
Test report ENTRAK Personal Cooling System to use within a fully encapsulated Chemical Protection Suit

The ENTRAK cooling system has been tested during Hazmat training scenarios which are based on the response objectives for hazmat operations for first responders at the Technician level in accordance to NFPA 472. The data within this report is based on visual and sentiment evaluations during the training sessions. It was not possible to use medical and technical observation equipment to evaluate the medical fact like body temperature or stress related medical information.

Test environment:

The test of the cooling system was performed during a cloudy day with an outside temperature of 16 degrees Celsius. Given 4 different hazmat incident scenarios, 4 teams each with 2 fire fighters within full chemical protective equipment, have to perform the response. One fire fighter within the team was equipped with the ENTRAK cooling system and the other with the conventional method (without any cooling device). Fire fighters wear 100% cotton sweats underneath the fully encapsulated chemical protection suit as well as SCBA and standard German type fire fighting helmets.

Scenarios:

1. Patching of a 200 Liter barrel with the given patching material
2. Salvage of a 20 Liter container
3. Mounting an valve with provided tools
4. Shutting off a leaking pipe by finding the correct valve within an structure

The time where fire fighters wearing fully encapsulated chemical protection suits is subdivided into:

1. Five minutes entering the hot zone
 2. Ten minutes work time
 3. 5 minutes leaving hot zone including gross decontamination
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Each attendee has been interviewed direct after the response and visually evaluated as well as directly compared with each other. The individual physical condition of the attendee was not considered within the test.

Outcome

Visual Evaluation.

- Fogging of the visor of the CPS : It was visually possible to detect the team member equipped with the ENTRAK cooling system by the observer because of no fogging of the visor of the CPS
- Physical condition of the attendee after the response: After doing off the CPS the wearer of the cooling system was in a more relaxed condition as his team partner not having the cooling system within the suit. It was also visually detectable that the wearer of the cooling system was not that much sweating as his team member.
- The time difference given during doing on the CPS with or without the cooling system is that small so it is negligible.
- Interferences given thru the cooling system are not given.

Interview with the wearer of the cooling system

- Fogging of the visor: The fire fighters wearing the ENTRAK climate system stated that there was very less to no fogging of the CPS visors.
- Stress wearing a CPS: Fire Fighters wearing the cooling system stated that the climate inside the CPS feels better especially during the emergency procedure where they need to breathe out of the CPS with disconnected air supply. All attendees stated that the heat stress during CPS operations was fellable lower with the cooling system within the CPS.
- Weight of the cooling system: All attendees stated that the weight of the cooling system is not bothering the wearer at all and any other interference has not been detected during working off the different scenarios.
- Disadvantages: No one of the fire fighters stated that they experienced any disadvantages of the ENTRAK cooling system during the test.