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Wells Lamont Industrial

Welding

Contents

Y3034 Premium Leather MIG Welding Para-aramid Lined Glove Y3034

This premium MIG welding glove is exactly what you're looking for in comfort, durability and protection. This top quality glove features an A3 cut level to reduce hand injuries along with Dupont™ Kevlar® lining with heat resistance up to 300°F.

Features:

- Top-Grain cowhide palm for comfort and dexterity
- Cowhide split back adds resistance to sparks and heat
- Lining made with Para-aramid yarns that adds heat protection up to 300°F without the bulk
- Thumb reinforcement for extra long wear
- 4″ Cuff for extra protection
- Stitching made with Para-aramid yarns for added strength at the seams
- ANSI Cut Level A3
- ANSI Abrasion Level 3
- ANSI Heat Level 2
- ANSI Puncture Level 4
- Sold by the dozen pair

Ideal for:

- Welding
- Metal Manufacturing

Learn more at www.wellslamontindustrial.com/product/y3034-premium-leather-mig-welding-para-aramid-lined-glove/

FLEXTECH Cut Resistant Foam Nitrile Palm Coated Gloves (Y9258)

Wells Lamont Industrial

The Y2024 goatskin welder with cut resistant liner provides double the protection of a standard welding glove – offering not only cut but heat protection as well. Para-aramid yarns liner protects the hand against possible exposure to lacerations, burns from sparks or hot parts – up to 350°F. The Y2024 – another pioneering leather glove from Wells Lamont Industrial – offering extended wear with the added cut and heat protection necessary to weld parts in extreme environments

Features:

- Full goatskin leather provides increased flexibility and durability
- Para-aramid yarns Lining in palm, back of hand, and fingers provides superior cut and heat protection
- Gauntlet cuff provides wrist and forearm protection
- Keystone thumb delivers a comfortable fit along with additional dexterity
- ANSI Cut Level A4
- ANSI Heat Level 2 (350°F)
- ANSI Heat Level 1 (Cuff) 250°F
- ANSI Puncture Level 4
- Sold by the dozen pair

Ideal for:

- Metal Fabrication
- Automotive

Learn more at www.wellslamontindustrial.com/product/goatskin-welder-with-cut-resistant-liner-y2024/

By: **Peter Deutsch**, *Contributor*

Mastering Welding Performance & Safety Requirements

The performance and safety requirements in welding are becoming more stringent. All welders in industry and workshops notice this every day, due to the ever-increasing pressure to perform. How can you deal with these rising demands on the welder with confidence? It's simple: Integrate the best technology into a welding helmet to make work easier and safer, and simply put it in the welder's hand (on his head).

As an example, let's take a look at two technologies that make daily work much safer, while also increasing the quality of the work.

What are the challenges of welding? Since the human eye cannot look directly into the welding light, a welding filter must be used. Today, welding filters automatically darken when welding begins (ADF = auto darkening filter). This leaves both hands free to work and gives a more or less good view of the component before welding. The brighter the filter is when the welder is not welding, the better.

In addition to darkening, the ADF has another fundamentally important function—filtering out dangerous UV and IR radiation. This filter element in every ADF is one of the most expensive components in an ADF. Therefore, a simple filter is often used that protects well, but it does not transmit all visible colors. These filters can be recognized by the fact that the welding arc and everything around it can be seen in green or orange. However, this is a significant disadvantage in welding. Welding temper colors and marks can hardly be seen, and the welding pool cannot be seen clearly.

Solving Common Challenges

In the meantime, however, there are welding helmets with ADFs on the market that solve this specific problem. Through an elaborate manufacturing process, technology is now available that enables both an open shade level of 2 and an especially true color view of the welding process.

An example of this is CL Technology (CLT). This technology gives the welder an unprecedented bright, clear and true-color view also when the helmet is open (*Figure 1*). This allows the helmet to be worn throughout the work process without having to constantly flip it up and down. This saves time and prevents work interruptions due to poor visibility, while at the same time protecting the workers' eyes from debris and other welders in the area.

