⓦ (normal process)

9.2.1 The mass of the complete load is given in Table 1. Unless the mass of a single specimen (fabric, composite or garment) exceeds 50 % of the mass of the load, the mass of the test specimen(s) shall not exceed 50 % of the mass of the load. The remainder of the load shall consist of ballast (6.8).

9.2.2 Prepare the detergent solution by diluting the detergent (5.2) in 1 l of lukewarm, soft water (see Table 1).

9.2.3 Set up the reference washing machine according to Table 1.

9.2.4 Place the load in the reference washing machine.

9.2.5 Start the reference washing machine.

9.2.6 During the filling stage, add the detergent solution (9.2.2).

9.2.7 Before the drying procedure and before the completion of the washing process, run one drying sequence with the tumble dryer empty in order to set the tumble dryer to working temperatures.

9.2.8 When the washing process is completed, transfer the load to the tumble dryer and dry the load under the conditions specified in Table 1.

9.2.9 When the drying process is completed, carry out the finishing treatments appropriate to the test specimen from the following methods and record the processing conditions used:

— method A: no finishing required;

— method B: finishing with an iron (6.3);

— method C: finishing with a steam press (6.4);

— method D: finishing on a press table (6.5);

— method E: finishing with in a steam cabinet (6.6) or a steam former (6.7);

— method F: no suitable finishing method could be found; report methods and conditions attempted and reasons for unsuitability.

Record actual steaming times to allow for the reaction times of steam pedal switches, and timer mechanisms.

9.2.10 If necessary, repeat 9.2.1 to 9.2.9.

NOTE 1 For the selection of the number of cycles, see the Introduction and Clause 4.

The purpose of finishing after professional wetcleaning is to restore an article to its original condition before use. The amount and type of finishing shall be consistent with the fabric and/or garment properties and the restorative requirements.

Steaming in method C shall be top steam only to equate to good pressing practice.

NOTE 2 Steaming/vacuuming times for methods C and D will vary, e.g. from (2 ± 1) s actual steam, (5 ± 1) s vacuum for a lightweight garment to (4 ± 1) s actual steam/(8 ± 1) s vacuum for heavy garments.

NOTE 3 It is likely that Method E would be used with methods B or C to achieve good standard of finish.

9.3 Procedure for sensitive materials and label Ⓦ (mild process)

Process the sensitive material as in 9.2 with the appropriate parameters given in Table 1.

9.4 Procedure for very sensitive materials and label Ⓦ (very mild process)

Process the very sensitive materials as in 9.2 with the appropriate parameters given in Table 1 and following the instruction in 9.2.9: air drying can be necessary to complete the drying process until a suitable moisture retention is reached to apply the selected finishing treatment.

10 Additional assessment

The properties which should be considered in an assessment for professional wetcleaning together with the methods for their assessment are given in ISO 3175-1. Special attention shall be given to the following aspects: damage, surface appearance, surface handle, shape in general, shape of collars, etc.

11 Test report

The test report shall include the following information:

a) name of testing authority and report identification;

b) date of testing;

c) details of item evaluated (description and reference);

d) cross-reference to any test report relating to the specimen(s) issued under ISO 3175-1;

e) a reference to this document, i.e. ISO 3175-4:2018;

f) type of equipment used;

g) procedures used taken from Table 1;

h) report on additional assessment;

i) variations in procedures and parameters specified in Table 1;

j) total number of cleaning and finishing procedures;

k) details of any deviation from the specified procedure.

Table 1 — Simulated professional wetcleaning procedures for a Type A reference washing machine and the tumble dryer

Programme procedure	Normal process (normal material)	Mild process (sensitive material)	Very mild process (very sensitive material)
Material to be marked as	Ⓦ	Ⓦ	Ⓦ
Load	(2,6 ± 0,1) kg	(2,6 ± 0,1) kg	(2,6 ± 0,1) kg
Main wash			
Dosage of detergent per load	(6,5 ± 1,0) g	(6,5 ± 1,0) g	(6,5 ± 1,0) g
Quantity of water	26 l	26 l	26 l
Static fill	Yes	Yes	Yes
Reversing rhythm/rotation	3 s on — 12 s off	3 s on — 30 s off	3 s on — 30 s off
Temperature	(40 ± 3) °C	(30 ± 3) °C	(30 ± 3) °C
Washing time at max. temperature	15 min	10 min	5 min
Drainage	1 min	1 min	1 min
Extract			
Speed	Low	Low	Low
Duration	1 min	1 min	1 min
Rinse			
Quantity of water[a]	26 l	26 l	26 l
Static fill	Yes	Yes	Yes
Reversing rhythm/rotation	3 s on — 12 s off	3 s on — 30 s off	3 s on — 30 s off
Duration	5 min	5 min	5 min
Drainage	1 min	1 min	1 min
Number of rinses	1	1	1
Extract			
Speed	High	High	Low
Duration	3 min	3 min	3 min

[a] Including carry over.

[b] Set temperature = maximum outgoing air temperature.

[c] This is mainly intended for removing wrinkles.

Table 1 *(continued)*

Programme procedure	Normal process (normal material)	Mild process (sensitive material)	Very mild process (very sensitive material)
Drying cycle			
Set temperature[b]	60 °C	60 °C	40 °C
Dry to humidity rate of	≤3 %	(15 ± 3) %	not applicable
Drying time	not applicable	not applicable	2 min[c]

[a] Including carry over.

[b] Set temperature = maximum outgoing air temperature.

[c] This is mainly intended for removing wrinkles.

Annex A
(normative)

Description of the reference tumble dryer

Table A.1 — Specifications of the reference tumble dryer

Load capacity (dry laundry)/load ratio	3 kg to 6 kg/1:50
Volume	150 l to 300 l
Humidity control	Yes
Cage outlet temperature	Yes
Reversibly rotating drum	Yes
Heating	Electric
Heater rating	8 kW (for 150 l dryer) – 20 kW (for 300 l dryer)