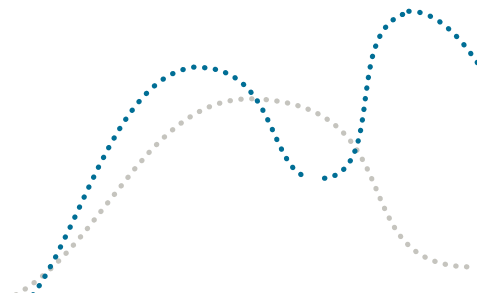




Issue1  
2017

# Our hand protection guide.

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# Our hand protection guide.

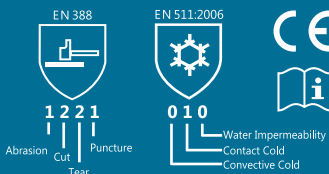
## Answering common questions in a handy guide.

### PRODUCT SPOTLIGHT



**OUR REF:** AceTherm - F

Extremely soft comfortable glove to wear in cold conditions. Bright orange acrylic liner is brushed on the inside for added insulation and comfort. Soft foam latex coating to palm enhances grip for both wet and dry handling. Excellent dexterity as coating remains flexible in low temperatures. Ideal glove for low light environments and outdoor wear.



### Introduction to the guide

The days when you needed a “pair of gloves” to protect you at work have long since disappeared. Today such a simplistic approach would be a recipe for disaster, leaving the employer open to prosecution, punitive damages and possibly corporate manslaughter charges.

Fortunately the **Personal Protective Equipment (PPE)** industry has kept pace with relevant changes in the law and Harmonised European Standards to provide a huge if sometimes confusing array of PPE to cover almost every situation. The range of hand protection available is now so varied that what was once a simple choice is now one of the most important decisions in the workplace. Founded in 1986 Ultimate Industrial has been dealing with hand protection for almost 30 years and is ideally suited to providing cost effective hand protection with a comprehensive range covering everything from leather to advanced composite styles. Our hand protection range matches and often exceeds many of the products available elsewhere at some of the most competitive prices available within the UK. With expert advice readily available our staff are on hand to ensure our customers get the correct product at the best possible price, usually within 24 hours of placing an order.

A brief guide to some of the most relevant information and standards is provided in this guide to assist with preliminary selection which we are happy to discuss when ordering. We can also visit the point of use to assist with product selection and offer distributors basic training on all our products. Copies of **CE Certificates** are available for immediate download for ALL our products whenever needed along with our own Technical Data Sheets.

### Back to the basics...

To assist in preliminary glove selection a very brief discussion on the different types of gloves, along with the more common materials used in yarns and coatings is covered in this guide.

### Knitted gloves

**Knitted** gloves are produced on automated machines ensuring consistency during production. A variety of yarns can be used with carefully selected properties to give excellent cut resistance, dexterity and breathability. A wide range of coatings can be applied to enhance physical properties such as grip, chemical protection and liquid resistance amongst others.

### Cut & sewn gloves

**Cut & Sewn** gloves, as the name suggests are made by sewing together the individual pieces of the glove usually by hand. This may result in slight differences in glove sizing, for example, and also introduces possible weaknesses in seams and stitching. Most commonly used in traditional leather gloves but also used with other synthetic materials.

### Supported gloves

**Supported** gloves are usually based on a knitted liner which is then dipped in the coating material. These gloves offer good all round performance and are available with various coatings, nitrile rubber and pvc being the most common.

### Un-supported gloves

**Un-supported** gloves are similar to supported gloves but do not have the inner liner. These can be made from a variety of materials such as latex, nitrile, pvc or mixtures of different compounds.



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# Our hand protection guide.

## Glove materials, from leather to HPPE.

### DID YOU KNOW?



**Kevlar® has a tensile strength that is 5 times that of steel and will not melt or burn.**



Kutlass® PU500 made from HPPE, high performance polyethylene.