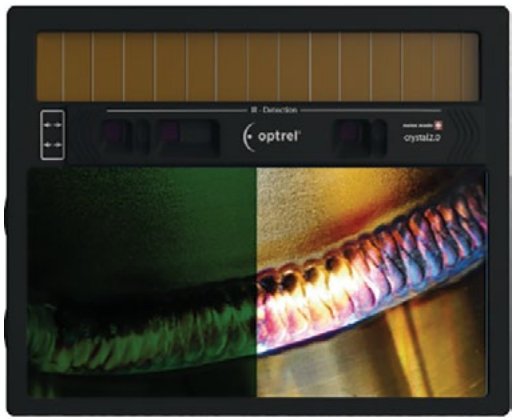


Figure 1: The bright, clear and true-color view through a modern cassette (example optrel crystal2.0). *Photo courtesy of Optrel*

In the dark state during welding, the CLT now provides an unprecedented view of the arc and the component being welded. The welder can see every subtlety in the arc and the molten metal and can finally fully control the arc. Furthermore, the welding temper colors during welding can now be seen completely, which allows ideal control of the heat input. This makes welding much easier and prevents expensive and time-consuming welding errors, such as binding errors or a heat-affect zone that is too large.

Other Challenges Welders Face

With modern welding power sources, the welder can adapt his arc (welding current) to the component during welding. For example, with a foot pedal or a torch switch in TIG welding, the welding power can be continuously increased or decreased, according to the requirements. However, this also means that the brightness of the arc increases or decreases accordingly. This is exactly where the welder with an ordinary automatic helmet has a problem. The shade level is then no longer appropriate for the amperage being used.

Crafty engineers have also found a perfect solution to this problem: An ADF

that also automatically adjusts to the brightness of the arc. With this technology, an automatic helmet now becomes a fully automatic helmet. The "automatic" of ordinary welding helmets refers, as already mentioned, only to the darkening of the ADF.

Automatic shade level adjustment, however, goes one decisive step further: The shade level of the ADF adapts fully automatically to the brightness of the arc. This means the welder always has the correct protection level setting and always has a perfect view of the arc, thus preventing eye fatigue and eye strain, which can often lead to headaches while welding at the incorrect shade level. This also works when the welding power is changed during welding, e.g., when changing from main current to secondary current. Here, the darkening level automatically and continuously follows the brightness of the arc (*Fig. 2*).

Previously, the welder only had the choice between, for example, "too bright with secondary current" or "too dark with main current." This not only made the eyes very tired, but also preprogrammed welding errors due to the lack of visibility. With this technology, this shortcoming of ordinary welding helmets is finally eliminated. And, since every welder has an individual perception of brightness, the brightness can also be adjusted by +/-2 protection levels.

As these two examples of technical progress show, a small investment in an innovative welding helmet can make work considerably easier and safer. By avoiding errors and increasing productivity—at the same time relieving the welder—the investment pays for itself in a very short time.

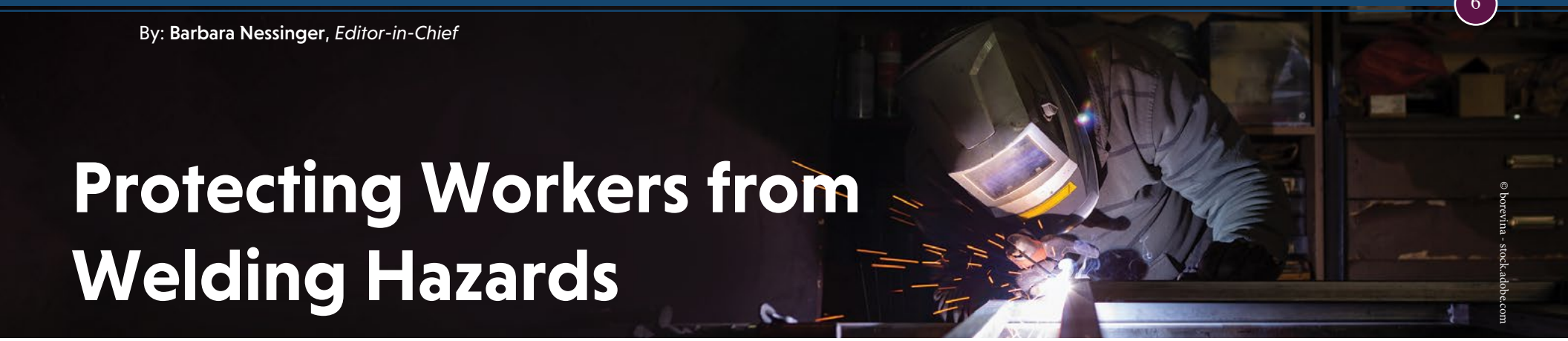
[Editor's note: This article first appeared in Workplace Material Handling & Safety. *See https://bit.ly/3oNaPXU.]*

