

Special features number extra thermal protection on the chest; braces anchor point on trousers repositioned to the side of the chest; full female size range for gloves; and full female sizing for fire boots (Integrated Clothing Project turnout kit for female firefighters, UK national procurement programme Firebuy).



almost all male profession to one that supports and promotes diversity and inclusivity is now recognised globally. As recently as the 1990's firefighters were recruited against specific body shapes and sizes. This was, in part, to fit the equipment used, turn out kit offered to recruits, and the then perceived role of the firefighter.

The most significant profile shift has been the presence of female firefighters amongst the ranks of fire service personnel. In the USA there are well over 6,000 female firefighters, and 1,500 in the UK. And this does not include the thousands who operate as voluntary firefighters.

The need to accommodate female firefighters within the PPE specifications for firefighters is obvious. There are significant differences in shoulder width, height and chest size. Until recently the fire service in the UK placed a minimum height restriction on new entrants of five feet six inches. Not only was this a discriminatory factor (the average female across the UK and USA is five feet three inches tall) but it also influenced the range of PPE provided for shorter entrants.

Whilst poorly fitting equipment was not the sole penance of female firefighters it was exasperated by the significant difference in size variation. Casting our minds back 15 years ago the challenge set before all recruits was to not only come to terms with a demanding profession but to also make the best of the kit that was provided to them. Boots sort of fitted. Gloves never did. Helmets swum about on sweaty heads. Breathing apparatus sets locked your back into a fixed position and you bent around them as best you could.

Until a few years ago trying to find a leather fire boot for a size 4-5 foot was almost impossible. The result of the lack of available PPE is that many of the first female firefighters found that they were often either given kit that did not fit or alternatives that

An agenda for inclusivity

Serving Officer Gary Fleming looks at the evolution of PPE for female firefighters, and examines some of the challenges still to come.

The fit, quality and durability of the vital first layer of protective equipment has never been more under scrutiny and challenge than now. The challenge comes from a mixture of market forces including health and safety, the changing role of firefighters, higher industry expectations and advances in technology.

Most noticeably amongst these is the changing profile of the fire service over the past two decades. The migration from an

although fitted looked different to their male counterparts – thereby setting them apart from the rest of their colleagues. It is not difficult to see how this very action could be seen as discriminatory against female firefighters. At the very least it occasionally added to integration and acceptance issues.

The issues behind the integration of females into the profession and the role that PPE played within this was highlighted in the New York State Legislative Hearings on the Equal Rights Amendment to the New York State Constitution (March 22, 2006) report, which stated, "Areas that are particularly tenacious in keeping women out are firefighting and skilled trades work in the construction industry." The role of female firefighters in championing equality was further recognised within the report, which stated, "Challenge had come from female firefighters themselves, noting that they had had to raise the issue with their respective employers of protective gear and uniforms designed for men only."

It is against this backdrop that some of the greatest advantages of increased workforce diversity have been realised.

Within the UK the issues of clothing provision has been championed through the Integrated Clothing Project (ICP), which is the first national procurement programme for clothing for the UK fire and rescue service.

The project delivers a complete range of clothing designed specifically for fire service staff including protective clothing that offers comprehensive protection for firefighters.

As part of the procurement process, an extensive evaluation of



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firefighter protective clothing was undertaken. The evaluation included 16 male and female firefighters from around the UK. The trials included thorough physiological and ergonomic tests designed to compare the performance of the clothing under conditions likely to be experienced by firefighters in the course of their duties. Further wearer trials examined the performance of station wear, sports wear, control staff wear and corporate wear.

The outcome delivered a clothing solution that offers up to 14 different fit variations including specific tailored cuts for female firefighters. This option is available across the UK therefore supporting the principle of equality nationally.

Locally interviews with female firefighters in the UK suggested that although many barriers are now being overcome, some issues still remain, predominantly in relation to the fitting of gloves. It was noted in some instances that the narrower profile of the female hand was causing difficulties with the provision of well fitting firefighting gloves. Particular problems were noted with the liners inside the gloves. However this was felt to be minor and services and suppliers were working to resolve this issue.

As well as clothing the development of fire helmets has also served to accommodate the varying range of head sizes and shapes. The days of a fire helmet sliding around on a sweaty head have passed and most are now fitted with ratchet style adjustable head harnesses.

Many of these innovations in PPE design have been championed by suppliers. It is also notable within fire and rescue services that as diversity has increased so has the challenge for the provision of good PPE from firefighters in general. H&S matters in relation to PPE are now raised as a matter of course and serve as a fuel to drive further innovation in the sector through the expectation and demands placed on the market by the end users.

The response to this level of expectation from manufacturers is to offer bespoke fitting services for firefighters including tailored gloves to accommodate the odd missing or shortened fingers. Whilst this is not solely linked to female firefighter issues it is an interesting development in the variety and range of PPE now available and the drivers in the market.

For many fire and rescue services turnout kit also includes respiratory protection in the form of breathing apparatus. Over recent years the technology behind such sets has moved forward to meet the ergonomic needs of a diverse work force. This includes adjustable back plates and pivoting waist belts with the ability to respond to, rather than set the parameters for, movement.

