

- ▶ Hand-arm vibration syndrome
- ▶ Ensuring glove use compliance
- ▶ Future of glove technology
- ▶ Tips for choosing the right glove

HAND PROTECTION Best Practices

**ALL
NEW
CONTENT**

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introduction

Welcome to ISHN's third volume of feature articles and sponsored content relating to workplace hand protection. Hand and arm protection – work gloves and sleeves – are among the most important personal protective equipment (PPE). Almost everyone uses their hands on the job, especially in manufacturing and construction. And all the types of work needed to be done by hands makes finger, palms, the back of the hand, and the forearm vulnerable to cuts, lacerations, abrasions, punctures, vibrations, impacts, chemical burns, thermal burns and skin absorption of harmful substances.

Injuries to hands are very frequent and often serious. Deep cuts can become infected. Chemical splashes can lead to allergic reactions. Burns can require extensive medical care. And then there are amputations of fingers and hands, and smashed digits

that will never be the same. The U.S. Bureau of Labor Statistics reports that occupational hand injuries represent 40 percent of all lost-time injuries. There were about 150,000 injuries to the hand that required recuperating time away from work, according to the BLS.

The articles in this eBook have one aim: to protect your workers from the wear, tear and long-term punishment their hands might have to endure: sprains, strains, tears, soreness, pain, cuts, lacerations, punctures, bruises, contusions, fractures and amputations. There is a wide and ever-increasing variety of glove types and materials for you to select from, based on the hazards your workers face. You'll find helpful information about glove R&D, standards, and selection tips in the articles in this eBook:

Dave Johnson - *ISHN* Editor

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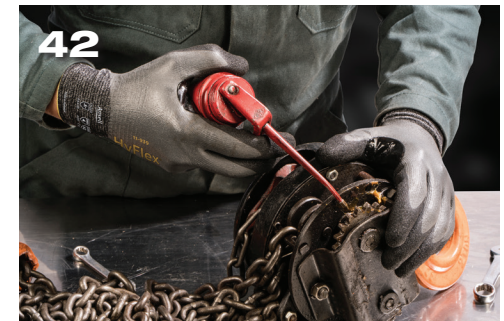
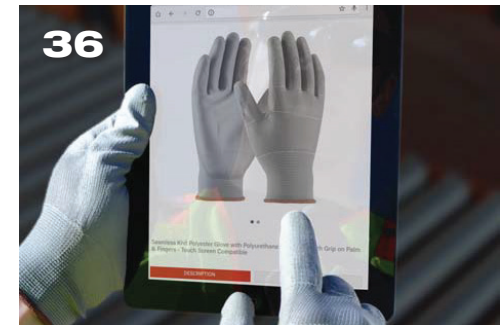
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Coming soon: a glove impact standard

ISEA standard will measure reduction of peak impact force

By DAVE JOHNSON, *ISHN* editor

When you think about it, you spend more time looking at the back of your hand than the palm when working with your hands. The back of your hand is called the dorsal aspect of the hand, and since much work is done with the palms down and the dorsal side exposed, it's vulnerable. Many times, when hands are injured at work, the damage is done to the dorsal side, which is complex network of small bones, muscles and tendons. Dorsal side injuries are particularly common in oil and gas drilling, mining, and heavy construction.

Glove suppliers and safety experts have recognized for years the damage that impact hazards can cause to the fingers, knuckles and bones in the back of the hand. Many glove suppliers market gloves with specific designs and materials to protect wearers against back-of-hand broken bones, pinching and bruising. Impact-resistant work gloves have unique protective features such as Thermoplastic Rubber (TPR) or Thermoplastic Elastomers (TPE) and proprietary foams that shield the top of your hand from unexpected impact, smashes, crashes and abrasion injuries. Soft, flexible, shock-absorbing pads can be strategically placed along the back of the hand for maximum cushioning while not interfering with how your hands function. These heavy duty gloves are most commonly used in automotive, oil and gas, construction, heavy equipment



operation and towing/transportation industries.

Being aware that dorsal protection work gloves are widely available on the market is a start. But how does a purchaser know the quality of that protection? Currently, there are no hand protection standards for measuring hand impact reduction. Manufacturers are not required to test the impact protection of their gloves, and this can lead to various claims and sub-optimal protection. How do you evaluate and compare impact protection offered by various glove models?

Coming soon: a glove impact standard

continued

Filling the void

The sole international standard regarding anti-impact hand protection addresses only knuckle protection. But this void is soon to be filled by a U.S. voluntary standard – ISEA 138, Performance and Classification of Impact Resistance Hand Protection. ISEA is the International Safety Equipment Association, made up of the leading personal protective equipment (PPE) manufacturers, including glove manufacturers, as well as other safety product suppliers. ISEA has a Hand Protection Group of 22 glove manufacturers, and in 2016 the

group began work on setting a uniform standard to measure the reduction of peak impact force across the hand.

The testing and performance criteria standard originally was conceived as a component to the widely-used ANSI/ISEA 105-2016, American National Standard for Hand Protection Classification. But now, according to ISEA Director of Membership and Technical Services Christine Fargo, ISEA 138 will be a stand-alone document rather than added content to the ISEA 105 standard. ISEA expects the standards-setting process to be completed by end of 2018, according to Fargo.



ISEA has a Hand Protection Group of 22 glove manufacturers, and in 2016 the group began work on setting a uniform standard to measure the reduction of peak impact force across the hand.

According to ISEA, glove suppliers and workplace safety experts recognize that impact hazards can cause injuries to the fingers, knuckles and bones in the back of the hand. Many suppliers, such as D3O, Superior Glove, Mechanix, MCR Safety, Majestic, Ironclad Performance Wear, Condor, Uline, Magid and Impacto and others offer gloves with features designed to protect wearers against these injuries, but to-date there are no uniform tests to evaluate gloves for impact protection. The ISEA

Coming soon: a glove impact standard

continued

project will focus on developing industry-accepted test criteria to measure the reduction of peak impact force across the hand, and a set of classifications to enable users to select gloves suited to their work environments.

Ironclad, on its website, posts details about measuring peak impact force reduction with gloves being worn on a mannequin hand, while the force measurements should be taken on the surface of the hand beneath the protective glove. The hand must mimic the soft tissue and hard structure (bones) of the human hand, as well as the three dimensional shape of the hand, says Ironclad. The impact measurements can be taken from three regions: the metacarpal region, the fingers, and the knuckles, and must be presented as a percentage of reduction in peak impact force at each region of the hand.

An 80-percent reduction in peak impact force equates to a 200-pound impact being reduced to a 40-pound impact (likely to cause bruising only), according to the Ironclad post. Thresholds for injuries vary widely from person to person and between different pinching, bruising, and fracture injuries, according to Ironclad.

Ask for impact protection

Global Sales and Marketing Manager, Rodney Taylor, who leads D3O's Industrial Personal Protective Equipment (PPE) business, explained in an ISEA press release:

“In North America, there are really no government mandated performance standards in place, like we see in some other regions of the world with large volume PPE consumption. The result is that safety professionals are faced with the daunting task of wading through thousands of different products – all with different performance claims – to select the appropriate PPE for their workers.

“The sole international standard regarding anti-impact hand protection addresses only knuckle protection.”

“For impact protective gloves, performance can vary widely by manufacturer. Yet, without a performance standards infrastructure in place for impact protection, there is no reliable means of making comparisons between different products on an equal basis.

“Standards provide an objective means of evaluating performance and reduce complexity in the purchasing process. But, in a voluntary standards compliance environment like the U.S., manufacturers will only produce products that meet standards if there is demand from end users. So there is a burden on PPE purchasers to request products from the value chain that meet specific standards.”

MCR Safety – We Protect People!

Whether it's the construction site, shop floor, or oil rig, we are providing solutions to workplace hazards. We are MCR Safety! Workers who wear our gear refused to be outperformed and so do we. Today 18% of all concrete injuries are from cut, lacerations, and punctures. The next most commonly occurring occurs from being struck by an object. Just as professional athletes require the latest technology to maximize their performance, today's workers need the latest PPE gear to maximize their productivity and remain safe.

MCR Safety distinguishes itself as a manufacturer of our core product groups. Our knowledge as a manufacturer helps us evaluate other sources of supply to assure reliable quality and competitiveness. Additionally, we pride ourselves in providing our distributors technical expertise and superior customer service. While Hilliard Crews, our founder, had humble beginnings with only his wife to assist in early operations, today MCR Safety is recognized as a global PPE leader. We have been recognized multiple times for New Product of the Year Innovations and awards in manufacturing operations.