Peter Deutsch is a welding engineer (IWE) and head of Product Management for Optrel, a leading global supplier of face and head protection products, breathing protection solutions and active sunglasses (www.optrel.us).

Figure 2: Continuous adjustment of the darkening with the optrel ShadeTronic®. *Photo courtesy of Optrel*

By: **Barbara Nessinger**, *Editor-in-Chief*

Protecting Workers from Welding Hazards



According to the American Welding Society, an estimated 50% U.S. gross national product is affected by welding. Anything made of metal, no matter how big or small, can be welded. Welding is the most common method used to join metal parts in large structures and equipment, due to its strength. Soldering and brazing are similar processes to welding, but they are used on electronic and other small equipment and use lower temperatures to melt the filler metal.

Exposure to welding fumes and gases may be acute or prolonged. Acute exposure can cause eye, nose and throat irritation, dizziness and nausea. *(photo courtesy Adobe Stock)*

Most welding today falls into one of two categories: arc welding (the use of an electrical arc to melt the work materials) and torch welding (the use of an oxyacetylene torch to melt the working material and welding rod). There are more than 100 welding processes; most involve a skilled worker using a high-heat torch; filler material that is usually in wire or stick form; and pressure to permanently bond metal pieces.

Welding, cutting, brazing and grinding all create significant fire and explosion risks. This type of work generates hot sparks and slag. Those can then come into contact with nearby combustibles and flammable gases.

Most welding safety practices and equipment are universally applicable. Welding exposes everyone to similar hazards, from a welding-intensive manufacturing company; a billion-dollar engineering and construction firm; a small independent fabricator; or someone responsible for safety-at-large in the workplace. Wearing the proper PPE equipment is extremely important to keep welders and watchers safe from multiple hazards.

Implementing good welding/hot-work safety practices can help do more than just save lives. When welding safety becomes an ingrained part of the corporate culture, there can be fewer reduced lost-time incidences and improved productivity. *[See sidebar "Preventing Hot-Work Accidents."]*

Energy is Everything

Clothed in protective gear, surrounded by flying sparks, the welder wields a powerful energy source and generates heat up to 15,000°F in order to fuse two materials together into a strong joint—called a weldment—that will be permanent once the parts cool. An economical and efficient process, welding is vital to the construction, manufacturing, aerospace, automotive, railroad and shipping industries, among others.

Many of the potential dangers of using the kinds of energy sources (electric arc, gas flame, laser, electron beam, friction or ultrasound) and extreme heat required in welding are obvious and straightforward: burns, electric shock, vision damage and exposure to ultraviolet radiation at unhealthy levels. Another risk, arising from the inhalation of hazardous fumes and gases, is more complex, in that both the types of toxins and the range of potential health effects are many.

Fumes, Explained

Welding fumes are condensed into very fine particles when a metal is heated above its boiling point; they are a mixture of metallic oxides, silicates and fluorides, as well as particles from the electrode and the material being welded. Both the metals being welded and the coatings or residue on those metals can contribute toxins to welding fumes. Among the metals and gases that welding fumes can contain include

PREVENTING HOT-WORK ACCIDENTS

According to OSHA, between 2005-2015, there were 85 fire-related deaths in the oil and gas industry. Of those, 28 occurred due to improper hot-work practices. RMI's blog, titled "Preventing fires with a Hot-Works Program," provides some general guidance on ways to prevent hot-work incidents, even for those not working in oil/gas. Here are some basic ways to prevent hot-work incidents:

Having and using a hot-work permit

A written permit is required in certain situations, but it's a good idea to use them for all your hot-work activities. The permit ensures that all necessary safety precautions are in place. It also helps lower the risk of fire or explosion.

Performing hot-work in a safe location

Remove all combustibles from the area before conducting hot-work. Whenever possible, perform the work in an area that won't interfere with other workers.

Wearing the proper PPE

Always wear FR clothing when performing hot work. It is the responsibility of the employer to provide this to the employee. Further, FR clothing should be maintained and kept in good condition.

Using fire blankets to protect equipment from sparks and slag

If you cannot move combustibles or nearby equipment out of the way, lay fire blankets over them. This will protect them and prevent them from catching fire.

Having fire extinguishers nearby and ready

Employees should always know where to find the nearest fire extinguisher. This is even more critical when performing hot-work. Hoses and other suppression equipment can work, too.

Assigning a fire watch for all hot-work activities

A fire watch should always be present for hot-work activities. The fire watch should know how to sound the alarm in the event of a fire. They should also know to only extinguish a fire when it is small and contained to one area. OSHA requires the fire watch remain in place for at least 30 minutes after the work is complete. IHW

[For the complete blog, go to: http://blog.rmiwyoming.com/fire-prevention-for-the-oil-and-gas-industry.]

aluminum, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, silver, tin, titanium, vanadium, zinc, argon, helium, nitrogen, carbon dioxide, nitric oxide, nitrogen dioxide, ozone, phosgene, hydrogen and fluoride.

The composition of fumes depends on the materials being welded. Steel welding, for instance, produces fumes that mostly contain iron, along with small amounts of chromium, nickel, manganese, molybdenum, vanadium, titanium, cobalt and copper. Fumes arising from stainless steel welds have a large amount of chromium or nickel and a small amount of iron.

Longer Exposures = Serious Health Problems

Exposure to welding fumes and gases may be acute or prolonged. Acute exposure can cause eye, nose and throat irritation, dizziness and nausea. (Workers who experience these symptoms should leave the area immediately and obtain medical attention.)

Prolonged exposure may cause lung damage; lung, larynx and urinary tract cancers; stomach ulcers, kidney damage and nervous system damage. The list, below, contains just some of the hazardous materials found in welding and the potential health effects that acute or prolonged exposure to them can cause.

- Zinc oxide → Metal fume fever
- Manganese fume → Parkinson's–like symptoms
- Helium, argon & carbon dioxide → Suffocation
- Carbon monoxide → Asphyxiation
- Hexavalent chromium → Damage to eyes, skin, nose, throat & lungs; cancer
- Ozone → Headaches, dry eyes, lung damage
- Copper → Nausea, irritation of eyes, nose & throat, metal fume fever

Factors that can affect worker exposure to welding fumes include the type of welding process used; the kind of base and filler metals used; the composition of the welding rod; the welder's work practices; the location in which the welding is done (outside or in an enclosed space); the air movement in that location; and the use of ventilation controls.

In addition to the energy sources mentioned above, a laser, an electron beam, friction and ultrasound are also used in welding.

Reduce Worker Exposure

Proper ventilation is important to reducing fume and gas levels in a workspace. Welding should not be done in confined spaces that lack sufficient ventilation. Even in outdoor or open workspaces, care should be taken to ensure adequate ventilation. For instance, when welding outdoors, workers should position themselves both upwind—in order to avoid breathing welding fumes and gases—and from other workers. In other scenarios, local exhaust ventilation systems can help remove toxic gases from the welder's breathing zone.[1]

1 osha.gov/Publications/OSHA_FS-3647_Welding.pdf

Welding Safety Resources & Best Practices

Photo courtesy AdobeStock

The Bureau of Labor Statistics reports that more than 500,000 workers are injured annually due to welding accidents. Welding requires a dangerous level of heat and energy, so this unfortunate toll isn't shocking. Welding is a very dangerous job, with the risk of death being more than four per 1,000 during the course of a career.

Just how dangerous can welding be? Here are the most common welding injuries:

- Burns from fire, sparks or flammable material
- Eye injuries, due to excessive heat or the arc eye
- Infrared radiation exposure
- Electrocution
- Skin injuries other than burns
- UV exposure
- Toxic fume inhalation, especially due to working in confined spaces with little ventilation
- Invisible light exposure
- Hearing loss due to excessively loud noises
- Vision loss due to excessive lighting or injuries to the eyes

Under helmets and heat, body temperatures can rise significantly and increase chances of overexertion, heat exhaustion and even heat stroke. *(photo courtesy AdobeStock)*

Based on the ANSI Z49.1:2012 Safety in Welding Standard, the American Welding Society (AWS) offers a free course in best practices in welding safety. The course includes a broad range of topics, including hazards, safety equipment, ventilation, welding in confined spaces, safety precautions and safety specifications. Presented in easy-to-access, online modules, the "AWS Safety in Welding" course is equally accessible to students, hobbyists and established professionals who want to expand their knowledge base and core competencies.

CRITICAL SAFETY PRACTICES

According to ProWelding.org, here are the critical welding safety practices that must be followed:

Protect Your Eyes with the Right Headgear

According to OSHA, eye injuries are the single most common type of welding-related injury. Eyes are the most vulnerable body part in arc-welding, and regular eye protection is not enough.

With different types of lenses available for visors and welding helmets, choosing the best welding helmet for the type of welding job you'll be doing is important. For instance, a #12 filter is recommended for arc-welding. Using the wrong lens can cause retinal damage, both short- and long-term.

It is recommended to use auto-darkening helmets, because they can auto-adjust the shade level. This allows one to continue to protect the eyes, while having excellent visibility.

Always Wear High-Quality Gloves

When working with welding arc, regular gloves won't do much to protect you. It's important to get a decent pair of welding gloves that are lined with Kevlar, giving your hands an extra layer of protection. Also, ensure your gloves are completely dry before you handle any equipment. Even a little bit of water can short electric current and increase the possibility of electrocution.

Be Mindful of Your Clothing

Sparks easily burn skin and clothes. While you're required to be covered from head to toe, everyday clothes won't suffice. They can still catch fire. Invest in a high-quality leather apron to wear over your clothes to protect yourself from sparks. Do not use a synthetic apron. It can catch fire just as easily as your normal cotton/woolen clothes (if not faster). Welding can get very hot—naturally leading to sweating. But, you definitely don't want to work with voltage equipment in clothes that are wet with sweat. Leather boots are also important.

Prepare Metal by Stripping It

Fumes released by burning metal can be so toxic it makes stripping and preparing the metal beforehand a necessity. Stripping is the process of removing the top layer of the metal, which is generally a coating of chemicals meant to give the metal different characteristics (i.e., strength, color and durability).

However, it might not be possible to strip the top layer of the metal in every scenario. Welders are recommended to use masks and a fume or smoke extractor. Similar to a portable vacuum cleaner, these small machines help suck toxic fumes away from the welder and improve ventilation.

Ensure Enough Ventilation

Under helmets and heat, body temperatures can rise significantly and increase chances of overexertion, heat exhaustion and even heat stroke. Improving airflow by ensuring that there is enough ventilation and airflow helps maintain safe workplace temperatures; facilitate breathing; and improve morale among workers.

Beware of Your Surroundings

Before starting any welding work, look around the surface to ensure your workplace complies with OSHA's safe workplace environment guidelines for welding:

- There are no flammable substances in the near vicinity.
- The floor is not constructed of wood
- Tanks and similar objects that previously contained flammable or explosive substances have been thoroughly cleaned
- The floor is not wet
- The workplace is not littered with objects (welder could be seriously injured in case of a fall)
- The workplace is not congested or cramped

Read the Manual & Do Not Experiment

Whether you're a newly appointed welder or a master of your trade, reading manuals is always a good first step, especially when working with new equipment. Don't experiment with torches or regulators under normal working circumstances (without additional safety precautions). Stick to the guidelines.

Prepare for Emergencies

Lastly, prepare for every potential disaster beforehand. Basic disaster management should be included in training, and welders should be taught the right procedures in different scenarios (fire, electrocution, explosion, etc.). At the very least, fire extinguishers should be installed near the workplace where they are easily accessible by workers.

Additional Resources:

For more information on the "AWS Safety in Welding" course, go to: https://awo.aws.org/online-courses/safety-in-welding/

DOWNLOAD ANSI WELDING STANDARD

The American Welding Society's Board of Directors recently authorized free electronic distribution of the current ANSI Z49.1, Safety in Welding, Cutting and Allied Processes. The Board decided this important voluntary welding safety and health standards document should receive the widest distribution possible and has directed that Z49.1:2012 be made available for free download.

During World War II, the huge demand for war materials production placed on the U.S. brought a tremendous expansion into the use of welding. In mid-1943, it was recognized that some type of code or standard was needed relating to safe practices for performing welding. Under the auspices of the American Standards Association, the standard was drafted and published in 1944. It was entitled American War Standard Z49.1, Safety in Electric and Gas Welding, and Cutting Operations.

Following the war, the standard was first revised in 1950. Subsequent revisions occurred in 1958, 1967, 1973, 1983, 1988, 1994, 1999, 2005 and 2012. The 2012 revision is now available and accessible for free download from the AWS website. During the period of these revisions, the American Standards Association has become the American National Standards Institute and War Standard ASA Z49.1-1944 has become ANSI Z49.1-2012. *For a free download, visit https://www.aws.org/standards/page/ansi-z491*

Welders should be prepared for every potential disaster. Basic disaster management should be included in training, and welders should be taught the right procedures in different scenarios (fire, electrocution, explosion, etc.). *(photo courtesy AdobeStock)*

FREE WELDING SAFETY FACT SHEETS

The AWS offers a library of free welding safety fact sheets covering more than 40 welding hazards and safety practices. Topics include:

- Fumes and Gases
- Radiation
- Noise
- Chromium and Nickel in Welding Fume
- Electrical Hazards
- Fire and Explosion Prevention
- Burn Protection
- Mechanical Hazards
- Tripping and Falling
- Falling Objects
- Confined Spaces
- Contact Lens Wear
- Ergonomics in the Welding Environment
- Graphic Symbols for Precautionary Labels
- Style Guidelines for Safety and Health Documents
- Implantable Medical Devices and Arc Welding/Cutting
- Electric and Magnetic Fields (EMF)
- Lockout/Tagout/Tryout
- Laser Welding and Cutting Safety
- Thermal Spraying Safety
- Resistance Spot Welding
- Cadmium Exposure from Welding and Allied Processes
- California Proposition 65
- Fluxes for Arc Welding and Brazing: Safe Handling and Use
- Metal Fume Fever
- Arc Viewing Distance
- Thoriated Tungsten Electrodes
- Oxyfuel Safety: Check Valves and Flashback Arrestors
- Grounding of Portable and Vehicle Mounted Welding Generators
- Cylinders: Safe Storage, Handling, and Use
- Eye and Face Protection for Welding and Cutting Operations
- GHS – and Hazard Communications for the Welder
- Personal Protective Equipment (PPE) for Welding and Cutting
- Coated Steels: Welding and Cutting Safety Concerns
- Welding Safety in Education and Schools
- Ventilation for Welding and Cutting
- Selecting Gloves for Welding and Cutting
- Respiratory Protection Basics for Welding Operations

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