

Efficient and Rapid Solidification for Liquid Waste



What are SAPs?

SAPs are non-toxic cross-linked polymers offering the highest absorption capacity, hydration speed, and long-term retention of any liquid waste solidification technology on the market. Environmental remediation and waste management professionals utilize the unique SAP features to drastically reduce liquid waste handling costs and on-site time by transforming challenging liquids into solids for cost-effective hauling and disposal.

Why use SAPs?

Liquid waste, such as spent drill cuttings (HDD, oil, and gas), dredged sediments, and saturated coal ash are difficult and costly to handle, transport, and dispose. Once solidified with SAPs, waste is easier to handle and transport, can be disposed at Subtitle C and D landfills, and in some cases, left on-site permanently. Furthermore, liquids often contain toxic chemical species that can threaten water and land resources. SAPs are a critical tool used to protect the environment from harmful contaminant releases.

What are SAPs made of?

SAPs are made of sodium polyacrylate, the most well-known, commercially available superabsorbent polymer technology. Sodium polyacrylate polymers are chains of sodium neutralized acrylic acid molecules, or monomers, designed to absorb large volumes of water-based fluids and retain the fluid indefinitely under vibrations and moderate pressure.

What do SAPs absorb?

Sodium polyacrylate SAPs are designed to absorb and retain aqueous fluids through hydrogen bonding between the water and SAP molecules. Chemical fluid properties, such as salinity and pH, affect the SAP's absorbency. Free phase oils are not compatible with SAPs. Most SAP usage in the environmental waste treatment industries involve the solidification of solids and water mixtures, such as wastewater treatment sludge, horizontal directional drilling mud, hydro excavation fluid, and coal ash.

Industries Served	Applications	Advantages
<ul style="list-style-type: none"> • Directional Drilling & Tunneling • Oil & Gas Exploration • Sediment Dredging • Electric Power Utilities • Water & Wastewater Treatment • Mining & Exploration • Environmental Remediation • Nuclear Power Generation • Emergency Response • Transportation • Railroad 	<ul style="list-style-type: none"> • HDD & Tunneling Fluids Management • Hazardous Waste Remediation • Stabilization of Oil & Gas Drill Cutting, Dredged Sediments, Mine Tailings, and Wastewater Sludge • CCR Basin Closure • Solidification of Landfill Leachate and Hydro-vac Slurry • Concrete slurry management • Tank Bottom Closeouts • Spill Control • Leak Prevention 	<ul style="list-style-type: none"> • Absorption Capacity <i>Drastically reduces solidification media volume, and waste transportation/disposal costs</i> • Absorption Speed <i>Minimizes waste mixing time, labor, and equipment costs</i> • Compatible with Varying Waste Content <i>High organics, heavy metals, and hazardous waste (PCB, PFAS, etc)</i> • No Curing Pits Needed • Easy and Safe to Handle <i>Requires only basic PPE</i> • Does Not Impact pH of Waste

Rapid Solidification



Pre-application in wastewater lagoon.



Portion of lagoon wastewater solidified with SAP.

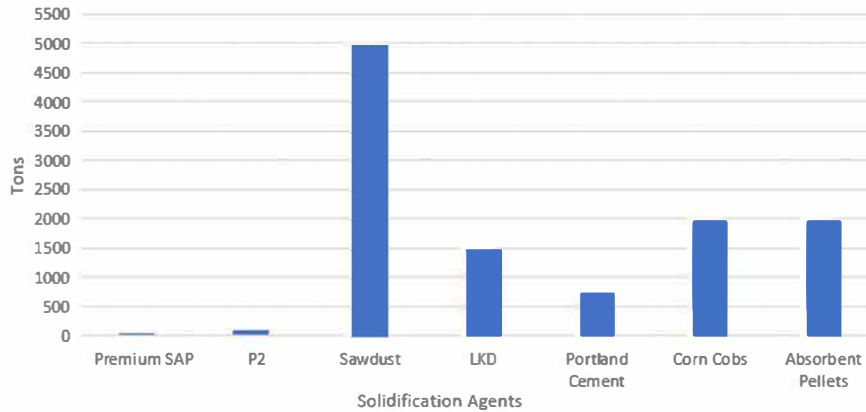
How to use SAPs

Several methods can be used to apply SAPs to a liquid waste. The most common application method is to blend the granular SAP into the waste matrix using an excavator (or similar) bucket until thoroughly mixed. Rotary head mixers, pug mills, and agricultural spreaders can also be used to apply SAPs.

Required Volume of Solidification Media

(per 10,000 tons of waste)

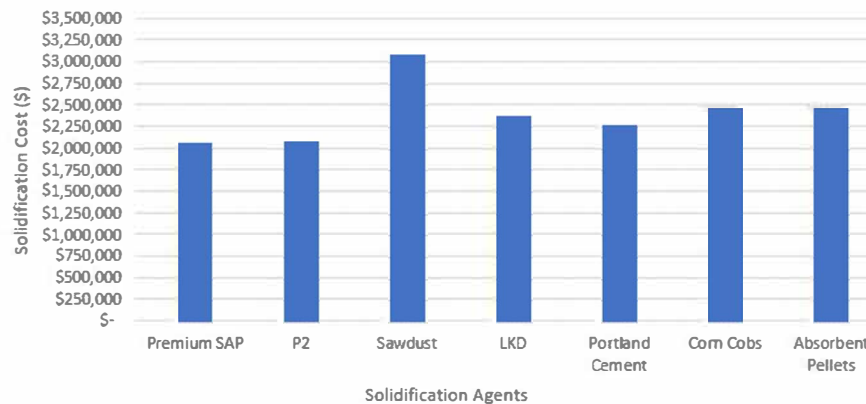
SAPs are used in ultra-low dosage rates resulting in substantially less absorbents needed versus competitive materials.



Total Solidification Costs using Various Drying Agents

(per 10,000 tons of dredged sediments)

High-absorbency of SAP reduces the overall cost per treated ton.



SAP Benefits:

- ✓ Ultra-low dosage rates; 0.5 to 1.5%
- ✓ Does not release under moderate pressure or vibration
- ✓ Instantaneous reaction and easy to mix; 20-30 minutes to solidify full roll-off box volume (~20 tons of waste)
- ✓ Compressive strength goals achievable when blended with recommended dosage rates or additives
- ✓ Minimizes labor, transportation, and disposal costs
- ✓ Rapid solidification; minutes versus hours or weeks with alternative options
- ✓ Ease of use
- ✓ Environmentally safe
- ✓ Does not alter or impact pH of waste material
- ✓ On-demand material availability

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