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### Glove materials

A wide and diverse range of materials are used in the manufacture of hand and arm protection, stretching from the traditional leather to the advanced synthetic yarns.

#### Leather

**Leather** is still widely used in a wide range of PPE as it is cost effective, durable and easy to incorporate into a wide range of gloves. Split leather is commonly used in welding gauntlets and general purpose handling gloves giving good grip and heat protection. Premium leathers from other animals are also used in more specialised gloves as they are often still superior to synthetic alternatives. Leather gloves are still made essentially by hand and with the increasing cost of raw materials can often prove a more expensive option for less hazardous applications.

#### Cotton

**Cotton** offers good absorption of perspiration and is comfortable to wear for long periods. It can be used on its own or mixed with other fibres for improved durability. Commonly used in terry or cut and sewn drill gloves it offers good insulation but is not as durable as some synthetic alternatives.

#### Acrylic

**Acrylic** is soft and pliable and can be used on its own or mixed with other fibres. It is a light fibre with good insulation properties against cold and cost effective to produce. It may also be used as a liner to improve thermal insulation.

#### Polyester

**Polyester** is a tough synthetic material which can be softer than nylon on the skin. Very durable and easy to wash although it can distort at higher temperatures. Whilst flammable it tends to shrink away from flames, self extinguish and absorbs very little moisture.

#### Polyamide

**Polyamide** or nylon is a tough synthetic fibre with good stretch and durability. It offers low lint properties when used alone but is often mixed with other fibres.

#### Aramid

The most common aramid fibre used in hand protection is Kevlar® made by DuPont™. All Sitex products use genuine Kevlar® made by approved Kevlar® licensees. It is soft, durable and washable (avoid chlorine bleach). It can be used on its own or in combination with other fibres such as steel for high levels of cut protection. It offers good protection from heat as it does not ignite and is often used in sleeves as well as gloves.

#### HPPE

**HPPE** is a high performance polyethylene which is light, flexible and very cut resistant. It can be used alone or with other fibres to increase cut protection. One of the biggest advantages of this fibre is its outstanding resistance to abrasion. Unlike aramid fibres, HPPE resists chlorine bleach commonly used in commercial laundering and is virtually unaffected by UV radiation. Because HPPE fibres are very smooth and lightweight they produce gloves which are very comfortable to wear. They also dissipate heat well meaning a wearers hands are less prone to sweating.

#### Composite fibres

**Composite** fibres are combinations where one fibre is either wrapped or coated with a different material. Typical examples could incorporate steel or glass cores for extreme cut protection while maintaining a natural glove feel. This is a particularly complex area to describe as the term applies to an almost infinite range of material combinations. While combinations which include glass fibre can offer very high cut protection in EN388 coup tests, the real world performance can be very different.

# Material Comparison .

	Cotton	Polyester & Nylon	High Tenacity Nylon	Kevlar®	HPPE	Glass Fibre & Nylon	Steel & Synthetic	HPPE, Nylon & Glass	Kevlar® Steel
<b>Cut Resistance</b>	Poor	Poor	Average	Very good	Very good	Good	Excellent	Very good	Excellent
<b>Tear Resistance</b>	Average	Average	Average	Excellent	Excellent	Poor	Excellent	Excellent	Excellent
<b>Comfort</b>	Very good	Very good	Good	Good	Excellent	Excellent	Poor	Good	Good
<b>Heat Resistance</b>	Good	Poor	Average	Very good	Poor	Poor	Poor	Poor	Average
<b>Cold Resistance</b>	Good	Average	Good	Very good	Average	Average	Average	Average	Average
<b>Sweat Absorption</b>	Very good	Poor	Poor	Average	Good	Poor	Poor	Good	Poor
<b>Elasticity</b>	Poor	Average	Poor	Poor	Poor	Poor	Poor	Poor	Poor
<b>Yarn Costs</b>	Very low	Very low	Low	High	High	Low	Medium	High	High

## DID YOU KNOW?



All of Sitex branded PVC dipped gloves and gauntlets are made using phthalate free plasticisers and are fully REACH® compliant.



