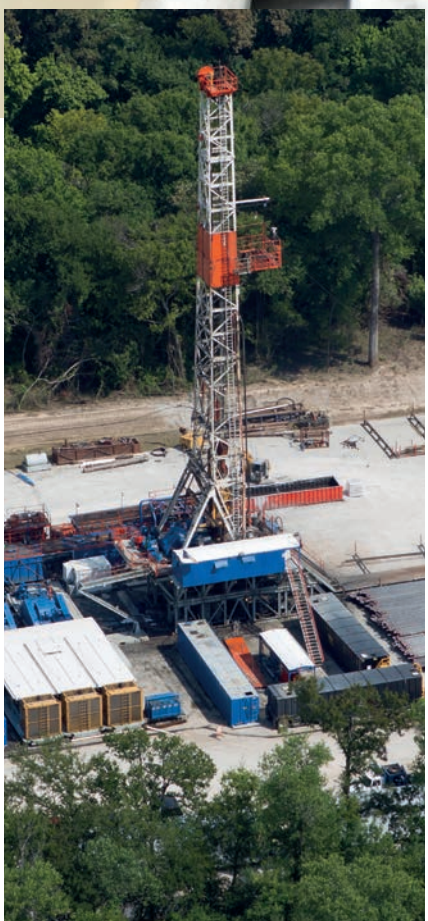
Show of Hands

Sometimes not wearing gloves is the safest route

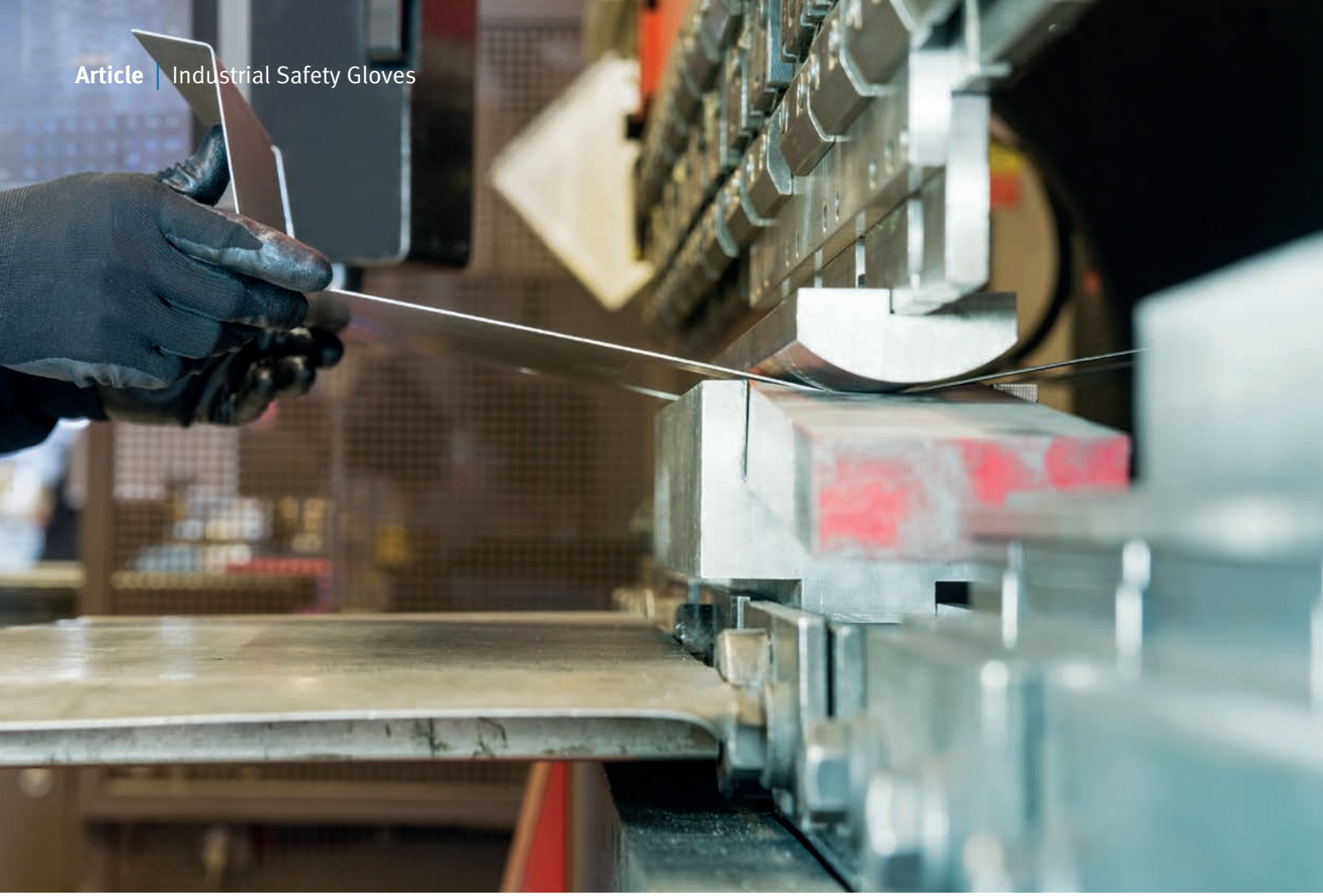


Maintaining a high level of health and safety is essential and this includes making sure that hands are protected at all times. Kevin Foy, personal protective equipment (PPE) certificate business enhancement product manager at SGS, explains where safety gloves fit into an overall PPE strategy, the standards that affect their manufacture and use, and the importance of selecting the right type of garment for the job.

As an employer or business owner, keeping employees safe and healthy should be a top priority, yet in 2016-17 the Labour Force Survey conducted by the Office for National Statistics found that over 609,000 injuries occurred at work. Furthermore, over the same period, the UK's Health and Safety Executive (HSE) stated that there were 70,116 injuries to employees reported under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). This resulted in 31.2 million working days lost due to work related illness and workplace injury at a cost of almost £15bn.

Handle with care

Around 22 percent of these RIDDOR injuries were handling related, so ensuring workers are wearing the correct safety gloves is of the utmost ▸



importance and vital for avoiding injury, adhering to the correct health and safety regulations and reducing days off due to injury. This is an area that must be taken seriously, as a hand injury can negatively impact the quality of an individual's work and ability to be productive, while in a worst-case scenario, it can end a career and detract from overall quality of life.

