BS EN 4507:2013

BSI Standards Publication

Aerospace series — Non-metallic materials — Textiles — Test method — Determination of water extractable matter

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National foreword

This British Standard is the UK implementation of EN 4507:2013.

The UK participation in its preparation was entrusted to Technical Committee ACE/65, Non-metallic materials for aerospace purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Foreword

This document (EN 4507:2013) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by Janauary 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

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Introduction

This standard is part of the series of EN non-metallic materials standards for aerospace applications. The general organisation of this series is described in EN 4385. This standard is a level 3 document as defined in EN 4385.

1 Scope

This European Standard specifies the procedure for the determination of water extractable matter of textile material.

This method has been written in response to an aerospace requirement for a method of extraction using hot water.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 4385 *Aerospace series — Non-metallic materials — General organisation of standardization — Links between types of standards* [1)]

EN 20139 *Textiles — Standard atmospheres for conditioning and testing (ISO 139)*

ISO 383 *Laboratory glassware — Interchangeable conical ground joints*

3 Terms and definitions

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

3.1
water extractable matter
added or naturally occurring matter which may be present in the fabric, i.e. yarn size, oils or grease that is extractable by boiling water

4 Health and safety

This standard does not necessarily include all health and safety requirements associated with its use.

Persons using this standard shall be familiar with normal laboratory/test house practices.

It is the responsibility of the user to establish satisfactory health, safety and environment practices and to ensure conformity with any European, National or local laws/regulations.

5 Principle/Technique

An aqueous extract is prepared using distilled or deionized water. The extractable matter is then measured by gravimetric method.

1) Published as ASD-STAN Prestandard at the date of publication of this standard

6 Resources/Facilities

6.1 Apparatus

6.1.1
Round bottomed flasks of chemically resistant glass with a volume of 250 ml and a ground glass neck of size 24/29 in accordance with ISO 383.

6.1.2
A glass stopper incorporating a stopcock with P.T.F.E. core liner to prevent sticking of the glass core in the neck of the stopcock

NOTE Grease shall not be used for this purpose.

6.1.3
Water-cooled condensers

6.1.4
Laboratory balance, accurate to 0,0002 g

6.1.5
Filter paper with the following nominal characteristics

- mass of 100 g/m^2
- retention 2,5 μm
- thickness 0,2 mm
- ash content 0,007 %
- initial filtration speed – slow

NOTE Whatman 42 has been found suitable.

6.1.6
100 ml Evaporating vessel.

6.2 Materials/Reagents

The following reagents are required and shall be of recognised analytical quality.

- Distilled or deionized water, having a maximum conductivity of 1 mS/m

6.3 Qualification of personnel

No specific requirements

7 Test samples/Test pieces

Samples shall be taken representative of the bulk and of sufficient size to provide all the test specimens required. All samples shall be kept identifiable to the bulk textiles which they represent. Cut the sample under test into pieces of such size that all parts readily wet out.

Care must be taken to avoid any contamination of samples and handling must be kept to an absolute minimum.

NOTE Nominal 10 mm squares have been found suitable.

The samples are conditioned and tested in a standard atmosphere of (65 ± 2) % r.h. and (20 ± 2) °C in accordance with EN 20139 – Standard Temperate Atmosphere For Testing.

8 Test procedure

8.1
Cut the sample into nominal 10 mm squares and weigh (5 ± 0,05) g of conditioned sample into flask(6.1.1).

8.2
To the flask containing the sample under test add (100 ± 0.1) ml of distilled water (6.1.2).

NOTE For sample weight of less than 5 g, the liquor ratio should be maintained at 1:20, i.e. 1 g of sample to 20 ml of water.

8.3
Connect the flask containing the sample and water to the water cooled condenser (6.1.3). Quickly bring contents to the boil and continue to boil liquor gently for 60 minutes. After this period disconnect and remove flask from condenser whilst liquor is still boiling close immediately with the glass stopcock (6.1.2).

8.4
Do not filter or make up volume but cool rapidly to (20 ± 2) °C to ensure a partial vacuum is created to ensure the extract is not contaminated.

8.5
Determination of water extractable matterFilter the extract through a suitable filter paper (6.1.5) and evaporate a measured portion of the filtered extract to dryness in a tarred evaporating vessel (6.1.6).

8.6
Dry the residue at 105 °C to 110 °C until a constant mass is achieve (no more than 0,0005 g loss of mass on drying for a further 30 min).

9 Expression of results

9.1 Individual results

Not applicable.

9.2 Calculation

The water extractable matter (Pw) is calculated as a percentage by mass of the conditioned mass of the specimen, by the following equation

a) For yarns or fabrics other than wool

$$Pw = \frac{2 \times 10^3 \times m}{V}$$

b) For felts, loose fibres and wool in any textile form

$$Pw = \frac{5 \times 10^3 \times m}{V}$$

where
m is the mass of the residue (g)
V is the volume of extract taken (ml)

10 Measurement uncertainties

Not applicable

11 Designation

Not applicable

12 Test report

The report shall include:

a) Reference to this European Standard, i.e. EN 4507;

b) Identification of sample tested (i.e. lot number, batch number);

c) The content of water extractable matter as a percentage of the conditioned mass of the specimen;

d) Traceability to the individual who performed the test;

e) Date of test;

f) Details of any deviation from this test method.

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