Dorr-Oliver Eimco
Thickeners & Clarifiers
Sedimentation products from FLSmidth

FLSmidth brings extensive experience to your process needs and can help determine the most cost-effective mechanism for your application, without compromising quality or dependability. Correct thickener and clarifier sizing will assure a margin of safety for process upsets and allow greatest operational flexibility. Our trained sales engineers are ready to help you with equipment sizing and selection. We will work with you to address your specific process challenges that affect your thickener and clarifier selection. This will include determining settling rates, detention times required for clarification, and the unit area and solids-retention time required for thickening.

This brochure will provide you with general information about our products to help you better understand the options that are available for your thickening and clarification process needs.
Experience leading technology

**Bridge-supported thickeners**
Eimco & Dorr-Oliver bridge-supported thickeners are beam or truss-supported units that can be used with light, medium, or heavy-duty applications with diameters of up to 178 feet (54 m). In this design, the drive is supported by the bridge and drives the rakes with a center shaft. Underflow is removed from a discharge cone at the bottom-center of the thickener. Tanks can be in-ground, on-ground, or elevated. Available lifting devices offer additional flexibility of operation.

**High-capacity thickeners**
High-capacity machines start with a choice of patented E-Duc®️, DynaFloc®️ or Dynacharge feed dilution systems to maximize flocculation efficiency, self-dilution and settling rates. High-rate thickeners are designed to provide roughly 12 times the throughput of conventional machines of similar size.

**Benefits include:**
- Maximum capacity
- Improved control
- Increased underflow density
- Lower flocculent dose
- Better slimes management

**Column-supported thickeners**
Eimco & Dorr-Oliver column-mounted thickeners are supported by a stationary center column of steel or concrete. The center column supports the drive and rake mechanisms, while the truss extending from the center pier to the tank periphery supports the walkway, power lines and feed launder. These units are suitable for basins and raking arms with diameters of up to 600 feet (180 m).

178-ft. diameter Hi-Density Sludge Thickener is the largest size bridge-supported unit with center shaft, producing hi-density metal hydroxide sludge.

This massive 125-m high-rate thickener handles 50% more solids than earlier generation high-rate machines at the same site.

Hi-Rate thickener featuring DynaFloc®️ feedwell in a coal washing plant.

The E-Duc®️ feed dilution system handles high tonnages to maximize throughput.
Thickeners

**Traction thickeners**
Traction thickeners have a stationary center pier, which partially supports the rake mechanism and serves as a pivot about which the rakes rotate. The rakes are powered by one or two drive units that run steel traction wheels around a steel rail at the periphery of the tank. The units are normally installed in concrete tanks and are available in diameters up to 650 feet. Under the proper climatic conditions, traction thickeners are a very efficient, cost effective design.

**CableTorq® thickeners**
Dorr-Oliver CableTorq® thickeners utilize cables to provide the mechanical link between the drive and the rake arms. These thickeners are recommended for high scaling conditions, acid service, and tacky or thixotropic muds.

**Caisson thickeners**
Caisson designs are column-mounted thickeners with an enlarged center pier to provide access to a center-column control and pumping station, as well as support the rake assembly. This eliminates the need for an underflow tunnel since the underflow is pumped up through the caisson.

Sizing and specifying a thickener can be challenging. FLSmidth’s trained personnel can guide you through the available alternatives and help you select the right thickener for your process application. To find our nearest regional office and contact information, go to www.flsmidth.com
Deep-Cone™ Paste and PPSM thickeners — Ultimate underflow solids concentrations

FLSmidth is the world leader in deep cone thickening technology with more installations in more applications than all competitors combined.

EIMCO Deep-Cone Paste Thickeners produce underflows concentrated to near their limit of pumpability. Their deep tank design maximizes pulp concentration, and produces uniform, non-segregating, paste consistency underflow slurry.