Safety Gear for Today's Industrial Athletes

96790HVI Watch Your Hands Gloves

The 96790HVI provides users with tactile sensitivity, dexterity, and abrasion resistance. This glove offers a 15-gauge gray nylon shell with high visibility orange premium nitrile foam on the palm and fingers. The premium nitrile foam offers excellent abrasion and grip protection. The 96790HVI offers a personal reminder to "Watch Your Hands" on the back of the glove. It is available in sizes small through XXL.

HellKat HK2/HK3 Glasses

The HellKat® 2 gives you all the features you want for a comfortable and stylish option in protective eyewear. This generous lens offers an outstanding orbital seal and



MCR Safety – We Protect People! *continued*



prevents hazards from threatening one of your most treasured belongings - your eyesight. The HellKat® 3 features a closed cell foam seal around the lens for better protection. Soft secure TPR (Thermal Plastic Rubber) nose pads give you long lasting comfort and non-slip soft bayonet temple helps hold the eyewear firmly in place. The HellKat® 2 and HellKat® 3 both feature our Max 6™ anti-fog coating which is proven to provide six times greater fog-resistance and dissipation as well as exceed ANSI Z87+ standards for high impact.

FF2930 ForceFlex Gloves with D3O Technology

MCR Safety is proud to expand the ForceFlex® line of multitask gloves. We are the first to offer D3O® technology protection both in the palm and back of hand in multitask gloves. The D3O® back of hand protection, high shock-absorbing



MCR Safety – We Protect People! *continued*

properties out-perform similar materials and is thinner allowing full flexibility and range of motion. Testing endorses:

- Back of hand impact dissipation up to 54% better while 57% thinner
- Impact dissipation on fingers up to 46% better while 37% thinner

Our FF2930 ForceFlex® series was Developed with Exxonmobil to produce highest performance impact protection, industry leading grip in dry, wet or oily conditions and maximum comfort and dexterity (best combination of protection and performance). Distinguishing characteristics include aqua blue two-way spandex back, tan suede synthetic leather palm with hybrid forchettes and reinforced thumb crotch for greater durability, and expansion gussets for ease of donning.

Additional features are the slip-on cuff with gusset, pull tab and ID panel for personalization. Sizes available for the FF2930 are medium through double extra-large. Machine washable, air dry

Endorsements in the field:

- Driller - “Can feel the Drawworks Brake handle / Mud pump handles better with my fingers”
- Oil rig trainer (CAVU) coach “Better grip, tactility and dexterity compared to more flexible and work really good in both wet and dry conditions”

Applications include oil and Gas, Heavy construction, mining, demolition, Heavy equipment operation, manufacturing, transportation, and maintenance and repair industries.

WATCH YOUR HANDS SUPERIOR ABRASION RESISTANCE COMFORT - DEXTERITY - GRIP



The 96790HVI provides users with all-day comfort, tactile dexterity, a strong grip and superior abrasion resistance. Offers 47% greater abrasion protection than the closest competitor. Features a high visibility orange palm with a personal reminder to "Watch Your Hands" and to be safe.

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An annoying little cut?

Don't be so fast to shrug off "minor" cuts & punctures

By DAVE JOHNSON, *ISHN* editor

You've seen plenty of occupational injury stats, here is one that's startling: In 2012, workers suffered 186,830 nonfatal injuries to the hands and wrists serious enough to warrant days away from work, according to the U.S. Bureau of Labor Statistics. That's 511 hand and wrist-related lost-time injuries every day of the year. This alone is enough to ensure you have a robust hand protection program.

Many of these serious hand and wrist injuries involve fractures, amputations, burns, carpal tunnel syndrome and tendonitis. But in 2014, BLS reports there were approximately 100,000 cuts, lacerations and punctures. These are the most likely everyday injuries to the hands – many time incurred by workers not wearing gloves. Many will require on-site first aid treatment and the worker goes back to the job. But think about it: Many more minor nicks, cuts and punctures to the hands will go unreported. Workers shake it off, maybe self-treat and put a bandage on the wound, thinking little of it.

A very close call

But consider the story of Chris Aldred, an IT specialist in Great Britain who cut his finger moving a computer, as reported in the London newspaper the Daily Mail. He didn't give it a second thought. He said he had worst cuts open an envelope. But two



weeks after his cut he felt a sharp twinge in his lower back. He also had a high temperature, felt hot and shivery, and had aches and pains - he assumed it was the flu. Three days later, Chris tried to get up to go to the bathroom in the middle of the night but was unable to move his legs. He was terrified.

An MRI scan revealed an eight-inch mass on his spine. The mass was an abscess. Doctors explained *Staphylococcus aureus* bacterium, known for causing infections, had entered his

An annoying little cut? *continued*

body via a recent wound or cut. Doctors drained the abscess during surgery. It relieved the pressure on his spinal cord, but Chris remained paralyzed. It wasn't clear if long-term damage had been caused. He was put on intravenous antibiotics to fight the remaining infection. Three days later, he felt confused, couldn't stop shaking, and was sweating so much his bedsheets had to be changed. He had developed sepsis, caused when the body overreacts to an infection - his abscess. Sepsis attacks organs and tissues, causing a life-threatening drop in blood pressure and organ failure.

Every year, severe sepsis strikes more than one million Americans, according to the National Institute of General Medical Sciences. It's estimated between 28 and 50 percent of these people die.

After five days of antibiotics, the infection was brought under control. Doctors warned of a slow recovery and couldn't say if Chris would walk again. Within three weeks of his operation, he could wriggle his toes. With physiotherapy, he rehabbed slowly and was able to walk unaided five months after falling ill. Eighteen months after cutting his finger, Chris finally returned to work.

Injury or infection to a finger or fingers is a common problem, according to WebMD. Infection can range from mild to potentially serious. Often, infections start out small and are relatively easy to treat. But failure to properly treat these infections can result in permanent disability or loss of the finger – or in Chris Aldred's case, something much worse.

Signs & symptoms of infection

Your workers should know that early recognition and proper treatment of finger cuts and punctures that become infected will help prevent most of the serious outcomes. Most infections are caused by bacteria. Symptoms vary widely. A burning or itching sensation may be present. There may be mild swelling. There also may be open wounds in the area affected occur in clusters after the formation of a small blisterlike lesion. The fluid in these lesions is usually clear in appearance but may be slightly cloudy. You may also have a low-grade fever and have swollen and tender lymph nodes in the area, according to WebMD.

If the motion of the fingers and hand is painful or difficult, this may indicate a deep space infection of some type. A deep space infection that arises in the web space of the fingers is also called a collar button abscess. The space between the fingers will be painful and swollen. The area may also be red and warm to the touch. As the abscess becomes larger, the fingers will be slightly spread apart by the increasing pressure. The central area may have a soft spot that represents a collection of pus under the skin, according to WebMD.

Don't wait to see a doc

If any signs and symptoms are present, you should contact your doctor at once, according to WebMD. If you have signs or symptoms of a superficial infection or deep space infection, you should seek emergency care at once.

An annoying little cut? *continued*

Another medical source, MedicineNet.com, which is reviewed by physicians, says if the wound begins to drain yellow or greenish fluid (pus), or if the skin around the wound becomes red, warm, swollen, or increasingly painful, a wound infection may be present and medical care should be sought. Any red streaking of the skin around the wound may indicate an infection in the system that drains fluid from the tissues, called the lymph system. This infection can be serious, especially if it is accompanied by a fever. Prompt medical care should be sought if streaking redness from a wound is noticed, according to MedicineNet.com

This medical source also states if you cannot control the bleeding from a cut or scrape (abrasion), seek medical attention. Any cut that goes beyond the top layer of skin or is deep enough to see into might need stitches, and should be seen by a doctor as soon as possible. Generally, the sooner the wound is sutured, the lower the risk of infection. Ideally, wounds should be repaired within six hours of the injury, according to MedicineNet.com

Puncture wounds do not usually bleed much, but treatment is necessary to prevent infection. A puncture wound can cause infection because it forces bacteria and debris deep into the tissue, and the wound closes quickly forming an ideal place for bacteria to grow, according to MedicineNet.com

If and when you see a doctor, be ready to answer these questions, according to WebMD:

- How did the injury or infection start?
- When did this first occur or begin?
- Where did it occur? Home? Work? In water? In dirt? From an animal or human bite?
- Is it possible that a foreign body is in the wound?
- What have you done to care for this before seeing your doctor?
- When was your last tetanus shot?
- Any previous injuries to the area?
- Any other medical problems that you may have not mentioned?

