WaterGelSacks

The new generation of sand-less bags

WaterGelSacks versus traditional sandbags

WaterGelSacks offer numerous advantages over traditional sandbags across all stages of handling, use, and deployment. From logistics, transportation, labor, and storage prior to utilization, WaterGelSacks present significant benefits. During use, they are more reliable, effective, and resilient compared to traditional sandbags.

Furthermore, their disposal is environmentally friendly, as all materials are 100% biodegradable. In contrast, traditional sandbags are prone to breakage, leading to scattered sand and reduced effectiveness. WaterGelSacks also have a broader range of applications, including drainage and firefighting, which traditional sandbags do not offer.

Additionally, the true costs of sandbags are often underestimated. The final cost per unit of a traditional sandbag, including materials, transportation, bagging, and labor, typically amounts to approximately 7-8 euros, excluding the costs associated with disposal after use.

	Sandbags	**WaterGelSacks**
Before utilization	They cannot be pre-stored as part of emergency preparedness due to the significant costs associated with their large volume. Additionally, they require a considerable amount of labor for handling from the outset of the process, due to their weight and bulkiness	WaterGelSacks can be stored in advance for emergencies or other purposes due to their compact size. They require minimal labor for handling; each bag weighs approximately 0.5 kg (1 lb) before hydration, making them easy to manage even by a single person.
	In the same amount of space occupied by a box of WaterGelSacks measuring 64 x 44 x 32 cm (25" x 17.3" x 12.6"), only 2 sandbags can be stored or transported. To accommodate or transport 50 sandbags, equivalent to 1,000 kilograms in weight (2,200 lb), we would require 25 times more space.	In a cardboard box measuring approximately 64 x 44 x 32 cm (25" x 17.3" x 12.6") and weighing 27 kilograms (59 lb), there are 50 bags measuring 60 x 40 x 0.5 cm (24" x 16" x 0.19"). Once hydrated, each WaterGelSack weighs between 18-20 kilograms (40-44 lb) and measures 53 x 34 x 17 cm (21" x 13.4" x 6.7"). In contrast, 50 traditional sandbags weigh a total of 1,000 kilograms (2,200 lb).
	Their unwieldiness and weight make transportation challenging, especially to locations with limited access, as only a small number of sandbags can be transported on each trip.	Their lightweight nature and compact size make transportation easy, even to locations with limited access (e.g., transportation via helicopters).

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Preparation for deployment	Due to their considerable weight and volume, pre-storing sandbags becomes impossible. Sandbags are typically prepared only at the time of an emergency, often leaving no time to effectively address the impending disaster.	Their convenient storage and ease of transportation allow for quick preparedness in emergencies with minimal reaction time.
	Sandbags are filled with sand and secured with ropes. According to emergency authorities in the USA, it is recommended to "mix 10 parts of sand (not soil) with 1 part of cement and moisten them after placement. The bags should be positioned with the folded part facing downward and against the direction of the flow to prevent them from opening and emptying as water levels rise."	Simply remove them from their original packaging and place them in contact with water. They do not require any special treatment during placement as all sides are sealed at the factory.
	Variations in the amount of sand in each bag, particularly when filled manually, result in discrepancies in weight and size. This inconsistency compromises the effectiveness of dikes constructed with sandbags.	Once filled with water, all bags are of uniform size, resulting in a more solid, stronger, and robust construction, making structures such as dikes much more reliable.
	The deployment process for sandbags is neither rapid (as thousands of bags must be filled individually) nor clean (with sand often spilling onto the ground). It also requires a significant amount of labor or specialized machinery on-site to fill the bags.	Deployment is straightforward, rapid, and clean. No specialized machinery or extensive labor is needed for placement, as they remain lightweight until they expand. This simplifies and significantly reduces the resources required for their deployment, use, and various applications.

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	Sandbags	WaterGelSacks
Throughout its use	The typical sandbag is made of polypropylene, a material prone to breakage. Using jute bags for sandbags is not feasible, as the sand would easily escape through the fibers, leading to bag emptiness. When constructing a dike or containment structure, manual adjustment of sandbags is necessary to fill gaps between them. Ensuring a tight fit between bags is crucial to prevent water infiltration. Sandbags cannot be reused to prevent contamination. Additionally, both the bag and the sand degrade significantly when exposed to sunlight and water.	Jute stands out as the most resilient natural fibers available (1). In dike construction, WaterGelSacks continuously absorb floodwater until they reach full capacity, ensuring a tight fit between the bags to prevent any gaps that could allow water to pass through. As long as any minimal gap remain between the bags, the polymer will keep expanding, adjusting its volume to fill the available space. WaterGelSacks can be reused multiple times, depending on the climate conditions of the area. Once hydrated, the bags can remain in optimal conditions for use for up to 8 months and be reused as needed during this period. Even after weeks of storage, if the bags deflate slightly due to evaporation, they will regain the required weight and volume upon contact with water again. This process can be repeated numerous times.

(1) A sandbag could potentially achieve similar resistance to WaterGelSacks in dike or containment construction if it were made from jute, as this material offers desirable qualities. However, the typical synthetic material (polypropylene) used in sandbag construction lacks the strength, durability and biodegradability of jute.

Jute saw a significant increase in commercial use during World War I, when it was used to fortify trenches with bags made from this material. Today, jute bags or fibers are employed to repair breaches in dikes, reinforce slopes with inclinations of up to 60%, secure substrates, and serve various other purposes.

	Sandbags	WaterGelSacks
Disposal	Disposal of sandbags should always comply with local regulations. They should always be transported to designated landfills as directed by local authorities, regardless of whether the water they were in contact with was contaminated or not.	If the water is not contaminated, WaterGelSacks can be recycled and repurposed for activities such as gardening or reforestation (2). In the case of contaminated water, proper disposal should be carried out by transporting the WaterGelSacks to landfills designated by local authorities.

(2) When using WaterGelSacks, there's no need to separate the components after use. WaterGelSacks can be repurposed for gardening or reforestation (provided they haven't been exposed to contaminated water) by simply burying them to nourish and enrich plants and tree roots, as all their components are biodegradable. They offer versatile applications in gardening, reforestation, and agriculture.

Originally, these water-retaining polymers were developed in USA to enhance water management efficiency, these water-retaining polymers were designed for nurseries, reforestation projects, and commercial agriculture. They improve water management by allowing roots to absorb water as needed and facilitating the uptake of fertilizer solutions and other soluble agrochemicals. This enhances the effectiveness of these products while remaining fully biodegradable.