Mixers and Flocculators
For Municipal Water Treatment
We manufacture a wide range of mechanical mixers and flocculators designed to enhance the performance of chemicals used in water treatment facilities. Generally speaking, these mechanisms fall into two categories: high energy mixers designed for rapid, efficient dispersion of chemicals, and flocculating devices intended for gentle, low-shear particle contacting to promote floc development.

All EIMCO® mixers and flocculators are designed to provide a specified level of mixing energy in a simple reliable mechanical package. Only high service-factor components are used and all speed reducers are rated by the American Gear Manufacturers Association (AGMA). Oil bath lubrication is standard as are cast iron enclosures. Controls and support bridges are available with all EIMCO mixers and flocculators.

Most importantly, EIMCO Flocculators are designed and manufactured by liquid-solid separation specialists. Both the structural and process requirements of each installation are carefully evaluated by our engineers using standardized design practices to ensure superior performance in every application.

The photograph above shows an integrated sedimentation system supplied completely by DOE/EIMCO Water Technologies. This system combines flash mixers, Flocculator® Oscillating Flocculators, Trac-Vac® Sludge Collectors and FlexKlear™ Inclined Plate Settlers.
We manufacture several types of flash mixers for rapid initial dispersion of treatment chemicals or for suspension of powdered activated carbon. These mixers are designed to impart high levels of energy, with typical velocity gradients in the range of 600 to 1000 sec⁻¹. All flash mixers can be supplied in fixed, two-speed or variable speed designs for installation on concrete or steel support bridges.

**Radical Flow, Vertical Turbine Flash Mixer**
This vertical shaft, flat blade turbine mechanism provides a radial flow pattern that disperses energy throughout the mixing basin. An important advantage of radial mixers over other impeller styles is that their discharge is less likely to induce rotation of the entire basin volume. This bulk fluid rotation reduces the relative motion of suspended particles with a consequent reduction in the effectiveness of treatment chemicals.

**Axial Flow, Vertical Impeller Flash Mixer**
Axial flow mixers employ a highly efficient pumping action to disperse mixing energy. Either a pitched blade or a high-efficiency hydrofoil impeller can be supplied and discharge can be directed up or down, depending on the application. Baffling is often required to reduce bulk rotation of the mixing basin contents.

**Powdered Activated Carbon Slurry Mixers**
This two-speed, combination mixer provides the aggressive, high-energy mixing required to effectively disperse and suspend powdered activated carbon. It is suitable for use in either slurry contractors or separate slurry mixing basins. An upper, radial flow turbine and a lower, axial flow impeller mounted on a single vertical shaft provide an efficient combination of turbulent energy for dispersion and scouring flow near the basin floor to prevent deposition. All submerged components are constructed of type 316 stainless steel for enhances resistance to corrosion and abrasion.
We manufacture five types of flocculators all designed to provide gentle, thorough mixing action with velocity gradients in a range dictated by the process needs of the treatment facility. Two variable speed options are available with EIMCO Flocculators: variable frequency drives or a mechanical variable speed arrangement. Variable Frequency drives are commonly used in larger plants where multiple functions may be similarly controlled. Mechanical variable speed drives are generally preferred in smaller facilities due to their simplicity, reliability and greater efficiency over a more limited range of speeds.

**EIMCO® Flocsillator® Oscillating Flocculator®**

The Flocsillator Oscillating Flocculator is unique among flocculating mechanisms, both in its mechanical design and in the character of the mixing action it provides. The Flocsillator consists of a wedge-shaped paddle array suspended from a horizontal drive shaft which spans the basin above water level. This arrangement allows all drive components, linkages, and bearings to be located above water as well, eliminating high-wear submerged bearings and greatly simplifying routine maintenance. Instead of rotating in the basin, Flocsillator paddles swing slowly back and forth in a gentle oscillation that influences the entire basin volume. Very low tip speeds minimize shearing action on established floc, and the constantly reversing action eliminates bulk fluid movement, maximizing particle interaction opportunities.
Various layouts are possible with the EIMCO Flocsillator

- Multiple paddle arrays can be run from a single drive
- Basin depth can range from 8 to 16 feet, width from 7 to 16 feet
- Freeboard may be up to 3 feet
- Multiple units may be separated by baffles, creating sequential stages
- Flow direction can be parallel or perpendicular to the shaft axis

Tapered flocculation can be achieved by utilizing multiple bays with decreasing velocity gradients. Paddle material options include FRP, PVC, Redwood, Douglas Fir and Steel.

Radial Flow, Vertical Turbine Flocculators

EIMCO Vertical Turbine Flocculators feature a shaft driven, flat blade turbine coupled to a bridge or platform mounted motor and reducer. The turbine's radial discharge pattern provides effective energy dispersion with a reduced tendency toward bulk fluid motion. Tip speeds are low, generally less than 3 feet per second. Staged or tapered flocculation is typically achieved with multiple units in series. Tank baffling is recommended in circular basins.

Axial Flow, Vertical Impeller Flocculators

Vertical Impeller Flocculators combine a pitched blade or hydrofoil impeller mounted on a vertical shaft, coupled with a bridge mounted motor and reducer. The axial impeller discharge can be directed either upward or down, depending on the application, and baffling may be required. Staged or tapered flocculation is typically achieved by placing several units in series.
Horizontal Paddle Flocculators

This is a traditional flocculator design for water treatment applications. Paddles revolve around a horizontal shaft driven by a motor and reducer through a chain and sprocket arrangement. Low tip speeds create a gentle rotary mixing which promotes floc development.

Power input is varied by changing the paddle tip speed, while adding or relocating paddles will alter both the amount of energy imparted to the water and the resulting velocity gradient.

Various basin layouts are possible with horizontal paddle flocculators

- Multiple shafts can be run from a single drive
- Flow direction can be parallel or perpendicular to the shaft axis
- Tank depth can range up to 15 feet, so long as the ratio of depth to width remains 1:1
- Individual bays may range from 7 to 16 feet in width

Staged flocculation may be achieved by decreasing velocity gradient values in successive bays.

Several chain and sprocket drive arrangements are available. Dry well arrangements are typical although more accessible, above water level designs are available. Paddle material options include FRP, PVC, Redwood, Douglas Fir and Steel.
**Vertical Paddle Flocculator**
The Vertical Paddle Flocculator consists of paddles revolving around a vertical shaft, coupled to a bridge-mounted motor and reducer. Low tip speeds provide gentle mixing and minimize shearing action on established floc. Tapered flocculation can be achieved with multiple units in series.

**MetalWeave™ Flocculation Baffles**
MetalWeave baffles offer an ideal means of managing hydraulic flow in water treatment basins and can be used to eliminate short circuits and increase detention time. Thin strips of stainless steel or PVC are woven into large sheets, producing a baffle material that is lightweight, corrosion-resistant, and flexible enough to be rolled for transport. Modular support systems adapt easily to any basin lay-out and process requirement, and install quickly with quick couplings and cinch anchors.
Other EIMCO Water Treatment Products

Eimco Water Technologies is here to help you with all your solid/liquid separation needs. Please call us to find out more about how our technology can improve your productivity.

FlexKlear™ Inclined Plate Settlers

Center Driven Sedimentation Equipment

Trac-Vac® Sludge Collectors

Granular Media Filters