More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)



Our selection guides to eyewear, head protection, respiratory protection, work at height, hearing protection, workwear and clothing and footwear.



How Sitex are providing solutions to protect the user and the environment.

## The different glove coatings.

### PVC

**PVC** is perhaps one of the most common and economic coatings available but is often out performed by nitrile rubber. Concerns over plasticisers (DEHP) used in recent years have largely been addressed with more environmentally acceptable alternatives now in use. These gloves are relatively cheap to produce and offer good resistance against many common chemicals especially when double dipped. PVC is particularly effective against water based compounds but can prove problematic with oil based products as it is oil based itself. One of the main disadvantages of standard PVC is the quality of grip on smooth surfaces. This lack of grip requires the user to exert more pressure when handling smooth, wet or oily items, resulting in increased hand fatigue and may also increase the risk of cuts as an object moves across the hand.

### PVC foamed

**PVC foamed** coatings are a fairly recent development which help address the problems with lack of grip on wet or oily items. The sponge like properties help conduct the liquid away from the point of contact and therefore require less pressure from the user to maintain grip. Items are less likely to slip in the hand thus helping reduce fatigue and reduce the risk of cuts.

### Nitrile

**Nitrile**, or Nitrile Butadiene Rubber, offers similar properties to PVC but tends to be more durable and able to resist higher temperatures. Commonly used in disposable gloves as a replacement for latex but widely used for general purpose gloves. It is particularly suitable for use against oil based compounds, but water based surfactants can cause a loss of tensile strength and softening of the coating.

### Nitrile foamed

**Nitrile foamed** is used to improve the wet or oily grip properties of gloves. The slightly porous surface helps direct liquids from the point of contact between surfaces which means a user needs less effort to grip an item compared to non foamed coatings. Similar advantages to foamed PVC with reduced effort needed to grip oily or wet objects, better dry grip and the potential to reduce the cut risk.

### Latex

**Latex** is a natural rubber which has been widely used for many years especially in medical examination gloves. It has excellent stretch and flexibility and when used as a coating offers outstanding grip on dry items. Unfortunately the wide use of this product especially within the healthcare field has resulted in an increase in latex allergies in certain susceptible individuals.

**DID YOU KNOW?**



**Our suppliers are an official licensed partner of Sanitized® AG.**

**PRODUCT SPOTLIGHT**



OUR REF: Adept™

**PRODUCT DESCRIPTION**

Nylon and Lycra blend liner providing one of the most comfortable and supportive gloves on the market. Patented NFT® coating, specially developed for when precision handling is required, produces unrivalled grip in dry, wet and oily conditions. Provides class leading abrasion resistance greater than 25,000 cycles. Certified to the Oeko-Tex® standard 100 for environmentally friendly textiles. Enhanced breathability working in conjunction with the Sanitized® hygiene function provides prolonged freshness, protection and outstanding wearer comfort over heavily extended uses.



More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)

**PU (Polyurethane)**

**PU** or polyurethane coatings tend to be thinner than other alternatives and therefore offer greater dexterity in delicate handling applications. Solvent based PU performs well in oily, wet and dry handling applications and is slightly porous offering a degree of breathability. It offers good elasticity, is extremely tough and remains flexible across a wide temperature range. PU does, however, have some disadvantages in practice, the slight porosity can allow liquids to penetrate and it is not particularly good at resisting abrasion. PU gloves tend to rely on the glove base layer to provide wear resistance while the impregnated coating provides grip.

# Glove technology. Innovations in hand protection.

At Sitex, we develop and use a range of innovative coatings and technology to ensure our branded gloves offer market leading dexterity and protection.



One of the problems commonly encountered with coated gloves is a lack of grip on wet or oily items. **NFT™** is a unique, proprietary technology that provides unrivalled grip to address this issue. This works in a similar way to the tread on a tyre, directing the liquid away from the contact surface for increased grip. Micro capillaries draw oil and water away from the surface of the glove, improving grip and reducing user fatigue. **NFT®** technology also provides class leading abrasion resistance of 25,000 cycles, making this coating extremely durable, whilst maintaining superb dexterity.