Depending on the industry and the handling application, there are hundreds of consequences that can result in the use of improper or unfit for purpose safety garments. These include cuts and grazes, puncture wounds, heat burns, skin irritation from hazardous substances, chemical burns, pain from extreme hot and cold temperatures, bacteria and viruses, the loss of fingers and nails, and dermatitis and other skin disorders caused by direct contact with chemicals in products and materials. It is worth remembering that even a minor cut or hand injury can lead to infection and mean lost workdays, medical expenses and more serious health problems.

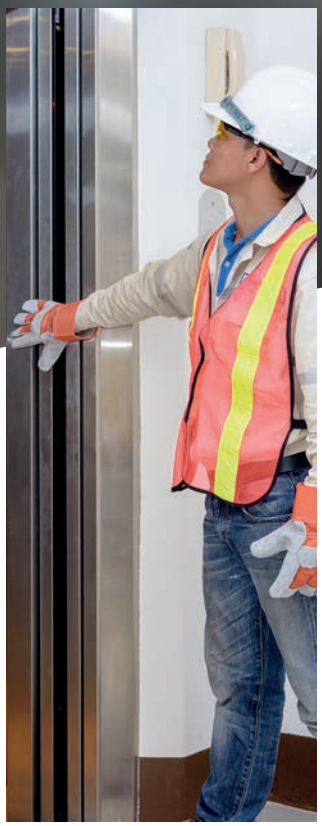
Although wearing safety gloves is important, what's equally vital is to ensure that individuals wear the correct garment for the specific industry they work in and the task they are performing. Put simply, wearing inappropriate safety gloves won't protect the wearer from all the potential hazards in an environment and consideration has to be given to assessing potential risk; for example, does the wearer need protection from heavy objects and/or sharp items such as nails? By ascertaining this information it is possible to determine what type of glove to use, but this shouldn't be the only consideration. Thought should also be given to the manual dexterity required for each task, the risk of exposure, length of time the gloves need to be worn and getting the correct fit.

