

# KEMCO Wastewater Treatment Systems

## ASH (Air Sparged Hydrocyclone)

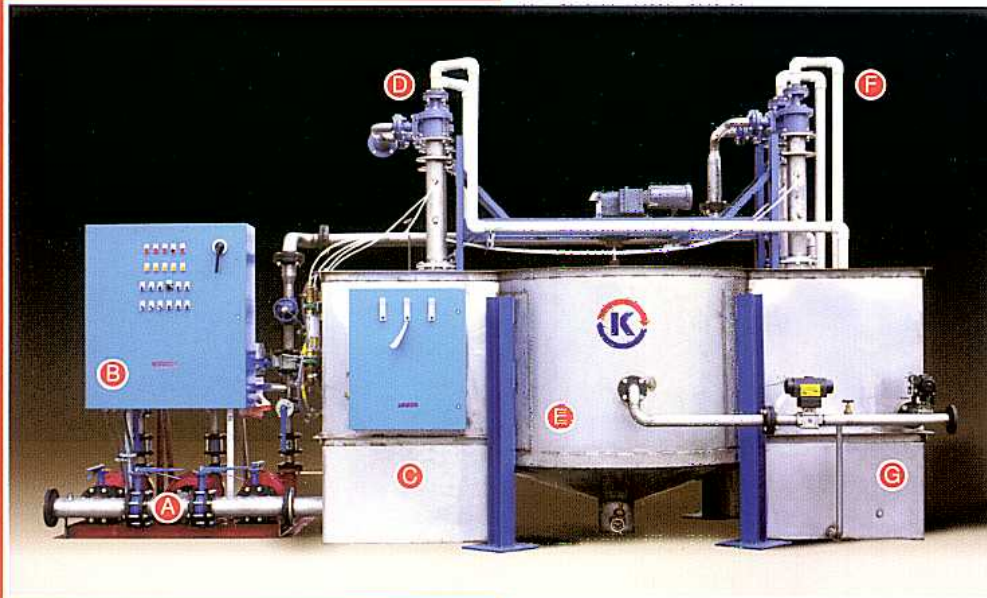


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# New Technology in Wastewater Treatment: KEMCO's ASH System



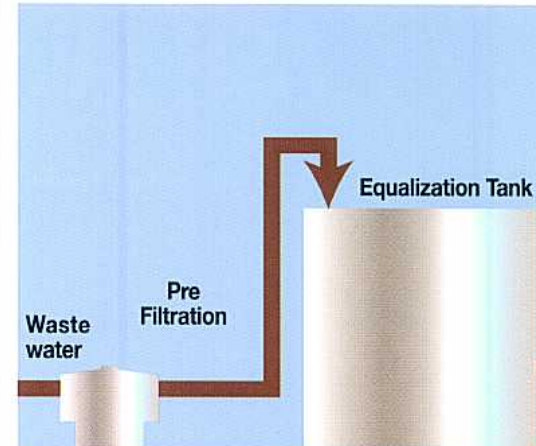
## ASH System Components

- A** 1st and 2nd stage pumps
- B** System control panel
- C** Clearwell area
- D** 1st stage modules
- E** Float cell and skimmer
- F** 2nd stage modules
- G** Sludge hold area

## The Most Advanced Wastewater System

Kemco Systems, the leader in process (fresh) water systems and wastewater treatment, sets a new benchmark by presenting NEW and IMPROVED wastewater technology, KEMCO'S ASH SYSTEM. Combining centrifugal separation with air floatation, KEMCO'S ASH SYSTEM (Air Sparged Hydrocyclone) produces efficiencies exceeding those in DAF's and other wastewater treatment technologies in the removal of FOG (Fats, Oil and Grease), TSS (Total Suspended Solids) and BOD (Biochemical Oxygen Demand).

Typical floatation treatment technologies such as dissolved air floatation require large floatation areas to remove contaminants. Using a significantly smaller footprint and vessel, KEMCO'S ASH SYSTEM achieves performance superior to that of typical floatation technologies. ASH systems also require less treatment chemicals and produce less sludge. This results in REDUCED CAPITAL COSTS and REDUCED OPERATING COSTS.