All the advantages of the **NFT®** range but with the **NFT®** coating applied over the top of a flat nitrile base layer. This has the advantage of producing a waterproof glove with outstanding wet or oily grip.



This innovative process produces an extra dipped layer on the thumb crotch area. This extra layer strengthens the potentially vulnerable part of the glove resulting in a more durable product with greater longevity.

**Oeko-TEX®**



The **Oeko-TEX®** Standard 100 is an independent testing and certification system for textile raw materials, intermediate and end products at all stages of production. **Oeko-TEX®** testing for harmful substances always focuses on the actual use of the textile. The more intensive the skin contact of a product, the stricter the human ecological requirements to be met. The requirement for certification of textile products according to **Oeko-TEX®** Standard 100 is that **all components** of an item have to comply with the required criteria without exception – that means in addition to the outer material any sewing threads, linings, prints etc. as well as non-textile accessories such as buttons, zip fasteners, rivets etc must also comply.



**HPT®** is a unique proprietary technology which produces a coating with outstanding comfort and performance. **HPT®** provides exceptional wet grip as the Hydropellent Technology™ repels liquids from the contact surface. The encapsulated air molecules have the added advantage of helping cushion the hand from minor vibrations for increased user comfort.



**Sanitized® Protection from the inside out.**

The **Sanitized®** hygiene function is incorporated into many of our gloves to minimise bacteria therefore minimising odour development and promoting freshness. The active biocidal substance used is zinc pyrithione.

# EN 388 standard. Cut index in more detail.

## DID YOU KNOW?



EC Directive was adopted on 21st January 1989 and came into force on 1st July 1992.



Our KKS sleeves made from Dupont® Kevlar®, available in 10,14,18 and 22 inch.



1 3 4 3

Abrasion  
Cut  
Puncture  
Tear



X 1 X X X X

Contact Heat

## EN388 Cut index

Although covered in our 'Hand and arm protection: standards and regulation' guide, it is worth exploring arguably the most crucial, but still ambiguous, components of EN388 in further detail - the cut index.

The **Cut Index** is the test which has come to the forefront in recent years and is the one most safety officers look at first. It's a very simple choice on the face of it.

**I need to protect my workers from cuts so I will give everybody the cheapest Cut Level 5 glove I can find.** After all, every cut level 5 glove offers the same level of protection, they are all cut proof and should last the same length of time. Simple...well no, not in reality. Cut level 5 gloves vary considerably in cut performance and are NOT cut proof. There are a wide range of factors to take into consideration when choosing the correct glove and we will try and cover a few of the more important considerations below.

### The cut test itself

While the standard coup test in EN 388 gives a reasonable indication of cut protection it is far from ideal in real situations. The moving blade tends to give better results on glass composite yarns and ceramics as they are more slippery and harder to cut with a moving blade and also blunt the blade. Steel composites on the other hand tend to slow and jam the blade as there is metal to metal contact.

Gloves, like any product can be engineered to pass a specific test which seems to be the case with lower cost gloves incorporating glass fibres. This type of construction can give outstanding results in the EN 388 cut test but very poor results in real applications. Glass is very brittle and breaks down under impact and cut pressure resulting in very poor performance in real life applications. Imagine trying to cut a glass bottle with a knife, the blade will slide over the surface with little damage but if you did the same thing with a metal cylinder, the knife would be harder to pull over the surface. In our experience **Cut Level 5** gloves incorporating glass fibre tend to give poorer performance in real world situations than **Cut Level 5** gloves based on steel or other yarns.

It should also be taken into consideration the fact that there is no upper limit on **Cut Level 5** results. This means that Cut Level 5 gloves can have huge differences in real world applications where one can have a cut index of 20 and another 100 yet both are marked as **Cut Level 5**.

