



Textilní zkušební ústav

(Textile Testing Institute)  
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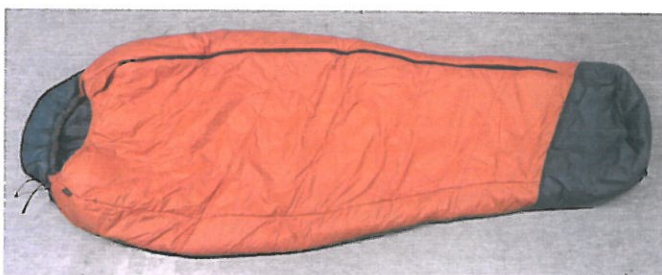
ACCREDITED TESTING LABORATORY No. 1001

# TEST REPORT

**AZL 14/0904-05**

**CUSTOMER :** COMPANY "SPLAV" LTD.  
Ketcherskaya Str.16  
Moscow, 111402  
Russia

**SAMPLE :** Sleeping Bag FANTASY 233  
(according to the customer order) Size: 190 x 75 x 45



**SUBJECT OF ASSESSMENT :** Thermal properties of sleeping bags according to EN 13537: 2012

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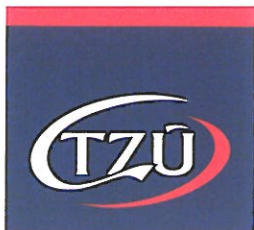
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## PROCEDURE OF ASSESSMENT

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

**Test method:** EN 13537:2012

**Test conditions:**

- Standard atmosphere for testing: relative humidity 63%, temperature  $(20,0 \pm 0,5) ^\circ\text{C}$
- Thermal manikin: KAREL
- Manikin body surface area:  $1,85 \text{ m}^2$
- Manikin body height: 175 cm
- Manikin body weight: 48 kg
- Manikin body surface temperature:  $38 ^\circ\text{C}$
- Air flow inside the climatic room:  $\leq 0,35 \text{ m}\cdot\text{s}^{-1}$
- Number of tested specimens: 3x the same sample; each measurement after 24 hour delay
- Artificial ground: manikin laying on rigid mattress ( $R_{ct} = 0,85 \text{ m}^2 \cdot \text{K}\cdot\text{W}^{-1}$ )
- Manikin garment: two-piece suit ( $R_{ct} = 0,051 \text{ m}^2 \cdot \text{K}\cdot\text{W}^{-1}$ ); knee-length socks ( $R_{ct} = 0,058 \text{ m}^2 \cdot \text{K}\cdot\text{W}^{-1}$ )

**Position of manikin during testing: in lying position with attached head mask**

## TEST RESULTS

<b>Sleeping Bag FANTASY 233</b> Size: 190 x 75 x 45			
Characteristics	Test method	Measuring Unit	Values identified
<b>Standard thermal insulation <math>R_c</math> (1)</b>	EN 13537	$\text{m}^2 \cdot \text{K}\cdot\text{W}^{-1}$	0,926
- average value			
- coefficient of variation		%	1,416

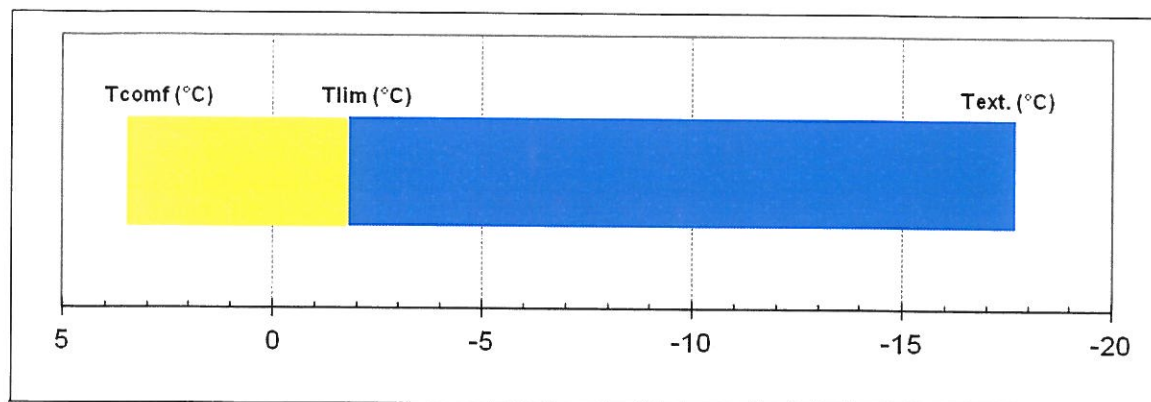
<b>Lower temperature limits of the range of utility</b>		
Comfort temperature $T_{\text{comf}}^{(3)}$	Limit temperature $T_{\text{lim}}^{(2)}$	Extreme temperature $T_{\text{ext}}^{(1)}$
3,5 °C	-1,8 °C	-17,7 °C

- (1) extreme temperature - lower extreme temperature where the risk of health damage by hypothermia occurs (related to a standard woman and in standard conditions of use)
- (2) limit temperature - lower limit of the comfort range down to which a sleeping bag user with a rolled-up body posture is globally in thermal equilibrium and just not feeling cold (related to standard man and in standard conditions of use)
- (3) comfort temperature - lower limit of the comfort range down to which a sleeping bag user with a relaxed posture such as lying on the back is globally in thermal equilibrium and just not feeling cold (related to standard woman and in standard condition of use)

All values of uncertainty of measurement were calculated with assumption of normal distribution. For purposes of calculation of expanded uncertainty values will be multiplied by coverage factor  $k=2$  for statistical level 95%. Sampling was not taken into consideration



### Graph for the range of utility



**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**

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 this European Standard only Compaq 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 and therefore shall 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 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 greatly affects sensation of cold of the sleeping bag user. It shall be emphasised that the test method in this European Standard 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 this European Standard sleeping bags are considered as dry: high moisture content may lower thermal performance.

  
Petr Nasadil  
Head of Testing Laboratory

