



DEFENSE LOGISTICS AGENCY

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IN REPLY
REFER TO

DNSC-MO

SUBJECT: Updated storage manual Appendix 4-A for Mercury

Discussion: DNSC-MO has recently completed a update of the mercury manual section. This section has been updated to the newest information that is currently available. Please add this section to your printed copy of the storage manual and remove the current section for mercury. As always the most up to date version of the storage manual is located at <https://www.dla.dnsc/iamthekey.com>

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DNSC-MO

Chief, Operations
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DNSC-ME

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Attachment

cc: Office file - DNSC-MO
DNSC-E, DNSC-G, DNSC-D, DNSC-C
DNSC-MO: Charles Harder x1163:7/23/08

APPENDIX 4-A

STORAGE OF MERCURY

1. Description

Mercury a chemical element, also called quicksilver, is a metal that is liquid at ordinary temperatures. It has a silvery-white color and a high luster.

2. Packaging

The mercury is packed in cast iron or steel flasks securely stoppered with a screw plug to prevent leakage. Flasks may vary considerably in size and shape but each flask normally contains 76 pounds net of mercury. The DNSC has recently completed the over packing of all of the stockpile mercury to ensure that mercury will not be released into the environment. The packaging configuration is six, 76-pound steel storage flasks, placed upright inside 30-gallon, 16-gauge steel drums with a 6-mil plastic bag, absorbent pad on the bottom of the drum and cardboard dividers between the flasks as cushioning. A steel drip pan 48"x 48" is placed on a two-way; flush; non-reversible; 48" X 48"; group III; hard wood; four-stringer pallet. Five drums are placed on each drip pan. The storage of Stockpile mercury are in specially prepared, secured warehouse.

3. Marking

Each flask was stenciled or has a non-ferrous metal tag firmly wired to its neck showing the original government purchase contract number, lot, container number, country of origin, and the gross, tare, and net weights. Markings for drums containing mercury flasks have country of origin, number of flasks, and net weight.

4. Storage

- a. Mercury should not be stored in the same warehouse section with other material.
- b. Leaking containers must be replaced and the mercury reflasked before the mercury is placed in permanent storage. Should a leak occur during storage, the mercury shall be recovered and filtered through cheesecloth into a flask or flasks stenciled "Mercury from Leakers" to distinguish it from that in original flasks. Note Section 5, PRECAUTIONS TO BE TAKEN. Any increase in the number of flasks resulting from an accumulation of mercury from leakers, should be reported on DNSC Form 42, Receiving Report. No increase in weight should be recorded as this weight is already accounted for in the original receipts of the mercury. When leakage is detected, the Directorate of Stockpile Operations and the Directorate of Environmental Management shall be notified.
- c. To facilitate the taking of a physical inventory at any time by count and computation, each drum shall contain six flasks except when fewer than six flasks of the same origin are available. Each drum is labeled to indicate the number of flasks contained within.
- d. The storage layout for a pallet is 16 square feet. The recommended layout is as follows:

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- Storage area locations for pallets shall be in uniform back to back rows along the length of the storage area.
- Rows shall be placed with a minimum aisle space of 3 feet along the walls.
- Aisle width between each set of back to back rows shall be sufficient to provide easy access for a forklift, emergency response equipment, etc.

5. Precautions to be Taken

a. Health- Elemental mercury can be taken into the body by inhaling mercury vapor, absorption through the skin, or ingestion by mouth, and these can result in acute or chronic illness. Therefore, personnel in mercury storage areas must take special precautions. Follow DNSC Occupational Health Guidelines for mercury located at <https://www.dla.dnsc.mil/iamthekey.com>.

b. General

1. The storage site for mercury should be in an area apart from materials such as food for humans or animals, products for biological use, medical supplies, clothing, or other materials, which might become contaminated.
2. Although packaged and contained mercury is not a health hazard, mercury that has escaped into the room through obvious leaks or spills or has previously been absorbed onto the floors and walls does represent a potential hazard. Under these conditions the concentration of mercury vapor in the air may exceed the Occupational Safety & Health Administration (OSHA) permissible exposure limit for mercury vapor of 0.1 mg (100,000 ng) per cubic meter of air as a ceiling limit.
3. Meticulous housekeeping procedures shall be enforced to prevent the absorption of mercury onto the floors and walls of the buildings and to prevent the accumulation of hazardous concentrations of mercury vapor in the storage area. Should a leak or spill occur, it shall be cleaned up immediately. Small quantities of mercury may be collected by a capillary tube attached to an aspirator bottle. Larger spills require a mercury vacuum. Care must be exercised to prevent spilled mercury from entering a water drainage system.
4. Walk-through inspections, when no appreciable amount of time is to be spent in the mercury storage area, are not considered hazardous to personnel. If personnel are to spend any greater length of time in the area, the space must be sufficiently ventilated to ensure the mercury vapor concentration does not exceed the DNSC action level for mercury of 25,000 ng/m³. Under the direction of DNSC-ME, mercury storage areas shall

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periodically be tested with a mercury analyzer to determine the mercury content in the air in accordance with the environmental inspection plan. The results of the tests will be furnished to DNSC-MO and DNSC-ME.