Get a hold on hand safety

Prevent lost time and money with awareness & training

By BENITA MEHTA, Managing Editor

According to data from the Bureau of Labor Statistics¹, in 2016 there were 1,118,400 nonfatal occupational hand injuries involving days away from work in private industries in the United States. Hand injuries resulting from cuts and puncture cost the construction industry approximately \$382 million each year, second only to back strain and sprain injury, according to the BLS.

The National Safety Council offers a guide to estimating costs: Direct cost of a laceration is about \$10,000; stitches about \$2,000 plus indirect costs; butterfly about \$300; and a severed tendon about \$70,000.

A hand injury can interfere with a worker's job performance and quality of life, and sometimes end a career.

Protect your hands

According to the BLS, 70 percent of workers who experienced hand injuries were not wearing gloves.

To help prevent workplace injuries, OSHA's hand protection (PPE) standard mandates that employers select and require employees to use appropriate hand protection when employees' hands are exposed to the following hazards:



- skin absorption of harmful substances
- severe cuts or lacerations
- severe abrasions or punctures
- chemical burns or thermal burns
- harmful temperature extremes

OSHA recommends that “gloves be selected based on the task that will be performed, the chemicals encountered,

Get a hold on hand safety *continued*

and the performance and construction characteristics of the glove material.”²

Choosing the right hand tool is also a key part of protecting your hands.³ Tools with handles that fit your hand reduce fatigue, increase productivity and reduce the risk for hand and wrist problems. Having to grip a tool too tightly or bend your wrist awkwardly to use a tool can lead to repetitive strain injuries and reduce your grip strength.

Common hand injuries

- Fractures, crushed injuries and amputations
- Lacerations, cuts and punctures
- Skin disorders caused by contact with chemicals and burns
- Work-related musculoskeletal disorders (MSD) caused by using a forceful grip, awkward hand and wrist positions, and/or excessive hand vibration

A hand injury, such as the loss of a finger, a broken bone, nerve damage, MSD, or skin disorder, can interfere with a worker’s job performance and quality of life, sometimes ending a career. Work-related hand injuries are also costly to the employer, in terms of lost work time and productivity, and higher insurance rates.

Avoid injuries on and off the job

If you work with your hands for most of the day, you might be at increased risk of repetitive stress injuries.³ Plenty of common activities present additional risks to the hands, including yard work, working on a car or power tool use. Practicing the same hand safety habits you follow on the job will help keep your hands safe at home.

The following hand –related illnesses often go unnoticed until they become more serious, but may begin in the workplace.

- Carpal tunnel syndrome – caused by a pinched nerve in the wrist, it leads to tingling or numbness in the fingers and sharp, shooting pains in the wrist.
- Osteoarthritis – also known as wear-and-tear arthritis, it occurs when cartilage between bones wears down over time. Symptoms include pain, tenderness, stiffness or a grating sensation when moving the affected joint.
- Tendonitis – caused by inflammation of the tendons, symptoms of tendonitis include tenderness, pain and swelling.

Sources:

1. <https://www.bls.gov/news.release/osh.nr0.htm>
2. <https://choosehandsafety.com/choosing-gloves>
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Voluntary Standards Cover the Spectrum:

From Hand Protection to Safety Colors

In an effort to communicate the vital role that standards play in daily life, the [American National Standards Institute](#) (ANSI) will publish, on an ongoing basis, a series of snapshots of the diverse standards initiatives undertaken in the global and national standards arena, many of which are performed by ANSI members and ANSI-accredited standards developers. Two of the latest selections follow:

Hand Protection

According to the International Safety Equipment Association (ISEA), nearly 20 percent of industrial workplace injuries involve cuts and lacerations to the hands and fingers. To assist employers and employees alike in selecting the appropriate gloves to protect against workplace hazards, ISEA recently released ANSI/ISEA 105-2016, Hand Protection Selection Criteria.

ANSI/ISEA 105-2011 covers gloves, partial gloves, and mittens used to provide protection against specific hazards such as chemicals, cuts, or burns. The standard provides a numeric scale to rate product contaminant and exposure properties against a variety of performance assessments related to chemical and industrial applications. With this scale, users can make better-informed decisions about which gloves are most suitable for the task at hand.

The updated American National Standard (ANS) supersedes



the 2011 edition and includes test methods to determine abrasion resistance, a cut resistance performance calculator for use in classifying gloves designed to protect against cuts, as well as a section describing how fit, function, and comfort factor into proper selection. ANSI/ISEA 105-2016 also includes reference information on special considerations such as biological protection, extreme temperature applications, cleanroom applications, hazardous materials response applications, electrical protection, and radiation hazards.

Safety Colors

Almost four decades ago, the ANSI Z53 Committee on Safety Colors was combined with the ANSI Z35 Committee on Safety Signs to form the ANSI Z535 Committee on Safety Signs and Colors. The committee works to develop standards for the design, application, and use of signs, colors, and symbols intended to identify and warn against specific hazards and for other accident prevention purposes.

One development is the ANSI/NEMA Z535 SET, Safety color code - Complete set. It includes all six above-mentioned parts and the ANSI Z535 Safety Color Chart, which gives the user a

Voluntary Standards Cover the Spectrum:

continued

sample of each of the safety colors: red, orange, yellow, green, blue, purple, white, and black. It also describes each color's ink formulation and closest PANTONE color.

ANSI offers subscriptions by selecting [listing of over 100 standards developing organizations](#) or selecting from a [listing of pre-defined industry collections](#) currently available for subscription. A [Standards Subscription from ANSI](#) provides convenient and cost-effective, multi-user access to specific standards. Subscribers can create a customized site license collection by selecting standards from a wide range of different standards developers.

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About ANSI

ANSI is a private non-profit organization whose mission is to enhance U.S. global competitiveness and the American quality of life by promoting, facilitating, and safeguarding the integrity of the voluntary standardization and conformity assessment system. Its membership is comprised of businesses, professional societies and trade associations, standards developers, government agencies, and consumer and labor organizations. The Institute represents the diverse interests of more than 125,000 companies and organizations and 3.5 million professionals worldwide.

The Institute is the official U.S. representative to the International Organization for Standardization (ISO) and, via the U.S. National Committee, the International Electrotechnical Commission (IEC), and is a U.S. representative to the International Accreditation Forum (IAF).. For more information, visit www.ansi.org.



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Chemical protection is needed for working hands

Skin disease cases exceed recordable respiratory illnesses

By MAUREEN PARAVENTI, Web Editor

A great deal of attention about chemical dangers in the workplace gets focused on inhalation as an exposure route, but skin contact – especially via busy hands -- can also result in significant harm to human health. In many cases, skin is a more significant route of exposure than the lung. This is particularly true for non-volatile chemicals which are relatively toxic and can remain on work surfaces for long periods of time. Toxins can damage the skin directly, be absorbed into the body through the skin or enter the body via hand-to-mouth transfer. Many studies indicate that absorption of chemicals through the skin can occur without being noticed by the worker.

Skin v. lung exposure

How widespread is the need for chemical barriers? Skin exposure to chemicals in the workplace is a significant problem in the U.S. Both the number of cases and the rate of skin disease exceed recordable respiratory illnesses. In its Pocket Guide to Chemical Hazards¹, the National Institute for Occupational Safety and Health (NIOSH) identifies approximately 450 organic substances for which skin protection is required.



Hand protection that is in the chemical protective clothing (CPC) category is vitally important in the control of chemical hazards in the workplace. Having said that, neither NIOSH nor

Chemical protection is needed for working hands *continued*

OSHA recommend relying on CPC as a first line of defense against chemical exposure, because it is not always reliable in providing consistent, dependable protection.

It's important to keep in mind that commonly available glove materials provide only limited protection against many chemicals. The best approach is to select the most appropriate glove for a particular application and to determine how long it can be worn and whether it can be reused.

CPC should be only one component of an approach that includes substitution or elimination; process change; isolation/enclosure; ventilation; good housekeeping; training, medical surveillance programs; and environmental monitoring. This comprehensive strategy can be effective at controlling all chemical hazards, including those that primarily involve potential contact with the skin because of aerosol impingement or direct contact.

How to determine CPC hand protection needs?

Companies must consider cost, practicality of use, workplace exposure conditions, and toxicity when choosing CPC.