KEMCO'S ASH SYSTEM is applicable to wastewater from numerous industries including meat processing, poultry processing, food processing, industrial laundries, and military facilities.

The key technological breakthrough contributing to KEMCO'S ASH SYSTEM's outstanding capability is improved air/particle



Comparison of: (left) wastewater treated with DAF system, and (right) wastewater treated with ASH system.

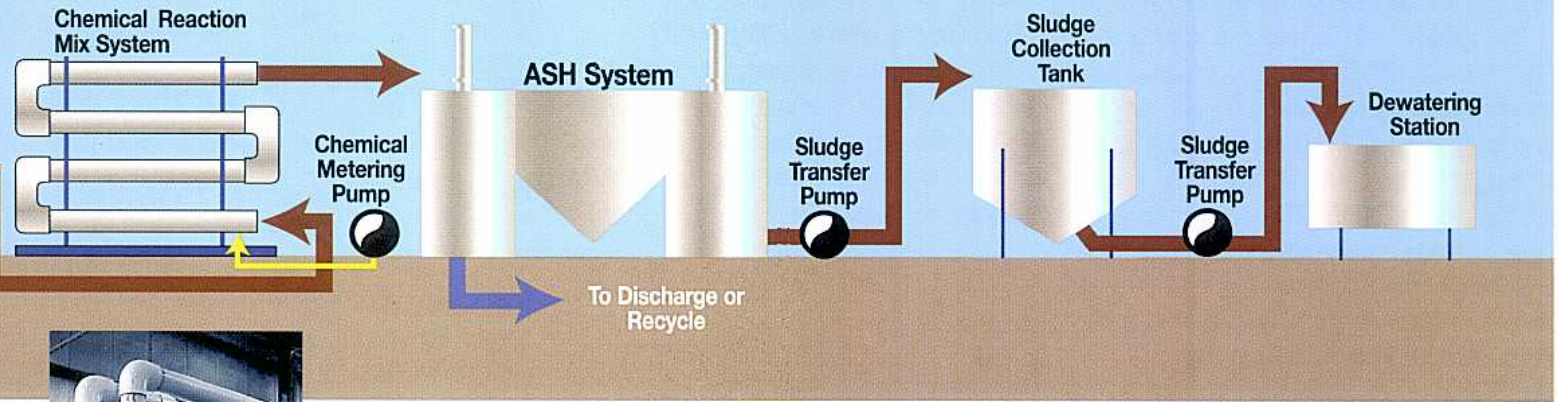
interaction. The net result is exceptionally efficient particulate floatation at high surface loadings, lower hydraulic retention times and enhanced removal compared with standard DAF systems.

In addition, multi-stage ASH systems can treat wastewater with widely varying characteristics.



# ASH System Results

## Typical ASH System Layout



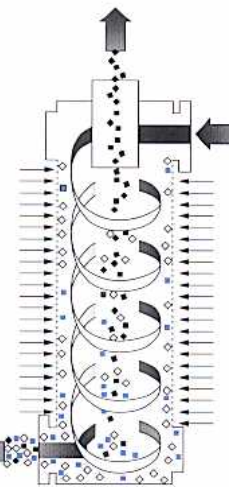
### How It Works

In an ASH chamber, the wastewater is simultaneously subjected to a high-speed centrifugal force and mixed with air. The wastewater is introduced into the chamber tangentially, forming a cyclonic motion swirling the fluid downward along the chamber's length. Concurrently, compressed air is introduced through extremely fine pores in a surrounding membrane, contacting the swirling fluid. The shear creates extremely fine bubbles and

results in a high probability of air-particle collision. This design, and the hydrophobic nature of oils, greases and other contaminants, produces a froth which is more easily separated from the water. The centrifugal separation characteristics of KEMCO'S ASH SYSTEM, using the density difference between the air-particles and the water, separate a large percentage of the contaminants prior to floatation. The result is a system capable of high hydraulic loading (small floatation area) and a very small retention time (small volume).

