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The future of hand protection

When it comes to hand protection, workers across the UK are increasingly benefiting from the appliance of science in the fight to keep their hands safe from workplace hazards.

Since the early 1980's, fibre and material developments, the rise in harmonised European Standards and a greater focus on wearer safety have literally transformed not only how gloves are made, but provided the wearer with a much greater range of protection, comfort and fit for purpose applications. These developments have also played a major contributing factor in the increased awareness of hand protection as a key PPE issue which through effective glove selection can have a significant impact on workplace injury reduction and prevention.

With such major strides having taken place in recent years, just what does the future hold for the hand protection market and what further developments might there be? Just what more can manufacturers achieve to help protect the hands of workers or are we reaching the limit of what is possible?

Here, John Thorne of hand protection experts Marigold Industrial® looks to see just where the market has come from and what tomorrow may bring.

You really don't have to cast your mind back that far to remember the time when hand protection really was a completely different industry to the one we see today.

It was a time when price before protection was a common practice, where often only one size of gloves really was purchased and as a result really did fit all, when the infamous red PVC glove was the staple diet of almost every construction and manufacturing site across the country, joined by the Rigger glove - complete with its 17 pressure points – used for a myriad of jobs across many industrial sectors – the vast majority of which they were wholly unsuitable for.

But in a relatively short space of time, the hand protection industry has been revolutionised to the point where today, it is almost unrecognizable to that one in the mid 1980's. So what has driven this sea change – not just from the manufacturing perspective, but the way in which the issue of hand protection is now seen and managed by businesses across the UK?

In reality, it was not so much a watershed as a convergence of contributing factors and influences that really drove the change in the hand protection market and that largely continue to drive change today.

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Materials development with fibres and coatings have transformed the way in which gloves are manufactured and the level and type of protection they provide, the introduction of EN Harmonised standards for PPE, the growth of litigation and an increasing awareness of the very real impact that hand injuries have in the workplace – driven through campaigns such as the HSE's It's In Your Hands programme – all combined to effect the changes we have witnessed.

Dermatitis became the word on many employers lips – the disease that workers for many years had not have a name for, but seemed almost accepting that 'bad skin' was part of the job – and there was a growing emphasis on creating a safe working environment and investing in hand protection education and training programmes.

Hand protection today – and just as importantly – the attitude towards it shown by the vast majority of worker's and employers is quite simply light years away from where it was only 20 years ago.

You only have to look at the hand and arm injury statistics published by the Health and Safety Executive to see the impact that these contributing factors have brought to bear in the UK workplace.

But what does the future hold for hand protection in a market that has developed so fast – what further developments are there likely to be and just how far can protection be enhanced?

We believe the future of the hand protection market will be driven by four key factors:

- Ecological
- Environmental
- Technical Development
- Product Hygiene

Ecological

Moving forward there will be much more emphasis placed on protecting the glove wearer chemically – both in terms of the substances they come into contact with and need to be protect them against and the materials used to manufacture gloves - that could potentially pose a threat to the skin.

Whilst EN374 has undoubtedly helped increase levels of awareness and understanding of chemical protection and the glove selection processes needed in terms of understanding the importance of performance levels and breakthrough times, manufacturers are placing increasing emphasis on safeguarding the health and well being of the worker by making the gloves they wear safer for the skin.

This is already happening with the growing removal of DMF (Dimethylformamide) from glove manufacturing and also through the growing importance of the Oeko-Tex 100 Standard, helping to create green gloves that are free of any materials used within their manufacture that could be harmful to the skin.

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Developed in 1992, the Oeko-Tex® Standard 100 is a globally uniformed testing and certification system for textile raw materials, and intermediate and end products, such as gloves, at all stages of production.

The test covers 100 harmful substances that are prohibited or regulated by law, or for chemicals, which are known to be harmful to health, and parameters, which are included as a precautionary measure to safeguard health.
Tests are carried out on materials on the basis that the more intensively a product comes into contact with the skin, the stricter the human ecological requirements it must fulfill.
Products tested that pass the standard are guaranteed

- Carcinogen free
- Are tested against pesticides and phenol chlorine
- Contain no heavy metals
- Have little or no formaldehyde
- Have a neutral pH
- Are accelerator free
- Contain no added biocides.

Only successfully tested products can then use the Oeko-Tex® label to show that their products comply with the specified test criteria without exception and meet the very highest standards, providing the specifier with complete peace of mind, and a level of quality assurance in terms of the glove's manufacture and make up.

