



White Phosphorus Guide

Image Source: The Associated Press.

Sources and Chemical Properties

White phosphorus is a solid element that spontaneously ignites in air forming phosphorus pentoxide. White phosphorus is used as an incendiary agent in weapons and fireworks. Oxidation may produce yellow flame, while the production of white smoke indicates ongoing formation of phosphoric acid. The corrosive action of phosphoric acids and the heat from their chemical reactions contribute to tissue damage.

Clinical Manifestations

White phosphorus produces a combined chemical and thermal burn. Particles of white phosphorus that become embedded in wounds can continue to oxidize and cause tissue damage until debrided, treated, or consumed. Systemic toxicity can include severe hypocalcemia or hyperphosphatemia and hepatic necrosis. Burns covering a total body surface area of only 10 to 15 percent can be fatal.

Incendiary Weapons Direct Effect



Incendiary Weapons inflict extremely painful burns, sometimes to the bone. These burns can be fatal or cause severe and lifelong injuries that are physical and psychological. In many cases, over 15 percent of the body's surface area is harmed by burn wounds. Inflamed airways and toxic fumes can cause respiratory damage. The initial injuries can also lead to infection, shock, extreme dehydrations and organ failure, incendiary weapons are especially lethal for children, as the younger the victim and the larger the surface of burns, the lower the chances of survival are.

The Human Suffering these weapons is extremely agonizing. Victims often experience immediate and lifelong physical pain, as well as profound psychological and socioeconomic problems.

White Phosphorus Reactions/ Emergency Response

- White phosphorus is extremely flammable.
- Phosphorus will spontaneously ignite if exposed to air.
- Phosphorus ignites at approximately 86°F (30°C) in air; the ignition temperature is higher when the air is dry.
- Phosphorus reacts violently with oxidants, halogens, some metals, nitrites, sulfur, and many other compounds, causing a fire hazard.
- The agent burns rapidly, releasing dense, white irritating fumes.
- The agent can be transported in a molten form.
- The agent may re-ignite after a fire is extinguished.
- For small fires, use cold water spray, wet sand, or wet earth.
- For large fires, use cold water spray or fog. Do not scatter spilled material with high-pressure cold water streams. Move containers from the fire area if it is possible to do so without risk to personnel.
- Fight fires involving tanks or car/trailer loads from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of cold water until well after the fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tanks. Always stay away from tanks engulfed in fire.
- Run-off from fire control may be corrosive and/or toxic, and it may cause pollution.
- If the situation allows, control and properly dispose of run-off (effluent).

Symptoms

Exposure to white phosphorus may cause immediate burns that heal slowly. Systemic toxicity from white phosphorus exposure is categorized into 3 phases:

- **The first phase (gastrointestinal)** occurs a few minutes to 8 hours following white phosphorus exposure. Shock during this phase may be severe enough to cause death in 24 to 48 hours.
- **The second phase (asymptomatic)** follows the first phase and lasts for 8 hours to 3 days.
- **The third phase (multi-organ failure and central nervous system injury)** may begin 4 to 8 days after the second phase begins, and may end in death.

First Aid Guide

Eyes

- Immediately remove the patient/victim from the source of exposure.
- Immediately wash eyes with large amounts of cool water for at least 15 minutes.
- Keep exposed eyes covered with wet compresses to prevent white phosphorus particles from re-igniting.
- Avoid applying any lipid- or oil-based ointments, which may increase the absorption of white phosphorus.
- Consider applying an eye cage to prevent direct pressure applied to the eyeball.
- Seek medical attention immediately.

Ingestion

- Immediately remove the patient/victim from the source of exposure.
- Ensure that the patient/victim's airway is not obstructed.
- Do not induce vomiting (emesis).
- Monitor heart function. Evaluate for low blood pressure (hypotension), abnormal heart rhythms (dysrhythmias), and reduced respiratory function (respiratory depression).
- Evaluate for low blood sugar (hypoglycemia), electrolyte disturbances, and low oxygen levels (hypoxia).
- If there is evidence of shock or low blood pressure (hypotension), begin intravenous (IV) fluid administration.
- Seek medical attention immediately.

First Aid Guide

Skin

- Immediately remove the patient/victim from the source of exposure.
- See the Decontamination section for patient/victim decontamination procedures.
- Immerse areas of affected skin in cold water or cover them with wet dressings at all times.
- Vigorous irrigation with cold water is the best way to remove white phosphorous embedded in the skin.
- Remove visible particles of white phosphorus while washing with large amounts of cold water or while the area is submerged in cold water.
- The use of cold water is critical, but be careful to guard the patient/victim against hypothermia.
- Immediately place any removed particles of white phosphorus into a container of cold water to reduce risk to medical personnel and others.
- Avoid applying any lipid- or oil-based ointments, which may increase the absorption of white phosphorus.
- Monitor the patient/victim for signs of whole-body (systemic) effects.
- If signs of whole-body (systemic) poisoning appear, see the Ingestion section for treatment recommendations.
- Seek medical attention immediately.

First Aid Guide



Inhalation

- Immediately remove the patient/victim from the source of exposure.
- Evaluate respiratory function and pulse.
- Ensure that the patient/victim's airway is not obstructed.

If shortness of breath occurs or breathing is difficult (dyspnea), administer oxygen.

- Assist ventilation as required. Always use a barrier or bag-valve-mask device.
- If breathing has ceased (apnea), provide artificial respiration.
- Monitor for respiratory compromise, respiratory distress, and accumulation of fluid in the lungs (pulmonary edema).
- Monitor the patient/victim for signs of whole-body (systemic) effects and administer treatment as necessary based on symptoms.
- Seek medical attention immediately.



This initiative aims to raise awareness, and protect Journalists with utmost hope for the safety and security for our families, communities in the south, and across Lebanon.

Supervised by Dr. Lina Ghandour