Danger zone

Although there are clear and obvious benefits to using safety gloves, in addition to the above considerations, the potential for the gloves themselves to cause injury when used with machinery can affect their suitability for a task.

In 2015, Thornsett Engineering in Derbyshire, now trading under Alken Engineering, was fined after a 50 year old worker, Darren Coombs, was injured as he was manufacturing aluminium parts using a three roll bender. The gloves he was wearing caught between two of the rollers and although Coombs eventually released his hand from the glove, he lost the ring finger on his left hand and damaged the middle finger. The HSE investigation found that the risk assessment was not suitable and sufficient and did not identify the risk of entanglement from wearing gloves. In addition, there was no competent health and safety advice at the company. Thornsett Engineering pleaded guilty to breaching Section 2(1) of the Health and Safety at Work Act, was fined £16,000 and ordered to pay costs of £2,843.

This type of incident is, unfortunately, not uncommon, and in 2013 Honda was fined after Cesar Santos lost two fingers polishing a piece of equipment at its plant in South Marston. An HSE investigation found that Santos was in the last stages of polishing the component when the glove on his right hand became entangled in the equipment, severing two fingers. Even though it may seem counter intuitive, it is important that any company's glove policy makes it absolutely clear that there are times when gloves ▸



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should not be worn because the gloves themselves will increase the risk of an accident when performing certain tasks.

Protect and survive

There is a legal duty on behalf of all employers to provide PPE and they should know the standards that need to be adhered to for their specific industry. As well as safety gloves, PPE can include items such as safety helmets, eye protection, high visibility clothing, safety footwear, safety harnesses and respiratory protective equipment (RPE). In appropriate situations disposable PPE may be provided, such as single use coveralls.

Employers should provide PPE to their employees only where there is a health and safety risk that cannot be adequately controlled by other means and it must be appropriate for the risks and for the working environment. It should also take account of the user's health and adequately control the risk presented by the hazard without increasing overall risk experienced by the worker. Safety gloves must therefore be suitable for that particular handling situation or range of handling situations. By adhering to the correct industry safety regulations a business owner minimises the risk of litigation and also avoids any negative impact on their operation's reputation.

An understanding of the complex reasons gloves can fail to protect properly is essential for anyone responsible for specifying them. This can include misuse, such as using the wrong gloves, using them incorrectly, using them for longer than necessary and not storing them in a proper way. Damage or selecting the wrong performance level can leave the user vulnerable, as can destruction of the glove by chemicals. Another serious cause of failure is permeation, which is the transmission of a chemical through the glove at a molecular level, and may be undetectable by the wearer.

All change

2018 has been an important year for PPE regulation, as on 21st April Regulation (EU) 2016/425 came fully into force, following a two-year transition period for member states and notified bodies to prepare for its introduction. In the UK, a notified body is an organisation that has been appointed by the department for Business, Energy and Industrial Strategy (BEIS) to carry out one or more of the conformity assessment procedures Modules B, C2 and D of Regulation (EU) 2016/425.

Regulation (EU) 2016/425 supersedes the Directive 89/686/EEC, which, as one of the original 'new approach' directives, was adopted by the European Council in 1989 and had seen very few amendments since. When it was first introduced, Directive 89/686/EEC was very important as it covered the design, manufacture and marketing of PPE. It defined legal obligations to ensure that any PPE on the European Union (EU) market provided the appropriate level of protection against hazards and made having a CE marking affixed to PPE mandatory to provide evidence of this protection.

Regulation (EU) 2016/425 is aligned to the New Legislative Framework policy and slightly modifies the scope and the risk categorisation of products to reflect current technologies and processes for developing and bringing PPE to the market. It also clarifies the documentary obligations of economic operators, enhances consumer safety and ensures fair competition between companies.

