

# Acid Safety

Concentrated acids are strongly corrosive to all body tissue, especially eyes and skin, and are highly toxic due to their extreme corrosiveness.

Concentrated sulfuric acid is a strong dehydrating agent. Because of its strong ability to remove water, it reacts violently with many organic materials such as sugar, wood, and paper.

Always add acid to water! Never add water to concentrated acids. The acid may splatter and generate acidic steam, and heat is generated. This is the primary reason there are several back-check devices to keep irrigation water from getting into the field storage tanks. Acids are corrosive and will eat through most fabrics, resulting in small holes in clothing. This process does not occur instantly but rather over several hours and may not become apparent until the clothes are washed.

Always review the Material Safety Data Sheet (MSDS) before using any hazardous material.

Apply Derma Shield lotion to hands every four hours, before working around acids, caustics, or petroleum products. The office has a half gallon container of replenishment available to refill the two ounce bottles, which are provided.

Diphoterine is an enzyme which is made in France and is used by applying on the skin after an acid has splashed on the skin. The manufacturer claims it is able to stop the penetration of acids and other aggressive chemical products into the tissues.

Keep bystanders away. The best prevention is keeping physical distance away. Upwind is best. Anyone within approximately 30 feet of the transferring hose should be wearing PPE.

## **PPE**

Always, at a minimum, wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron when using concentrated acids or acid solutions. Nitrile rubber gloves are acid-resistant and are the best choice to use when handling concentrated acids. However, any plastic or vinyl glove will provide some protection against the occasional splash, small spill, and splatter that may occur.

## **Eye Protection**

Make it a habit of checking the eyewash and shower before transferring acid. Chemical splash goggles must be worn anytime acids or acid solutions are used. Safety glasses are not adequate protection. An approved eyewash must treat both eyes and provide clean potable water for at least 15 to 20 minutes.

## **Spills**

Spill control materials (dirt, sand, absorbent, and neutralizer) must be available whenever acids or acid solutions are used. If small spills are made at the field unloading site in the field, carry a shovel and

freshen up the site with dirt. This also makes a better impression to the grower after you have left the site. Have a five gallon bucket to catch any drips from the hoses. Dilute and neutralize all acids before disposal.

### **First Aid**

Always seek professional medical attention upon exposure to any hazardous chemical, especially concentrated acids. Take the MSDS with you. The doctor will ask for it. Decontaminate before leaving the site for medical attention. The best first aid for any chemical exposure to body tissue or eyes is immediate dilution with water. If an acid is splashed in the eyes, use and eyewash to irrigate the eyes for at least 15 to 20 minutes. Make sure the eyelids are held open to properly irrigate them. Ask the victim to look up, down, and sideways to better reach all parts of the eye. If an acid is splashed onto clothing, remove the clothing immediately before the acid soaks through the clothing and reacts with the skin. If an acid splashes onto your skin and clothing, immediately begin rinsing the affected skin with water (safety shower is ideal) and then begin to remove affected clothing. Modesty must take a back seat to the potential chemical burns that can occur. Carry a pair of Tyvek coveralls in your vehicle for this purpose, in case it is needed. If acid is ingested, the primary goal is to dilute the acid in the stomach and prevent further injury caused by vomiting. If the victim is conscious, immediately have the victim rinse their mouth out with water. Have the victim drink one or two cups of water or milk. Gastric antacids such as milk of magnesia or aluminum hydroxide can also be given. Do not induce vomiting. Do not try to neutralize the acid with a strong base. Do not give the victim any sodium bicarbonate or any carbonated drinks. Call poison control center (1-800-222-1222) or hospital emergency room and follow their directions. It has been our experience that the hospital emergency room has referred chemical eye injuries to an ophthalmologist. However, our workers compensation carrier does not have an approved provider in Hanford. The nearest SCIF approved ophthalmologists are in either Tulare or Fresno. In Tulare, it is Dr. Joseph Ruda, 136 North "O" Street, Tulare, (559) 686-5367, office hours are 9 AM to 3 PM, Monday, Tuesday, and Thursday.

