

## Evaluation of the cooling vests

### Introduction

After questions from the field to improve the comfort of wearing PPE in Ebola management centers, a cooling vest was tried out in the Amsterdam Ebola Training Centre. This test demonstrated that the vest did seem to reduce the temperature inside the full PPE suit but unclear with how much degrees. In the other hand there were disadvantages like the weight, reduced movability and complications by undressing. Additional questions were raised on how to disinfect the suit and how to solve the problem of freezer the cooling packs

In February, 6 cooling vests in 3 different sizes from the firm TechKewl™ Phase Change Cooling Vest were send to the field by courier. In the field, they were equally distributed between Magburaka EMC and Bo EMC.

### Product description

According the manufacturer, the vests maintain a temperature of 14 degrees C for up to 3 hours to regulate body temperature. They are mainly used for under heat protective and hazardous material suits as well as military body armor.

They are made from cotton with V-neck, thermal lining and zipper and have girth adjustments. They have 4 garment pockets for 4 phase change cool pack inserts

The cool packs should be frozen in a freezer or submerged in ice water for 45 minutes before they are placed in the vest. The weight of one vest including cool packs is 3.8 kg

The costs of the vests are € 125 net per piece with an additional 30% duties and 15% sales tax

### Responses of users

- About 20 staff members were interviewed after wearing the vest inside the high risk zone wearing full PPE.
- A large minority found the vest heavy and only to be used for short intervals. About 60% did not have any problems with the weight and could work normally. One person did not want to wear it at all due to the weight.
- The vest do help the wearer to keep a bit cooler according the majority but unclear how significant. Most staff seems to sweat less, but the sweating in general seems not to be seen as a problem. Some respondents were more afraid of catching a cold or even pneumonia
- Although a concern during the first trail in Amsterdam, mobility was not that much affected while wearing it. It was felt a being heavy but it was not felt as hampering movements. A long as the vest fits well, mobility stays intact
- None of the respondents said that it was hindering the undressing procedure.
- It must be said that wearing the vests was by some local staff seen as a “cool “status item which increases the standing of the wearer. Some would like to wear it every day.
- Another observation was that staff using the vests starts appreciating the vests more over time. One example is Otis the expat watsan who was participating in the decontamination of Bo facilities who was using the vests for considerable time inside the high risk facilities



- There are no conclusions on the influence of the position of the log tech meter on the results. First, there are not enough measurements. Second, it depends on the size of the vest and scrub suit. If the scrub suit is too big and vest too small, the Log tech will be not covered by the vest and therefore not measuring the cooling effect
- It seems that the humidity is lower while wearing the vest. A lower humidity gives a feeling of being cooler. The humidity gives a better picture of the comfort of the person wearing the PPE. It reaches very high values up to 94% which is comparable with humidity measured in open air by 40 degree Celsius at that time in Magburaka
- After undressing, the humidity percentage is dropping to values of before putting on the PPE in 5 to 10 minutes time.
- Also the temperature seems to drop but this is less clear in the observations. On the 6<sup>th</sup> the temperature is going up for the one wearing the vest but going down for the one not wearing the vest. It possible also has to do on the position of the log tech monitor in relation with the vest

## Conclusions

- The vests have enough cooling effect to support their usage in the field for an EMC.
- It should only be used by some people for certain jobs like medical or disinfection reasons.