Development of the combat sleeping bag system of the Latvian National Armed Forces

Sitvjenkins, Igors; Kuklane, Kalev; Vilumsone, Ausma; Abele, Iveta

Published in:
6th European Conference on Protective Clothing

2014

LATVIAN NATIONAL ARMED FORCES	Vienibas alley 56 LV-1004, Riga Republic of Latvia +37167601217 lcod@mil.lv www.mil.lv	
Main task is to ensure the inviolability of the State territory, territorial waters and airspace, participate in international military operations, ensure NAF and reserve personnel training and participate in operations to avert national threat situations	**Contact:** Igors Šitvjenkins +37126480297 Igors.sitvjenkins@mil.lv	

Development of the combat sleeping bag system of the Latvian National Armed Forces

Igors Sitvjenkins, Kalev Kuklane, Ausma Vilumsone, Iveta Abele

Latvian National Armed forces (LNAF) in cooperation with Lund University, Sweden and Riga Technical University, Latvia has developed the combat sleeping bag system (CSBS) of the LNAF under the Soldier System platform (SSP) 2009 – 2013 modernization program.

Protection from the cold and thermal infrared surveillance during the low level metabolic heat rate of sleeping (40 W/m^2) is the key aspect of the survivability of the soldier in combat and training operation to maintain task fulfilled. Three level CSBS were evaluated in conjunction with eleven combinations of the combat dress uniform system (CDU) of the LNAF Combat individual protection system (CIPS). There is no existing standard for the requirements of the combat sleeping bags.

The evaluation was done under the modified civil standard EN 13537:2002 “Requirements for sleeping bags” in the climatic chamber of the Lund University. LNAF had special needs of the location of the mannequin according to the operation using and possible location of the soldier inside sleeping bag, closing mode of the sleeping bag, as well as area of the sleeping bag contact points to the ground during the combat and training.

Parallel calculation method was used and the values were corrected for standard. CSBS providing protection comply with the requirements of NATO AECTP-230 “Climatic conditions” cold climate categories C0, C1, representing actual climatic condition of the Republic of Latvia, as well as ISAF operation region.

The following range of the quality was established during evaluation – lowest level $I_{tot,\ parallel}$=0.824 m^2K/W, $I_{tot,\ serial}$=0.881 m^2K/W, $I_{tot,\ standard}$=0.758 m^2K/W, comfort temperature 8.8^{0}C, limit temperature 4.4^{0}C, extreme temperature – 9^{0}C; highest level $I_{tot,\ parallel}$=1.612 m^2K/W, $I_{tot,\ serial}$=1.819 m^2K/W, $I_{tot,\ standard}$=1.383 m^2K/W, comfort temperature – 10.5^{0}C, limit temperature – 18.1^{0}C, extreme temperature – 40.2^{0}C. Increasing number of layers doesn’t provide adequate increase of the thermal insulation, due to compressing of the layers and decreasing amount of the static air.

Physiological model for calculation of extreme temperature of the standard EN 13537:2002 “Requirements for the sleeping bags” utilizes 25 years old female with weight of 60 kg, height of 1.60 m, and body area of 1.62 m^2. LNAF average soldier’s corresponding parameters are male, 24 years old, weight 81 kg, height 1.81 m and body area 2,0 m^2. Difference between physiological model of the standard EN 13537:2002 and LNAF soldier should be evaluated during the field trial under the life weather condition.

The high level of the CSBS protection against thermal infrared surveillance was defined during the field evaluation. There is no any standard defines requirements of the thermal infrared protection level. Difference in ergonomic models and customizing of the thermal infrared protection evaluation making limitation of the logistics system in order to provide ability of making open tenders.