OSHA's Personal Protective Equipment (PPE) standard (1910.132²) requires a hazard assessment that includes: conducting a survey of each operation; identifying specific

potential hazards; organizing the data; and analyzing the information. The analysis should include a determination of the level of risk and seriousness of the potential injury from each hazard found in the area.

NIOSH has a Recommendations for Chemical Protective Clothing database³ that's a good starting point for those seeking information about CPC hand protection. Keep in mind, though, that although glove materials and construction are tested, the actual use conditions of the CPC may differ from those in the laboratory in terms of working temperatures, mechanical stresses and exposure to chemical mixtures. Additionally, workers may need a certain level of tactility when performing a job. NIOSH says more frequent changes but better usability may be an acceptable trade-off for choosing a glove with a shorter breakthrough time. Another factor to consider: gloves will likely become contaminated on the inside by repeated doffing and donning.

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2. www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9777
3. www.cdc.gov/niosh/ncpc/default.html

Delicate parts

The importance of a hand safety plan

By TJ SCIMONE

Every workplace has unique health and safety requirements: office settings aren't hard-hat zones and crab fishers don't worry about typing-related carpal tunnel syndrome. Yet hand safety is a concern regardless of environment or job type. Human hands are amazing feats of

engineering with complex interactions among bones, muscles, and ligaments, but this makes them vulnerable to injury. And, if you think about it, there are hardly any jobs that can be done without the use of hands, which is why hand safety is vital for health and safety programs in every industry.



Minor injury, major impact

Minor hand injuries have a disproportionate impact compared with minor injuries elsewhere on the body. Hands are relatively delicate body parts that are always in use and easy to injure. A small cut on the skin of the leg, for example, may be a quick repair, but a cut of the same depth on a hand can cause permanent damage. Hand injuries take a long time to heal, resulting in time loss and lowered productivity. A comprehensive hand safety plan is crucial to a healthy workplace. Here's how to get started.

Understanding your risk

Any effective hand safety program begins with a thorough understanding of the risks that are particular to your workplace. Some of these will be obvious—heavy machinery, utility knives, and power tools come to mind—but sometimes it takes a fresh look to find all the potential hazards. A great way to catch these

Delicate parts *continued*

is to do a walk-through of your facility. Watch people work and analyze their tasks. Think about what could go wrong.

Considerations for your hand safety audit include the following:

- Ergonomics - Keep in mind that any motion, when repeated over time, can cause repetitive strain. This is especially true in the hands and wrists.
- Pinch Points and Crushing Hazards - These are most evident in heavy machinery and power tools.
- Lacerations - These are a risk with any cutting action, whether from a large machine, a handheld power tool, or a hand tool like a box cutter.

Once you think you have a comprehensive list of hazards, make sure to ask staff members if you've forgotten any. Your mitigation strategies will only be effective if you've captured all the dangers in the first place, so take the time to be thorough in this crucial first step.

One step at a time

Once you have a comprehensive list it's time to tackle hazards. The best way to do this is systematically. The details of your plan will likely depend on several factors, including your resource constraints. These might include the following:

- A sense of urgency because of recent incidents
- Financial restraints
- A feeling of being overwhelmed by the sheer number of processes that need to be examined

Let these constraints guide you as you set priorities for your

hand safety plan. Maybe you'll need to start with the least expensive remedies; maybe the areas with a history of injuries will be top priority. Some plans are grouped by task—all heavy machinery together, all laceration risks together, etc. Choose a starting point that works for you.

How will you know if your changes are effective? In the case of an injury-prone process, the obvious metric is a lowered incidence of reportables. But what about preventative measures in low-injury areas? Find a way to quantify effectiveness. That might be staff uptake of a new tool, a measure of staff morale, or overall productivity in a given department. Choose a metric ahead of time and stick to it.

Find the right equipment

Once you've identified your hazard, it's time to look at what technologies exist specifically to solve that problem. The world of safety tools and PPE is always changing, so it's likely there are new technologies out there since you last checked. If you have a list of approved vendors, ask them about what tools or PPE can solve your issues, but don't be afraid to do your own research, too. The internet allows you to reach innovative startups with fresh ideas for hand safety.

Once you've narrowed down a few choices, ask for samples and set up a trialing program. Evaluation is important here, too. Do the new tools seem safer? Can you safely simulate an accident to see if the potential injuries are less severe? Do the tools affect productivity? Does the PPE cause any problems in

Delicate parts *continued*

terms of dexterity movement?

It's also important to consider how new equipment works in conjunction with your processes. For example, a glove with higher cut-resistance will lower the chance of lacerations, but will it also limit dexterity to the point of causing other accidents? Will larger gloves pose a new hazard of poor fit that increases the chances of getting hands caught in moving machinery? For some issues like these, you'll have to experiment and find the sweet spot.

Keep in mind that not every safety issue is solved with better equipment. Sometimes a shift in procedure can increase safety. A great example of this is proper lifting technique. To that end, you need to think about training.



Safety training

The reduction in injuries is well worth any time invested in safety training. If your company's procedures make traditional safety workshops impractical, you can still implement safety training through small-scale toolbox talks, social media reminders, or safety videos playing in break rooms. The better your employees understand the risks inherent in their jobs, the easier your job will be in terms of ensuring compliance.

TJ Scimone is the founder and CEO of Slice, Inc. Since 2008, he's worked with world-renowned engineers to rethink every aspect of safety, creating a unique line of tools with finger-friendly blades that last eleven times longer than metal blades. Slice donates a portion of global sales to autism research.

Bad vibes

Hand-Arm Vibration Syndrome can be debilitating

By GREG SCHRAB

PHOTOS COURTESY OF ERGODYNE

Experts say about two million U.S. workers are exposed to hand-arm vibration on the job and as many as half of them will develop Hand-Arm Vibration Syndrome (HAVS). Otherwise known as White Finger, HAVS is a permanent and irreversible medical condition in which fingers, hands and arms lose feeling and/or have continual tremors based on the after-effects of frequent and prolonged operation of vibrating tools or machinery. Extreme cases have resulted in the loss of parts of or entire digits. Here's a look at what causes HAVS, how to recognize symptoms and how to mitigate the damage.

Anybody who's ever spent a few hours weeding, pushing a lawnmower or going for a lengthy bike ride has probably experienced it on some level: tingling and numbness in the hands and arms.

It's not your imagination. Hand-arm vibration is a real thing. And Hand-Arm Vibration Syndrome is a genuine affliction that particularly affects workers who regularly operate vibrating machinery as part of their daily work routine. While HAVS can disproportionately have an effect on workers operating heavy machinery, such as jackhammers, even less jarring tools such as hand saws, power drills and, yes lawnmowers, can still contribute to more modest incidents of HAVS.



HAVS is nothing that should be taken lightly. While occasional use of vibrating machinery may only cause numbness and tingling for a few minutes or hours, regular, sustained use of such machinery can lead to severe cases of HAVS that can be both debilitating and irreversible.

In cases such as sustained jackhammer operation, for example, an individual may suffer a loss of grip strength and

Bad vibes *continued*

decreased dexterity, an increased chance of developing arthritis, tendonitis, carpal tunnel syndrome, and even experience chronic pain.

Difficult to predict

Some of the higher HAVS risk occupations, not surprisingly, include construction, sheet metal work, welding, automotive repair and electrical work. If a job requires the regular use of any machinery that vibrates at all, the potential exists of developing HAVS to some extent or another.

Because of its slow-to-show, long-term progression, often times HAVS isn't diagnosed until the damage is done. It's

notoriously difficult to predict from individual to individual. Some people are just more susceptible or attuned to vibrations, and are therefore more apt to suffer HAVS symptoms. Others can work an entire lifetime in high vibration environments and never experience any problems whatsoever.

The exact underlying mechanism responsible for HAVS is generally believed to be a disruption in the flow of oxygenated blood through the body's vascular system. This is particularly pronounced at the extremities most associated with HAVS symptoms. Sustained exposure to vibrations can eventually damage the tissues themselves, at which point the condition may become irreversible.

As stated, some of the early onset HAVS symptoms include tingling and numbness, which may or may not dissipate after a relatively short amount of time. With sustained vibration exposure, however, tingling and numbness can give way to more ominous symptoms. Visual manifestations can include a noticeable change in skin color, or whitening, of the extremities, which usually occurs in combination with a heightened sensitivity to hot and cold temperatures. In fact, HAVS is more likely to afflict individuals who work outdoors in extreme temperatures.

HAVS is preventable

In more advanced cases of HAVS, patients may experience a loss of function to affected areas. Even mundane tasks like filling a glass of water can become incredibly difficult. In



Bad vibes *continued*

its most advanced stages, HAVS can lead to visible tissue damage, and even gangrene.

