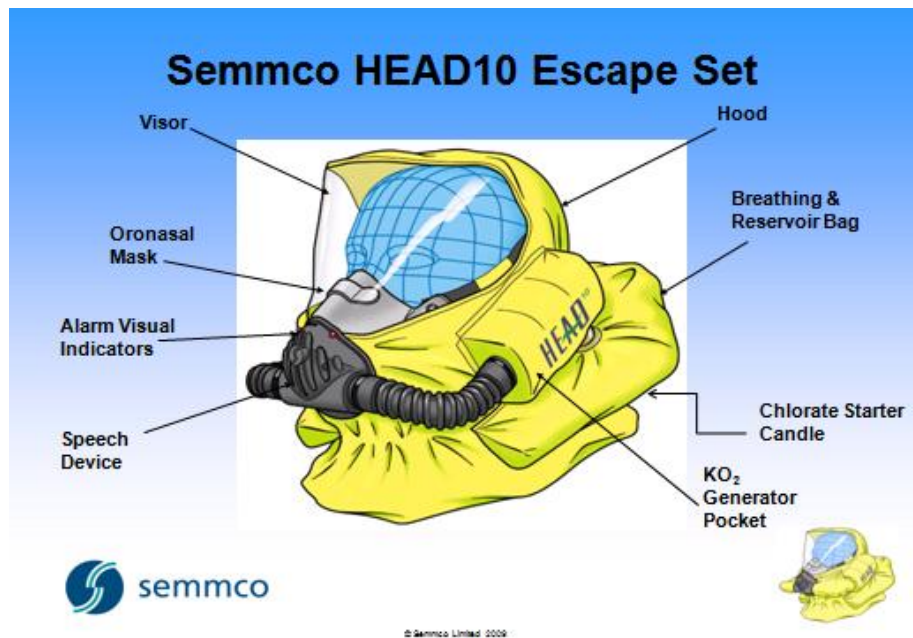


HEAD10 Escape Set

Case Study



What is HEAD

HEAD10 is an award winning respiratory protection used for escape. It is a lightweight, ergonomic, closed circuit hooded apparatus, providing the wearer with a safe, simple and effective means of escaping an irrespirable atmosphere of toxic gasses, Oxygen deficiency or smoke.

How it works

When the user breathes out, water vapour is released which combines with potassium superoxide (KO₂) in the unit resulting in oxygen and potassium hydroxide. This potassium hydroxide (KOH) reacts with exhaled carbon dioxide (CO₂) to produce potassium carbonate (K₂CO₃). Result – oxygen given and carbon dioxide taken away.

The Challenge

In an environment where toxic or asphyxiating atmospheres could be experienced the consequence of being unable to escape safely could be disastrous. Escape sets are a much needed piece of safety equipment that allows personnel to safely escape a hazardous environment of this type.

For many years at Centrica the equipment adopted for respiratory protection was costly to purchase and maintain. An examination carried out found that ten out of the twenty sets they had on site were out of their five yearly cylinder recertification with a further six due. At around seventeen years old, these sets are now obsolete and spare parts no longer available.

These units were predominantly located in the plant control room buildings and corridors. During an evacuation these enabled personnel to escape to a safe fresh air environment in the event of a gas leak or fire. These units were slow to put on as the user was required to wear a strap around the neck containing a cumbersome and heavy oxygen cylinder. This not only made them difficult to manipulate but vision was limited within the head gear.

Each new member of staff had to be trained to use the sets so when these sets needed to be recharged for future use it meant that there were fewer sets in service. The used unit would then have to be dispatched to the supplying company for refurbishment. This created a break in continuity of in-service units and further costs incurred by Centrica.

There was also the risk that when dealing with a live scenario a user tends to lose track of time as attention is focused on the unveiling situation rather than time lapsed. If the attention is on the burden of using equipment this can be a danger to lives.

Thus there was not only a need to source replacements but the solution needed to be easy to don in a crisis and not impede escape from the building.

Solving the Problem

The HEAD10 chosen was developed using 'chemical oxygen' (Potassium Superoxide - KO_2) to generate oxygen and allow carbon dioxide (CO_2) to be removed from the breathable air. The initial start up phase incorporates a chlorate candle that is activated as the set is removed from its packaging while also initiating the generation of the self-check alarm procedure. The first out breath of the wearer through the generators commences the generation of oxygen and removal of carbon dioxide.

