

# Anaerobic Digestion Solutions



**WESTECH**<sup>®</sup>

 SWIRE WATER

# Steel Anaerobic Digester Covers



WesTech anaerobic digester covers are ideal for new and retrofit installations. These custom covers are innovatively designed by WesTech engineers who have decades of experience meeting customer specifications for biogas and odor containment. Incorporating the most current structural standards, WesTech covers are economical and easy to install.

## Unique Features of WesTech Truss and Radial Beam Covers

- Prefabricated beam roof sections for faster installation
- Designed for tank diameters ranging from 20 - 125 ft.

### Radial Beam Structure

Beam covers are a very economical choice for anaerobic digester covers, as they have no ceiling plates and 50% less field weld length than a truss cover.

- Fixed and gasholder cover designs
- Economical option



### Truss Structure

Truss covers use welded steel plates on both the top and bottom of the trusses to form an attic space, that protects the structural members from corrosion and provides insulation for the sludge.

- Ideal for buoyant cover design
- Attic space for insulation



### Additional WesTech Options

- Geomembrane seal
- Hinged ballast block platform design



**Hinged ballast block shelf**



**Geomembrane seal**



# Types of Digester Covers

WesTech is the only company that offers each type of cover; this means the customer gets the best solution, not just what's available. WesTech has fabricated hundreds of these three types of covers:

## Fixed Covers

Innovative cover designs incorporate a water launder or more advanced seal materials that overcome liquid level variation limitations. A conventional annular seal design relies on sidesheets submerged in the sludge to achieve a pressure seal and prevent odors from escaping.

- **No movement; they are attached to the tank**
- **Best option for small liquid level variations**
- **Most economical steel cover option**



## Buoyant Covers

Buoyant floating covers are in contact with the sludge, which reduces the exposed liquid surface area and prevents a large scum blanket.

- **Covers float on the surface of the liquid**
- **Best option for high liquid level variations**
- **Truss design increases the stability of the cover**
- **Attic space provides thermal insulation**



## Gasholder Covers

Gasholder covers can be constructed using radial beams or trusses.

- **Covers float on digester gas that is held under the cover**
- **Stores digester gas and maintains pressure**
- **Pressurized gas storage for optimized downstream utilization**
- **Allows for greater liquid level variation**



## Slide Guides for Gasholder and Buoyant Covers

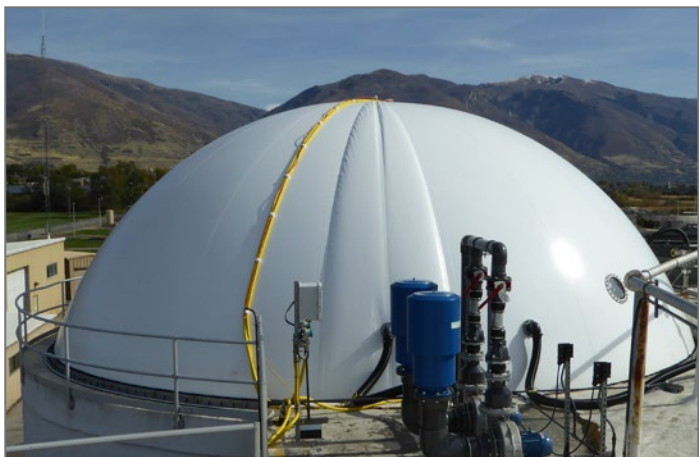
Slide guides allow the cover to travel above the tank wall, thus increasing gas storage at high liquid levels. WesTech's Ultra-High Molecular Weight (UHMW) polyethylene slide plates, used on three sides of the structural steel tube, prevent covers from tipping and binding as they move vertically within the tank. They resist wind, seismic, and unbalanced loads in both radial and tangential directions. The durable, low-friction UHMW surfaces remove the need for lubrication, enabling maintenance-free operation.



## Advantages of WesTech Slide Guides

- Great for retrofits and upgrades with old cover in place
- Eliminates tipping and binding
- Corrosion-proof slide plates
- No lubrication required
- Loads re-distributed over several guides
- Adjustable for easy installation and alignment
- Minimal wear and maintenance

# DuoSphere™ Dual Membrane Solution for Biogas Storage



As energy costs grow, facilities are increasingly seeking alternative fuel sources, including biogas, to help offset power costs for their plants. WesTech has many years of experience in supplying customers with anaerobic digestion equipment that adds value to plant operations.

