



THE EIMCO-K.C.P. LTD.



EIMCO-KCP THICKENERS & CLARIFIERS  
(HIGH RATE & CONVENTIONAL)

## THICKENERS & CLARIFIERS



Eimco-KCP Thickeners and Clarifiers are designed for continuous operation in metallurgical, ore processing, chemical industries and also for the water treatment plants.

Equipments are designed to accommodate the more sophisticated processes with emphasis on dependable and low cost operation.

Eimco-KCP thickeners are manufactured for heavy duty concentrates, tailings and fine application and three basic configurations: bridge mounted, column mounted and traction type and sizes up to 500 feet diameter are available.

Drive heads are shipped completely assembled and factory tested to reduce the cost of field erection.

The drive head torques up to 4,600,000 ft-lbs

Eimco-KCP equipments are available for elevated and low temperature operation.

102 ft diameter high rate thickener with Hydraulic Drive and Hydraulic lift







## THICKENERS

### Bridge mounted Thickeners

Eimco-KCP bridge supported thickeners can be used with low, medium and heavy duty applications. In this design the drive is supported by the bridge and raises the rakes with the center shaft. Tanks can be in-ground, on-ground, or elevated. Lifting devices are additional features.

### High Rate Thickener

High rate thickeners are designed to maximize the flocculation efficiency, self-dilution and settling rates.

High rate thickeners are designed to provide high underflow concentration with smaller diameter.

### Column mounted Thickeners

Eimco-KCP column supported thickeners are supported by a stationary center column of concrete or steel center column supports the drive and rake mechanism.

### Cable Torque Thickeners

Eimco-KCP Cable torque thickeners are recommended for high scaling condition and to handle thixotropic solids.



# THICKENER APPLICATIONS



## • Mineral Processing

- Iron
- Copper
- Coal
- Base Metals
- Silver
- Gold
- Platinum group
- Nickel
- Diamond
- Nickel
- Uranium
- Aluminium
- Bauxite
- Mineral Sands

## Application

- Grinding
- Concentrate
- Tailing
- Leach
- Clarification
- High Density Slurry
- Counter Current Decantation
- Paste Backfill
- Chemical / Industrial
- Refineries
- Smelters
- Cement Industry
- Gas cleaning plant
- Steel melt shop

## Water Treatment and Waste Water

- Sewage Treatment
- De-salination
- Water purification

## Optional

### Auto dosing system

We provide Automatic Chemical Dosing systems for fast sedimentation of solids as required and for selected feed applications for high rate thickener.

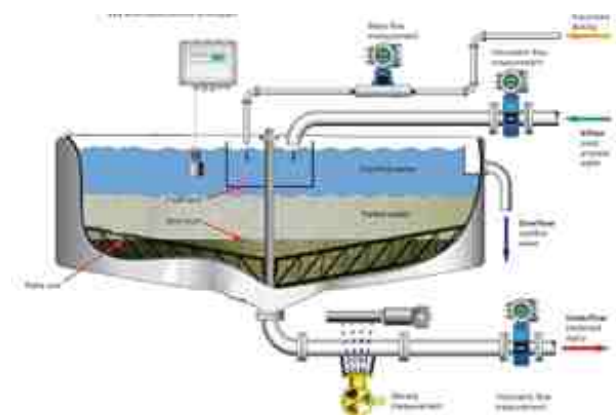
### Auto dilution system

The Auto dilution principle ensures automatic dilution of the feed to maintain constant % of solids and hence helps in maintaining optimum Flocculent Consumption.

### Controls

Typical controls for thickeners are

- Bed mass / Bed level measurement techniques.
- Mass flow measurement.
- Density measurement.
- Volumetric flow measurement. etc.





# SEDIMENTATION DRIVE HEADS



The drive head is the heart of the Thickener & Clarifier mechanism. The present design of Eimco-KCP Drive heads is a result of careful study and experience gained over 40 years of operation in the Sedimentation equipments operating in various Minerals & Metal Industries and Chemical Industries under severe operating conditions.

A Sedimentation drive generally operates at a relatively low value of output torque in a well-operated installation. As long as the solids input equals the solids output from the mechanism, torque will begin to climb and the alarm on the drive control will actuate to warn the operator to take corrective action.

Three types of drives are generally used for Clarifier and Thickener Mechanism. "W" Series/ "B" Series/ "C" Series

## Hydraulic Drive Heads

EKCP's Hydraulic Drive includes drive unit with bull gear and pinion driven by planetary gear system in turn by a hydraulic motor and by a hydraulic power pack. Also the unit includes a torque transducer to activate the overload alarm and to produce an output signal. Automatic rake lifting arrangement and drive tripping arrangement is provided in order to protect the mechanism from overloading.

