

WATER DESALINATION REPORT

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Ionosphere

NASA TESTS FO FOR DIRECT REUSE

NASA's final space shuttle flight ferried six forward osmosis (FO) kits from Hydration Technology Innovation (HTI) into space last month for testing in microgravity. The system will be used to recycle wastewater, including urine, to make a fortified drink that provides hydration and nutrients for the astronauts.

The two-stage system was specially adapted with quick-release fittings for use in space and included an activated carbon filter to remove urea and alcohol before water from the 'waste' solution permeated through the FO membrane to dilute the concentrate.

For the test, an astronaut injected a low concentration liquid containing dye into the outer chamber of the apparatus, representing the "dirty" water. A higher concentrated draw solution was then injected into the bag's inner chamber.

Three of the six bags were hand-kneaded to see if mixing would increase the flux and reduce the time required to accomplish the process in zero gravity. After the five-hour experiment, the samples were returned to earth for analysis.



NASA's Forward Osmosis Test Packs

If it is determined that mixing helps, a long-term application may be incorporated into a spacesuit to induce mechanical mixing as an astronaut moves around during a spacewalk.