MULTIPURPOSE UNIT

The Multipurpose Unit is an emergency shelter designed for hosting collective activities and different functions and could be removed or re-used for other purposes later. The Multipurpose Unit measures 48 m² and is designed to shelter between 20-22 people. The vertical walls facilitate the connections between units, allowing the creation of bigger spaces and camp infrastructures. As a shelter typology, it is addressed to vulnerable groups of affected communities like elderly, orphans and handicapped.

The Multipurpose Unit aims to create a rapid emergency shelter kit that is multipurpose and re-usable in different situations. The general requirements are:

- Easy set-up procedures and connections
- Flexibility of layout and modularity of the system
- Possibility to connect different units for creating bigger spaces and different configurations
- Lightness of the system for the transportation (reduce packaging volume and weight)
- Possibility to connect different units for creating bigger spaces and different configurations
- Durability

Product description

Connected and usable by:

- Design and realization by:
- M. Barozzi, A. Zanelli, G. Giabardo
- Materiart, S. Aliprandi, M. Barozzi, A. Campioli, L. Collina, G. Giabardo, C. Monticelli, S. Viscuso and A. Zanelli (coord.)
- The research group of POLIMI has tested the resistance to snow load of one prototype. The work has been developed inside a research team of Politecnico di Milano: S. Aliprandi, M. Barozzi, A. Campioli, L. Collina, G. Giabardo, C. Monticelli, S. Viscuso and A. Zanelli (coord.).

INNOVATIVE ASPECTS

Connections between units

- Facilitate the connections between units
- Solve the problem of rain effect degradation identified in the tested tents

The idea is to adapt the same system for the same use case of high temperature. The Unit should be able to withstand wind speeds up to 75 m/s and a shading system. The Multipurpose Unit contains inside the package a shade net and a shading system. The new prototypes have been improved for reaching the snow load target. The reinforcement lines, stitched beforehand on the external part of the tent, are positioned as a grid inside the canvas. This adaptation increases the structural behaviour of the membrane (the successful test on the field in new configuration).

The connections are the same (5-ways joint) but repeated, in order to facilitate the building procedures. The joints functions also as shade net antennas, allowing the elimination of additional framework to support the layer. In this way the shade net can be retracted in the back of shelter. The tent is composed by a breathable material (poly-cotton) for the upper part and a waterproof ground sheet (not separated). The fabric is hung from inside the structure in order to ease the essential/maintenance operations. The space between the hanging tent and the shade net measures 70-90 cm, a good distance for guarantee air flows passage. The shelter can be used in all climatic types. In case of cold climate or winter application an external heating system should be provided or arranged, for what is concerning the application in hot climates, the attention is pointed on good ventilation and shading system. Four small windows on each long side and doors on the front guarantee the inside ventilation.

Structural calculations

Biaxial test and load test

The Multipurpose Unit has been designed to be easily and fast erected. The elements are equal or repeated (all the same joints, same poles).

Field test

Instructions manual and packaging

More information: http://www.speedki.ts

INNOVATIONS ASPECTS CONNECTION BETWEEN UNITS

The idea is to create a 5-ways joint in order to have always the same connections, turned depending on the position inside the structure. In fact the hinge has different angles based on its location: when it is used as a link between the column and the roof it has a different inclination in front of the connection on the roof top. When positioned in the connection wall-roof, the free way is used as an antenna for the shade net, eliminating the necessity of an extra framework to bear it.

PACKAGING: labels

Manual: building procedure