ABANA

SAFETY GUIDE

Revision NC1

Forward

Safety is paramount. Three of the main elements of Safety are:

- **Planning**
- **Inquisitive Attitude**
- **Knowing equipment and area layout**

Blacksmithing is inherently dangerous. The object of this "Safety Guide" is to allow the Blacksmith to fully enjoy the craft while minimizing the inherent dangers. Planning safe work and maintaining an inquisitive safety attitude will sustain many hours of injury-free blacksmithing.

Blacksmithing safety practices have come a long way. "Practical Blacksmithing" by M.T. Richardson, which was originally published in four volumes in the 1800's, and is still used today as a blacksmith's guide, never mentioned the word "SAFETY". Today, we understand that safe work practices are the best work practices. We achieve safety practices by continuously evaluating the work environment and assessing the fitness of our tools -- our inquisitive safety attitude -- and by planning to work safely.

This "SAFETY GUIDE' recommends basic safety practices compatible with traditional methods of blacksmithing. ABANA encourages Blacksmiths to exceed these basic recommendations whenever possible.

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1.1 INTRODUCTION

1.2 Purpose

This Safety Guide defines policy for the Artist-Blacksmiths' Association of North America (ABANA).

1.2 Application

This Safety Guide will continue in effect until rescinded by ABANA.

The Safety Guide will be revised as necessary to accommodate updates and improvement in techniques.

The requirements and guidelines contained in this Safety Guide are applicable to all Members, Instructors, Demonstrators, and Guests attending or participating in ABANA-sanctioned activities.

1.3 ABANA Safety Policy

The strength of any organization is built upon the collective wisdom and talents of its members. It is the policy of ABANA to provide a safe environment and to follow practices and principles which safeguard all Members, Instructors, Demonstrators and guests at ABANA-sanctioned activities, including demonstrations, workshops, conferences, and classes. The prevention of blacksmith-related injuries is the most important consideration in every decision concerning how work is performed during such activities. In ABANA's view, safety is the responsibility of every Member, Instructor, Demonstrator, and Guest: All are responsible for strict adherence to this Safety Guide and for working in such a way as not to endanger themselves or others.

1.3.1 Responsibility and Authority

ABANA members participating in ABANA-sanctioned activities will provide their own personal safety equipment ("PPE") e.g., safety glasses, hearing protection, footwear, etc.

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

During ABANA-sanctioned activities that include non-members and guests, ABANA will designate an on-site safety coordinator who will ensure that such activities are conducted in a safe manner. The on-site safety coordinator will support instructors and demonstrators in implementing the recommendations of this Safety Guide.

During ABANA-sanctioned demonstrations, the on-site safety coordinator will maintain an uncrowded work area for the Demonstrator and assistants of approximately 15ft X 15ft (as a minimum). The on-site safety coordinator will also monitor members and guests to ensure that PPE is worn and used effectively.

ABANA will provide a portable eyewash for use at sanctioned activities where blacksmithing work is performed.

In the event of an emergency during an ABANA-sanctioned event local 911 services will be used.

1.3.2 Disciplinary Action Program

In order for this Safety guide 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 ABANA elected/appointed officers/instructors will suffice. However, if a member habitually violates safety rules or shows no regard for themselves or others, the member will be removed from the area and the member's affiliation with ABANA may be terminated. It is most important that ABANA Instructors set a safe example for other members.

2.1 **Blacksmith Safety**

2.2 Eye Protection

2.1.1 Impact-Type Safety Glasses or Goggles

Safety glasses and goggles are the blacksmith's first line of defense against injury. ABANA requires that eye protection be worn anytime anyone is blacksmithing, watching or demonstrating. Remember that normal prescription eyeglasses do not meet all the requirements for safety glasses.

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. Polycarbonate lenses meeting these requirements are acceptable. Tasks, which dictate the need for such eyewear, 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 eyewear when working in the blacksmithing environment. If worn, additional eye protection must be worn.

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 a face shield will always include the use of safety glasses under the face shield.

2.1.4 OXY-GAS Welding or Burning Goggles

Approved burning goggles shall be worn when an oxygen-gas torch is used for cutting or burning to protect from ultraviolet radiation. A number 8 shade is considered a minimum; the shade used shall be appropriate for the operation.

2.1.5 Welding Hood for Arc Welding

A welding hood with a filtered lens of up to number 14 shade shall be used to provide protection from ultraviolet rays produced during arc welding. A number 14 shade is considered a minimum; the shade used shall be appropriate for the operation with 3/8-inch electrodes. (Reference OSHA 29 CFR 1926.102)

2.2 Hearing Protection/ Conservation

2.2.1 Approved Hearing Protection

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

It is ***strongly recommended*** that all ABANA 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.

Be sure to provide consistent fresh air source and air movement as a first line of defense.

When ventilation does not remove contaminants in a confined or restricted area, use of respirators/dust masks is recommended. 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. This topic has many variables and safety professionals should be consulted for specific situations.

Particulate respirators are strongly recommended for anyone using a powered grinder, cut-off or sander.