Amongst the key changes, manufacturers must issue a declaration of conformity with each item of PPE or at least a link to where it can be obtained, a compulsory maximum five-year certificate of validity and there is also a requirement for manufacturers to place their name and address on the product. For a product manufactured overseas, distributors must also verify that it bears the CE marking, and is accompanied by the required instructions in a language that can be understood by end users in the country where PPE is to be made available.

Defining moment

Under Regulation (EU) 2016/425 domestic oven gloves and mitts have now become PPE for the first time. ▸

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Just as importantly, Regulation (EU) 2016/425 includes definitions for a range of terms including manufacturer, authorised representative, importer, distributor, economic operators, technical specification, harmonised standard, accreditation, national accreditation body, conformity assessment, conformity assessment body, recall, withdrawal, EU harmonisation legislation and CE marking. It also clearly defines PPE as 'any device or appliance designed to be worn or held by an individual for protection against one or more health and safety hazards'.

PPE is divided into three product categories and safety gloves come into each one:

Category I

Otherwise referred to as Simple PPE, these items are for activities with minimal risks that have a manufacturer's self-declaration of conformance. These products include simple gardening gloves and rubber gloves used for washing up.

Category II

Otherwise referred to as Intermediate PPE this covers all items for risks other than those listed in Category I and Category III. Gloves are placed in this category when the risk is not classified as minimal or irreversible. Safety gloves must be subjected to independent testing and certification by a notified body, which then issues a CE certificate – or a Module B (EU) certificate – showing the gloves' protective capacities. This category incorporates general handling gloves requiring good puncture and abrasion performance.

Category III

Otherwise referred to as Complex PPE, this equipment is for activities that could have very serious consequences, such as death or irreversible damage to health. Category III requires certification by a notified body and annual audits at the manufacturer's site. There are two options – Module C2, which is based on audit sampling and testing and Module D, which is a management system approach based around ISO 9001.

For both Category II and III products the manufacturer needs to obtain an EU examination certificate to Module B of Regulation (EU) 2016/425. The service involves reviewing technical documentation, which must meet the requirements of both Regulation (EU) 2016/425 and testing against the appropriate harmonised standard.

Up to standard

To assist wearers with the selection of suitable gloves, several European safety standards are in place, which allow levels of protection against different risks to be clearly defined. These levels of protection enable appropriate gloves to be selected, based on the hazards and risks identified for a specific work activity.

There are more than 15,000 different chemicals in use in more than 60,000 products within industry, construction and agriculture etc. Therefore, Category II and III safety gloves ▸

need to be independently tested by a notified body or a laboratory with accreditation for that test by an ILAC approved body. The notified body validates the quality assurance system used by the manufacturer and proves that they meet the requirements of relevant ISO, EN or BS standards. Once a notified body has tested and approved a Category III product the organisation's unique four-digit code must be displayed on the product alongside the CE mark, and this differentiates a Category II safety glove from a Category III product.

There are a number of standards in use, but perhaps the most common is EN (ISO) 374 Protective gloves against dangerous chemicals and microorganisms. It consists of the following:

- *BS EN ISO 374-1:2016 Terminology and performance requirements for chemical risks*
- *BS EN 374-2:2014 Determination of resistance to penetration*
- *BS EN 374-4:2013 Determination of resistance to degradation by chemicals*
- *BS EN ISO 374-5:2016 Terminology and performance requirements for microorganisms risks*
- *BS EN 16523-1:2015 Determination of material resistance to permeation by chemicals. Permeation by liquid chemical under conditions of continuous contact*

Risky business

Another widely referred to standard is EN 388:2016 Gloves giving protection from mechanical risks. This applies to all kinds of protective gloves in respect of physical and mechanical encounters caused by abrasion, circular and straight blade cut, puncture, tearing and impact. Protection against mechanical hazards is expressed by a pictogram followed by four numbers representing performance levels, each signifying test performance against a specific hazard. For example, with tear resistance it is based on the amount of force required to tear the sample, and the protection factor is then indicated on a scale from one to four.

