

BE HEALTHY DRINK R.O. WATER

BY

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Water is the basis for all animal life—it acts as a solvent, coolant, lubricant, and for transportation and dispersal of waste material. Approximately 55–65% of total body weight is water; blood contains 83% of water, with the brain containing 47%, and bone structure 22%. As the catastrophic Mexican earthquake has shown, people can live for weeks (anything up to 50 days) on a water-only diet, but only for a few days (up to 7 depending on the ambient conditions and personal fitness) if water is denied.

For good health, potable water should be low in salts, with the sodium and chloride levels as low as possible. The presence of some elements, notably calcium, in drinking water is beneficial. In the past, the standard of potable water in the R.N. has generally been very high indeed (average purity a mere few parts per million Total Dissolved Solids), dictated by the overriding requirements for pure distilled water in the steam main propulsion feed systems.

With the advent of water produced by reverse osmosis (R.O.), there has been a natural concern over the standard produced by the new process. Happily, these fears are groundless. As TABLE I shows, R.O. produced water is well within the maximum limits set by the World Health Organization, and generally the quality of such water equates to the U.K. mainland domestic water standards. Due to the presence of trace elements and calcium and magnesium salts in the water, it is healthier and more palatable than the totally pure distilled water normally available afloat.

TABLE I—Content and properties of water produced from a single stage sea water R.O. plant (as fitted in Type 23 and 'Upholder' Class)

	<i>R.O. produced water</i> mg/litre	<i>Maximum Permissible</i> <i>limits set by W.H.O.</i> mg/litre
pH	7.5	6.5-9.2
Iron	Nil	10
Chlorides	124	600
Sodium	88	1000
Calcium	2	200
Magnesium	3	150
Sulphates	14	400
Total Hardness (CaCO ₃)	18	500
Total Dissolved Solids	260	1500

Bacteria, pathogens, viruses and other biological 'nasties' are the main ingredients causing water contamination. Again, the R.O. story is satisfactory. Recent extensive trials (1985) show that 99.9% of all biological organisms are rejected by the membrane barrier; an average bacterial cell is 140 times the size of the water molecules, the membrane presenting a virtually impenetrable barrier to its passage. However, ship R.O. fresh water systems will be fitted with sterilizing equipment to counter any bacteria present and as a safety precaution in the event of membrane rupture, seal leakage, etc. Such equipment will also neutralize any nascent organisms present in the ship fresh water tanks.

As the many thousands of running hours achieved by R.O. plants fitted in ships engaged in 'Operation Corporate' bear witness, such water is quite safe for human consumption. Indeed the presence of small quantities of dissolved solids imparts a taste more acceptable than the blandness characteristic of distilled water. Operational trials of its supportive role in the Fleet's nightcap follow—by you.

Reference

1. Melly, R. G.: Reverse Osmosis plants for the Type 2400 submarine and the Type 23 frigate; *Journal of Naval Engineering*, vol. 28, no. 3, Dec. 1984, pp. 441-447.