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WITHDRAWAL

June 2016

Standards in series Geosynthetics

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Juin 2016

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CAN/CGSB-148.1

Methods of testing geosynthetics

No. 1-94/ISO 9862:1990

Geotextiles — Sampling and preparation of test specimens (ICS 59.080.70)

No. 2-M85

Mass per unit area (ICS 59.080.70)

No. 3-M85

Thickness of geotextiles (ICS 59.080.70)

No. 4-94

Geotextiles — Normal water permeability under no compressive load (ICS 59.080.70)

No. 6.1-93

Bursting strength of geotextiles under no compressive load (ICS 59.080.70)

No. 7.3-92

Grab tensile test for geotextiles (ICS 59.080.70)

No. 10-94

Geotextiles — Filtration opening size (ICS 59.080.70)

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CAN/CGSB-148.1

Méthodes d'essai des géosynthétiques

N° 1-94/ISO 9862 :1990

Géotextiles — Échantillonnage et préparation des spécimens d'essai (ICS 59.080.70)

N° 2-M85

Masse surfacique (ICS 59.080.70)

N° 3-M85

Épaisseur des géotextiles (ICS 59.080.70)

N° 4-94

Géotextiles — Perméabilité à l'eau dans un sens normal sans charge de compression (ICS 59.080.70)

N° 6.1-93

Résistance à l'éclatement des géotextiles non sollicités en compression (ICS 59.080.70)

N° 7.3-92

Essai de résistance à la rupture des géotextiles — Essai d'arrachement (ICS 59.080.70)

N° 10-94

Géotextiles — Détermination du diamètre d'ouverture de filtration (ICS 59.080.70)

No. 14-93

Stiffness of geotextiles (ICS 59.080.70)

No. 100-95

Conditioning geosynthetics for testing
(ICS 59.080.70)

CAN/CGSB-148.2-M89

Geotextiles and geomembranes —
Definitions (ICS 59.080.70)

N° 14-93

Rigidité des géotextiles (ICS 59.080.70)

N° 100-95

Conditionnement des géosynthétiques
pour fins d'essais (ICS 59.080.70)

CAN/CGSB-148.2-M89

Géotextiles et géomembranes — Définitions
(ICS 59.080.70)



Canadian
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CAN/CGSB-148.1
No. 100-95

Methods of Testing Geosynthetics

Conditioning Geosynthetics for Testing

Withdrawn/Retirée



National Standard of Canada

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METHODS OF TESTING GEOSYNTHETICS
CONDITIONING GEOSYNTHETICS FOR TESTING

Prepared by the
Canadian General Standards Board 

Approved by the
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 Ottawa Canada K1A 1G6	METHODS OF TESTING GEOSYNTHETICS	CAN/CGSB-148.1
	Conditioning Geosynthetics for Testing	No. 100-95

1. PURPOSE AND SCOPE

- 1.1 This method describes a procedure for conditioning most types of geosynthetics to a temperature and to a moisture equilibrium with a standard atmosphere. This method is not recommended for geosynthetic clay liners.
- 1.2 The standard atmosphere is defined as air maintained at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $60 \pm 10\%$.
- 1.3 Tests in which differences in the moisture content of the specimen will influence the results are carried out on materials in moisture equilibrium with the standard atmosphere (Note 1).
- 1.4 The testing and evaluation of a product against this method may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this method has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any existing applicable regulatory requirements prior to its use.

2. PRINCIPLE

- 2.1 The geosynthetic sample or specimen is freely exposed to a controlled atmosphere until its mass and temperature are substantially constant.

3. TERMINOLOGY

- 3.1 For the purpose of this method, the following definitions shall apply:
 - 3.1.1 **Moisture content (dry mass basis):** the mass of water in a material determined under prescribed conditions and expressed as a percentage of the mass of the dry material, that is, the original mass comprising the dry substance without any water present.
 - 3.1.2 **Moisture equilibrium:** the condition reached by a sample when it no longer takes up moisture from, or gives up moisture to, the surrounding atmosphere (Note 2).
 - 3.1.3 **Precondition:** to bring a sample or specimen of a geosynthetic to a relatively low moisture content (approximate equilibrium in an atmosphere between 10 and 25% relative humidity) prior to conditioning in a controlled atmosphere.
 - 3.1.4 **Relative humidity:** the ratio of the actual pressure of the water vapour in the atmosphere to the saturation vapour pressure at the same temperature. The ratio is usually expressed as a percentage.
 - 3.1.5 **Standard atmosphere for conditioning geosynthetics:** an atmosphere which has a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $60 \pm 10\%$. It is under these conditions that the normal routine comparative conditioning of geosynthetics is done.

Note 1: When standard atmospheric conditions are not available, tests may be carried out under prevailing atmospheric conditions, but it must be recognized that the results observed may not correspond with the results that would be obtained in the standard atmosphere. In cases of uncertainty or dispute, all specimens shall be brought to moisture equilibrium with the standard atmosphere and tested in this condition.