2.3.1 General Blacksmithing/Forging

Proper fire management is always important. Working at the forge discharges toxic vapors, fumes and particulates; be mindful of others nearby. Sufficient ventilation, and burning coke, charcoal or gas instead of coal can help reduce exposure to these hazards. Alternatively an induction heater can be utilized to mitigate these risks

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 permanent injury. 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 as well as metal loss in the forge. You can mitigate their affects by practicing proper fire management as well as avoiding heating coated or painted metals. Further protection is possible with appropriate ventilation and wearing appropriate respirators, 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 respirators, such as when arc welding. Additionally, cleaning the work area to not allow combustible soot to accumulate is a good practice.

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 respirator while working on a fireproof floor, such as gravel or concrete, maintaining reasonable housekeeping, 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 airborne. Be sure to wear safety equipment and be aware of the direction and location of the scattered metal particulates. Plated metals and certain alloys such as galvanized pipe and beryllium bronze emit dangerous fumes and should not be used in ABANA sanctioned events.

2.3.7 Ceramic Particulates

Inhalable Ceramic Particulates can result in serious injuries to lung health that over a long-term exposure can become lethal. Insulating fire blanket materials are friable and 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 them with a durable "hot face" material such as Mizzou high temperature, strength castable, etc. ITC 100 isn't sufficient as a hot face in a gas forge to contain fibers.

2.3.8 Volatile Organic Fumes

Many solvents, paints and other liquid materials contain volatile organic compounds that can damage lungs, sinuses and nasal cavities. Proper ventilation or respirators should be worn whenever working with such substances.

2.3.9 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 (within hours). Respirators are equipped with a non-disposable structure, with multiple replacement cartridge filters are available, as well as air fed respirators. These can be used in combination for longer and more comprehensive lung protection in various applications.

2.3.10 Respirators/Dust Masks Selection & Proper Fit

Respirators 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 fit, their features, duty cycles, and which filter(s) are required for specific/desired uses. Equipment manufacturers are an excellent source of this information. Not all respirators are designed for organic solvents and compounds, when using organics make sure the respirator is designed to filter those compounds.

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 will 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, should 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.

Loose gloves and clothes should not be worn near rotary devices such as bench grinders, angle grinders and the like. Loose fitted gloves and clothes could be caught by the rotating parts and draw the covered body parts into the machinery.
It is recommended that jewelry not be worn while smithing.

2.5 Foot Protection

2.5.1 Recommendation for Foot Protection

Heavy duty, high top 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.
Boots with safety toes are always recommended as protection from dropped tools and stock.

Open toed shoes or sandals are inappropriate footwear in a forging area.

2.6 Clothing

Cotton is the best all-around clothing material. 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 ABANA-sanctioned activities must wear pants that cover the tops of their footwear. Spectators are advised to do likewise. Spectators choosing to wear clothing that exposes their legs do so at their own risk.

2.7 Alcohol/ Drugs

ABANA members, ABANA 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.
ABANA will not tolerate the use of illegal drugs at any ABANA sponsored event. Use of illegal drugs will be grounds for expulsion from ABANA events. *ABANA has a zero-tolerance policy regarding illegal drug use or legal recreational drug use that could impair motor function.*

2.8 Tool Box Safety Meeting (Safety Review)

Instructors will conduct a toolbox 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 Safety Guide, discussions of planned hazardous operations, and other safety subjects as determined by the instructor.

An ABANA representative will conduct a toolbox safety meeting prior to an ABANA sanctioned demonstration. The subject will include a discussion of planned hazardous operations.

2.9 Power tools

2.9.1 Pedestal, Bench, Portable Grinders, and Wire wheels

Face shields and safety glasses/goggles will be worn when grinding or polishing with a wire wheel. All shirts must be tucked into pants and loose clothing secured prior to using grinders or wire wheels.
Care should be taken to keep long hair out of harm's way. Long hair must be tied into a ponytail and tucked into shirt.
Guards, work rests, eye shields and other permanent protective devices must not be removed from any grinding or buffing wheel. Pedestal grinder work rests shall be kept at a distance not to exceed one-eighth inch from the surface of the wheel.
Cotton, Hot Mill, or Kevlar gloves are not recommended for use at a wire wheel. In this application a good snug fitting leather glove can be used.
Synthetic fiber shirts are not recommended for wear when using a wire wheel or grinding as such fabrics are prone to catch fire.

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.
- Pay attention to your body position.
- 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. Ensure 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 a power hammer provided they are under direct supervision.

3.0 Basic Blacksmith Tools

- Hammer- Keep the head tight on the hammer handle. Frequently inspect the hammer face to ensure 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.
- Hardy- Always remove the hardy from the hardy hole before you continue hammering. The sharp edge of the hardy 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 (mushrooming).
- Files- Never use a file without a handle.
- Forge- Assume anything on or under the forge is hot.
- Compressed Air- Be cautious when using compressed air to clean parts or operate tools.

THE LAST WORD

This Safety Guides provides ABANA Members, guests, students and instructors with basic safety recommendations compatible with traditional Blacksmith practice. ABANA strongly urges all Blacksmiths to familiarize themselves with additional safety information including equipment manufacturers' safety instructions. Another important source of safety information is the US Occupational Safety and Health Administration's website which offers a valuable resource of protocols and precautions to consider before engaging in any potentially hazardous activity.

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

SIGNATURE PAGE

I agree to abide by the safety policy as written during all National Curriculum training events.

Name Print_____

Signature_____ Date_____