5. Personnel performing repackaging, reflasking, or cleanup operations shall be provided with appropriate safety equipment and clothing, including
 - a. Respirator with NIOSH approval for mercury.
 - b. Mercury impervious coveralls with hoods and booties
 - c. Nitrile gloves
 - d. ANSI approved safety shoes
 - e. Safety goggles or glasses with side shields
6. There shall be no eating, drinking, or smoking in the work area. Personnel leaving the work area after performing repackaging, reflasking, or cleanup operations shall wash with hot water and soap and change clothes.
7. As mercury is a toxic metal, firefighting personnel and others who may have to enter the mercury storage area under fire conditions, must be cautioned that highly toxic mercury vapor may be present. Caution placards shall be placed on all entryways into the mercury storage areas. Each entrance into a mercury storage area shall be marked:

“CAUTION”
MERCURY, METALLIC
Highly toxic by skin absorption
And inhalation of fume or vapor

Reference: DNSC Occupational Health Guidelines-Mercury, Revised
December 1, 2008, page 4, paragraph 2

6. Inspection Plan For Mercury in Storage

- a. Background- Liquid mercury and mercury vapor pose a health hazard if sufficient quantities are inhaled, ingested or absorbed through the skin. After absorption, the blood carries elemental mercury to the central nervous system where it may cause damage.
- b. Purpose - To document and support the control measures required for the protection, safety and health of workers, the public and environment.
 1. Monitor and report measurements of mercury vapors in the air and visually inspect for metallic mercury on the floor, drip pans, pallets, or drums.

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2. Prepare an inspection report utilizing the Excel template format provided on December 22, 1999. Attach the template to a DNSC Form 30.
 3. Electronically transmit the report to the DNSC Divisions of Environmental Management (DNSC-ME) and Storage Operations (DNSC-MO).
- c. Equipment- Direct reading mercury vapor monitor, high intensity portable lights.
- d. Operational Procedures
1. The Directorate of Material Management (DNSC-M) or local depot authorities will assign qualified personnel to perform the inspections. Headquarters specialists will review the inspection report and complete a memorandum of concurrence for any recommended corrective actions. The Chiefs, DNSC-MO and DNSC-ME will review and sign memorandums of corrective action and initiate all actions not requiring significant expenditure of funds. If significant funding is required, the matter will be brought to the attention of the Director, DNSC-M for implementation. Copies of the inspection report and any concurrence memoranda will be distributed to a cognizant official at the storage facility.
2. Frequency of Inspections
- a. **Normal inspection** level is defined as one inspection per month
 - b. **Tightened inspection** is defined as one inspection per week. It occurs when detection levels exceed the DNSC action level of 0.025 mg/ m^3 ($25,000 \text{ nanograms/ m}^3$) and continues until any visible mercury is cleaned up and two consecutive tightened inspection cycles **do not** detect visible mercury or mercury vapors in excess of 0.0125 mg/ m^3 ($12,500 \text{ nanograms/ m}^3$).
3. Monitoring Procedures- In each warehouse section, a minimum of four readings are to be taken in each inspection aisle, two at the breathing zone and two at the floor level. There will be a minimum of 20 readings in each section. The readings are documented on the template attached to the Form 30 report. Also record the temperature from both the exterior and interior of the warehouse on the inspection report.
4. If any reading is found to be above the DNSC action level of 0.025 mg/ m^3 , an investigation is initiated to determine the cause. Corrective action is to take place to reduce mercury vapors.

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5. Visual Inspection- In each warehouse the floor, drip pans, pallets, and drums will be thoroughly visually inspected for mercury using high intensity lights. If mercury is found, the source of the spill shall be determined and corrective action taken to eliminate the source. The spill shall be cleaned up
6. Corrective Action- Headquarters specialists and the responsible depot official shall determine best corrective action in accordance with the site specific Mercury Emergency Response Plan. Depot officials will document the corrective action taken in memorandum format and follow-up on the corrective action weekly until completed.

**FOR ADDITIONAL INFORMATION ON THIS COMMODITY REFER TO THE
MATERIAL SAFETY DATA SHEET.**