
**Requirements for sleeping bags —
Part 2:
Fabric and material properties**

Exigences pour les sacs de couchage —

Partie 2: Propriétés de l'étoffe et des matières

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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.

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 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.

ISO 23537 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment* in collaboration with ISO Technical Committee TC 83, *Sports and other recreational facilities and equipment*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 23537 consists of the following parts, under the general title, *Requirements for sleeping bags*:

- *Part 1: Thermal and dimensional requirements*
- *Part 2: Fabric and material properties*

Introduction

This is the first edition of this part of ISO 23537. It is based on continued development of the European Standard, EN 13537.

This International Standard consists of two parts which allows for separate validation of thermal properties and product and material performance. This separation of parts also allows for continued development of new product combinations as it encourages manufacturers to consider new combinations of materials which for example may not be suitable to test by traditional textile physical tests, but which can still have thermal properties evaluated.

This part of ISO 23537 considers important aspects to the physical and performance properties of the sleeping bag. The thermal properties are covered in ISO 23537-1.

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Requirements for sleeping bags —

Part 2: Fabric and material properties

1 Scope

This part of ISO 23537 specifies the fabric and material properties as well as provisions for labelling of adult sized sleeping bags for use in sports and leisure time activities. Thermal and dimensional requirements are specified in ISO 23537-1.

This part of ISO 23537 does not apply to sleeping bags intended for specific purpose such as military use and extreme climate zone expedition. It does not apply to sleeping bags for children or babies.

NOTE No prediction model exists for the determination of the limiting temperatures based on the thermal resistance of the sleeping bag for children and babies. Moreover, such a model for testing cannot be developed because the necessary controlled sleep trials with children or babies in climatic chambers are, out of ethical reasons, not permitted.

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.

ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 105-C06, *Textiles — Tests for colour fastness — Part C06: Colour fastness to domestic and commercial laundering*

ISO 105-E04, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration*

ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing*

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

ISO 3758, *Textiles — Care labelling code using symbols*

ISO 12947-1, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus*

ISO 12947-2, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 2: Determination of specimen breakdown*

ISO 13937-1, *Textiles — Tear properties of fabrics — Part 1: Determination of tear force using ballistic pendulum method (Elmendorf)*

EN 12130, *Feather and down — Test methods — Determination of the filling power (bulk density)*

EN 12132-1, *Feather and down — Methods of testing the down proof properties of fabrics — Part 1: Rubbing test*

EN 12934, *Feather and down — Composition labelling of processed feathers and down for use as sole filling material*

EN 12935, *Feather and down — Hygiene and cleanliness requirements*

EN 13088, *Manufactured articles filled with feather and down — Method for the determination of a filled product's total mass and for the determination of the mass of the filling*

EN 13538-3, *Determination of dimensional characteristics of sleeping bags — Part 3: Volume under load and easiness of packing*

EN 15586, *Textiles — Methods of testing the fibre proof properties of fabrics: Rubbing test*

EN 29073-1, *Textiles — Test method for nonwovens — Part 1: Determination of mass per unit area*

3 Requirements and test methods

3.1 Fabrics

3.1.1 Down proofness

When testing the fabric/fabric combinations of the shell or lining of the sleeping bag in accordance with EN 12132-1, the number of feather and/or down particles counted as described in EN 12132-1 shall not exceed 10 for each fabric/fabric combination.

3.1.2 Synthetic fibre proofness

When tested in accordance with EN 15586, the number of synthetic fibres protruded through the shell or lining of the sleeping bags shall be ≤ 30 for each cushion.

3.1.3 Mechanical properties

3.1.3.1 Abrasion

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When tested in accordance with ISO 12947-1 and ISO 12947-2, the shell of sleeping bags shall withstand $\geq 20\,000$ test cycles.

3.1.3.2 Tear force

When tested in accordance with ISO 13937-1, the tear force of shell and lining fabrics shall be ≥ 10 N.

3.1.3.3 Colour fastness

The colour fastness of the shell and lining shall be tested as follows.

- a) When testing the colour fastness to rubbing according to ISO 105-X12 wet and dry, the requirement for staining shall be a grade ≥ 3 to 4.
- b) When testing the colour fastness to washing according to ISO 105-C06 at care label temperature, the requirements for staining and change of colour shall be a grade ≥ 4 .
- c) When testing the colour fastness to perspiration according to ISO 105-E04, the requirement for staining and change of colour shall be a grade ≥ 3 to 4.
- d) When testing the colour fastness to light according to ISO 105-B02, the requirement for change of colour shall be a grade ≥ 4 to 5.

3.2 Filling material

3.2.1 Feather and/or down

3.2.1.1 Composition

The composition of the filling material shall be determined in accordance with EN 12934.

3.2.1.2 Hygienic state

The filling material shall conform to the requirements according to EN 12935.

3.2.1.3 Filling power

The filling power shall be tested in accordance with EN 12130.

The deviation of the filling power from the declared nominal value shall be $\leq 5\%$.

3.2.1.4 Filling material mass

The filling material mass, in g, shall be measured according to EN 13088.

The deviation of the filling material mass from the declared nominal value shall be $\leq 7\%$.

3.2.2 Filling material other than feather and/or down – Mass per unit area

The mass per unit area, in g/m^2 , shall be measured according to EN 29073-1.

The deviation of the mass per unit area from the declared nominal value shall be $\leq 7\%$.

3.3 Finished articles

3.3.1 Inside dimensions

3.3.1.1 Inside length

To enable labelling of the sleeping bag, the inside length of the sleeping bag shall be measured within ± 3 cm. The measurement is made by turning the sleeping bag inside out and measuring the length from the position of the seam where the heel of the foot is placed to the top of the sleeping bag (excluding any vertical components of the hood), without applying any force to extend the sleeping bag length.

3.3.1.2 Maximum inside width

To enable labelling of the sleeping bag, the maximum inside width shall be measured within ± 2 cm. The measurement is made by turning the sleeping bag inside out and measuring the circumference at the widest point without stretching the fabric. If the maximum inside width of the sleeping bag is not in the chest area, then the position of the widest point of the sleeping bag shall be indicated on the label. The circumference is halved to provide the width of the sleeping bag. If the sleeping bag has elastic seams, a force of (10 ± 1) N may be used to extend these seams prior to measurement, for instance by using a spring balance.

3.3.1.3 Inside foot width

To enable labelling of the sleeping bag, the foot width shall be measured within ± 2 cm. The measurement is made by turning the sleeping bag inside out and measuring the circumference at a distance (30 ± 1) cm towards the hood from the position where the heel of the foot is placed. The circumference is halved to