- The drive is mounted on a lift plate and provided with hydraulic lift arrangement with cylinders.
- Drive Heads with duty rated torque upto 4,600,000 ft-lbs and peak torque rating upto 13,800,000ft-lbs, using High Precision Ring Gears are standard on large EKCP Thickeners
- Increased torque capacity
- Reliable and adjustable torque sensing
- Hydraulic Drive Heads are offered for both 'B' type and 'C' type Thickener.

## Eimco-KCP Drive Heads have been engineered to assure:

- Adequate output torque
- Maximum service life
- Support for the mechanism and its operating loads.
- Reliable overload protection.
- Optimum rotation speed for each service requirement.
- Allowance for lift capability.

# SEDIMENTATION DRIVE HEADS



**C120 B2 Drive**  
Supplied for Copper Concentrate application

**C84 B2 Drive**



## Mechanical Drive Heads

- Spur gear drives, utilized in center column mounted operation, are manufactured with heat-treated cast steel main spur gears, alloy steel pinions, alloy bronze worm gears and hardened steel worms. These are mounted on precision bearings and enclosed by dust tight cast iron housings for oil lubrication. The drives (illustrated) are provide with slew ring bearing to withstand higher loads.
- For bridge-mounted operations, the drive units are manufactured with heat-treated cast steel main spur gears, alloy steel pinions, alloy bronze worm gears and hardened steel worms; all mounted on precision bearings and enclosed by dust tight cast iron housing for lubrication.
- Worm gear drives for smaller units have high quality cast iron main gears with hardened steel worms; mounted on precision ball bearings and enclosed by dust tight cast iron housing for lubrication.





# THICKENERS

## Column Mounted Lifting Device

EIMCO-KCP type CLDT Automatic motorized lifting device will be provided and will consist of two telescoping steel cages driven by the main gear and supported by the centre column support. The outer lift cage is supported by the inner drive cage. The lift cage will be raised and lowered around the drive cage and is guided in its movement by self-lubricating slide plates. The outer lift cage which supports the weight of the rake arm will be raised and lowered by means of four lifting screws.

An approx. 36" (900 mm) of lift will be provided with the mechanism rotating. The four lifting screws will be driven by a sprocket and chain arrangement through a motor and reducer. An access ladder and platform will be furnished for inspection and lubrication of the lifting device. A guarded electrical conductor and slip ring assembly will be furnished.



## Hydraulic Lifting Device

EIMCO-KCP Hydraulic drive heads are supplied with hydraulic lifting devices for both 'B' type & 'C' type thickener



## Bridge Mounted Lifting Device

EIMCO-KCP type LDM Automatic motorized Lifting Device with steel driving cylinder mounted on the main gear will be provided up to 36" (900 mm) lift with the mechanism rotating. The driving lugs will be keyed to the shaft, which will be free to move vertically through the main gear. The lifting screw attached to the shaft will be supported and rotated by a gear set mounted on the driving cylinder. The gear set will be driven by a hardened steel worm through a motor. An emergency crank will be provided for use in case of power failure. An adapter shaft shield will be furnished.



# THICKENER & CLARIFIER TANKS

EIMCO KCP Thickener tanks are constructed either from bolted / steel welded or concrete. For diameter up to 45 m elevated steel tanks can be provided.

Most of the chemical process industries prefer the steel tanks construction since they may be elevated above ground level, allow inspection of the tank's floor for leakages and bring the underflow slurry pumps nearer to the outlet of the discharge cone.

Another consideration in selecting steel tanks is their ready adaptation to corrosive processes by rubber covering the wetted parts of the tank. The bottom of the tanks is sloped and on smaller thickeners there is one continuous slope of 1.75:12. On larger thickeners there are normally two slopes with the external circle at 1:12 and the internal 2:12.





# CLARIFIERS

Circular Clarifiers are the most common type of sedimentation basin used for separating suspended solids from liquids in the treatment of water, sewage, and Industrial waste



Eimco-KCP clarifiers are designed to handle a variety of applications & flows and clarifier includes scum skimming device to remove the floating material.

- Primary Clarifiers
- Secondary Clarifiers
- Brine Clarifiers for Caustic Soda Industries
- FGD
- Reactor Clarifiers
- White Liquid Clarifiers & Green Liquor Clarifiers for Pulp & Paper Industries
- Lamella Clarifiers
- Clariflocculators

Eimco KCP Offers Bridge mounted (B) type and Column Mounted (C) Type Clarifier mechanism for various applications. These operate on the common principle of moving settled solids to the center of principle of moving settled solids to the centre of the tank for removal, and differ principally in the method used to support and drive the rotating sludge removal arms.