Whether your municipal or industrial application requires a slab-mounted gasholder or a tank-mounted alternative to steel digester covers, our DuoSphere™ dual membrane structures are standout solutions for biogas storage. The superior design features high-strength fabric and utilizes a radio frequency welding process for increased strength and safety.

## Tank-Mounted DuoSphere Covers

Membrane digester covers offer an innovative and cost-effective solution for new and replacement covers.

- **Alternative to more costly steel covers**
- **Ideal for retrofits**
- **Variable liquid level**



## Slab-Mounted DuoSphere Gasholders

Dual membrane gasholders provide stand-alone digester gas storage with the capacity to suit a variety of needs.

- **Mounts to flat concrete slab or short walls**
- **Gas chamber comes sealed from the factory**
- **Easy access to inspect inner membrane**



95' Digester Cover Comparison	Installed Weight (lbs.)	Gas Storage (cubic feet)	Installation Duration (weeks)
DuoSphere	7,500	150,000 (above wall)	2-3 weeks
Steel Gasholder	505,000	33,000	2-3 months

## Advantages of DuoSphere Membrane Gas Storage

- **Constant pressure regulation**
- **Custom flow and sizes**
- **Low capital and installation cost**
- **Absolute odor containment**
- **No field welding, painting, or blasting**
- **Often eliminates the need for complex reinforcing cables or frameworks**
- **When used for retrofits, allows reuse of existing mechanical equipment**

	DuoSphere Gasholder	DuoSphere Digester Cover
Purpose	Slab-mounted gas storage	Tank-mounted digester cover and gas storage
Materials	PVC-coated polyester fabric membranes, stainless steel anchors	
Fabrication Methods	Radio frequency welds form a very strong seam — Support cables are typically not necessary	
Sizes	700 ft. <sup>3</sup> –317,800 ft. <sup>3</sup> (20 m <sup>3</sup> –9000 m <sup>3</sup> )	Custom fabricated to fit tank
Footprint	15–100 ft. concrete slab	25–100 ft. diameter plus
Fans	AMCA spark-resistant construction, two fans for safe duty/standby operation	
Installation	1–3 weeks	2–3 weeks

## Optimal Digestion Heating

### Tube-In-Tube Heat Exchangers

Sludge is pumped from the digester while hot water is pumped from the boiler. Heat is transferred within the tube-in-tube heat exchanger.

- **Efficient counter flow design**
- **Long-term energy savings**
- **Large sludge passages prevent clogging**



### Draft Tube Heat Exchangers

Instead of pumping sludge to a remote heat exchanger, hot water is piped to the heat exchanger mounted on the draft tube of an internal or external sludge mixer. Heat is transferred to the sludge as the mixers circulate flow through the hot water jacket region of the draft tube.

- **Efficient heating and mixing**
- **Simple operation and maintenance**
- **Cost-effective**
- **No sludge pumping required**
- **Heat exchanger is wrapped around the draft tube**
- **Can be used with internal or external mixers**



### Combination Boiler / Heat Exchangers

Our package heating system is dual-fuel capable, using primarily digester gas with a conventional backup fuel source. This allows for efficient use of the valuable biogas produced in anaerobic digestion.

- **Utilize reclaimed energy**
- **Skid-mounted units**



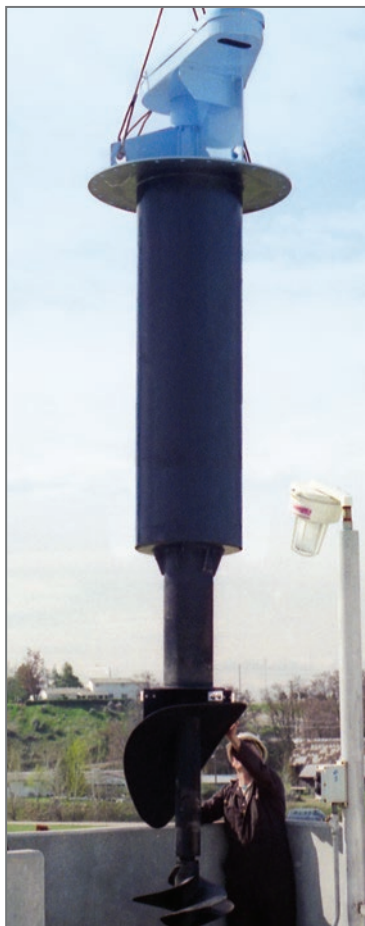
# ExtremeDuty™ Sludge Mixer



WesTech ExtremeDuty Sludge Mixers provide vigorous mixing of digester contents to prevent stratification and improve the anaerobic process.

