



WATER TREATMENT EQUIPMENT

Vertical Mixing Tank (VMT 10)

PORTABLE MULTI-REAGENT MIXING AND DOSING SYSTEMS

Earth Systems' portable Vertical Mixing Tank (VMT) systems are specifically designed for efficient mixing and dosing of a broad range of dry powdered reagents or dense solutions. The units provide a cost-effective and portable solution for treatment of a range of water quality issues.

- Acid and metalliferous drainage (AMD)
- Turbidity control
- Algal control
- Nutrient pollution control
- Disinfection and chlorination
- Cyanide destruction
- pH control
- Metal control
- Salinity control

Earth Systems' VMT systems are portable tanks, sized to permit transportation on a flat-bed truck and to be loaded with conventional lifting equipment (eg. excavator, forklift, tele-handler, back-hoe). This portability provides flexibility for sites that are difficult to access, and permits the system to be either used at a single fixed location or moved among multiple locations.

The vertical paddle mixer and internal baffle arrangements are specifically designed to provide efficient mixing of dense solutions or uniform slurries of 1–30 wt% solids. The units are suitable for mixing a broad range of dry powdered reagents including limestone, hydrated lime (calcium hydroxide) and quicklime (calcium oxide).

The standard model features a 10,000 L epoxy-painted mild steel tank with a reagent addition hatch, access ladder, handrails, lifting hooks, fluid inlets and outlets, dust exhaust vent and an integrated control panel for the mixer and pump(s). Slurry is agitated using a variable low-speed 4-blade single-paddle mixer, and the mixing and baffle system is designed to separate out insoluble grit, which can be periodically removed via a side access hatch.

Various configurations are available depending on site-specific water treatment requirements. Optional components include a bulk bag feed chute with bag-breaker system, corrosion-resistant feed water supply pump, integrated variable-speed positive displacement dosing pump, and PLC control in a range of configurations for automated and/or remote operation.

The 10,000 L model is capable of mixing and dosing up to 6 tonnes of dry powdered reagent equivalent per hour and can be optimised for rapid bulk dosing or fine dosing control. The entire system can be powered by either mains or portable power.

MODE OF OPERATION

To operate, the slurry mixing tank is partly filled with water and the internal mixer is activated. Dry powdered reagents (eg. hydrated lime) are then added to the tank from a silo or hopper, or from 25 kg or 1 tonne bulk bags. Depending on the reagent used, up to 10,000 L of slurry can be mixed and stored within the system ready for dosing.

As an example, for acid control, up to 3 tonnes of dry hydrated lime powder equivalent can be added to the 10,000 L tank to produce a slurry of up to 30 wt% solids.

The VMT systems provide the ability to periodically or semi-continuously agitate reagent mixtures, which is required to prevent



the solids from settling. The reagent mixture can be distributed by gravity feed or by using the pump-based dispersion system.

ADVANTAGES

- Ideal as a routine, fixed-plant, continuous dosing system.
- Ideal for emergency response dosing.
- Suitable for most dry powdered reagents including lime-based reagents.
- Can mix and dose up to 6 tonnes of dry powder equivalent per hour.
- Suitable for conventional process water reagent addition.
- Suitable for correcting water quality issues in dams, pit lakes, tailings facilities, process ponds, etc.
- Portable – can be used at multiple locations on a single site or across several sites.
- Flexible dispensing options for sites with difficult or remote access.
- Simple operation and control systems.
- High reagent throughput.
- Ideal for remote sites.
- Low running and maintenance costs.

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Technical Specifications

General Arrangement			<p>Depicted with optional variable-speed dosing pump and reagent feed chute with bag breaker.</p>
Mixing Tank	Design volume	10.6 m ³ (10,600 L)	
	Working volume	10.0 m ³ (10,000 L)	
	Mixing method	4-blade single-paddle variable low-speed vertical mixer and mixing tank internal baffles.	
	Mixing rotating speed	Variable speed 0–76 rpm	
Control System	Standard	Integrated control panel with standard PLC (expandable). Features IP55 (minimum) controls and overload protection.	
	Options	<ul style="list-style-type: none"> - Fully automated and/or remote operation (dependant on client requirements) - Automated feed back from water quality monitoring equipment including pH, electrical conductivity (EC), turbidity, oxidation–reduction potential (ORP) etc. 	
Power Requirements	3-phase power		
Other parameters	Railing and platform	Yes (removable for transportation)	
	Empty weight	2,150 kg	
	Working weight	~13,500 kg	
	Total dimensional size	~2.3 m diameter × 2.66 m high (excluding handrails or feed chute)	
Optional Feed Water Supply Pump	Flow rate	Various options available (500–2,000 L/min)	
	Pump construction	316 stainless steel	
	Motor	~1.5–3.0 kW (3-phase) electric	
	Additional features	Skid-mounted, power lead to connect to mixing tank control panel	
Optional Integrated Dosing Pump	Pump Type	High-durability peristaltic pump. Anti-scaling design.	
	Flow rate	Variable speed (various options available)	
	Pump construction	Heavy-duty steel/aluminium construction	
	Motor	~1.5–3.0 kW (3-phase) electric	
	Additional features	Integrated variable speed control via mixing tank control panel	
Optional Bulk-bag Loading Chute	Includes bag-breaker system to minimise operator exposure to dust. Removable for transportation.		
Site-Specific Options	A range of site specific options can be included depending on client needs, including reagent dispersion systems, water quality monitoring equipment and on-site water-treatment training.		
Spare Parts	Various spare parts kits can be provided to minimise potential down-time.		



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