Please also bear in mind that the **Cut Level** is not a linear measurement, so for example

a **Cut Level 5** glove has 4 times more resistance to cuts than a **Cut Level 3** glove.

### What else should be considered?

**Do you actually need a cut resistant glove at all.** Seems a strange thing to consider, but like all PPE requirements it is always the best option where possible to consider ways of removing the hazard in the first place. If it is not possible to avoid the hazard then can it be reduced to a lower level risk.

**Try it.** Simply put, try different gloves in the workplace. A glove costing twice as much but lasting three times as long as a cheaper alternative is still a better choice. You may not need a Cut Level 5 glove and a lower cost alternative may be a viable alternative.

**Find a good supplier.** Ultimate Industrial have been selling safety gloves since 1986 and offer a vast depth of knowledge in this field. With a varied range based on nearly 30 years of experience we can offer the advice that can really make a difference.

**Is the glove actually tested.** With a lot of cheaper imports and more and more "glove experts" entering the market it is more important than ever to check the test results claimed by the supplier. Think of **CE** as standing for "**C**heck **E**verything". Ask your supplier for the CE Certificate for the glove and then check it carefully, is it to the actual glove concerned or a "similar" product. Is the suppliers name actually on the certificate, is to the correct standard and can you verify it with the testing house? Ultimate Industrial will happily supply copies of certification for any of our products on request.



More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)

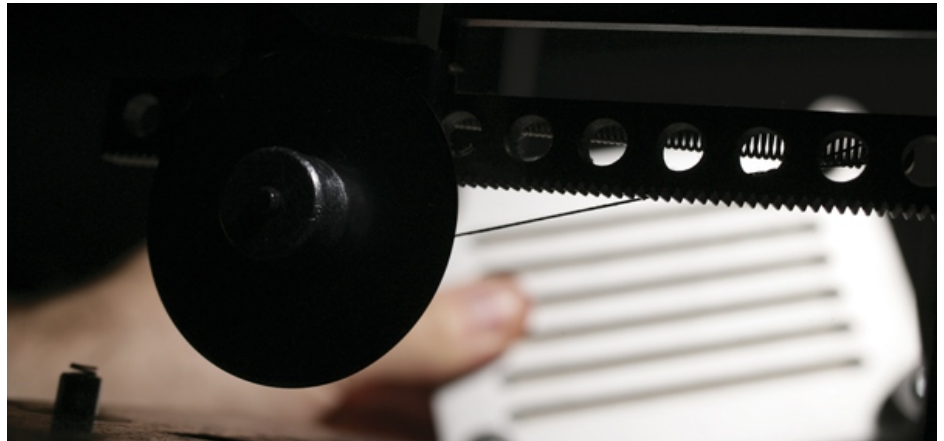
# EN Standards.

## EN388: Cut index in more detail.

### DID YOU KNOW?



EN 388 – Blade Cut Test (Coup type) is a long-established test, in use since 1994, and forms part of EN 388:2003 for glove materials.



**Does the glove fit.** “One size” really doesn’t suit all. A poorly fitting glove often requires the user to grip harder and increases the risk of the object sliding in the hand, increasing the risk of cuts.

**What coating (if any) is needed.** Glove coatings increase grip and physical properties, protect the user from contaminants and prolong glove life.

**What about dexterity.** Generally speaking the thinner the glove the better as long as it can offer the required protection. If the user needs dexterity, they generally need a thinner glove or they will be tempted to remove it for delicate operations.

**Stock Levels.** Choosing the correct glove is pointless if you then find you can’t find where to buy it. Ultimate Industrial imports directly giving complete control over the supply chain and holds some of the largest stocks of PPE in the UK.

**Wear the glove.** As with any PPE it is only effective if used. If a glove is uncomfortable or impedes the user then there is always a chance they simply won’t wear it.

**2. How does the test data relate to the application.** The EN388 tests for cut are carried out using a knife blade which while on the face of it are the same as a sheet of steel. In reality sheet steel can have more of a tearing rather than cutting action as the edge is rarely smooth. While the EN388 test gives an indication of performance it is fundamentally flawed as the two steel edges can be very different.