As the diversity in fire and rescue services increased the ability of the standard fitting BA facemask to provide a suitable face-to-mask seal across an increasingly diverse range of face profiles became compromised.

This had traditionally been managed through a choice of natural rubber or silicon facemasks. For more extreme problems inserts could be used to fill gaps within the facemask seal.

As the numbers of female firefighters has increased so has the variation in the number and type of facemasks to meet the needs of the female face shape which is typically smaller than that of the

XTREME launch in Myrtle Beach

Ashburn Hill Corp, a manufacturer of fire-retardant apparel for industrial and firefighting applications, has launched TECGEN XTREME protective apparel at the Southeastern Association of Fire Chiefs' Annual Leadership Conference in Myrtle Beach, SC, in June. TECGEN XTREME is a dual-certified product that meets the National Fire Protection Association's specifications for wildland firefighting (NFPA 1977-2005) and technical rescue ensemble (NFPA 1951-2007).

"Currently, there aren't many products in the market that can meet both of these specifications without additional layers for protection," said Jon Heard, President and Chief Executive Officer of Ashburn Hill Corp. "We are thrilled to bring a product to market that can provide needed protection without the added bulk."

In many instances, firefighters wear heavy-duty turnout gear, even in scenarios that may not require the extent of protection provided by those suits, adding unnecessary weight, discomfort, and expense. In a single layer, TECGEN XTREME protective apparel provides a comfortable, breathable alternative to turnout gear that is compliant for up to 75 percent of firefighting responses. The product especially excelled in its Thermal Protective Performance (TPP) test, scoring an 18.7 – which is 8.7 points above the minimum requirement and 5.4 points above the current market leader's fabric, giving it the best TPP on a single-layer coverall for the Fire Service. Additionally, with heat stress being the number one killer of firefighters, this product has much higher total heat loss (THL) than turnout gear, keeping the body cooler.

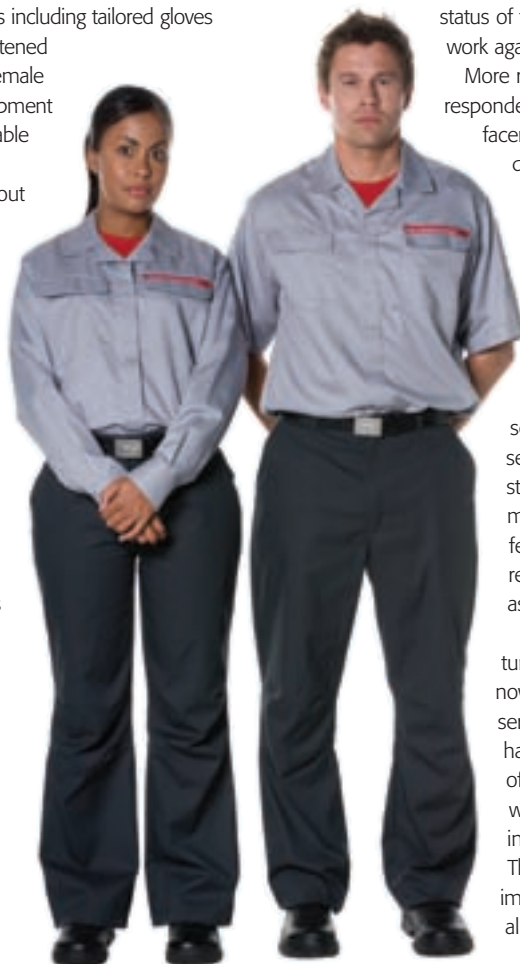
male. This has caused issues for departments with a range of different facemasks and inserts styles in operation leading to higher costs and greater maintenance levels.

The impact for female and male firefighters is that this would often identify them on stations as requiring non-standard equipment to be able to fulfil their role. In addition to this the silicon facemasks were often bright yellow in colour whilst the normal masks would generally be either grey or black. This type of obvious deviation from standard issue equipment serves to further alienate and highlight the minority status of females within the work place and work against the principles of integration.

More recently manufacturers have responded to this pressure by developing facemasks that although of a single design, come in a range of sizes. An example is the new Dräger FPS 7000 full-face mask, which comes in small, medium and large sizes.

Evidence from fire services suggests that new products such as this have overcome the face fit issues providing a sound seal for all face sizes whilst only servicing one style of masks. This step forward has improved the BA market for all wearers – not only female firefighters – and has removed barriers to integration such as colour and style variations.

In summary it is evident that turnout kit for female firefighters is now a standard part of fire and rescue service equipment provision. Suppliers have responded to meet the needs of an increasingly diverse workforce whilst moving forward with innovative design and style options. The impact has delivered an improvement across kit provision for all fire service personnel.



Integrated Clothing Project station wear for female firefighters, as per the UK's national procurement programme Firebuy. Features include trousers cut for female sizes; shoes designed for the female foot (not scaled down men's sizes); and full female size range of 28 sizes as standard.