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What are Chemical Agents and Chemical Weapons?

Chemical agents are toxic liquid compounds. The nation's stockpile consists of two principal types of chemical agents: nerve and blister. These agents are securely stored at seven locations in the United States and are either contained in one of five types of munitions or stored in steel bulk storage containers, called ton containers. The ton containers hold about 170 gallons of liquid agent and weigh approximately 1,600 pounds empty. Over a long period of time, some of these liquid agents can deteriorate into thick, sludge-like substances.

Chemical weapons are a mix of different types of munitions that contain one type of agent. These munitions include rockets, land mines, projectiles or bombs designed to disperse chemical agent either from exploding weapons or through spray tanks attached to the underside of airplanes. The U.S. chemical stockpile was developed as a deterrent to enemy troops from using similar weapons against our nation's troops. The United States has never used these chemical weapons. Each stockpile site has a unique configuration of agents and munitions. Information on the types of chemical weapons stored at each of the nation's stockpile sites is available from the U.S. Army Chemical Materials Agency (CMA) Web site, www.cma.army.mil.

Types of Chemical Agents

Blister agents

H, HD, HT, L

Blister agents are liquid, oily substances that are amber to dark brown in color, with an odor similar to garlic, horseradish or mustard—a common name for the compounds. Blister agents damage tissue they come into contact with by causing chemical burns or blisters. They can also destroy cells of living tissue, particularly in eyes and lungs. Blister agents cause no immediate symptoms upon contact; symptoms can be delayed from two to 24 hours after exposure.

Blister agents were designed to prohibit movement of enemy soldiers during battle. The munitions that contain blister agents include the 105 mm M60 and 155 mm projectiles. Blister agents not put into munitions are stored in steel bulk containers used for shipping and storage.

Nerve agents

GA, GB, VX

Nerve agents are fast-acting, lethal, organophosphate compounds similar to insecticides. They affect the body by inhibiting or deactivating the enzyme cholinesterase, an enzyme found throughout the body. When

Agent	Color	Odor	Rate of Action	Effect on Body
Sarin (GB) *nerve agent*	**Colorless liquid**	**None in pure form**	**Very rapid - seconds to minutes**	**Inhibits nerve conduction**
Tabun (GA) *nerve agent*	**Colorless liquid**	**Slightly fruity**	**Very rapid - seconds to minutes**	**Inhibits nerve conduction**
VX *nerve agent*	**Colorless to amber liquid**	**None**	**Very rapid - seconds to minutes**	**Inhibits nerve conduction**
Mustard *blister agent*	**Colorless to pale yellow liquid**	**Garlic or horseradish**	**Delayed - hours**	**Irritates skin, eyes and respiratory tract**
Lewisite (L) *blister agent*	**Colorless liquid**	**Geraniums**	**Immediate - within 30 seconds**	**Irritates eyes, skin, respiratory tract and circulatory system**

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What are Chemical Agents and Chemical Weapons? (continued)

cholinesterase is inhibited, hyperactivity of the glands and muscles results. Glands over-secrete, causing a fluid to build up in the lungs and muscles to convulse uncontrollably. This hyperactivity continues until the muscles fatigue and go into a state of total relaxation. Death by nerve agent poisoning is the result of respiratory failure.

Nerve agents were designed for use in weapons such as rockets, land mines, projectiles or bombs and would have been dispersed when these weapons exploded. VX was also designed for use in spray tanks in potential aerial missions against enemy troops and equipment.

Types of Munitions

M55 Rocket

Each rocket is made of aluminum and is more than six-feet long. It contains a little more than 1 gallon of either GB or VX. It is packed in its own fiberglass shipping and firing tube and stored in protective wooden pallets. The rocket consists of a fin-nozzle assembly, motor, warhead and fuze.

The M55 rocket was designed to disperse nerve agents upon impact.

M23 Mine

One of the Cold War-era munitions, an M-23 mine is pre-filled with about 10 pounds of nerve agent for actions against enemy tanks and personnel. The land mine consists of a steel body, burster, sideinitiator charge and fuze. As a safety precaution, fuzes and activators are packed separately from land mines within 16-gallon storage and shipping drums. Each drum contains three land mines.

Projectiles

105-mm, 155-mm, 8-inch

Projectiles are artillery shells that are fired from cannons. Each projectile contains a fuze and an explosive burster. Upon impact, the fuze ignites the burster charge, located in the center of the shell. This causes the shell to explode and disperse the agent.

There are two types of 105 mm projectiles, the M60 that contains blister agent HD (mustard) and the M360 that contains GB nerve agent. There are five types of 155 mm projectiles that contain GB and VX nerve agents and H and HD blister agents. The 8-inch projectile contains either GB or VX.

Bombs

MC-1, MK-94

The MC-1 and MK-94 bombs consist of a heavy steel body, central burster tubes and fuzes. Both types of bombs are filled with GB nerve agent. When the fuze detonates, the burster charge ruptures the bomb, which heats GB and disperses it as an aerosol mist.

Spray Tanks

TMU-24/B

The TMU-28/B liquid agent spray tank is not a weapon because it doesn't explode; rather, it is designed to disperse liquid nerve agent VX from underneath an aircraft. The tank has four major components: agent container, aircraft suspension system, tailcone section and agent-dispersal nozzle. Spray tanks were designed to force air through nozzles to disperse agent as a fine mist.

Ton Containers

Ton containers are not a weapon. They are bulk storage containers made of steel and measuring approximately seven feet in length. They weigh approximately 1,600 pounds empty. Ton containers are equipped with fittings to permit the closed-system transfer of chemical agents. The containers have been used since the 1930's to store and ship bulk chemicals including chemical agent.