**3. Edge properties.** Thin steel has a smaller burr when cut by stamping than thicker steel. Rougher edges need thicker gloves with more abrasion resistant coatings to be effective. When used with thicker steel, gloves need a higher tensile strength and the coating becomes more of a consideration.

**4. Shape.** Often overlooked, the shape becomes important when there are long edges which may move through the hand. While in practice it is difficult to avoid some slipping through the hand careful selection of coating can improve grip, especially on oily items, to keep this to a minimum. The tendency to use the hand to slow items as they come off conveyors should also be avoided if possible.

**5. Weight.** It is fairly obvious that heavier objects with a sharp edge will have a greater cutting potential than lighter ones. Thicker heavyweight gloves should be used with heavier items because they increase cut protection and can also cushion the hand to some extent.

### The cut Index in practice

One of the most common applications for cut resistant gloves is in the handling of sheet steel and we will consider some of the practical considerations below.

**1. Do you have to handle the material?** Is it possible to use mechanical aids to handle the steel or to automate the whole process. This is clearly the best option but is rarely practical or cost effective in reality.



£6,500<sup>+</sup>

Every new certification process can cost between £250 to over £6000 and take weeks to complete.



More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)



Our selection guides to eyewear, head protection, respiratory protection, work at height, hearing protection, workwear and clothing and footwear.



An explanation of the standards and regulations for all types of different PPE.

# EN Standards.


## EN388: Cut index in more detail.

### PRODUCT SPOTLIGHT

OUR REF: Kutlass® PU500G

#### PRODUCT DESCRIPTION

A specialised blend of advanced yarns provide cut level 5 protection in a lightweight, highly versatile glove. The incorporation of spandex vastly increases comfort and fit. Flexible PU coating provides superb dexterity and grip. The breathable liner reduces perspiration and works in conjunction with the Sanitized® hygiene function to provide a fresh, comfortable and odour free experience throughout extended usage.

Part of the **Colour Coded Range** 

EN 388 

CE 

4 5 4 3 

Abrasion Cut Puncture  
Tear



 More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)

**6. How hard is the material.** There are a huge range of steel types available from mild to stainless, tempered, surgical etc with different edge properties. The harder types will usually need gloves incorporating steel to resist these products effectively.


**7. Surface finish.** Sheet metal is rarely dry as oils and lubricants are regularly used as part of the manufacturing process. Oily surfaces benefit from gloves with “foamed” coatings which have a degree of absorption to conduct the oil away from the contact area. In certain applications, such as tightening a nut, some degree of slip may be advantageous.


**8. Lubricants and chemicals.** Steel may have a residual process coating from machining or surface treatments. As well as being able to grip the steel, the user should also be protected from possible contamination. There is little point in using a coating which will be degraded by any of the chemicals used. The basic properties of common coatings has been dealt with earlier in this document.

**9. Puncture versus cuts.** The end result of a puncture wound is very much the same as a cut as far as the user is concerned. Highly cut resistant gloves are almost exclusively of knitted construction which is particularly ineffective in protecting against puncture due to its open weave. As explained elsewhere, the puncture test can be very inconsistent on knitted gloves as the test point may hit a fibre or the gap between fibres. In this case the glove coating can provide more protection than the glove shell.

**10. Moving edges.** No glove can protect effectively against a continuously moving or rotating blade or edge. In fact more serious injury can result when wearing highly cut resistant gloves because if the glove catches on the blade it can drag the users hand, arm or even whole body into the machinery.

 More information available online at [www.sitexindustrial.com](http://www.sitexindustrial.com)

 Our selection guides to eyewear, head protection, respiratory protection, work at height, hearing protection, workwear and clothing and footwear.

 The other components of EN388 explained.

### Testing houses

Our suppliers only use trusted and accredited testing houses to certify our products. Among many, these include:





