

CALIFORNIA BLACKSMITH ASSOCIATION

SAFETY PLAN AND GUIDE

PREPARED JANUARY 2002

Revision 2

Forward

Safety is paramount and cannot be overly expressed. Two of the main elements of Safety are:

- **Common sense.**
- **Attitude.**

Using common sense and having the proper attitude about safety will bring many hours of injury free blacksmithing. There are many potential hazards associated with blacksmithing. The object of this “Safety Plan and Guide” is to minimize these hazards yet allow the Blacksmith to fully enjoy the craft.

We have come a long way in the practice of safety. “Practical Blacksmithing” by M.T. Richardson, which was originally published in four volumes in the 1800’s, and still used today as a blacksmith’s guide, never mentioned the word “SAFETY”. Today we consider safety paramount as we have come to realize that workers and their respective skills are not expendable.

The requirements of this “SAFETY PLAN and GUIDE’ are considered to be safety as a minimum and therefore the requirements of this document can always be exceeded.

Rev Change	Date	Reason	Revision Page	Paragraphs Affected
Basic	Jan 2002	Initial Issue		All
Revision 1	February 2003	Update Safety Plan		2.5.1 2.6 2.8.2
Revision 2	April 2017	Update Safety Plan Lung Protection/Conservation		2.3. – 2.3.8
		Subsequent Section Numbers Updated		2.4 – 3.0

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1.0 INTRODUCTION

1.1 Purpose

This safety plan defines policy for the California Blacksmith Association (CBA).

1.2 Application

This safety plan will continue in effect until rescinded by the California Blacksmith Association.

The safety plan and guide will be revised as necessary to accommodate updates and improvement in techniques.

The requirements and guidelines contained in this plan are applicable to all Members, Instructors, Demonstrators, and Guests attending CBA sanctioned functions.

1.3 CBA Safety Policy

The strength of any organization is built upon the collective wisdom and talents of its members. The prevention of blacksmith related injuries will be given precedence over every decision whenever and wherever necessary. It is the policy of CBA to provide a safe environment and to follow practices and principles which will safeguard all Members, Instructors, Demonstrators and guests.

Safety is the responsibility of every Member, Instructor, Demonstrator, and Guest. All the above are responsible for strict compliance with all CBA established safety rules and for performing tasks in such a way as not to endanger themselves or others.

In the event of an emergency during a CBA sanctioned event local 911 services will be utilized. CBA will provide a portable eye wash for use at sanctioned events.

During a CBA sanctioned demonstration an area around the Demonstrator of approximately 15ft X 15ft (as a minimum) will be cordoned off. This will provide an uncrowded work area for the Demonstrator and Assistants. The area outside the cordon rope will provide an area reasonably free of risk for observers.

It is recommended that jewelry not be worn while smithing.

1.3.1 Responsibility and Authority

The Education Committee is responsible to ensure that training of CBA members is conducted in a safe manner. The Education Committee shall ensure that CBA sanctioned Demonstrations are conducted in a safe manner. To this end Safety Monitors will be solicited from the CBA membership and assigned to aid the Demonstrator in following the intent of this plan.

CBA instructors are responsible to conduct the training of CBA members in a safe manner in accordance with this Safety Plan.

CBA members under instruction (Basic I and Basic II) and CBA members in general will provide their own personal safety equipment e.g., safety glasses, hearing protection, etc.

1.3.2 Disciplinary Action Program

In order for this Safety Plan to work, disciplinary action must be taken when violations occur. The forms of discipline for violations will vary dependent upon the seriousness and frequency of the offense. In most cases a simple discussion with one of the CBA elected/appointed officers will suffice. However if a member habitually violates safety rules or shows no regard for themselves or others the members affiliation with CBA may be terminated. It is most important that CBA Instructors set a safe example for other members.

2.0 Blacksmith Safety

2.1 Eye Protection

2.1.1 Impact-Type Safety Glasses or Goggles

Safety glasses and goggles are the blacksmiths first line of defense against injury. Eye protection will be worn anytime a CBA member or guest is smithing, Watching or demonstrating. This is a mandatory requirement.

ANSI approved impact-type safety glasses or goggles shall be worn to ensure greater eye protection from flying particles. The glasses shall meet the requirements of ANSI Z 87.140 with side shields. Poly carbonate lenses meeting these requirements are acceptable. Tasks which dictate the need for such eye wear include:

- | | | | |
|------------|---------------|----------|--------------------|
| • Forging | Forge Welding | Blowing | Pneumatic Tool Use |
| • Scraping | Hammering | Drilling | Punching |
| • Buffing | Grinding | Slitting | |

2.1.2 Contact Lenses

Contact lenses are not considered approved eye wear when working in the environment that the blacksmith is subjected to.

2.1.3 Face Shield

An approved face shield may be used in addition to eye protection for added protection from flying particles. The use of face shield will always include the use of safety glasses under the face shield.

2.1.4 OX-GAS Welding or Burning Goggles

Approved burning goggles shall be worn to provide protection from ultra-violet radiation. (number 5 shade of lens is considered adequate) Number 5 shade is considered a minimum the shade used shall be appropriate for the operation. Burning goggles shall be used when ox-gas torch is used for cutting or burning.

2.1.5 Welding Hood

A welding hood with a filtered lens of number 10 shade shall be used to provide protection from ultra-violet rays produced during arc welding. Number 10 shade is considered a minimum the shade used shall be appropriate for the operation.

2.2 Hearing Protection/ Conservation

2.2.1 Approved Hearing Protection

The ring of the anvil is usually greater than 85db and requires the use of hearing protection. Approved hearing protection shall consist of ear plugs, ear muffs, or a combination thereof, which must eliminate the noise exposure to within a permissible limit.

It is ***strongly recommended*** that all CBA members and guests use hearing protection whenever work at the anvil is in progress.

2.3 Lung Protection/Conservation

Hazards associated with blacksmithing that potentially can affect lung health are well known and should not be disregarded. Familiarity with these hazards and the benefits of protecting the lungs from exposure is clearly understood. We are each responsible to become informed.

Use of respirators/dust masks is recommended. Be sure to provide consistent fresh air source and air movement. Proper selection and use of various devices and materials for their intended function, while conforming to manufacturers guidelines, is key for best practices of personal safety.

2.3.1 General Blacksmithing/Forging

Proper fire management is always important. Working at the forge discharges toxic fumes and particulates, be mindful of others nearby. Sufficient ventilation, switching to burning coke, charcoal or gas can help to reduce exposure to these hazards.

2.3.2 Gasses

Products of combustion include Carbon Monoxide and other noxious gasses. Chronic exposure can lead to cumulative health impacts ranging from short term to severe. This can be avoided by practicing proper fire management. Protection can be achieved with appropriate ventilation and using a functioning carbon monoxide monitor.

2.3.3 Fumes

Fumes are generated from burning solid fuels and burning off coatings on metal. You can avoid their affects by practicing proper fire management. Further protection is possible with appropriate ventilation and wearing protective masks as appropriate, such as when arc welding.

2.3.4 Smoke

Smoke is generated while burning solid fuels. Also, soot, from incomplete combustion can become an issue. Each of these can be avoided by practicing proper fire management. Further protection can be achieved with appropriate ventilation and wearing proper masks, such as when arc welding.

2.3.5 Dust Particulates

Sources for dust particulates include earth floors and solid fuels such as coal and charcoal dust. These may become stirred up from activity, possibly becoming wind/air borne. Wearing an appropriate mask while working on a fire proof floor, such as gravel or concrete, maintaining reasonable house keeping, can help to minimize health impacts.

2.3.6 Metallic Particulates

Grinding, disc cutoff saws, power/hand sanding are sources for metal particulates that may be scattered and become air borne. Be sure to wear safety equipment and be aware about the direction and location that the metal particulates are broadcast.

2.3.7 Ceramic Particulates

Inhalable Ceramic Particulates can result in a serious impact on lung health, that over a long term exposure, can become lethal. Insulating materials inevitably break down. They are not designed, or intended, to be subjected to direct flame or abrasion, such as found in many gas forge interiors (i.e. refractory wool, fiber board, soft refractory brick, etc.)

Protect these fibers from being disturbed in the long term by shielding and containing with a durable “hot face” material such as Super Duty Hard Firebrick, Mizou high temperature, strength castable, etc. At minimum, make sure that any exposed soft insulating materials are in some way contained or at least coated to temporarily help to reduce release of fiber and/or frayed particles from getting into the air. (ITC100 or similar product)

2.3.8 Respirators/Dust Masks

Respirators/dust Masks are the blacksmiths’ personal line of defense against lung injury. Dust masks are generally disposable, provide only limited lung protection, a reduced duty cycle and must be replaced regularly (hours). Respirators are equipped with a non-disposable structure, with multiple replacement cartridge filters available. These can be used in combination for longer and more comprehensive lung protection in various applications.

2.3.9 Respirators/Dust Masks Selection & Proper Fit

Respirators/Dust Masks must seal well against the skin to avoid leaks. Facial hair, damage, distortion, exhausted filter and/or elastic straps may defeat a proper seal against or over the face. Become familiar with how respirators/dust masks fit, their features, duty cycles, which filter(s) are required for specific/desired uses.

