



Textilní zkušební ústav, s.p.

Cejl 480/12, 602 00 Brno, Česká republika  
(Textile Testing Institute)

## TESTING LABORATORY NO. 1001

accredited according to EN ISO/IEC 17025:2018 by Czech institute for accreditation

# TEST REPORT

**AZL23/0318-06**

**CUSTOMER:** PE «Excalibur»  
Str.Aitieva 10  
050026 Almaty  
Kazakhstan

**SAMPLE:** Sleeping bag "GRAVITON COMFORT" (art. 4500690)  
(according to the customer order) Shel fabric: 100% nylon, DWR  
Lining: 100% nylon, DWR  
Insulation: 90/10 hydrophobic white goose down FP 850



**OF ASSESSMENT:** Thermal properties of sleeping bags; EN ISO 23537-1: 2022

**CONDITIONS OF APPLICATION OF THE TEST REPORT:**

Test Report contains results of the tests related to the submitted sample only. Sampling has been done by customer. The Report may not be reproduced in any way other than as a complete set. Reproduction of certain parts of the Report is subject to approval of the test laboratory, which has issued it. All information about subcontracted tests results or unaccredited test methods is presented in text part of the test report.

**PREPARED BY:**  
**CHECKED BY:**  
**NUMBER OF PAGES:**

Jakubcová  
Nasadil  
2+1 annex

**DATE OF ACCEPTANCE:**  
17.3.2023

**DATE OF EXAMINATION:**  
22.3. - 27.3.2023

**DATE OF ISSUE:**  
6.4.2023



+420 543 426 722  
+420 543 426 742  
<http://www.tzu.cz>  
[azl@tzu.cz](mailto:azl@tzu.cz)



## PROCEDURE OF ASSESSMENT

### Requirements for sleeping bags – Thermal properties of sleeping bags

**Test method: EN ISO 23537-1:2022**

#### Test conditions:

- Standard atmosphere for testing: relative humidity 50 -70%, temperature 10 °C
- Thermal manikin: KAREL
- Manikin body surface area: 1,85 m<sup>2</sup>
- Manikin body parameters: body height: 175 cm; body weight: 48 kg
- Manikin body surface temperature: 34 °C
- Position of manikin during testing: in lying position without attached head mask
- Air flow inside the climatic room: (0,4±0,1) m.s<sup>-1</sup>
- Number of tested specimens: 3x the same sample
- Artificial ground: manikin laying on rigid mattress (R<sub>ct</sub> = 0,85 m<sup>2</sup>.K.W<sup>-1</sup>)
- Manikin garment: two-piece suit (R<sub>ct</sub> = 0,051 m<sup>2</sup>.K.W<sup>-1</sup>); knee-length socks (R<sub>ct</sub> = 0,058 m<sup>2</sup>.K.W<sup>-1</sup>)

#### TEST RESULTS:

Sleeping bag "GRAVITON COMFORT" (art. 4500690)			
Shel fabric: 100% nylon, DWR, Lining: 100% nylon, DWR			
Insulation: 90/10 hydrophobic white goose down FP 850			
Characteristics	Test method	Measuring Unit	Values identified
<b>Standard thermal insulation R<sub>c</sub> (1)</b>	<b>EN ISO 23537-1:2022</b>	m <sup>2</sup> .K.W <sup>-1</sup>	1,041
. average value			2,2
. coefficient of variation		%	

#### Lower temperature limits of the range of utility:

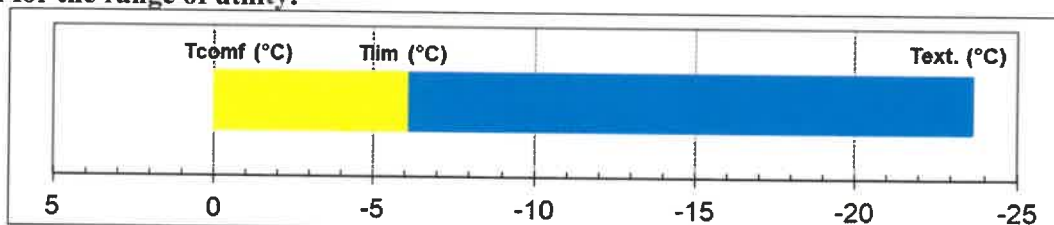
Comfort temperature T <sub>comf</sub> <sup>(3)</sup>	Limit temperature T <sub>lim</sub> <sup>(2)</sup>	Extreme temperature T <sub>ext</sub> <sup>(1)</sup>
-0,1 °C	-6,0 °C	-23,6 °C

(1) extreme temperature - lower extreme temperature where the risk of health damage by hypothermia occurs

(2) limit temperature - lower limit at which a sleeping bag user with a curled-up body posture is globally in thermal equilibrium and just not feeling cold

(3) comfort temperature - lower limit of the comfort range, down to which a sleeping bag user with a relaxed posture, such as lying on their back, is globally in thermal equilibrium and just not feeling cold

#### Graph for the range of utility:



**WARNING: In the risk range a strong sensation of cold has to be expected. There is a risk of health damage by hypothermia.**





Annex:

**Warning of misuse of temperature rating**

The insulation of a sleeping bag varies widely with the conditions of use (wind, radiating ambience, posture and clothing of the sleeping bag user, ground insulation, eventual humidity in the sleeping bag etc.), and perception of cold is also individually different (influence of acclimatisation, physical and psychological state, food etc.).

The limiting temperatures of the range of utility as determined in the EN ISO 23537-1: 2022 only compare performance of sleeping bags with regard to standardised test conditions. They do not take into account all possible variations in conditions of use and in individual reactions, and therefore should be considered only as a guideline, that needs personal adaptation for practical use.

In particular, it shall be noted that the extreme temperature is a very theoretical limit. It shall therefore only be considered as a point of danger that should not be approached - unless the sleeping bag user has a wide personal experience.

The determination of the comfort temperature uses the available knowledge of published data, based on the thermal balance of the whole body. The human body is very sensitive to local discomfort: a local thermal bridge may not influence the global insulation of the sleeping bag, but might greatly affect the sensation of cold of the sleeping bag user. It shall be emphasised that the test method in the EN ISO 23537-1: 2022 does not provide any guarantee against local cooling.

The temperatures of the range of utility relate to indoor conditions. For outdoor use, wind may affect insulation of the bag to a large extent, especially if the shell fabric of the sleeping bag is air permeable. In the EN ISO 23537-1: 2022, sleeping bags are considered as dry. High moisture content might lower thermal performance.

Approved:

  
Renata Čermáková  
Head of the mechanical testing laboratory