The previously adopted equipment had no time-lapse gauge but during the development of the HEAD10 it was deemed vital to incorporate this. The resultant alarm, once set, stays quiet for $\frac{2}{3}$ of the usable air time after which an audible alarm sounds and LED lights flash showing $\frac{1}{3}$ of the air remains. Once this time is complete, a constant alarm sounds. This last alarm provides a safety margin whereby a measure of breathable air is still forthcoming but indicates that the user must reach clean air as a matter of urgency.

The unit was designed with a lightweight, flame proof hood with a large clear visor. Monthly checks can be made visually with ease.

To avoid out of service units during recharging, Semmco provided Centrica with training sets without the 'chemical oxygen'. They appeared the same as the user would wear in an emergency but allowed for inhalation of the surrounding air rather than created Oxygen as with the 'live' sets. A designated trainer was trained on all aspects of use by Semmco at the Centrica site.

HEAD10 is supplied in either a wall-mounted box or a bandolier carry bag, and is sealed in an aluminium foil vacuum container. A unique visual indicator and security tag constantly shows the unit's integrity and condition.

The Benefits

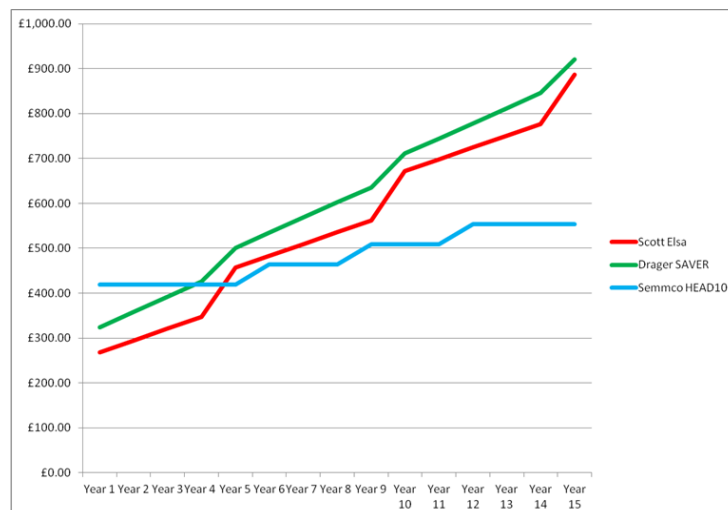
The wearer can move unhindered by bulky equipment because not only is the HEAD10 lighter, faster and easier to don than previous equipment but it has no straps, valves or activation system so operates hands free. The hood allows for excellent panoramic vision while the automatic starting system and built in alarm further assist with safety.

The mounting allows the breather to be set in a convenient location and the visual indicator enables the unit to display that it is ready for use so allowing the user to be confident of its capability. This allowed a simple monthly visual check and no cylinder re-certification costs.

The training sets ensure that no units are out of commission for the recharging process. Once the on-site train the trainer course is completed, Centrica can continue this with new employees or provide refresher training where appropriate.

Centrica was pleased to have found a British company to service them.

Major cost savings are provided without the need of servicing for an initial 9 years with only a 6 year validation check off site required. The financial benefit is a through life cost saving of 36% over the previous equipment when using HEAD10.





SHP IOSH Awards 2008



Safety & Health Expo 2001 – Product Innovation Awards
HEAD 10

CE 120 (EC Directive 89/686EC)

ATEX Directive 94/9/EC

The Company Background

Semmco is a design and engineering company offering a range of specialist services for ground support equipment and access solutions for the aircraft and aviation maintenance markets. Providing engineering design and consultancy for special projects and bespoke customer requirements, Semmco is committed to quality, safety and reliability throughout its innovative designs, manufacturing safe and cost effective engineered solutions.

The Health & Safety Executive has used Semmco as a reference supplier for working with commercial aviation airlines and achieving major improvements in access equipment.

Since 1992 Semmco has operating throughout the UK and international markets while working with customers to design multi-functional, safe equipment, providing the customer with long-term solutions and efficiency improvements.

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