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

Part 2:

Procedure for testing performance when cleaning and finishing using tetrachloroethene

*Textiles — Entretien professionnel, nettoyage à sec et nettoyage à l'eau des étoffes et des vêtements —
Partie 2: Mode opératoire pour évaluer la résistance au nettoyage et à la finition lors du traitement au
tétrachloroéthylène*

ICS: 59.080.01

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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

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.

ISO 3175-2 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 2, *Cleansing, finishing and water resistance tests*.

This third edition cancels and replaces the second edition (ISO 3175-2:2010), which has been technically revised.

The main changes in comparison with the previous edition include:

- the improvement of the consistency in the structure of Part 2 and Part 3;
- in [clause 3](#), withdrawal of “very sensitive material” (3.5);
- in sub-clause [6.1.4](#), the addition of an automatic solvent dryness control of the drycleaning machine;
- in sub-clause [6.3](#), the addition of technical specifications for ballasts (mass per unit area);
- in [clause 7](#), the clarification about the test specimen conditioning and the standard atmosphere;
- in [Table 1](#), the addition of “5 min minimum until the temperature is lower than 45 °C” for deodorization time.

ISO 3175 consists of the following parts, under the general title *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments*:

- *Part 1: Assessment of performance after cleaning and finishing*
- *Part 2: Procedure for testing performance when cleaning and finishing using tetrachloroethene*
- *Part 3: Procedures for testing performance when cleaning and finishing using hydrocarbon solvents*
- *Part 4: Procedure for testing performance when cleaning and finishing using simulated wetcleaning*

Introduction

Drycleaning is a process for cleaning textiles in an organic solvent that dissolves oils and fats and disperses particulate dirt substantially without the swelling and creasing associated with washing or wet cleaning. Small quantities of water may be incorporated in the solvent with the aid of a surfactant for the purpose of obtaining better soil and stain removal. Some moisture-sensitive articles are preferably drycleaned without the addition of water to the solvent. A surfactant is often used to assist with soil removal and reduce the risk of greying, but it should be borne in mind that surfactants contain varying amounts of water in their formulations.

Drycleaning is normally followed by an appropriate restorative finishing procedure. In most cases, this comprises some form of steam treatment and/or hot pressing.

Properties of the textile or garment may change progressively on drycleaning and steaming and/or pressing and 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 which can affect the useful life of the article. Generally, most of the potential changes become apparent after three to five of the drycleaning and finishing treatments specified in this part of ISO 3175. This progressive change should be borne in mind when the parties determine the number of repeat cycles which shall be given.

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

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

Part 2: Procedure for testing performance when cleaning and finishing using tetrachloroethene

SAFETY PRECAUTIONS — When using drycleaning equipment, official regulations and normal safety precautions should be observed.

1 Scope

This part of ISO 3175 specifies drycleaning procedures for tetrachloroethene (perchloroethylene), using commercial drycleaning machines, for fabrics and garments. It comprises procedures for normal and sensitive materials.

When using commercial drycleaning equipment, national regulations and normal safety precautions should be observed.

2 Normative references

The following referenced documents are indispensable for the application 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*

3 Terms and definitions

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

3.1

material

garment, composite or fabric

3.2

composite test specimen

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

3.3

normal material

material consisting of all component parts which is able to withstand the normal drycleaning process as specified in this part of ISO 3175 without modification

3.4 sensitive material

material consisting of all component parts which may require restrictions as to mechanical action and/or drying temperatures and/or water additions

EXAMPLE Fibre type: acrylic, modacrylic, silk, angora. Fabric type: crepe.

Note 1 to entry: Giving careful consideration to the comments on progressive change in the introduction, textile items tested in the procedures intended for normal and sensitive materials in [Table 1](#), and which perform satisfactorily in the assessments described in ISO 3175-1, may be labelled with the © and © underlined symbols, respectively, as described in ISO 3758.

4 Principle

The specimen, or specimens, are drycleaned in a commercial machine and finished according to one of the specified procedures. This process is a precursor to the assessment of the cleaned specimen in accordance with ISO 3175-1.

5 Reagents

5.1 **Tetrachloroethene**, CCl₂ = CCl₂ distilled, sold for the purpose of drycleaning.

5.2 **Sorbitan mono-oleate**.

Note: Sorbitan mono-oleate is used as a model for a standard drycleaning detergent. Sorbitan mono-oleate is used as an emulsifier for water in the drycleaning solvent.

In order to prevent foaming, it is important to use redistilled, clean solvent solution and not overfill the still.

6 Apparatus

6.1 **Drycleaning machine**, consisting of a reversible rotating cage type, totally enclosed machine, intended for use with tetrachloroethene.

The diameter of the rotating cage shall be 600 mm minimum and 1 080 mm maximum. Its depth shall be 300 mm minimum. It shall be fitted with three or four lifters. The speed shall be such as to give a *g*-factor of between 0,5 and 0,8 for cleaning and between 60 and 120 for extraction.

The *g*-factor is calculated according to the following formula:

$$g = 5,6 n^2 d \times 10^{-7}$$

where

n is the rotational frequency, in rotations per minute;

d is the rotating cage diameter, in millimetres.

6.1.1 The machine shall be fitted with the means to control solvent and air temperature as required (see [Table 1](#)).

6.1.2 The machine shall have suitable facilities to allow the emulsion (see [9.2.3](#)) to be introduced gradually into the solvent between the cage and drum below the level of the solvent.

6.1.3 The machine shall be equipped with a means of measuring the temperature of the solvent during washing and either the incoming or the outgoing air during drying to within ± 2 °C.

6.1.4 The machine shall be equipped with an automatic solvent dryness control.

6.2 Apparatus for applying the appropriate finishing treatment to the test pieces, consisting of the following:

6.2.1 Iron, with an approximate mass of 1,5 kg and a sole surface area of 150 cm² to 200 cm².

6.2.2 Steam press, consisting of two bucks, one fixed and the other movable, each buck having a surface area of approximately 0,35 m². Steam being 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.

6.2.3 Steam table, having a shape and dimensions suitable to the dimensions of the specimens. The steam shall be released at a pressure of approximately 500 kPa.

6.2.4 Steam former (mannequin), which may or may not be specific in shape for garments. The steam shall be released at a pressure of approximately 500 kPa.

6.2.5 Steam cabinet, which needs to be specific in shape for garments. The steam shall be released at a pressure of approximately 500 kPa.

6.3 Ballast, consisting of clean textile pieces which shall be either white or of a light colour and which shall consist of approximately 80 % wool pieces (230 ± 10) g/m² and 20 % cotton pieces (180 ± 10) g/m² by mass. Each piece shall comprise two layers of fabric sewn together at the edges and shall be (300 ± 30) mm².

NOTE If it is agreed that an alternative ballast maintaining fibre composition (e.g. same colour garments) is to be used, this can be included in the test report.

7 Conditioning

Condition all specimens, except the first, for at least 16 h in the standard atmosphere (20°C, 65%h.r.) for conditioning and testing textiles specified in ISO 139. Specimens shall be tested immediately after removal from the conditioning atmosphere; otherwise they shall be placed in sealed plastic bags and tested within 30 min.

8 Test specimens

8.1 Garments shall be tested as is.

8.2 Composite test specimens ([3.2](#)).

8.3 Fabrics shall be cut into test pieces, preferably not smaller than 500 mm square and stitched on all sides with polyester thread to prevent unravelling.

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

Testing may be an iterative procedure since alternative processes of varying severity may be used, and it is advisable to obtain sufficient specimens for all the testing which may be required.