

# Bristol Uniforms tackles PPE contamination head on

PPE contamination was at the top of the agenda at this year's Emergency Services Show. In the Health and Wellbeing Theatre, for example, researchers from the University of Central Lancashire (UCLan) highlighted the risks associated with absorbing carcinogenic substances through the skin and urged the industry to take action.

Dangerous chemicals known as Polycyclic Aromatic Hydrocarbons (PAHs) are proven to stay on PPE following exposure to smoke, and can be transferred from person to person, and from vehicles to fire stations. The UCLan study has revealed that wearing contaminated PPE increases exposure to these harmful substances, long after the fire is out, and is putting firefighters at greater risk of developing cancer.

This has presented a significant challenge for the PPE industry: to create PPE that not only acts as a barrier to toxins and potentially harmful particles, but also to come up with innovative ways of helping fire and rescue services (FRSs) keep their kit clean.



Bristol Uniforms is the UK distributor for Solo Rescue® decontamination machines.

## Decontamination machines

At this year's Emergency Services Show, Bristol Uniforms announced that it has become the UK distributor for innovative Solo Rescue® decontamination machines.

Most FRSs have two sets of clothing and therefore can use a laundry service to ensure thorough cleaning. Bristol Uniforms, for example, offers an in-house Managed Services provision whereby its drivers collect soiled or damaged PPE from FRSs around the country and are trained to handle kit carefully to prevent cross-contamination. The garments are transported to one of Bristol's two Service Centres for thorough cleaning, inspection and repair, and are returned to the customer within seven days.

It's not always possible however to use the service for helmets and self-contained breathing apparatus (SCBA) because most firefighters only have one helmet or share SCBA and this vital equipment cannot be sent off-site for cleaning in case a Major Incident occurs.

As a result, many FRSs clean helmets and SCBA in the fire station by hand, which is a difficult, lengthy process and can expose the firefighter undertaking the cleaning to further risk of contamination.

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## Minimises manual contact

Bristol's Solo Rescue® decontamination machine cleans boots, helmets, gloves and SCBA in a self-contained, sealed compartment, which minimises manual contact with contaminated material. Kit can be cleaned immediately upon return to the fire station, with the machine successfully removing residues of combustion gases, soot particles and toxins in just a few minutes, and fits in a compact space of less than 1m<sup>2</sup>.

The durable stainless-steel machines have a swift cleaning cycle, meaning that up to 14 sets of SCBA can be decontaminated in just one hour, considerably improving the speed and efficiency of the cleaning process. Solo Rescue® decontamination machines are also simple to operate, with minimal servicing required.

## Clothing design

As well as supporting FRSs with cleaning, manufacturers such as Bristol are also looking at PPE designs and introducing enhanced particulate protection.



Bristol Uniforms' in-house Managed Services provision offers thorough cleaning, inspection and repair of decontaminated PPE.



Bristol's new Particulate Protection Hood is specifically designed to filter harmful smoke particles.

Studies have shown that the neck and jaw areas are most vulnerable to smoke particle exposure, and that protective hoods are usually the most penetrable part of a firefighter's kit. According to a safety bulletin issued by the NFPA in January 2017, hoods are particularly concerning because they are in direct contact with a firefighter's skin. It states that, 'The face and neck have been identified as a significant area of dermal exposure to products of combustion and potential carcinogens.'

In response, Bristol's Product Innovation Development team has worked with fabric and fibre manufacturers to develop a revolutionary new Particulate Protection Hood, specifically designed to filter harmful smoke particles. Worn under the helmet and collar, it covers the vulnerable neck and jawline areas, and is proven to be 99.8% efficient at preventing particle exposure. The hood crucially features the innovative Nomex NanoFlex particulate barrier from DuPont, which has been specifically developed to prevent contamination from potentially harmful particles. At the same time, the hood is also lightweight, soft and breathable, allowing heat and moisture to escape, thereby reducing the risk of heat stress.

## Further reducing the risk

Along with regular cleaning, and using specific particle-blocking garments for vulnerable areas, other practices such as the swift removal of PPE following a fire-related incident, using wet wipes to clean particularly vulnerable areas such as the face and neck immediately after an incident, and showering and changing on return to the fire station, have also been highlighted as a practical means of reducing the risk of carcinogens entering the body.

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