Return

Carderock Division
Naval Surface Warfare Center
9500 MacArthur Blvd, West Bethesda, Maryland 20817-5700
Point of Contact: Peter McGraw
Solid Waste Management Branch, Code 634
(301) 227-5155

Small Pulper

The Small Pulper processes shipboard food, cardboard and paper waste (including classified documents) into a wet slurry for discharge overboard. The Small Pulper is intended for Navy ships that do not have the space available for the Large Pulper, nor require its high processing capability.

- The operator sorts waste on the feed tray to remove non-pulpables such as metal, glass and plastic. The operator then pushes the paper and food waste into the pulping tank. Seawater flow, at 25 gallons per minute (1.5 liters per second), is mixed with the waste. A quiet, cascading orificial restrictive device throttles the seawater flow from the shipboard firemain.

- A 7.5-hp (5.6-kW) motor rotates a two-bladed impeller at high speed past five stationary cutters. The impeller pulps the waste, and generates a vortex to mix the seawater and waste.

- The processed pulp exits the pulping tank by gravity through 1/4-inch (0.64-cm) holes in a security ring (strainer). A 25 gallon per minute (1.5 liter per second) seawater eductor dilutes the slurry to less than 2% and discharges the waste overboard.

- The control system sequentially starts up and shuts down the Pulper. It alerts the operator to stop feeding the Pulper when the motor is overloaded. The control system stops the Pulper and shuts the seawater valves if the chamber hatch is opened, if the slurry chamber overflows, or if firemain seawater flow is lost.

- The operator cleans non-pulpable residue from the junkbox and slurry chamber after shutdown.

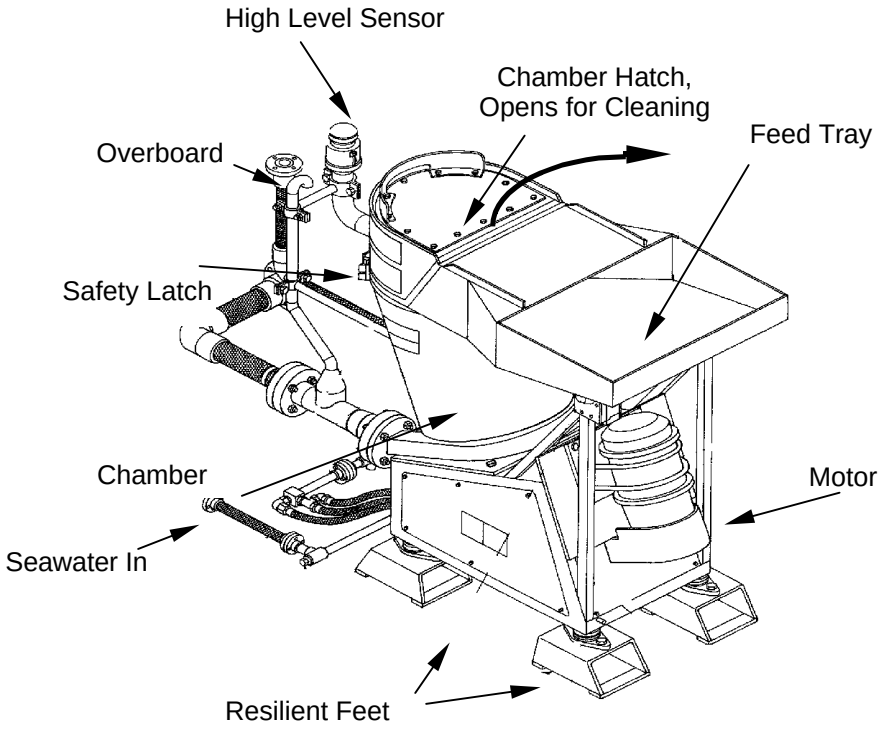
A Small Pulper successfully completed a formal evaluation aboard the aircraft carrier USS GEORGE WASHINGTON (CVN-73) in 1994 and received approval for U.S. Navy procurement in 1995. The Small Pulper has continued to operate on board USS GEORGE WASHINGTON without any failures. A follow-on formal evaluation will be performed in 1996 on a Small Pulper installed onboard the frigate USS VANDEGRIFT (FFG-48).

Return

SOLID WASTE SYSTEMS

Small Pulper

Performance:	
Processing Rate:	100 lb/hr (45 kg/hr) paper and cardboard 200 lb/hr (91 kg/hr) food waste 140 lb/hr (64 kg/hr) mixed waste
Output:	Wet slurry (1% to 2% by weight)
Envelope:	
Weight:	1,100 lb (500 kg)
Footprint:	69 in. (1.8 m) wide by 26 in. (0.66 m) deep by 65 in. (1.7 m) high
Maintenance and Operational Envelope:	76 in. (1.9 m) wide by 60 in. (1.5 m) deep by 70 in. (1.8 m) high
Control Enclosure:	Bulkhead mounted (same compartment); 30 in. (77 cm) long by 8 in. (21 cm) wide by 30 in. (77 cm) high
Services:	
Electrical Power Supply:	440 Vac, three–phase, 25 A, 60 Hz
Seawater Supply (including eductor supply):	50 gal/min (189 L/s) strained
Compressed Air Supply:	1.0 scfm (0.47 L/s) intermittent; 80 psi (551 kPa) to 125 psi (861 kPa)
Recommended Seawater Supply Line Size:	1.5 in. (3.8 cm)
Recommended Discharge Line Size:	2.5 in. (6.6 cm)



- The Small Pulper consists of a 20-in. (51-cm) pulping tank with an integral junkbox, a feed tray, and a 7.5-hp (5.6-kW) motor. Seawater is mixed with waste in the tank and macerated into the pulp; it also powers the eductor. Diluted pulp is educted overboard. An electrical control system senses overloads, high level, safety latch position and loss of water.
- The Pulper shuts down on loss of water, high level, or if the chamber hatch is opened.
- The Small Pulper is mounted on a structural frame and resilient mounting feet.
- The wetted parts are 316-L stainless steel, except for the piping, which is 90/10 copper nickel.
- The structural, non-wetted parts are 304 stainless steel.