A folder of providers, copied from the State Compensation Insurance Fund (SCIF) website, is provided to each field employee, if he is outside the Hanford area.

### **Acid Burns**

Most acid burns are minor, but there have been rare cases of death in acid burns. Burns most frequently occur on the arms or legs because of exposed skin. Other places include the face, neck and stomach areas. Symptoms of an acid burn include redness, irritation, and in some instances, seizures, dizziness and fatigue. Acid burns can be deceiving injuries, because what may appear to be a topical burn can have deep tissue damage and be the cause of other serious symptoms, such as seizures.

- Initial Treatment - A burn caused by a chemical, also known as an acid burn, can be very painful. Treatment depends primarily on the severity of the burn. Like most typical first and second degree burns, the first thing you should do with chemical burn is flush it clean with ample amounts of cool or cold water. This may mean jumping into an irrigation canal if it is safe to do so. This will help clean off the chemical causing the burn and provide temporary comfort.

- Secondary Treatment - According to the Mayo Clinic, immediately after rinsing off the burn you should remove any jewelry and wrap the affected area in clean, dry gauze. Depending on the severity of the burn, you may also want to consult a doctor. You can also take an over-the-counter pain killer such as ibuprofen or naproxen to help with the pain.
- Treatment Differences - Unlike burns caused by fire or hot surfaces, it is generally recommended that you do not use any antibiotic or soothing ointments on an acid burn, as the chemicals in these products could react negatively with the chemical that caused the burn. This does not apply if the doctor prescribes a crème or ointment to put on the wound.
- Follow up Care - After a serious acid burn of the skin, the Mayo Clinic recommends you receive a tetanus shot. The burns should be kept clean as they heal, and you should replace the bandaging often while it does.

**Seek emergency medical assistance if:**

- The person shows signs of shock, such as fainting, pale complexion or breathing in a notably shallow manner
- The chemical burn penetrated through the first layer of skin, and the resulting second-degree burn
- The chemical burn occurred on the eye, hands, feet, face, groin or buttocks, or over a major joint
- The person has pain that cannot be controlled with over-the-counter pain relievers
- If in doubt, seek medical attention

Generally, helicopter evacuation will not be an option because the crew will not take the risk of getting themselves contaminated.

**A sulfuric acid burns**, like all chemical burns, can cause a great deal of damage to the skin. When the acid accidentally comes in contact with the skin or the eyes, it is imperative to take actions immediately. Here are some quick first aid tips to help minimize the damage while waiting for professional medical assistance to arrive.

Assess the area where the acid came into contact with the skin. If the area is the hands, face or feet, immediately wipe the area with a wet cloth to remove the top layer of the acid.

Remove any clothing or jewelry that may have come in contact with the acid. This will help to ensure the acid does not have a chance to accidentally come in contact with another sections of skin and exacerbate the problem.

Use running water to flush out the area. For hands and feet, stick the affected area under an open spigot and allow the water to run over the area for at least 15 minutes. If the eyes are involved, lay the person flat and hold the eyelids open. Run a low pressure flow of cool water over the eyes for the full 15 minutes.

Determine if professional medical attention is needed. After 15 minutes of flushing the affected area, stop the use of water and observe the appearance of the area. If the skin is continuing to discolor, transport the individual to an emergency room or a doctor's office. If the eyes were involved and appear to be bloodshot and swollen, call for paramedics immediately and resume flushing the eyes with cool water. Should the person exhibit any symptoms of shock, seek medical attention at once.

Wrap the affected area with clean sterile dressing, such as gauze pads. This will help to prevent any foreign agents from reaching the tender skin until a doctor can look at the burn and prescribe a cream or ointment.

Keep the individual as calm as possible. While this may be relatively simple if the acid burn is on the hand or feet, this may be a more difficult process if the eyes are involved. Keep the cool water running until professional help arrives