Note 2: The geosynthetic is considered to have reached moisture equilibrium when the change in mass of successive determinations made at intervals of not less than 15 min is not greater than 0.1%.

3.1.6 **Standard atmosphere for preconditioning geosynthetics:** an atmosphere which has a temperature of not over 50°C and a relative humidity of 10 to 25%.

3.1.7 **Standard sample temperature:** the temperature reached by a sample when exposed to the standard atmosphere.

4. APPARATUS

4.1 **Conditioning room or cabinet:** which is capable of maintaining the standard atmosphere for conditioning geosynthetics within the tolerances given in par. 1.2 and 3.1.5, and provides reasonably uniform circulation of the atmosphere around the sample.

4.2 **Preconditioning room, cabinet or others:** which is capable of maintaining the standard atmosphere for preconditioning geosynthetics within the tolerances given in par. 3.1.6, and provides reasonably uniform circulation of the atmosphere throughout the enclosed space (Note 3).

4.3 **Recording instruments:** instruments(s) capable of recording the temperature and the humidity of the air in the conditioning room or cabinet.

4.4 **Balance:** having a sensitivity of 1 part in 1000 of the mass of the specimen.

4.5 **Sling psychrometer or wet and dry bulb hygrometer:** for the accurate measurement of the relative humidity at any given time. These instruments are capable of measuring the relative humidity with an accuracy of about 1%. In using either instrument, an air velocity of 3 to 5 m/s past the wet bulb is necessary to attain the true bulb temperature (Note 4).

4.6 **Conditioning/preconditioning rack with perforated shelves:** for spreading out geosynthetic samples and/or specimens.

5. PROCEDURE

5.1 Determine the temperature and the relative humidity of the air in the conditioning room or chamber and, if preconditioning is also required (Note 5), in the preconditioning chamber of container. If necessary, adjust the conditions to meet the specified atmosphere in par. 3.1.5 and/or 3.1.6.

5.2 If both preconditioning and conditioning are required, proceed as directed in par. 5.3, 5.4 and 5.5. If preconditioning is not required, condition the geosynthetic as directed in par. 5.3 and 5.5.

5.3 Expose the samples or specimens in the preconditioning or conditioning atmosphere in such a manner that the atmosphere has free access to all the surfaces of the geosynthetic.

5.3.1 Spread out the geosynthetic samples or specimens singly on the perforated shelves of a conditioning/preconditioning rack to facilitate the proper conditioning or preconditioning of all sides of the material.

5.3.2 For test methods that allow the conditioning and/or preconditioning of the samples before cutting out the test specimens, a conditioning line may be used to hang multiple samples. This is satisfactory except in circumstances where the stretching of the geosynthetic may affect certain testing parameters, in which cases the conditioning/preconditioning rack must be used.

5.4 Place the samples or specimens in the standard preconditioning atmosphere for geosynthetics, as specified in par. 3.1.6. Keep the samples or specimens in this atmosphere until the material has attained moisture equilibrium as defined in par. 3.1.3.

Note 3: Where a preconditioning room or chamber is not available, this can usually be achieved by freely exposing the geosynthetic in a ventilated oven at 50°C for one or two hours. In cases of uncertainty, the geosynthetic should be preconditioned until constant mass is reached.

Note 4: The wet bulb should be covered with clean, unsized, bleached cotton cloth. The covering should be washed or replaced frequently, to ensure proper wetting of the bulb, particularly if distilled water is not used to moisten it.

Note 5: If the geosynthetic has recently been exposed to an atmosphere of relative humidity higher than 60%, it should be preconditioned before placing it in the standard conditioning atmosphere.

- 5.4.1 If preconditioning is carried out in an oven, take precautions to ensure that the geosynthetic does not become moisture free.
- 5.4.2 Exposure of the samples or specimens for several hours to the lower humidity is usually sufficient to reach moisture equilibrium.
- 5.5 Place the samples or specimens in the standard atmosphere for conditioning geosynthetics, as specified in par. 3.1.5. Keep the samples or specimens in this atmosphere until the material has reached the moisture equilibrium as defined in par. 3.1.2.
- 5.5.1 It is recognized that in practice the mass of geosynthetics is frequently not determined to ensure that moisture equilibrium has been reached. Although such a procedure cannot be accepted in cases of dispute, it may be sufficient in routine testing to expose geosynthetics to the standard atmosphere for a reasonable period of time before it is tested.

6. REPORT

6.1 Conditioning Report

The conditioning report shall include the following:

Sample or specimen identification
Temperature of the conditioning chamber or room
Relative humidity of the conditioning chamber or room
Conditioning time used, to the nearest 0.5 h.

6.2 Preconditioning report

If preconditioning was done on the samples or specimens prior to conditioning, the report shall include the following:

Sample or specimen identification
Temperature of the preconditioning chamber, room or others
Relative humidity of the preconditioning chamber, room or others
Preconditioning time used, to the nearest 0.5 h.



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