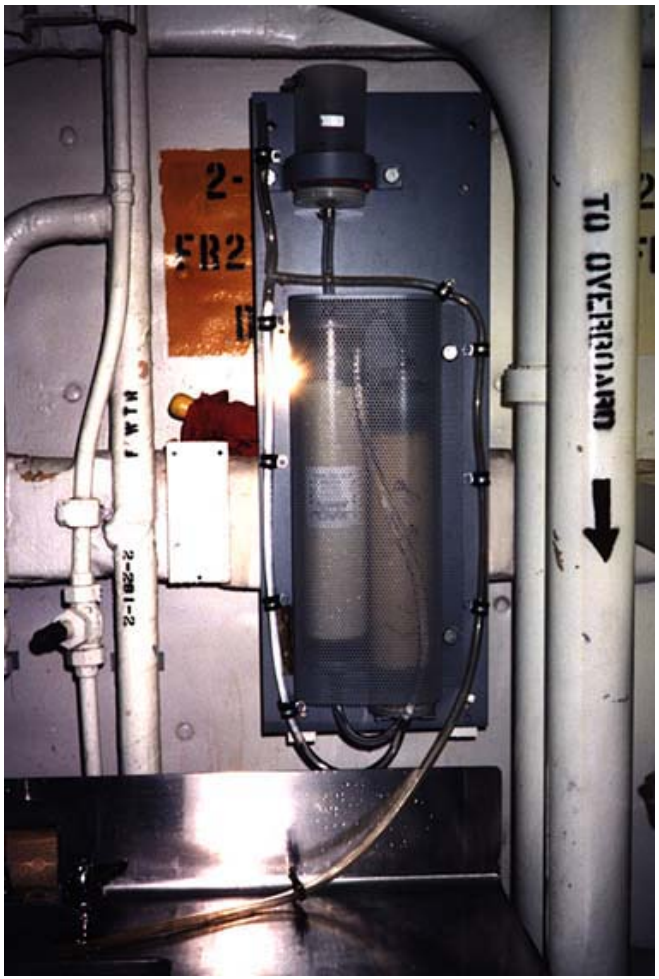
Mercury Ion Exchange Cartridge System



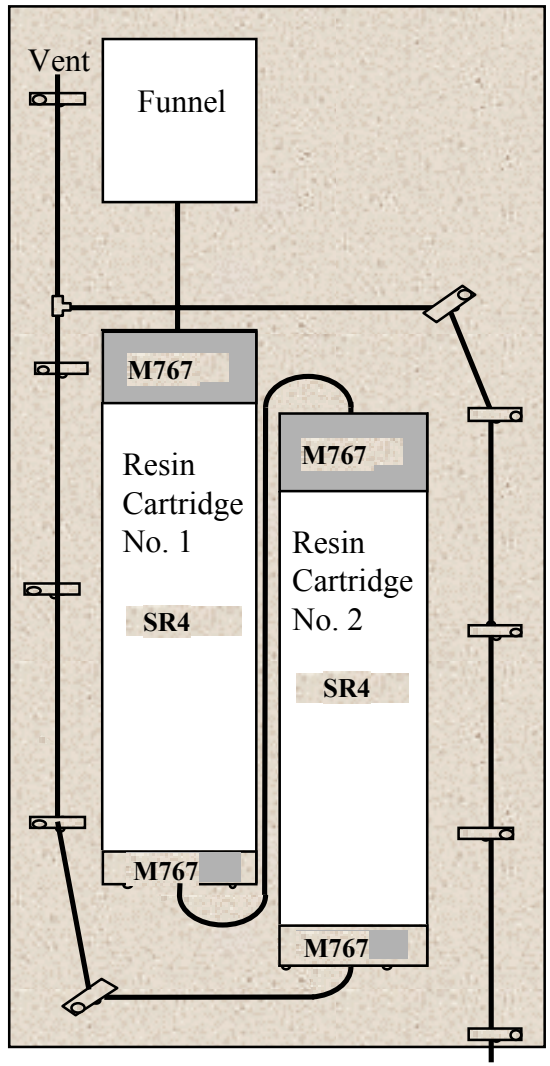
General Information

- Processes the mercury-contaminated waste water resulting from boiler feedwater and boiler water chloride testing.
- Installed in the ships' Oil Lab where chloride testing is usually performed. Navy ships may generate as much as 85-gallons of mercury-contaminated wastewater per 6-month deployment.
- Mercury-contaminated wastewater is generated during chloride testing, in which drops of mercuric nitrate are added to titrate the water sample. The resulting waste water can now be poured through a gravity-fed funnel into resin beds specifically designed for mercury absorption. As the wastewater passes through the resin bed, mercury is captured. The resulting effluent has been tested to have mercury levels less then 2 ppb (the legal limit for discharge).
- TM Number S9592-CS-CAT-010
- APL: 469990293
- NSN: 4610-01-473-4675

Operational Information

The Mercury Ion Exchange Cartridge System Consists of:

- An inlet funnel and tubing to pour wastewater into resin-bed.
- The cartridges are connected in series with tygon tubing and polypropylene connectors. Each column is rated to absorb mercury from 300 liters of wastewater.
- The outlet tubing is routed to the graywater system via a sink in the Oil Lab.
- Slowly pour chloride analysis wastewater generated during the performance of Feedwater Chloride Testing as called out in Navy Ships Technical Manual S9086-GX-STM-020/CH-220 V2 Section 26.21 into the reservoir cup.
- Record the amount of liquid processed through the mercury ion exchange cartridge system in the logbook.
- Replace both cartridges every six months. Flush system with two liters of deionized water before replacing. Cap both ends of the expended cartridges using the end caps removed from the new cartridges. Turn the expended cartridges into the hazardous material coordinator for proper disposal.
- Record installation date and expiration date on cartridges on the new cartridges.
- When installing new cartridges, remove all air bubbles in the system using distilled water in accordance with the technical manual. Flow rate should be approx. 125 ml/min.



Safety Information

- Both cartridges must be replaced every six month, in accordance with PMS procedures, to prevent discharges above 2 ppb. One column usually will meet this requirement but the second column provides an adequate safety factor to ensure mercury is not present in concentrations greater then 2.0 ppb in the effluent.
- Dispose in accordance with OPNAVINST 5090.1 Series Environmental and Natural Resources Program Manual, Appendix L, *Disposal of Shipboard Hazardous Material*. This waste is listed as “boiler wastewater” in the column titled *Shipboard Hazardous Material Type*, and further defined as “feedwater and mercuric sample demineralizer resins” under the column titled *Examples of Generation Sources*. The authorized disposal method listed for used or excess ion exchange cartridges is “containerize for shore disposal as used hazardous material”.
- Wear proper PPE when handling the waste waste and when replacing the cartridges.
- Always ensure resin cartridges are wet before adding any waste water.