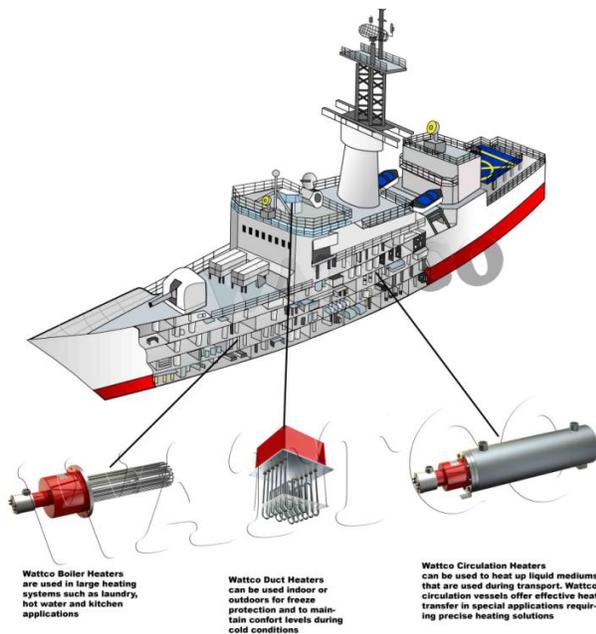


## The Military Application of Heaters

The electric heaters have many useful applications for various industrial sectors. Those applications often stretch beyond the commercial sectors and encompass to some extent the military sector. WATTCO™ builds military heaters in many different areas. What distinguishes the electric heater from other industrial heaters powered by combustion power sources is the portability. In the military application, portability is the primary concern particularly because the military units that require the use of heaters need to be mobile.



In the military application, most use of heater concerns heating of the portable water supply on the military vessels. The US naval ships utilize a portable water supply for the general ship's water usage whether they be for the sanitized drinking and cooking water or for the general usage such as dishwashing, laundering, or showering. Additionally, the potable water supply is used for other important functions such as a medical use. Even though the normal disinfection process takes place on the water supply before they get to the

ships, the portable water supply must be boiled on the ships where they are used. Hence, various types of heaters are required for the heating purpose depending on the application of the water.

The military application does not stop at the general use of the portable water supply. The testing of various missile components that are using hydraulic power supply requires high-end heaters to provide the accurate and reliable heat source. The hydraulics operate on high pressure using the supplied oil that requires an extremely accurate temperature for a precise control. In this case, the importance of heating elements are further augmented by the importance of other devices that control the heating such as thermostatic controls, terminal boxes, and thermal insulations. WATTCO™ provides various high-end controls and boxes such as digitally controlled thermocouples or RTDs, and NEMA certified terminal housings such as NEMA 4 (4x) waterproof or NEMA 7 explosion proof terminal boxes. They also supply high-temperature/waterproof thermal jackets for extreme insulation purposes.

The water heating in the military applications usually involves heavy-duty equipment and setup. The average portable water requirement on a US naval ship, according to the Department of Navy, is 2 gallons per crew per day, multiply that by the number of crews and the number of days. The enormity of given capacity therefore suggests that any naval vessel may require in excess of a hundred thousand gallons of water portability and the ability to maintain the continuous heating of such quantity.

Apart from the use of water for the daily operation of the military personnel, there are additional usages of water in the military application such as marine operation or equipment sterilization. All these operations involve heating of water for which the flanged immersion heaters are the best fit. The temperature requirements for the heating usually runs around 120~135°F, which can be achieved quickly with the heating rods designed for the high-end applications. These heating elements usually consist of Nickel Chromium based register wires built into the protective sheath material made out of special alloys such as Incoloy® or Inconel®. WATTCO™ recommends to consult their support technicians to determine the size of the flanged heaters in relation to the size of the tanks that require the heating operation. More information can be found at <http://www.wattco.com/defense-industry.html>