Clariflocculators are available with peripheral Driven mechanisms with single flocculation paddles

## Skimming Devices

- Skimming Devices for removing floating solids are made for all types of Eimco KCP clarifier mechanisms.
- These devices consist basically of a rotating skimmer, scum scraper & scum box.
- The resulting lighter weight assures long wiper life and decreased maintenance cost.
- Two skimmers can be provided on any clarifier mechanism when specified. This eliminates the necessity of counterweights and keeps the water surface considerably cleaner as the clarifier is skimmed twice per revolution.
- Installation of Eimco – KCP weirs and baffles is also simplified by use of specially designed clamps and a simplified type of anchor bolt attachment to concrete walls.



# THICKENERS & CLARIFIERS



## Superstructure

The Super structure is either a beam or a truss type design which supports the feed pipe and provides access to the drive and lifting mechanism. Type B mechanism utilizes a superstructure which spans the basin, mounted on the tank wall or on end bents, and supports the drive ad mechanism. Type C mechanism uses a superstructure which is supported by the center column on the other end.



## Feedwell

The Feedwell is designed to dissipate the energy of the influent flow and feed dispersion shelf at the bottom. Stationary feed wells are used with Type B mechanisms, and rotating feed wells are used with Type C mechanisms. High rate thickener feed well are provided with conical feed dispersion shelf.



## Rake arms

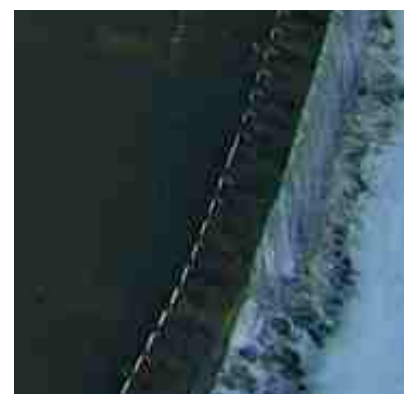
The raking arm mechanisms in Eimco-K.C.P. Thickeners are designed to ensure continuous movement of the settled solids to the discharge area.

The structural parameters for the arms are determined by the loading experienced during the operation. Each equipment has been designed so that there is proper balance between torque force and adequate safety factor. Extra strength in raking arms developed by Eimco- K.C.P. ensures they can be reinforced according to task.



## Weirs

The overflow weir that surrounds the tank ensures that the flow that leaves the thickener is distributed evenly in terms of  $m^3/hr/m$  weir length. The "V" notch weir is generally more common.





# REACTOR CLARIFIERS (High Rate Solid Contact Clarifier)



**190 ft diameter HRSCC**

Supplied to Bangkhen Water Treatment Plant, Thailand



The Solids Contact Reactor Clarifiers are basically divided into two different classes HRC and HRB mechanisms. HRC is the high rate column supported Reactor Clarifier of size ranging from 15m to 75m diameters. HRB is a high rate bridge mounted Reactor Clarifier supplied in sizes ranging from 3m to 23m diameters.

- The high rate Solids-Contact Reactor Clarifier operates with the raw influent liquid being brought into immediate contact with a large circulating volume of relatively dense previously formed floc and precipitate.
- The mixture of raw influent liquid and recirculated slurry is sent upward into the reaction cone with 75-90% being returned to recirculation with the incoming raw water.
- The remaining 10-25 % passes under the cone and into the clarification zone. Once in the clarification zone, the solids settle to the tank floor with the clarified liquid moving into the effluent launder and exiting tank

The BFR and CF Reactor Clarifiers are applied to processes where longer detention times within the feed well and no solids recycle are necessary or requested by customer. The detention times are considerably longer than those offered by higher rate solids-contact units and are necessary for proper flocculation.

# COMPLETE SERVICES

## Sedimentation trails

The bench or pilot scale test work can be conducted either on site or in our laboratories. Process guarantees are given based on test results.



ISO 9001:2008



## Design

We have in-house design capability for providing efficient design for the specific industry need .

## Installation and commissioning

We provide complete installation or supervision as required. We are always on call to assist our customers for quicker and accurate erection, resulting in saving time and safety of the machine.

## Manufacturing

The Company has adequate personnel consisting of highly qualified Chemical and Mechanical Engineers. The Workshop is managed by a team of qualified Engineers, backed by skilled operators in various trades.



## Supports

Our field engineers, technicians, and supervisors are adept at assessing problems and offering solutions based on their extensive technical training and broad base of field experience.

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