INTERNATIONAL STANDARD

ISO 3175-3

Second edition
2017-12

Corrected version
2019-12

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

Part 3: Procedure for testing performance when cleaning and finishing using hydrocarbon solvents

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

Partie 3: Mode opératoire pour évaluer la résistance au nettoyage et à la finition avec des solvants hydrocarbonés

Reference number
ISO 3175-3:2017(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 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 3175-3:2003), which has been technically revised. It also incorporates the Technical Corrigendum ISO 3175-3:2003/Cor. 1:2009.

The main changes compared to the previous edition are as follows:

— the consistency in the structure of ISO 3175-2 and ISO 3175-3 has been improved;

— in 6.1.4, an automatic solvent dryness control of the drycleaning machine has been added;

— in Clause 7, clarification about the test specimen conditioning and the standard atmosphere has been made;

— in Clause 8, clarification about the test specimen preparation has been made;

— in Table 1, the drying temperature for normal and sensitive materials in relation to the solvent flashpoint has been changed and “5 min minimum until the temperature is lower than 45 °C” has been added for deodorization time.

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

This corrected version of ISO 3175-2:2017 incorporates the following corrections:

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

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 wetcleaning. Small quantities of water may be incorporated in the solvent with the aid of a detergent 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 detergent is often used to assist with soil removal and reduce the risk of greying, but it should be borne in mind that detergents 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 may give little indication of the extent of dimensional and other changes that may arise after repeated treatments and which may affect the useful life of the article. Generally, most of the potential change will become apparent after three to five of the drycleaning and finishing treatments specified in this document. These progressive changes should be borne in mind when the interested parties determine the number of repeat cycles which is given.

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

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

Part 3:
Procedure for testing performance when cleaning and finishing using hydrocarbon solvents

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

1 Scope

This document specifies drycleaning procedures for hydrocarbon solvents, using commercial drycleaning machines, for fabrics and garments. It comprises procedures for normal and sensitive materials (see 3.3 and 3.4).

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*

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:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
material
garment, *composite test specimen* (3.2) 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 (3.1) consisting of all component parts which is able to withstand the normal drycleaning process as specified in this document, without modification

Note 1 to entry: Giving careful consideration to the comments on progressive change described in the Introduction, textile items tested in the procedures intended for normal materials in Table 1, and which perform satisfactorily in the assessments described in ISO 3175-1, may be labelled with the Ⓕ symbol, as described in ISO 3758.

3.4
sensitive material
material (3.1) consisting of all component parts which may require restrictions as to mechanical action and/or drying temperatures and/or water additions

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

Note 1 to entry: Giving careful consideration to the comments on progressive change made 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 Ⓕ symbol, as described in ISO 3758.

4 Principle

The specimen is 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 Hydrocarbon solvents.

HCS used for drycleaning are aliphatics (C_nH_{2n+2}; n = 10 to 12) or iso- and cyclo-aliphatics, flashpoint ≥38 °C, boiling range of 150 °C to 210 °C.

5.2 Coco fatty acid diethanolamide.

NOTE Coco fatty acid diethanolamide is used as a model for a standard drycleaning detergent. And it is used as an emulsifier for water in the drycleaning solvent. In order to prevent foaming, it is important to use distilled, clean solvent solution and not overfill the still.

6 Apparatus and materials

6.1 Drycleaning machine, consisting of a commercial reversible rotating cage and safety system intended for use with hydrocarbon solvents.

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 100 and 300 for extraction.

The g-factor is calculated according to Formula (1):

$$g = 5{,}6\, n^2 d \times 10^{-7} \quad (1)$$

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 a means of controlling solvent and air temperature as required (see Table 1).

6.1.2 The machine shall have suitable facilities (e.g. dosing apparatus) to allow the emulsion (see 9.2.3) to be introduced gradually into the solvent while avoiding direct contact with the textiles.

6.1.3 The machine shall be equipped with a means of measuring the temperature of the solvent in phase of drycleaning as well as that of 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, 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 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 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) mm × (300 ± 30) mm.

7 Conditioning

Condition all specimens, except the first, for at least 16 h in the standard atmosphere (20 °C, 65 % RH) 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 specimen

8.1 Garments shall be tested in the as-received condition.