The stabilizing properties of the froth and the low circulation velocities in the center of the cyclone create a very quiescent froth column for hydrophobic particles.

Hydrophilic particles are rejected with the major portion of the water.



Fine particles requiring high force fields in order to float are injected at the point of maximal centrifugal force.

Air is injected through the porous cyclone wall where the shear rate is maximal ensures the formation of small air bubbles.

**Diagram of floatation in a centrifugal field with the Air-Sparged Hydrocyclone.**

## DOCUMENTED ASH SYSTEM PERFORMANCE

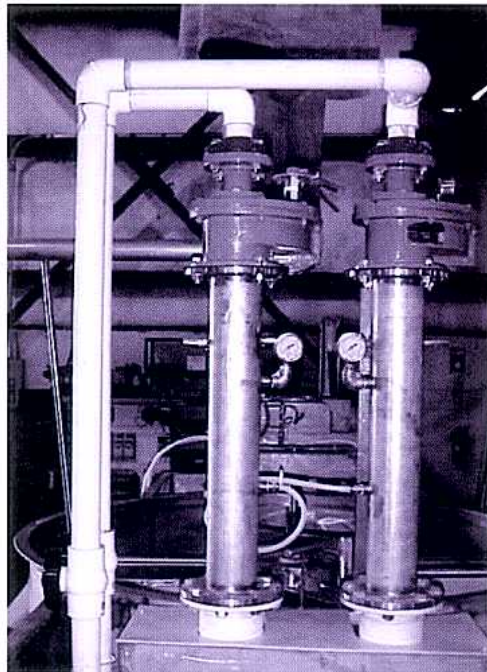
	First Stage Effluent			Second Stage Effluent	
	Influent Level (ppm)	Effluent Level (ppm)	Removal (%)	Effluent Level (ppm)	Removal (%)
FOG	2170	15	99	15	99
TSS	2007	143	93	101	95
BOD	3250	372	89	322	90

# KEMCO Will Bring The Most Advanced Wastewater Treatment System Available Right To Your Door.\*



## Advantages of KEMCO'S ASH SYSTEM:

• Reductions in FOG, TSS and BOD are extremely high under significantly varying conditions, demonstrating the outstanding performance of the system. In documented applications, KEMCO'S ASH SYSTEM has shown superior performance by removing 99% of FOG with removal rates of TSS and BOD greater than 90% under optimal conditions (see DOCUMENTED ASH SYSTEM PERFORMANCE in chart on previous page). These results exceed plant-reported removal efficiencies from existing DAF units of 85+% for FOG, and 70+% for TSS/BOD under comparable conditions (parallel testing).



- Surface loadings of nearly 10 gpm/sq. ft. can be achieved without significantly affecting system performance. Hydraulic retention times of less than 2 minutes can also be achieved. Normally, existing DAF systems have surface loadings of approximately 1 - 3 gpm/sq. ft. and hydraulic retention times greater than 30 minutes.
- The ASH system has been demonstrated to use less treatment chemicals than comparable DAF systems. Also, sludge volumes produced are 1/3 to 1/2 that of DAF systems. This results in significant cost savings.

## Benefits of the ASH System

- **SAVE on Initial Equipment Cost**
- **SAVE on Installation Cost**
- **SAVE on Operating Cost**
- **SAVE on Space**
- **Requires Less Maintenance**
- **Handles Varying Loads**

## Technology and Support

KEMCO'S ASH SYSTEM was developed from patented technology licensed from the University of Utah. Support is provided by Kemco's staff of engineers and scientists who are committed to using their combined experience to provide the most efficient solution to your process water needs.



## New Pilot Testing Program

KEMCO SYSTEMS has developed a mobile ASH unit and has the capacity to conduct pilot tests of the ASH System on your wastewater stream. For a nominal fee, KEMCO SYSTEMS will set up a pilot test of the ASH System at your facility so that you may confirm that this new technology will provide substantial savings before committing to purchase. The pilot test program has been very successful, and available appointments are limited, so call now to book a time slot for your test.



**\*Call 800.633.7055 x213 or 230 for more information on KEMCO's ASH system pilot testing program.**

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