Fortunately, HAVS is preventable. Following these five tips is a good start:

1. Use anti- or low-vibration tools.
2. Hold them as loosely as possible and in multiple positions.
3. Ensure those tools are well-maintained and inspected regularly.
4. Take regular 10-minute breaks. Short bursts of work with a vibrating tool are less harmful than long period of continual vibration.
5. Keep yourself (especially your hands) warm at work. Cold exhaust air from pneumatic tools should be kept away from hands.

Other administrative controls include rotating workers to do the task, so no individual worker has prolonged or repeated exposure to the vibration hazard.

As a last line of defense, employers should provide anti-vibration PPE for their workers as well. Specialized products like vibration-reducing work gloves that meet the requirements of the ANSI S2.73/ISO 10819 standard and feature a gel or other padded palm that reduces vibration, and dampens shock and impact, which can further reduce the negative effects of vibration on workers.

“Some people are just more susceptible or attuned to vibrations.”

Employing the above tips combined with regular worker rotation and use of anti-vibration PPE will ensure you're doing your part to prevent HAVS on your jobsite.

Greg Schrab is SVP of Operations & Product Management at Ergodyne.

A cut above

Future of glove technology could involve coreless yarn

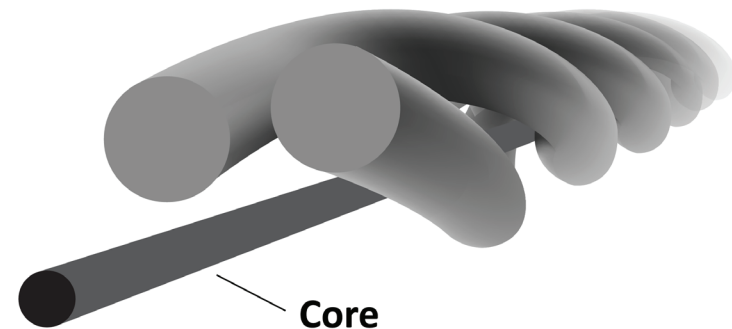
By M.B. SUTHERLAND

PHOTOS COURTESY OF MAGID

Every year work gloves and sleeves improve to offer stronger protection with higher cut resistance and better insulation from heat. And while these innovations are crucial to safety, another equally important aspect of protection is comfort. A glove that workers find comfortable is a glove they'll wear consistently – the best A9 glove on the market can't prevent lacerations if it's in your worker's pocket.

John Hanks has been in the EHS field for nearly a decade, including time at a large aerosol can manufacturer. Workers there handled steel sheets with very sharp edges. "They were basically handling a four-sided knife," he said, adding that even with such a dangerous job, "one of my biggest uphill battles was getting people to keep gloves on their hands at all times and to use the proper gloves." Hanks said his workers wanted gloves that were "not too thick and not too thin. If they were too thin, they'd get needle pokes through the gloves from protruding objects. If they were too thick, they couldn't feel what they were handling. Then they wouldn't wear them at all for some tasks and we're right back to square one." Hanks estimated that, even with lighter gloves, about 10 percent of his workers experienced skin irritation from glove materials and had trouble finding something they could wear through a whole shift.

Traditional Cut Resistant Blend



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Hanks said irritation usually happened when workers started sweating, and that problems increased significantly in the summer months. So what causes so many workers to experience skin irritation from their gloves or sleeves? To find out, we have to understand how gloves are made cut-resistant.

A cut above *continued*

Traditional protective gloves

For every knit glove or sleeve, protection begins with the yarn. The yarn is traditionally made of an inner core surrounded by an outer wrap.

The outer wrap is usually made of cut-resistant HPPE (High Performance Polyethylene) or Aramid with some additional filler like nylon, polyester or spandex to make the material stretch and move.

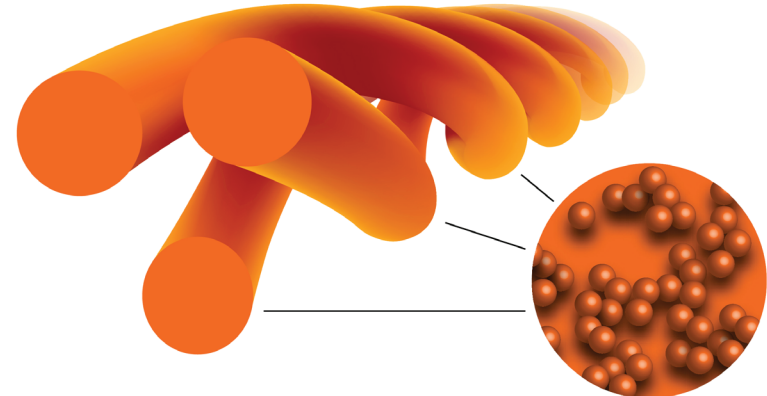
The core can be made from a few different materials, alone or blended together, depending on the glove's purpose. Fiberglass, the same material found in building insulation, provides the lowest cut resistance – generally from A2 to about A4. Steel provides higher cut resistance, but is the heaviest core material and also the most rigid. Basalt, or extruded volcanic rock, offers cut protection as high as A4. All three materials can be used together in different combinations to achieve cut levels as high as A5 or even higher. However, multiple blended core materials result in a heavier overall glove.

So what's the problem?

Fiberglass, steel and basalt cores have worked very well for many years, and for most workers it's been smooth sailing. But the problem lies in what happens when gloves begin to wear. As workers move their hands and arms, gripping and stretching within the material, the core inside each piece of yarn is stressed and over time, some of the strands break. While it isn't obvious to the naked eye, the glove begins to have tiny broken

fibers that poke out and rub against skin with every movement. For workers with sensitive skin, or workers with allergies to core materials, this causes redness, rash, itching and pain.

Coreless Technology



Strength Enhancing Micro-Particles

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What's the solution?

Until recently, options for workers with skin irritations were limited. Hanks said his problem-solving process was trial and error as he'd call different suppliers to trial various gloves or sleeves to see what might be less irritating. One of Hanks' workers even brought in an arm shield that he said "looked

A cut above *continued*

like he had a window screen strapped to his arm with loops. It wasn't the most ideal situation.”

Recent advancements in technology have brought us new coreless yarns. This technology is exactly what it sounds like – cut-resistant material made of yarn without a core. So no fiberglass, steel or basalt, and no rigid core material to break and poke into workers' skin. Instead, specially engineered yarn is infused with strength-enhancing micro particles for higher levels of cut protection that is inherent to the yarn itself. Coreless yarns currently on the market range anywhere from a cut level A2 to A4.

Coreless technology is great news for sensitive workers, but it's also good news for everyone else as eliminating the core creates material that's thinner, cooler to the touch and lighter-weight for a more comfortable glove or sleeve.

Looking to the future

Coreless yarns may be the wave of the future as safety managers look for better comfort and compliance. But right now, there are a few things standing in the way of making more products coreless. The first is cost. As with all new

technology, coreless materials are slightly more expensive than products made with traditional materials. In fact, it's possible that coreless will always be more a bit more expensive than traditional. Why? Because, depending on the cut level needed, using an inexpensive core like fiberglass allows manufacturers to use a less expensive HPPE or nylon material to make cut-resistant yarn. The combination of inexpensive core and inexpensive material create the desired cut level while lowering the overall cost of the glove. Another reason coreless isn't always the answer is that the level of cut-resistance achievable with this technology hasn't yet reached above an A4. But engineers continue to push the envelope and are expected to achieve thinner coreless yarns for lighter gloves and better tactile sensitivity in the not too distant future.

M.B. Sutherland has been writing for business and news outlets for over 20 years. She is currently the Senior Safety Writer at Magid – proud U.S. manufacturer and distributor of head-to-toe PPE since 1946. For more information about Magid's safety products and expertise, visit magidglove.com or call 800-444-8030.

Does it make the cut?

10 tips for choosing the right glove for the job

By MATT BURTNEY

PHOTOS COURTESY OF MAGID

When talking about the biggest pain points customers face, cut resistance always tops the list. There's lots of confusion. From what makes a glove cut-resistant to which level (yes, there are levels) of cut resistance is best.

To ease the confusion, we've compiled a list of ten tips for choosing the right cut-resistant gloves.

You don't need the highest cut glove

In most cases, it's a call from a worried manager who is looking for solutions after an injury, but buying a glove with the highest level of cut resistance on the market is not the best way to stay safe. Here's why:

Gloves are made cut-resistant through synthetic fibers like Kevlar® or Dyneema®. These fibers are wrapped around thin strands of steel or fiberglass.

