

# Solar Water Disinfecting Tarpaulin

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Clean drinking water is fundamental to public health, yet a significant portion of the world's population does not have access to a safe source of water. The World Health Organization estimates over 1.5 million deaths per year are directly attributable to waterborne pathogens imbibed in unsafe drinking water. The Solar Water Disinfecting Tarpaulin project addresses the problem of unsafe drinking water by imagining the possibility of a flexible and intuitive vessel for containing, carrying, and purifying water.

The Solar Water Disinfecting Tarpaulin implicates the current paradigm of water infrastructure in developing urban and rural regions around the world. In many places, individuals (especially women) must travel up to four hours to a safe source of drinking water. The Solar Water Disinfecting Tarpaulin is lightweight, expandable and comfortable to wear, allowing a greater volume of water to be carried when compared to traditional vessels. Because it is also a container for disinfecting water, one need not travel as far to find a safe source of water. As a result, the Solar Water Disinfecting Tarpaulin effectively reduces the amount of time and energy people must devote to securing clean drinking water.

The Solar Water Disinfecting Tarpaulin's low-tech operation means that it is easy to use and produces predictable results in the hands of almost any user. It employs a method of water pasteurization that has been approved World Health Organization and is based on passive solar radiation. The Solar Water Disinfecting Tarpaulin comprises two layers that form a container for water. The top layer is made of transparent recycled LDPE and the bottom layer is a durable rubberized nylon. Heat and UVa radiation from the sun pass through the top layer into the water-filled cavity of the Tarpaulin and are reflected by the bottom layer of nylon. By exposing water to the sun's heat and UVa radiation for 5 hours, the water is sterilized through a combination of pasteurization and radiation which work in synergy to destroy any microorganisms present. This method of disinfection presents an attractive alternative to intensive practices like bringing water to a boil over a fire.

The Solar Water Disinfecting Tarpaulin is fabricated to be flexible and robust. Layers of rubberized nylon and high performance LDPE are radio-frequency welded to produce durable, water-tight cells. The cellular construction of the Tarpaulin, morphologically inspired by

the saguaro cactus, is designed to conform to the body and varied volumes of water. The digitally designed pattern for the Solar Water Disinfecting Tarpaulin lends itself to mass variation and is designed to be easily appropriated for a variety of situations: from carrying water to creating a sun shade; from urban rooftops to rural huts.

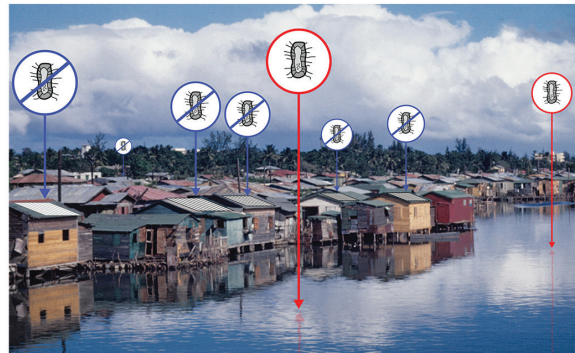
## Solar Water Disinfecting Tarpaulin Instructions

### Principles of Operation

Clean drinking water is fundamental to public health, yet a significant portion of the world's population does not have access to a safe source of water. The World Health Organization estimates over 1.5 million deaths per year are directly attributable to waterborne pathogens imbibed in unsafe drinking water. The Solar Water Disinfecting Tarpaulin helps reduce the risk of waterborne illness through a flexible and intuitive vessel for containing, carrying, and purifying water.

The Solar Water Disinfecting Tarpaulin is a digitally manufactured and designed container that is formally versatile and can be deployed in disaster areas, developing urban zones, rural regions, and anyplace where clean water is otherwise inaccessible. The Solar Water Disinfecting Tarpaulin is lightweight, expandable and comfortable to wear, allowing a greater volume of water to be carried when compared to traditional vessels. Because it is also a container for disinfecting water, one need not travel as far to find a safe source of water. As a result, the Solar Water Disinfecting Tarpaulin effectively reduces the amount of time and energy people must devote to securing clean drinking water.

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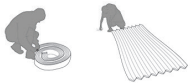


### Filling the Tarpaulin

The Solar Water Disinfecting Tarpaulin is easily filled. By extending the integrated filling tube, one may add up to 20 liters of contaminated water. The Tarpaulin's design allows it to evenly distribute contents and expand only as much as needed based on water volume.

To fill, follow these steps:

1. Unroll the tarpaulin and spread it out on a flat surface.
2. Open filling tube by releasing its clasp and unrolling the integral funnel.
3. Separate sides of funnel and pour water into the funnel mouth.
4. Once filled to desired level, allow and excess air to escape.
5. Roll funnel from the mouth down to the base of the filling tube.
6. Tighten clasp to secure the rolled filling tube and seal the tarpaulin.



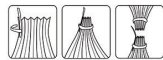
### Transporting the Tarpaulin

The Solar Water Disinfecting Tarpaulin is designed to increase the efficiency of water carrying. More water may be transported wearing the Solar Water Disinfecting Tarpaulin than with traditional clay vessels, and one need not travel as far to find "safe" sources of water because the Tarpaulin is both the means of transporting and purifying water.

The adaptive shape of the Solar Water Disinfecting Tarpaulin makes its use easy and intuitive. It may be gathered and connected to be worn like a kanga and its pleated structure makes the Tarpaulin both effective and versatile.

To transport, follow these steps:

1. Collect the pleated ends of the tarpaulin in a compact bundle.
2. Use the small Velcro® compression straps to secure the pleated ends.
3. Connect the two ends of the tarpaulin using the shoulder Velcro® strap.



### Deploying the Tarpaulin

The Tarpaulin is a flexible part of architectural envelope. It may be placed on rooftops, laid out on the ground, or hung as a vertical partition. The beauty of the Tarpaulin lies in the fact that it is easily co-opted by a broad range of urban and rural populations. The Solar Water Disinfecting Tarpaulin facilitates the elimination of waterborne pathogens through a combination of passive solar heat and ultraviolet radiation. One need only place the Tarpaulin in the sun for 5 hours to completely disinfect water. Terraces and rooftops present ideal locations for deploying the Solar Water Disinfecting Tarpaulin.

To deploy, follow these steps:

1. Release the Velcro® compression straps and shoulder strap.
2. Place tarpaulin on a surface in direct sunlight.
3. Stretch tarpaulin to maximize exposure to the sunlight.
4. Allow tarpaulin to set in direct sunlight for 5 hours.
5. Once this process is complete, the water contained in the tarpaulin is disinfected and potable.