The Dorr-Oliver Paste Production Storage Mechanism (PPSM) is a unique device and process designed to “flash thicken” solids to paste consistency. The paste viscosity is controlled to permit storage. Paste thickeners maximize the efficiency of a range of applications such as:

- Dry stacking of tailings
- Underground paste backfill
- Counter-current decantation (CCD)
- Autoclave leach feed
- Maximum water and chemical recovery
- Increase downstream process efficiency

E-Cat® ultra-high rate clarifier and thickener

This rakeless design uses novel technology to accomplish both clarification and thickening in a single unit with minimal area. The design advantages include:

- Low capital cost compared to conventional thickeners
- Low maintenance costs due to no moving parts
- Much smaller area required compared to conventional thickeners
- Low operating costs, low flocculent consumption
- Counter-current decantation (CCD)
When clarity is important, FLSmidth has designs to handle a variety of applications and flows. Available clarifier features include:

- Surface skimmers
- Froth baffles
- Stamford baffles
- Low-shear turbines
- Internal or external solids recirculation
- Paddle flocculators
- Various feed pipe arrangements
- Custom instrumentation control packages

Feedwell alternatives include energy dissipating, hydraulic, or mechanical flocculation and solids-contact reaction wells. Effluent launder configurations can be designed for equalized flow distribution and optimized hydraulic loading.

**Reactor-Clarifier™ solids-contact unit**

EIMCO Reactor-Clarifiers provide optimal flocculation, solids contact, and precipitation. Dual concentric rake and turbine drives provide solids raking along with low shear pumping and mixing.

**Delta-Stak® clarifiers**

EIMCO Delta-Stak Clarifiers combine the simplicity of gravity settling with inclined plate sedimentation principles. The patented design reduces space requirements and costs while providing operational simplicity and high overflow rates.
Sedimentation drive heads

**Drives and lifts**
FLSmidth has extensive experience in gear design and manufacturing, combining leading technology with computerized parametric data to produce a complete line of application-engineered drive heads. Torque can be developed from 2,000 ft-lb to 7,200,000 ft-lb, enough to meet almost any process requirement. Drives are available using either electric or hydraulic motors. FLSmidth maintains complete control over the quality, materials and manufacture of its drive heads.

The superior design of the machines ensures:

- High output torque
- Maximum service life
- Support for the mechanism and its operating loads
- Reliable overload protection
- Allowance for lift capability

**Principle drive types**

**Worm gear drives** for smaller units – These drives have high-quality alloy bronze main gears with hardened steel worms mounted on precision ball bearings and are enclosed in dust-tight steel housings for oil-bath lubrication.

**Spur gear drives** for bridge or center column-mounted operations – These units are manufactured with heat-treated, forged-steel main spur gears, with alloy steel pinions, directly coupled to efficient planetary gear boxes; all mounted on precision bearings and are enclosed in dust-tight fabricated steel housings for oil-bath lubrication.

**Hydrostatic bearing drives** have two basic parts, a runner and stationary support pads. An oil film supports not only the vertical load, but also positions the rotating load radially. This configuration gives maximum clearance in the center of the drive allowing access to the column and underflow pumps.
In addition to providing a complete line of process equipment, FLSmidth is your source for everything necessary to meet the total needs of a project from inception to start-up and beyond.

**Flowsheet capabilities**  
FLSmidth engineers can help you with the design of your total flowsheet, ensuring that all your equipment will work together for optimal performance and ease of operation.

**Tankage and erection**  
FLSmidth can take the stress out of coordinating an independent contractor who may not be familiar with all the details necessary to install your thickener or clarifier. Our experienced tankage and erection crews can save you money and stress by doing all your field work and turning over to you a trouble-free machine.

**Upgrades and retrofits**  
Sedimentation technology is constantly advancing. Let us show you how you can incorporate state-of-the-art design improvements into your existing clarifier or thickener. Many upgrades can pay for themselves in a matter of months and help increase capacity as well as improve performance.

**Service**  
Our staff of skilled mechanical and process engineers can keep your EIMCO and Dorr-Oliver equipment in top condition and help you avoid costly unscheduled interruptions. FLSmidth is here to help you with all your solid/liquid separation needs. Please call us to find out more about how FLSmidth’s technology can improve your productivity.

For a complete listing of our worldwide locations and phone numbers, visit www.flsmidth.com.