



## Characteristics of Mustard Agents

The last chemical munition in the declared U.S. stockpile was destroyed July 7, 2023.

The Program Executive Office, Assembled Chemical Weapons Alternatives, known as PEO ACWA, is responsible for the safe and environmentally compliant destruction of the remaining U.S. chemical weapons stockpile stored at the [U.S. Army Pueblo Chemical Depot](#) in Colorado and the [Blue Grass Army Depot](#) in Kentucky. The safe, secure storage of the stockpiles in the U.S. Army inventory is the responsibility of the [U.S. Army Chemical Materials Activity \(CMA\)](#).

The ACWA program is responsible for destroying three types of mustard agent-filled weapons in the original Colorado and Kentucky stockpiles. The mustard agents are known by the military designations H, HD and HT. The original stockpile in Colorado consisted of 2,613 U.S. tons of mustard agents HD and HT configured in projectiles and mortar rounds. The original stockpile in Kentucky comprised 523 U.S. tons of nerve and mustard agents in rockets and projectiles, with approximately 90 tons of that quantity consisting of mustard agent H in projectiles.

Currently, the program is operating state-of-the-art pilot plants that are safely and efficiently destroying these stockpiles. Operations are on target for completion by the Chemical Weapons Convention treaty commitment of Sept. 30, 2023. U.S. Public Law mandates stockpile destruction by Dec. 31, 2023.

### What is mustard agent?

Mustard agent is a type of blistering agent or vesicant, which was designed to produce casualties, to degrade fighting efficiency, and to restrict use of terrain and equipment. Blister agents are chemical warfare agents that act on the eyes, mucous membranes, lungs, skin and blood-forming organs.

The majority of the Colorado stockpile consists of mustard agent HD, known as purified sulfur mustard or distilled mustard, which has a 5% sulfur impurity, less odor and greater blistering power than the original H mustard agent, the World War I vintage Levinstein mustard found in the Kentucky stockpile. A second configuration of mustard agent in the Colorado stockpile known as HT, a combination of HD and a chemical compound called T, equals about 59 tons.

Agent H contains about 20-30% impurities, and Agent HD is a nearly pure substance. In its pure liquid state, mustard agent is colorless. However, when exposed to impurities, it becomes a pale yellow to brown oily substance. Mustard agent freezes at 58° F, is liquid above 58° F and boils at 419° F. When vaporized, mustard agent has a garlic-like odor and can remain active in the soil for three years.

### Has mustard agent previously been destroyed in the U.S.?

As a signatory to the [Chemical Weapons Convention](#), the U.S. successfully completed the destruction of nearly 90% of its original chemical weapons stockpile in January 2012, via CMA. The remaining U.S. chemical weapons stockpile near Richmond, Kentucky and in Pueblo, Colorado represent the 10% for which PEO ACWA is responsible.

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Chemical weapons or bulk containers holding mustard agent have been previously destroyed at Johnston Atoll, a group of islands about 800 miles southwest of Hawaii; Edgewood, Maryland; Pine Bluff, Arkansas; Anniston, Alabama; Umatilla, Oregon; and Tooele, Utah.

### **Are mustard agents harmful?**

Mustard agent was designed to cause inflammation of the eyes, nose, throat, trachea, bronchi and lung tissue, as well as blistering of the skin. In amounts approaching the lethal dose, injury to bone marrow, lymph nodes and spleen may occur. Mustard agent is toxic and is a carcinogen.

### **What are the signs of exposure?**

In the unlikely event of an accident or incident involving mustard agent, avoiding mustard vapor is the primary goal. Symptoms may include redness and stinging of the eyes or skin, followed by skin blisters, burning of the nose and sinuses, sore throat and hoarseness or coughing. The severity of exposure depends on how much mustard is in the vapor and the length of time of exposure. Symptoms of mustard exposure may not appear for two to 24 hours. Anyone with symptoms of mustard exposure should call for medical help immediately and follow instructions.