



Self-Hydrating Membrane Pouch



Why is it Needed?

A self-hydrating membrane pouch will allow the direct rehydration of dehydrated ration components, (especially beverage powders) by non-potable water sources, providing optimal nutrition and acceptance while achieving the full range of performance requirements. This would result in a reduction of the weight and volume that the soldier must carry for sustainment.

Forward Osmosis (FO) is a non-powered technology that will provide the Future Force Warrior (FFW) with potable liquids that are obtained from water sources of unknown quality.

Technology:

Development of the self-hydrating membrane pouch requires the integration of FO separation technologies using semipermeable membranes and the osmotic potential of food ingredients, with military flexible packaging. The inner membrane pouch will have an osmotically charged ration component. The dehydrated ration will be designed with osmotic potential nutrients that act as the energy source absorbing water placed in the outer pouch reservoir by osmosis through the membrane. The membrane will act as a molecular filter removing pathogens found in non-potable water. Greater than 99.9999% bacteria removal is achieved. Also, because FO is driven by osmotic pressure differential and not mechanical forces the membrane is highly resistant to fouling and can be used in dirty turbid waters.



Semi-Permeable Membrane
Hydrophilic Membrane
Rejects Contaminants While Allowing Water to Pass Through

The technology has also been adapted to hydration backpack systems.

Key Features / Benefits:

Enhanced capability...safe and effective production of potable liquids allowing rehydration of beverages and foods where potable water is unavailable.

Versatile...the pouch can be coupled with New Generation Hydration Systems for use with FFW especially during operations requiring self contained suit applications. The bags can also be included as part of the Ration Cold Weather, Ration Long Range Patrol, and Survival Ration platforms.

Reduction of weight and volume...decrease the amount of water the soldier must carry helping to meet the FFW requirements.



Insulated bladder feeds clean water on demand

Disposable sport drink pouch provides flexibility and drives the filtration process

Compatible M.U.L.T. Hydration Backpack

3.5 liter dirty water reservoir for cleaning membrane filter



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