The more cut-resistant properties that a manufacturer wants their glove to possess, the more of these fibers they need to combine. This leads to bulkier gloves.

Extreme cut-resistant gloves are designed for very specific tasks, like changing slitter blades in paper mills or handling steel cables. Jobs where fine hand movement is not a concern but protection from severe cuts is paramount.

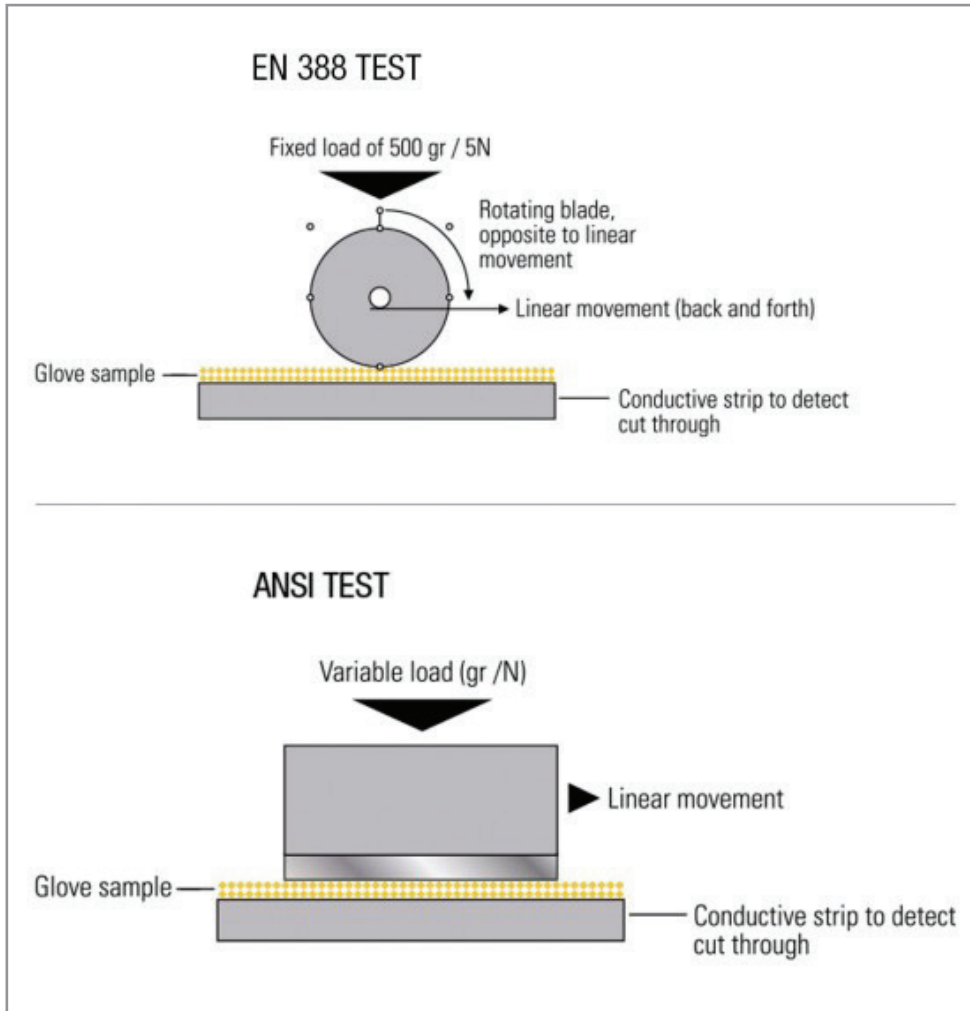


If you don't face those risks, a glove with lower cut-resistant properties will keep you well protected and save you money.

Don't mistake your glove for being cu-proof

Your glove is not cut-proof. Your coworker's glove is not cut proof. Do not treat your glove like it is cut -roof. There is no glove that will protect you from a band saw, table saw, or

Does it make the cut? *continued*



any other electric motor driven cutting tool. There's no further explanation needed for this, don't let your glove give you a false sense of security.

Educate yourself on the tests that measure cut resistance

There are two major standards for measuring cut-resistance, ANSI/ISEA 105-2016 and EN388. ANSI/ISEA is used in North and Central America. EN388 is used, by law, in Europe, and commonly used in South America, Asia and Australia.

Without diving too deep into these standards, we recommend using the ANSI/ISEA 105 standard over the EN388 standard – unless legally obligated – because it is a more true-to-life test method.

If you aren't sure which standard your glove is tested to, review the icons on your glove. If it has a CE symbol with a series of numbers, it was tested to the EN388 standard.

Pick a yarn that does double duty

Kevlar® and Dyneema® are the two most well-known cut-resistant fibers on the market. Both are inherently cut-resistant and both have similar properties of cut resistance.

When you're choosing which yarn material to go with, consider other factors like:

- Do you need thermal heat protection?
- Do you need sub-zero protection?
- Is the area where you work incredibly hot?
- Are you going to be sweating in the glove?
- Are you working around sparks?
- Will you need to bleach the glove? (Pertinent for those working in food industry)

Does it make the cut? *continued*

Kevlar® has exceptional extreme temperature properties. It can withstand heat upwards of 850°F and cryogenic temperatures of -320°F. It also works well around sparks.

Dyneema® is a more breathable fabric than Kevlar®, it pulls moisture away from the skin and feels cool to the touch.

When you're choosing cut-resistant gloves, make sure that they can perform as many tasks as possible to get the most bang for your buck.

Learn about gauges

The yarn used to make string-knit gloves comes in a variety of thicknesses. This is measured by its diameter, or gauge. Our gloves range anywhere from a thick 7-gauge to an impressively thin 21-gauge.

Each gauge will have its strong suits. For instance, thicker gloves (7- to 13-gauge gloves) are necessary when you need better abrasion-resistance because they don't wear through as fast. Thinner gloves (15- to 21-gauge) are necessary when you need more dexterity, like dealing with small parts.

“Simple fixes are never the best fixes.”

Remember that gloves are your last resort

Simple fixes are never the best fixes – WD-40 and duct tape work in a pinch, but don't expect them to hold forever.

Gloves (or any PPE) should never be your first method of protection. Remember the hierarchy of controls – elimination, substitution, engineering controls, administrative controls, PPE. Before you bring gloves into your plan for keeping employees safe, look at ways to mitigate risks and remove harm from the scenario.

Embrace engineered yarns

An engineered yarn uses two or more components to make a yarn that is stronger than either of the components would be on their own. For instance, taking a strand of steel and wrapping Kevlar® yarn around it. Now you have a yarn that is comfortable (thanks to the Kevlar®) and highly cut-resistant (thanks to the steel reinforcement).

Engineered yarns allow you to have incredibly thin gloves that are impressively cut-resistant. It's like adding rebar to concrete; it's taking something that's strong and making it even stronger.

Leather can be cut resistant (but it'll cost you!)

Leather is not inherently cut-resistant – it's the skin of an animal, meaning that it's as cut-resistant as your own skin (not very).

But, leather can be made cut-resistant by using a liner made of Kevlar® or Dyneema®. There are benefits to this for anyone who needs cut protection but also needs gloves that hold up to abrasion from ropes or concrete.

At the end of the day, you need to weigh the cost of a cut-resistant leather glove versus the use you get from it.

Does it make the cut? *continued*

Avoid trying to test cut resistance yourself

Our sales team has heard of various field tests performed to see if gloves are cut-resistant – box cutters, scissors, table saws and machetes (they’ve heard it all).

Cut tests are designed by scientists and engineers to represent real-world risks. No cut-resistant glove is designed to stop a pair of scissors, so you shouldn’t expect the glove to withstand that. If you’re unsure of the cut-resistance of your glove, ask your local rep for the glove’s cut documentation.

Choose the level of cut resistance that is appropriate to your hazards

If you’re moving boxes or working in metal panels, you may only need a low level of cut-resistance, anything over level A4 would be too much (and too costly).

But on the flip side, if you’re working with high cut risks, like sheet metal or slitter blades, you need to be conscious

of choosing adequate protection. You can’t expect that a glove designed for nuisance cuts will protect you from serious lacerations.

Conclusion

Choosing a cut-resistant glove isn’t meant to be difficult, but it will take some time to understand what you need to look for. By reviewing your risks, the options that are available and the types of jobs that you’re doing, you can choose the best cut-resistant glove for you. Determine the risks and make a choice based on those calculations.

