



# RECOVERED CHEMICAL MATERIEL DIRECTORATE FACT SHEET

## WHAT ARE CHEMICAL AGENTS AND CHEMICAL WEAPONS?

Chemical agents are toxic compounds contained in a munition delivery system, which contains one type of agent. The nation's stockpile consists of two principal types of chemical agents: nerve and blister. These agents are securely stored at locations in the United States and are 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. 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 chemical 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.

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 Activity (CMA) website, [www.cma.army.mil](http://www.cma.army.mil).

### Types of Chemical Agents

AGENT	COLOR	ODOR	RATE OF ACTION	EFFECT ON BODY
Sarin (GB) <i>nerve agent</i>	Colorless	None in pure form	Very rapid – seconds to minutes	Inhibits nerve conduction
Tabun (GA) <i>nerve agent</i>	Colorless	Slightly fruity	Very rapid – seconds to minutes	Inhibits nerve conduction
VX <i>nerve agent</i>	Colorless to amber	None	Very rapid – seconds to minutes	Inhibits nerve conduction
Mustard (H/HD/HT) <i>blister agent</i>	Colorless to pale yellow	Garlic or horseradish	Delayed – hours	Irritates skin, eyes and respiratory tract
Lewisite (L) <i>blister agent</i>	Colorless	Geraniums	Rapid – within 30 seconds	Irritates eyes, skin, respiratory tract and circulatory system

### 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 M60 105 mm and 155 mm projectiles. Blister agents not put into munitions are stored in steel bulk containers used for shipping and storage.





## WHAT ARE CHEMICAL AGENTS AND CHEMICAL WEAPONS?

### 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 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 one 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, side-initiator 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.

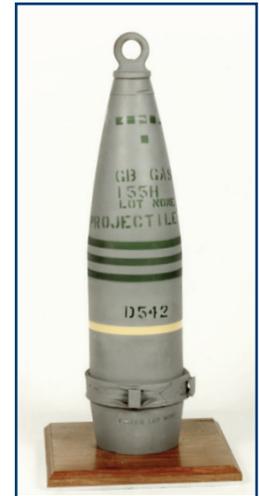
#### Projectiles

##### 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/HD blister agents. The 8-inch projectile contains either GB or VX.



M55 Rocket



Projectile



M23 Mine





## WHAT ARE CHEMICAL AGENTS AND CHEMICAL WEAPONS?

### TYPES OF MUNITIONS

#### 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. Ton containers are equipped with fittings to permit the closed-system transfer of chemical agents. The containers have been used since the 1930s to store and ship bulk chemicals including chemical agent.



Bomb



Spray Tank



Ton Containers





## **RECOVERED CHEMICAL MATERIEL DIRECTORATE**

U.S. ARMY CHEMICAL MATERIALS ACTIVITY | E4585 HOADLEY ROAD | Aberdeen Proving Ground, Maryland 21010  
RECOVERED CHEMICAL MATERIEL DIRECTORATE PUBLIC AFFAIRS OFFICE  
410-436-4292 | [www.cma.army.mil](http://www.cma.army.mil)