EN 388:2016 is intended to be used in conjunction with EN 420:2003+A1:2009 Protective gloves – General requirements and test methods, which aims to ensure that the gloves themselves do not cause harm to the wearer and are comfortable to work with. It should be noted that EN 420:2003+A1:2009 is currently under revision and will eventually become EN ISO 21420.

There are also a number of other relevant standards. When testing to EN 407 Gloves giving protection from thermal hazards, a glove's material is exposed to temperatures between +100°C and +500°C. The length of time is then measured for how long it takes the material on the inside of the glove to increase by 10°C from the starting temperature. Similarly, with EN 511 Protective gloves against cold, testing provides data of glove performance against convective and contact cold down to -50°C, as well as water permeability. EN 421: 2010 Protective gloves against ionising radiation and radioactive contamination includes special test procedures to measure the effectiveness of the glove at attenuating/ absorbing radiation and its water vapour permeability, while EN 12477 relates specifically to welding gloves.

If a manufacturer changes any aspect of the production process or the design of the product; for instance, using a new materials supplier, then the notified body must review the examination certificate and, if necessary, carry out a retest.

Material gains

The protection offered by a safety glove is largely dependent on the material used in its construction. Basic Category I garments will typically be made of cotton, rubber or cotton coated with plastic; work gloves will use stronger materials such as leather, metal and canvas; and chemical resistant and liquid resistant gloves will be constructed from butyl rubber, natural latex, neoprene and nitrile rubber. ▸

Although these materials have been extensively used for many years, some manufacturers are maximising the opportunities that science is creating through nanotechnology to produce increasingly sophisticated safety gloves that offer the best possible protection, as well as increased grip, durability, breathability and oil and water resistance.

Working in extreme temperatures can make wearing gloves an unpleasant experience, so in hot weather using products made with breathable coatings, such as polyurethane, can also keep hands cool and comfortable and provide flexibility. At the opposite end of the temperature spectrum, safety gloves used in cold and wet weather need to retain warmth to maintain flexibility, so those with a brushed acrylic inner lining can prove beneficial.

Knowledge is power

Businesses that need to provide staff with adequate PPE, such as safety gloves, should ensure they are up date to with all relevant standards. Manufacturers often produce charts to show how well their gloves perform against different substances using three key terms – breakthrough time, permeation rate and degradation – and since the performance of glove materials can vary slightly from manufacturer to manufacturer, selection should be based on the correct manufacturers' data. Making the workplace safe includes providing instructions, procedures, training and supervision to encourage people to work safely and responsibly. In addition, employers should review the use of safety gloves periodically and get employee feedback, as this can help ascertain if these items are performing as intended. ■

Author

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About SGS

SGS is the world's leading inspection, verification, testing and certification company and is recognised as the global benchmark for quality and integrity. With more than 95,000 employees, SGS operates a network of more than 2,400 offices and laboratories around the world.

Formed in 1878 as a grain inspection house, SGS has steadily grown into its industry leading role through continual improvement and innovation and through supporting its customers' operations by reducing risk and improving productivity.

Its core services can be divided into four categories:

- *Certification: Enabling customers to demonstrate that their products, processes, systems or services are compliant with either national or international standards and regulations or customer defined standards, through certification*
- *Verification: Ensures that products and services comply with global standards and local regulations. Combining global coverage with local knowledge, unrivalled experience and expertise in virtually every industry, SGS covers the entire supply chain from raw materials to final consumption.*
- *Inspection: Providing a comprehensive range of world-leading inspection and verification services, helping to control quantity and quality, meeting all relevant regulatory requirements across different regions and markets*
- *Testing: A global network of testing facilities, staffed by knowledgeable and experienced personnel, enable customers to reduce risks, shorten time to market and test the quality, safety and performance of their products against relevant health, safety and regulatory standards*

As the leader in providing specialised business solutions that improve quality, safety and productivity and reduce risk, SGS helps customers navigate an increasingly regulated world. Its independent services add significant value to customers' operations and ensure business sustainability.

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