Matt Burtney is the content marketer for Superior Glove: the five-time Canada’s Best Managed Company and a global leader in work glove manufacturing. He can be reached at matt.burtney@superiorglove.com. For more information about Superior Glove’s hand protection products, call (888) 428-1210 or visit www.superiorglove.com.

Working with industrial & consumer touchscreens

Understand the technology to find the right glove

By ANTHONY DI GIOVANNI

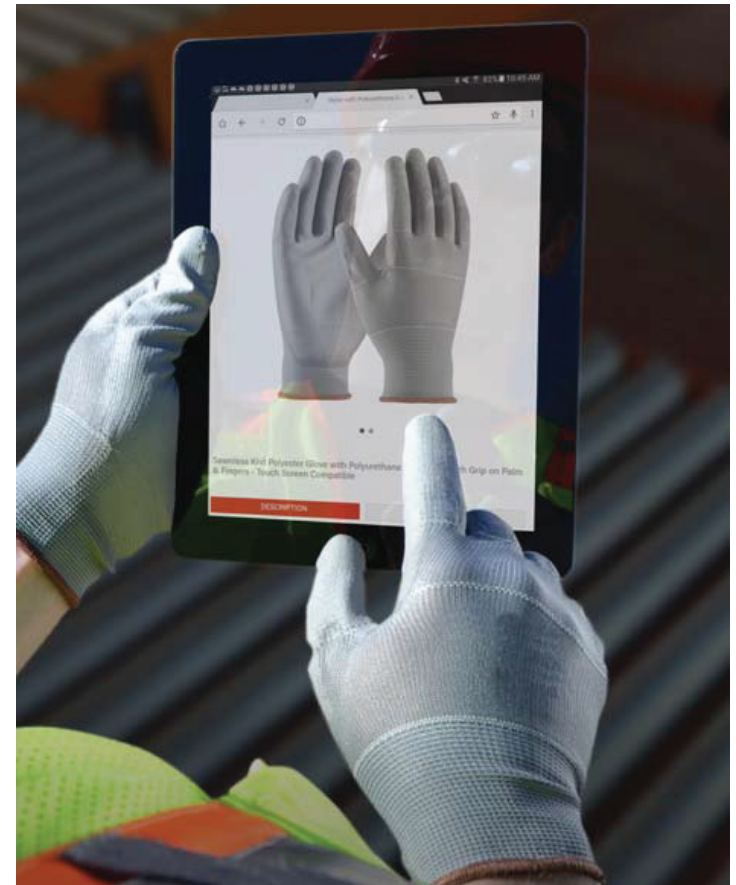
PHOTOS COURTESY OF PROTECTIVE INDUSTRIAL PRODUCTS, INC.

A big question when selecting work gloves today is touchscreen compatibility. Understanding what constitutes touchscreen compatibility is not straightforward and there is more to it than just the glove.

First and foremost, we need to correct a common misconception that touchscreens work based on heat from fingers. It's not heat that generates touchscreen functionality, instead, most screens work either on finger pressure applied or electrical field disruption. Basically, this means there are two main types of touchscreen technologies.

Resistive touchscreen

Resistive touchscreens are the most common type found on industrial controls. A resistive touchscreen has two transparent layers separated by a thin gap. These two layers have a conductive coating on the device's internal sides which both face each other. When these two layers of coating touch each other, a voltage is passed, which is in turn processed as a touch in that location. Because of this, one only needs to create a local pressure point to initiate a signal regardless of whether their fingers are bare or gloved. Resistive touchscreens are durable and reliable, but can only handle one touch point at a time — ruling out multi-touch gestures like two-finger zoom and swipe command motions, synonymous with smartphones, tablets and newer laptops.



Working with industrial & consumer touchscreens *continued*

It is, however, easy to understand why resistive technology is the first choice for most touchscreen controls found on industrial machinery.

Capacitive touchscreen

Unlike resistive touchscreens, capacitive screens do not rely on finger pressure. Instead, they work with anything that holds an electrical charge — including human skin. Our skin is comprised of atoms with positive and negative charges. Capacitive touchscreens coated with materials like copper or indium tin oxide, store electrical charges in an electrostatic grid of tiny wires — each thinner than a human hair. When there is finger contact with the screen surface, it changes electric fields and affects the capacitance. The processor determines the location of the electrical field disruption and commands are executed.

Variables to consider

Understanding this, one can logically assume that capacitive touchscreens will not work with most gloves and certainly not with any coated gloves. But, correlation is also not quite so straightforward. Randomly trying different coated gloves on your smartphone will demonstrate that some will activate the screen to varying degrees of performance. Why is this the case?

First, it clearly depends on the screen itself, physical properties like capacitance of the elements, drive signals and

performance of the processor. Second, as noted above, the mechanism for capacitance applies to anything that affects the electric field on the surface of the screen. So, while most glove coatings are not intentionally developed to achieve a level of dielectric performance, some of the coating compounds tested provided a measurable level of conductivity that may be enough to affect the electric fields on a touchscreen, which depending on fingertip pressure and/or time, will have an effect on screen functionality and responsiveness. Think of how fingertip pressure can compress the coating to a very thin layer at the contact point — enough to affect the electric fields. Furthermore, as if all of this wasn't complicated enough, most gloves with a black coating contain an inherently semi-conductive carbon material. The mere presence of carbon black allows many coated gloves to work at varying degrees of functionality with different tablet and smartphone screens.

Variations in glove performance

Based on our testing, we've concluded that most disposable gloves and thinner coated seamless knit gloves will work with tablets or smartphones. We do, however, caution that there are noticeable variations, with some requiring a little more pressure or response time. We've found that large touchscreens, such as those found on newer laptops, are responsive with disposable gloves, but may not do well with coated seamless knit gloves.

Working with industrial & consumer touchscreens *continued*

Touchscreens used on smaller devices such as tablets and smartphones are among the most sensitive. To avoid further issues with smartphones or tablets where fast precision swiping and scrolling is required, we recommend coated gloves with thin, non-tacky coatings. For less sensitive touchscreens, such as those found on laptops, we suggest the use of coated knit gloves that feature conductive fingertips designed to perform to bare-finger precision. (We remind you that all conductive tips will wear out after prolonged use.)

As the last point, it is important to mention that ill-fitting or wrong-sized gloves with fingers that are too long are unlikely to work. The excess material or air gap trapped in the tips will only serve to distance the electrical field rendering the gloves inoperative on touchscreens.

Bottom line

One can clearly understand now that glove touchscreen compatibility is not as simple as it seems. While we could make all our gloves with conductive fingertips, it would increase costs for a feature that only a small percentage of workers may need. In this article, we've learned three very important points:

There are two main types of touchscreen technologies.

First, most screens on modern industrial machines use resistive technology that work via light finger pressure and hence will work with any glove.

Second, most black-coated gloves will work with a majority of the capacitive touchscreens because they contain carbon black material that is inherently semi-conductive. Because it is semi-conductive, their effectiveness varies, based on the thickness of the coating.

Third, when someone asks: "Is this glove touchscreen compatible?," the best answer is: Most black-coated work gloves are technically touchscreen compatible. However, since there are different types of touchscreens with varying degrees of touch responsiveness, only by trying it will you be able to determine if it will work with your touchscreen. Let's begin by first selecting the glove for your work application and then we will test for touchscreen compatibility.

Anthony Di Giovanni is Vice President of Global Marketing for Protective Industrial Products, Inc. He has over 25 years of international experience in sales and marketing of industrial and safety products.

Evaluate your disposables

An accurate glove assessment improves safety and consolidates your choices

By ALICE FARAGO

PHOTOS COURTESY OF TRADEX

Disposable gloves play an important role in job safety and task efficiency. A disposable glove re-evaluation can lead to improved protection, efficiency and possible glove consolidation. Every facility has its own unique complex processes and tasks. A close examination of each process and the elements the user comes in contact with will lead to the best glove choice.



Chemicals

If employees work with chemicals, there is information available to guide the glove choice. OSHA provides a chemical resistance chart by glove type on page 26 of Publication #3151, *Personal Protection Equipment*, that you may access by going to www.osha.gov/Publications/osh3151.pdf. It provides a list of chemicals and rates all protective gloves by type, including latex/rubber and nitrile. When selecting chemical-resistant gloves, please refer to the manufacturer's recommendations, especially if the gloved hand(s) will be immersed in the chemical.