## Why Choose an ExtremeDuty?

For nearly 30 years, WesTech has been supplying mechanical sludge mixers for wastewater treatment plants. The current sludge mixer has evolved over the years as a result of WesTech striving to meet and exceed our customers' needs. The stellar performance of the durable ExtremeDuty™ Sludge Mixer is proven in hundreds of installations, with an unprecedented full five-year warranty.



## ExtremeDuty Advantages

### Unmatched five-year all inclusive warranty

- Includes parts, labor, and removal, if specified

### Ragless reversible impeller

- Dynamically balanced three-blade cast iron impeller is self-cleaning
- Forward and reverse pumping re-entrains foam and settled solids

### Bearing and seals

- Double-thrust and spherical roller bearings prevent wear
- Mechanical and double-lip seals ensure complete protection and increase abrasion resistance

### Grease lubrication and spent return system

- Lowest volume of grease usage (less than 20 L/year)
- Low pressure system protects seals
- Low viscosity 'triple-aught' (000) grease is readily available for purchase
- Spent grease is returned to the top of the mixer (not wasted into tank), providing up-to-date information on the condition of the seals and bearings

### Mixer housing

- Rigid design eliminates the need for stabilizers or centering devices

### Impeller shaft

- Designed to avoid natural frequencies that cause vibration and minimize deflection
- Precise machine tolerances assure a quiet and smooth running system

### Seal tube

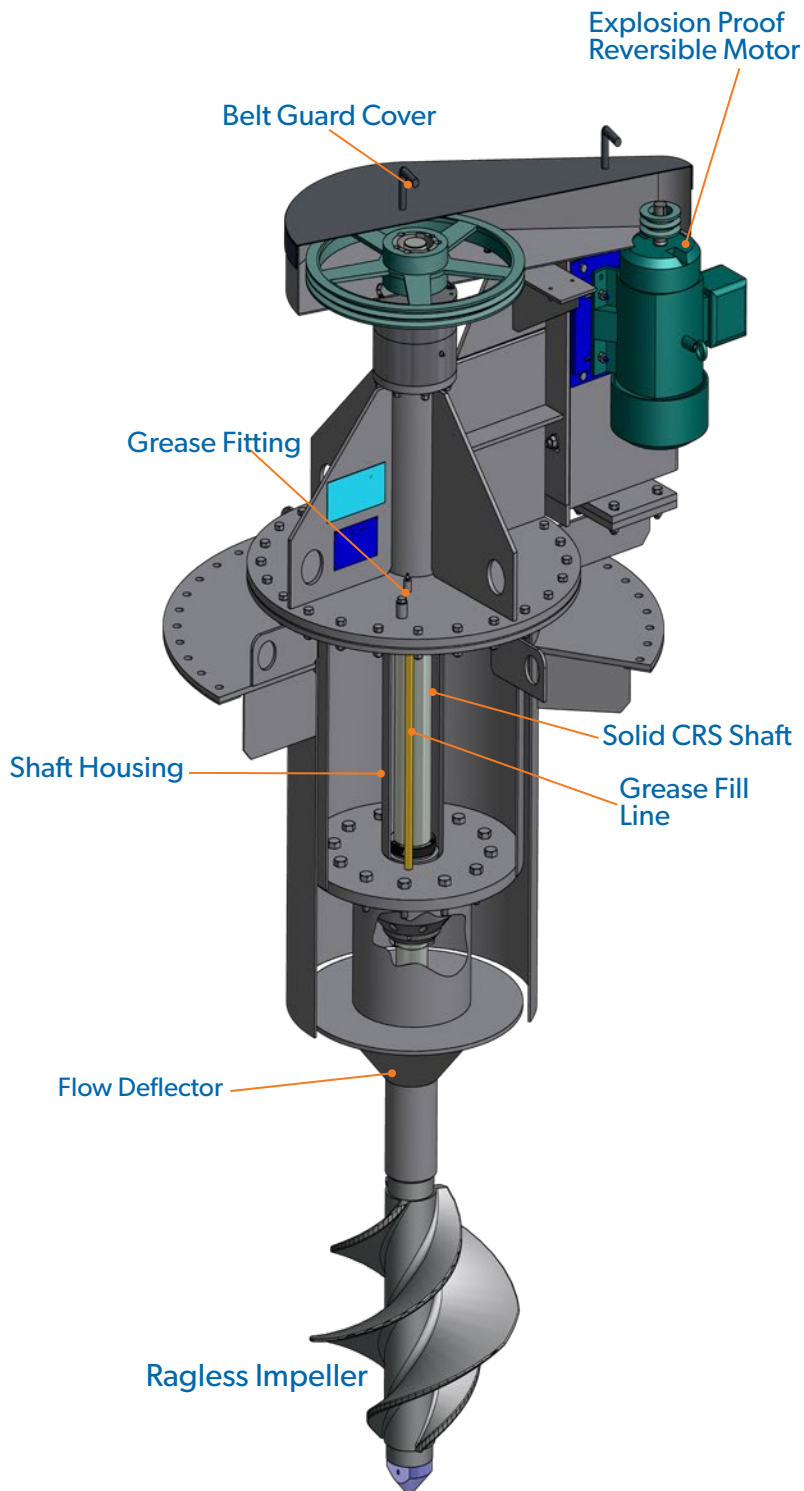
- Designed to create a liquid seal so the mixer can be removed without releasing pressure or draining the digester

