

International Federation of Red Cross and Red Crescent Societies

Shelter Research Unit

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Review in winter conditions R&D project for a new light self-standing tent





Review in winter conditions R&D project for a new light self-standing tent

Review date: April to May 2016

Project internal code:		24LU18				
Location:		Peshawar, Pakistan				
Status:		Finished				
Confidentiality:		open				

Overview

The winter test was originally planned to take place in Pakistan. However, following an analysis of the security situation, the IFRC-SRU together with the Project Committee, decided to organize this phase in two different blocks. The first part was a theoretical winter test in Luxembourg and the second was a remote monitoring in real winter conditions in Peshawar, Pakistan.

Due to several constraints, and despite a good collaboration between IFRC/SRU and UNHCR Pakistan, the field monitoring has started in April 2016. Therefore, the monitoring results were not available for the end of the R&D Project in March 2016.

These monitoring results will be included in a next R&D Project to finalize the winter kit specifications.

This document focuses on the results of the Pakistan monitoring conducted from April to May 2016 by the Pakistan UNHCR field team in Peshawar.

The following table shows a basic description of the used tent:

Old Dome Tent + WC (winter cover)

Short description:

Square-based double fly tent with a self-standing structure system. Frame made of flexible poles in sections, sliding in sleeves on the outer face of the canvas. Two long poles for the diagonal lines and one short pole for the central line. Exterior winter kit in polycotton placed over the tent. Four additional poles + guy ropes and pegs are needed.



Review procedures

The main objective of this review phase was to access the performance of the tents in terms of user satisfaction in real winter conditions.

The same procedure was followed in order to collect quantitative and qualitative data in a consistent way. By using a standard format and periodic visits, the users' feedback and team appreciations were recorded. In addition, the exterior and interior temperatures where recorded each 15 min with automatic loggers.

The following table shows the used logger:

Measurement instrument used

The following thermometers recorded temperature during the review period:

1) Thermometer - air temperature automatic data loggers.



Model:

LogTag TRIX-8



Measurement Range: ·	40°C to 85°C						
Resolution: Accuracy:	0.1°C (-40°C to 40°C); 0.2°C (40°C to 85°C) ±0.5°C: -20°C to +40°C						
Data Storage Capacity: 8000 Readings (16000 bytes Memory)							
Sampling Frequency:	30 Seconds to 18 Hours						
Power Source:	3 Volt Lithium Battery - Non-Replaceable						
Case Material:	Polycarbonate						
Weight:	35g						
Dimensions :	86mm x 54.5mm x 8.6mm						

Monito	ring			Со	mparis	on of pr	actical	and logis	stic param	neters		
0	Description and general conditions:											
	Evaluate practical and logistics aspect (setup, packaging, weight, etc.)											
	quantitative data.											
0	Approa	ach:	uutu	•								
	In the field and before starting the setup process, the field team has to take weight of the											
	packaging, pictures and other relevant appreciations and record all the data in a pre-											
	established format. During the setup process, time has to be measured, pictures taken and											
	o Density of measures:											
	An individual matrix per tent to document all the predefined data and pictures.											
0	• Values to collect:											
	Packaging weight (kg)											
	Setup time (min)											
	Observ	ation	es and	feedba	ck during	the set-	up proce	ss (text/dr	awings or c	others)		
Analysi	is of c	olled	cted (data:		,			annige er e			
Tartusiaktia ka												
70						_						
70												
60			25	_			 					
50	35		35	35	35	35	35	35		35	35	
40	-	_	-	-						-	_	
30	-		_	_						_	_	
20	_									_		
10	35		36	34	36	35.5	36	34.5		35	35.5	
10												
0	Tarra	. 1 . 7		Taut		4 Taut 1	Taut	C Tarat 7	Tarat 0	Tarat C	Tart 10	
Ient 1 Ient 2 Tent 3 Tent 4 Tent 5 Tent 6 Tent 7 Tent 8 Tent 9 Tent 10												
Weight Tent Package Weight of WC package												

Tent weight comments:

The heaviest measured tent was recorded 71kg (36 tent + 35 winter cover). The WC and the tent were recorded almost the same weight in all the cases. The maximum weight difference between the tents was 2kg which represents a deviation of around 3% of the total weight.



Analysis of collected data:

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Setup time comments:

-Two teams have participated in the tent setup; one with 5 persons and the second with 7. -The minimum recorded time with 5 persons was 75min and 45min with a team of 7. -The longest recorded time was 120min with a team of 5.

Note:

Note that the comments of the field team focuses on the difficulty of the tent setup. The other general concern is the diameter of the pipes and ropes that for them need to be "bigger". **Analysis of collected data - Pictures:**



1-Briefing made by the field team



3-Assembled tent including shade net and Winter Cover

Setup pictures comments:



2-Setting-up process



4-Frontal view of the tent with beneficiaries

-Picture 1: briefing + explanations by the field team, notice the quantity of people around including some children involved in the setting-up process.

-Picture 2: tent displacements during the setting-up process. The order of the pipes (arches) that the tent has been assembled in a different way than explained in the manual.



-The final configuration of the tent included all the possible layers (tent body + winter cover + shade net).

-Picture 3: the winter cover is placed over the guy ropes of the tent showing a kind of "cultural" adaptation but the final result is different than the designed and the one explained in the manual.



Max. min. temperatures comments:

-The maximum recorded temperature inside the tents was 57,7C and the minimum 15,6C.

-The maximum recorded exterior temperature was **49C** and minimum 13,9C.

-All the interior temperatures recorded during the monitoring period where higher than the exterior. -For the higher temperatures the difference between interior and exterior are bigger than for the lower range of temperatures.



Analysis of collected data:



Coldest days temperatures comments:

-The temperatures inside the tents are higher than the exterior during day and night.

-The max recorded temp was 45.3C.



are related to the difficulty to assemble the tent while week 4 most of the comments are focused on the hot temperature inside the tent.

- The most repeated comment was the difficulty to assemble during the first week.

- There are no detailed comments from weeks 3 and 5.



Note:

Please note that all the comments are based on the interpretation by the field team of the submitted documents and therefore it is necessary to consider the personal appreciation of the final information.



-More than 50% of the comments are positive opinions.

Review

General conclusions and recommendations

Observation:

The review process was conducted with the same tents that have been tested in Burkina Faso during the summer of 2015.

During the BF test some of the tents collapsed and 2 days after the test 9 of 10 tents flew away due to structural failures.

In this review none of the tents collapsed but the structural concerns were a constant comment from users and field team.

Recommendation:

The structural model of this tent needs to be improved, redesigned and probably re-dimensioned. (see BF report and Lux winter test - report produced by IFRC-SRU)

Observation:

This monitoring was planned for winter conditions and all the tents were set up with the Winter Cover in order to obtain information about the performance in cold conditions.

During the monitoring project we have recorded interior temperatures over 55C, around 10C hotter than the exterior temperature.

Recommendation:

The first impression is that these tents with Winter Cover do not perform well in hot temperatures. For this type of lightweight constructions, the good ventilation and protection against the heat radiation (sun) appear as the most adequate solutions to use in hot climate.

Observation:

The solution for the reviewed tent in winter conditions is an exterior layer that covers the full tent providing more covered living space and reducing the air infiltrations. From a design point of view this appears as a very good solution with proved results (see winter test in Luxembourg – IFRC-SRU). During the review we identify that this concept could be misunderstood or create confusion to setup the tents.

Recommendation:

The most logic strategy to follow appears to be to facilitate the setting up process with a simple design, redesign the setup manual and include a training/briefing session for future operations with these tents.