Future manufacturing changes are also likely to be driven by programmes such as REACH (**R**egistration, **E**valuation, **A**uthorisation and **r**estriction of **C**hemicals) with the ECHA (**E**uropean **C**hemical **A**gency) including 30* substances in the Candidate List of Substances of Very High Concern for authorisation – some of which are used in glove manufacturing.

Among them are Di (2-ethylhexyl) phthalate (DEHP) – one of the most common and widely available general-purpose plasticisers, which is mainly used for making PVC gloves soft and pliable, which will clearly have an impact on those manufacturers who currently use it.

Environmental

Environmental responsibilities are undoubtedly having a greater impact on every business today and this is certainly true now and
will become increasingly so for glove manufacturers – both from their own manufacturing processes and also ensuring employers meet their own through the gloves they use.

With glove packaging already using biodegradable and recycled materials, manufacturers will be doing more to create environmentally friendly solutions and ultimately gloves that are as green as possible.

Environmentally Friendly Innovation

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Looking forward, manufacturing developments will undoubtedly include:

- The development of biodegradable gloves
- The development of compostable gloves
- The increased use of sustainable manufacturing materials – such as bamboo fibres, water based PU and cotton
- The increased use of ethical policies

Developments in these areas are already progressing and it will not be too long until we start to see these new generation products come into the market with work already being carried out on vegetable based polymers.

Technical Developments

As we have pointed out, material and fibre developments have heralded a new era not only in t erms of enhanced protection but – particularly when it comes to mechanical and thermal protection - a greater emphasis on comfort and dexterity.

The technical aspects of many of the fibres mean that higher level protection can now be provided through less heavyweight fibres – the result – cut protection up to level 5 in a lightweight glove that offers the wearer comfort and, combined with the advancement in coatings, a high degree of dexterity and grip.

Fibres today include:
Dyneema® - Dyneema® is a super strong polyethylene fibre that offers maximum strength combined with minimum weight. It is up to 15 times stronger than quality steel and up to 40% stronger than aramid fibres, both on weight for weight basis. Gloves made of engineered yarns that incorporate Dyneema® fibres offer wearers the highest degree of protection against cuts, combined with a low weight and excellent wearing characteristics.

On a weight-for-weight basis, gloves made with Dyneema® offer twice the level of protection demanded for the highest class in EN 388 standards. Gloves incorporating Dyneema® fibres are more flexible, comfortable and conduct heat and moisture better than others.

Because Dyneema® is unaffected by water or detergents, and is highly resistant to abrasion, these gloves can be washed and re-used without any loss of cut resistance.

Techcor®: A unique hollow core thermo active fibre which wicks perspiration away from the skin, while
the inner layer remains warm and dry.

With an extremely fast evaporation rate, the material dries 50% faster than cotton, and when knitted is ideal for anyone working in cold store, refrigeration, warehousing and commercial fishing sectors as it also has excellent abrasion resistance.

Techcor® Knitting Technology

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Kevlar®: The most established and well-known glove fibre manufactured by DuPont, KEVLAR® is 5 times stronger than steel on an equal weight basis, yet, at the same time, is lightweight, flexible and comfortable.

Fibres of KEVLAR® consist of long molecular chains produced from poly-paraphenylene terephthalamide. The chains are highly oriented with strong interchain bonding, which result In a unique combination of properties.

The development is seamless glove manufacture has also had a positive impact on the market, with manufacturers able to offer higher degrees of comfort

Development of New Coatings

The possibility of mixing polymers is endless as technical practice grows which offers glove manufacturers a number of advantages - prolonging glove life and enhancing wearer safety and comfort.

The flexibility of these polymers is allowing glove development in area once thought impossible to such an extent that the question is how far away are we before we have a functional "Self Applied Glove"?

These developments in materials and coatings have led to an explosion in the range of disposable glove options now available and reduced the natural reluctance of wearers to don hand protection along with improvements in the workplace to reduce the levels of hand hazards that exist.

Looking further forward, the greatest area of expansion for chemical hand protection will undoubtedly be in the disposables sector.

Conclusion

The hand and arm protection market has seen greater changes than any other sector of the PPE market in the last 20 years and is one that will continue to change through the development of new fibres, new coatings and even greater demands on employers to be more environmentally responsible and ensure worker well being.

Lighter, safer and increasingly wearer and environmentally friendly will all have significant influence over the shape and direction of the hand and arm protection market in the years to come.

Not matter what the future has in store; one thing we must all strive for is a future which is firmly focused on Protection over Price.

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