2.4 Hand Protection

2.4.1 Recommendation for Hand Protection

The need for hand protection is a matter of choice. Some smiths use no hand protection. Some smiths use a glove on the tong/tool or hot metal holding hand and no glove on the hammer hand. The tong /tool or hot metal holding hand is usually closer to the hot work and protection is helpful. However a glove on the hammer hand results in a loss of grip on the hammer handle. If a glove or gloves

are used it is recommended that:

- The gloves are made of cotton, or Kevlar.
- If a leather gloves are used the glove on the tong hand be loose fitting so it can be removed quickly. The fit shall be loose enough that it can be shaken off the hand.
- Gloves made of synthetic materials, except for kevlar, not be used. Synthetic materials can melt onto the skin if exposed to hot sparks or flame.

If a glove becomes hot it shall not be soaked in water to cool the glove. Cooling a glove in water can produce steam in the glove. A glove that is soaked with sweat can also produce steam. Therefore it is necessary to have dry gloves available.

2.5 Foot Protection

2.5.1 Recommendation for Foot Protection

Heavy duty, high topped leather shoes are important. Many athletic type shoes Are made of synthetic materials and can melt onto your skin when exposed to heat, flame, or sparks and therefore will not be worn in the forging area. Low quarter shoes are not recommended. Sparks or hot slugs can find their way into these shoes.

Closed hi-top shoes constructed of canvas will be allowed in the forging area.

2.6 Clothing

Cotton is the best all-around material to wear. Synthetic materials are not recommended because they melt easily and some may burn rapidly when exposed to flame. Synthetics will not be allowed when working or in close proximity to the forging area.

2.6.1 Standard Work Clothes

Clothing that is in a good state of repair should be worn. Active participants in CBA sponsored events must wear clothing that covers the tops of their footwear. Spectators are advised to do likewise. Spectators choosing to wear clothing that exposes the legs do so at their own risk.

2.7 Alcohol/ Drugs

CBA members, CBA Instructors, and Demonstrators shall not consume alcoholic beverages when:

- Forging.
- Demonstrating.
- Instructing.

Be aware that some prescription and over the counter medications can cause drowsiness.

CBA will not tolerate the use of illegal drugs at any CBA sponsored event. Use of illegal drugs will be grounds for expulsion from the CBA event. *CBA has a zero tolerance policy.*

2.8 Tool Box Safety Meeting (Safety Review)

Instructors will conduct a tool box safety meeting at the start of each day and prior to beginning a training session. The subject of the meeting will include the contents of this plan, discussion of the pending hazardous operation, or other safety subject as determined by the instructor.

A CBA representative will conduct a tool box safety meeting prior to a CBA sanctioned demonstration. The subject will include a discussion of pending hazardous operations.

2.9 Power tools

2.9.1 Pedestal, Bench, Portable Grinders, and Wire wheels

Face shields and safety glasses or mono goggles will be worn when grinding or polishing with a wire wheel. All shirts must be tucked into trousers and loose clothing secured prior to using grinders or wire wheels.

Care should be taken to keep long hair out of harms way.

Guards, work rests, eye shields and other permanent protective devices must not be removed from any grinding or buffing wheel.

Cotton, Hot Mill, or Kevlar gloves are not recommended for use at a wire wheel.

In this application a good fitting leather gloves can be used.

2.9.2 Power Hammers

Power hammers come in many sizes and shapes. Power hammers use various sources of energy to produce the high energy required for their powerful striking blow. They all have two things in common. They are efficient and dangerous. Power hammers deserve your respect. When using a power hammer always:

- Keep hands clear of the falling weight (hammer) and anvil/bottom tool or die.
- Wear proper eye protection.
- Wear proper hearing protection.

Having said all that, it is recognized that for every rule there can be an exception. For example when using a treadle hammer with a chisel or chasing tool where good control and accuracy are required it is possible *with a proper positive safety stop* to hold the chisel or chasing tool in the hand. This type of operation should only be performed by a smith with sufficient experience; as a minimum Journeyman level.

Insure that the hammer is turned off and rendered inoperable when not in use.

Power hammers will not be used by Basic I and Basic II students. At Conferences students may use power hammer provided they are under supervision.

3.0 Basic Blacksmith Tools

- Hammer- Keep the head tight on the hammer handle. Frequently inspect the hammer face to insure the face is free of pits or cracks.
- Tongs- When picking up tongs assume the jaws are hot. Use tongs that have been adjusted to fit the work. A loose fit can allow the hot piece to fly out of the tong jaws.
- Hardie- Always remove the hardie from the hardie hole before you continue hammering. The sharp edge of the hardie can do major damage to your hand.

- Post Vice- Assume the jaws are hot. When finished with the post vice close the jaws, and put the handle in the vertical position. The handle is one more thing to run into.
- Chisels, Punches, and Drifts- Keep the head free of burrs (mushroom).
- Files- Never use a file without a handle.
- Forge- Assume any thing on or under the forge is hot.
- Compressed Air- Be cautious when using compressed air to clean parts or operate tools.

THE LAST WORD

Follow this safety plan. Get it hot, hit it hard. Have a good time.