Bloodborne pathogens

OSHA regulations require health care workers to use exam gloves to protect them from occupational exposure to blood or bodily fluids that are potentially infectious. Exam grade gloves are regulated and tested to reduce the risk of exposure to bloodborne pathogens.

Cut or puncture resistance

For vinyl users who are routinely exposed to sharp objects or abrasion, consider a thicker nitrile or latex glove that will offer more protection. A disposable glove with a thickness of 6 mil or higher should be considered for evaluation in these environments. For more tasks with more frequent and dangerous exposure to abrasion a non-disposable/reusable glove may be more suitable.

Evaluate your disposables *continued*

Dexterity and hand agility

Tasks that involve assembling components or handling small items require appropriate glove material and good fit. In general, a “thinner” glove will offer better dexterity and less hand fatigue for the user. Also, natural rubber latex is a good option for natural fit, comfort and dexterity. For users allergic to latex, nitrile gloves have similar qualities to latex and are a common choice to transition away from latex. Disposable nitrile gloves with a higher mil thickness can be an alternative to loose-fitting, reusable gloves, for better hand dexterity

Glove change frequency

Assessing glove change frequency can greatly impact glove choice. Using a higher quality glove than the task requires becomes especially costly when frequent glove changes are needed. Conversely, if the gloves are being changed out because of glove failure, then a higher quality glove may be needed.

“Assessing glove change frequency can greatly impact glove choice.”

Grip and texture

Glove texturing is not highly visible, but can be examined through touch and comparison of gloves. A textured glove can greatly improve grip in both wet and dry environments. Disposable gloves are available with no texturing, fingertip

texturing or entire glove texturing (fully textured). Gloves with a heavy embossing/texture normally should be produced with a heavier mil thickness because they are more prone to pinholes. Fully textured gloves are recommended for jobs that have gripping tasks, and in slippery or oily conditions.

Glove evaluation case examples

A health and safety manager at a contract packager and manufacturer of liquid personal care products supplied a vinyl glove for his production group. They noticed that the gloves were tearing frequently, and the employees were changing gloves often. He decided to make a switch to a nitrile glove. They found the glove to provide better protection, more durability, and more chemical protection when needed. Also, the textured nitrile gloves provide a better grip for handling small components or wet bottles. Although they were more expensive, less frequent glove changes offset much of the cost of a higher quality glove.

A regional manager at a grain elevator and agriculture equipment repair and maintenance company uses a heavy duty reusable glove for his employees. The staff repairs and maintains equipment, often in the presence wet and decaying grain product. Reusable or non-disposable gloves are thicker and looser fitting than disposable gloves. Reusable gloves typically range from 15 to 22 mil in thickness. They found their dexterity was comprised with thick reusable gloves when working with nuts, bolts and other small objects. They are now

Evaluate your disposables *continued*

investigating less expensive, thinner 6 and 8 mil heavy duty disposable gloves to improve glove fit for better hand agility.

A thorough evaluation of current disposable glove specifications and usage can provide insight for improved glove selection. Consideration for glove consolidation should be evaluated in situations where similar gloves are being used for multiple tasks. When considering glove re-assessment, a glove

specialist can provide new glove options, as well as the optimal gloves for safety, efficiency and value relative to your facility.

Alice Farago is a Product Manager for Tradex International, a Cardinal Health company. She specializes in consulting disposable glove users and providing educational material. Tradex, along with the AMBITEX® brand, are recognized in foodservice, janitorial, industrial and healthcare markets.

Breaking a bad habit

How to ensure noncompliance isn't commonplace

By MARK NICHOLLS

PHOTOS COURTESY OF ANSELL



What did your morning routine look like today? Perhaps you brushed your teeth before running out the door, giving the doorknob an extra pull to ensure the front door was locked. Maybe you ran through the drive-through and ordered your regular coffee without giving the menu a second thought. You might have even glanced at your phone while at a red light to see if your boss had emailed you yet. Our days are

full of routine habits — good and bad — that largely impact the rest of our day.

And habits aren't just reserved for our personal lives — hundreds of habits influence our workday on a regular basis. Perhaps one of the most important habits is how one dons their personal protective equipment (PPE). After all, habitually donning the right gloves throughout the day might make the difference between returning home from work safely or a visit to the hospital with an injured hand. One would think the choice to don gloves would be an easy one. But you would be wrong. Too many workers either don't wear gloves or wear the wrong gloves for the job — and it's unfortunately become all too common in today's workplace.

Getting to the root of noncompliance

Before we break down bad PPE habits, it's important to recognize the positive ways hand protection habits have impacted the workplace. There once was a time when regular hand protection in the workplace was an afterthought at best. However, frequent burns, nasty cuts or dirty hands eventually led to the consistent practice of donning gloves in most industrial environments.

Breaking a bad habit *continued*

For decades, it was standard practice to wear simple cotton, canvas or leather gloves for day-to-day protection. However, a changing workforce — new technologies, advanced machinery and a constant drive to multitask and optimize efficiency — created a need for more advanced hand protection. Safety managers started to recognize that PPE designed with technologies and materials intended to support comfort, performance and protection were a better choice for both their workers and their bottom line. Advanced industrial environments replaced traditional routine work, changing the PPE needs and requirements of workers in the process.

So, is it safe to say a changing workforce can redefine the habits of a worker? Unfortunately, it's not that simple and straightforward.

According to the Bureau of Labor Statistics (OSHA), 70 percent of workers who suffered hand injuries were not wearing gloves when they suffered the injury. The other 30 percent were wearing gloves that were inadequate, damaged or the wrong type of glove for the hazard.¹ That's a statistic that's sure to frustrate any safety manager — or anyone who cares about worker safety for that matter. The performance and quality of gloves have caught up to the demands of today's workforce — why haven't workplace practices?

Decoding a habit

We tend to notice bad habits in everyday life — nail-biting, mindless snacking, obsessively checking a smart phone. But

there are good habits too. A morning jog or flossing your teeth at night are good examples. Our life is often impacted by hundreds of habits, and we often do these routines without thinking. That's the exact essence of a habit — a common behavior that becomes automatic in one's daily life.

Automatic is a key word here — habitual behaviors can become automatic outside of any conscious or rationale thought process. When applied to the concept of wearing PPE, the brain may comprehend that a glove provides critical protection. However, if removing a glove has become a regular habit, that safety knowledge might not make a difference, and the glove may still be removed.

That's where we run into the real danger. Every time a worker chooses to remove a glove in an application that requires the need to protect the hand — or chooses to wear a glove with improper protection for the task at hand — they are at risk of injury. According to the Bureau of Labor Statistics, more than one million workers go to the emergency room with hand injuries each year.² That's a startling statistics that safety managers simply can't tolerate. And with so many quality PPE



Breaking a bad habit *continued*

products available, they shouldn't have to. The safety solutions needed to protect workers are available, and many safety managers are making them easily accessible every day. So where's the disconnect?

Teaching an old dog new tricks

Let's revisit the earlier statistic from the Bureau of Labor Statistics that noted 70 percent of workers who suffered hand injuries were not wearing gloves when they suffered the injury. It's not that they weren't provided gloves or weren't wearing them. It's more likely that they removed their gloves at some point throughout the workday. That's a routine that can be tied to habit.

Maybe a worker associates better dexterity when handling small parts with bare fingertips. Result? The worker removes his or her gloves. Perhaps a worker finds it easier to check his phone without wearing a glove. Result? The gloves come off. Maybe a worker simply associates comfort with a bare hand. The result? I bet you can guess.

So how do we change the bad habits of workers around the world? It all comes down to conducting a proper risk assessment and pinpointing the root of the bad habit and glove removal – and then eliminating the issue and reconditioning the habit through better glove solutions, education and proactive safety monitoring. Thankfully, most glove manufacturers make this process easier for safety managers. New materials and designs can deliver effective protection while delivering the grip and dexterity workers need and the comfort they deserve.

Likewise, there are multitudes of multipurpose gloves on the market specifically designed to eliminate the need for workers to remove or change gloves between tasks.

Breaking the bad habit

Changing bad habits of workers is easier now than ever before. Advancements in gloves are specifically designed to combat the core reasons workers remove gloves, inherently paving the path toward compliance. However, humans are inherently creatures of habit — and it takes time to recondition routine behaviors, even if the right resources are provided.

It's encouraging to know that an infinite amount of resources and safety solutions are easily available to safety managers. Selecting the right PPE for specific worker protection and comfort needs, along with a proactive approach to changing behavior and encouraging compliance can help to break bad habits once and for all.

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