### Design flexibility

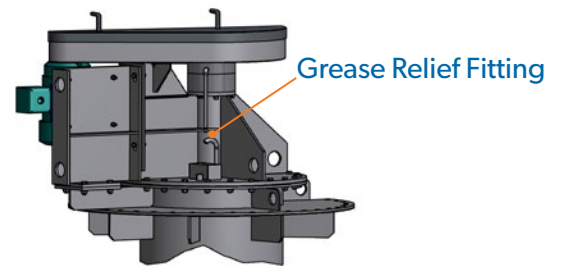
- Internally mounted on the digester cover
- Externally mounted with supports on the ground and two holes through the tank wall

# Drive Configurations

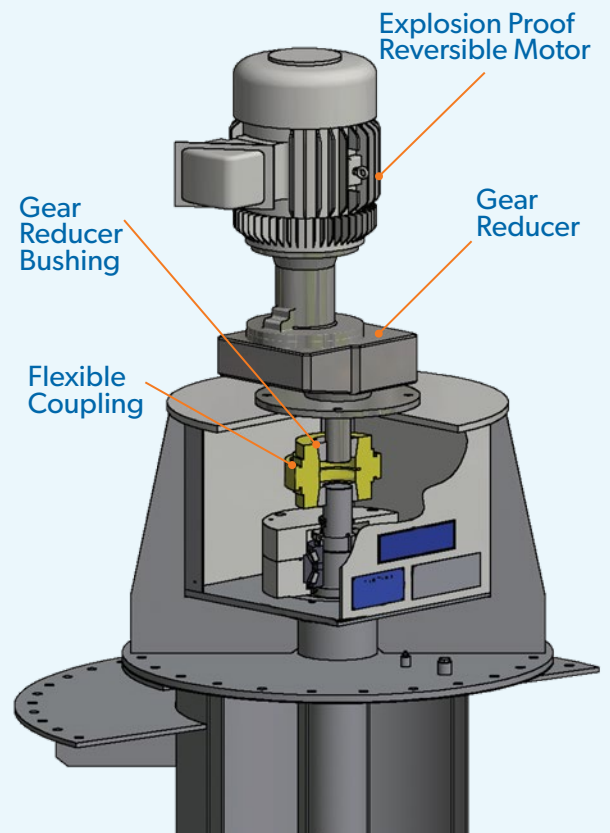
## Standard Belt Drive Configuration



### Back Side View



## Optional Direct Drive Configuration





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