

## Spiral Scraper Clarifier

### Key features & benefits

- Special design developed for faster sludge removal
- Best performance on 1:12 floor slope
- Better control of sludge blanket

### How we create value

- Low maintenance requirements
- Trouble-free installation
- Long lasting durable design



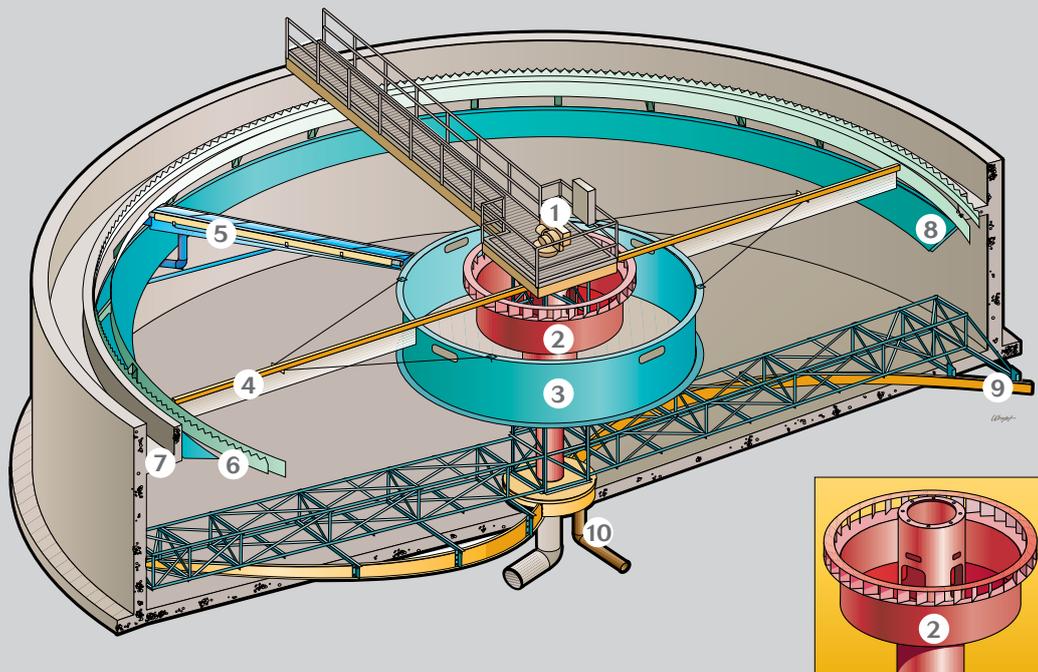
# Spiral Scraper Clarifier

## Features

Ovivo's Spiral Scraper Clarifier (C4-FTS) offers rapid sludge removal with spiral blades and a rotating sludge collection drum. The Spiral Scraper Clarifier offers full radius skimming and an enhanced energy dissipation well: the EquaFlo 360™.

Our clarifier design includes the most common components of the scraper clarifier as well as competitive innovations such as the EquaFlo 360™ EDI (Energy Dissipating Inlet) or the rotating sludge collection drum.

1. Drive
2. EquaFlo 360™
3. Flocculation feedwell
4. Full radius surface skimming
5. Full radius trough skimmer with radial ramp
6. Effluent weir and baffle
7. Inboard effluent launder
8. Density Current Baffle
9. Spiral rake blade
10. Rotating sludge collection drum



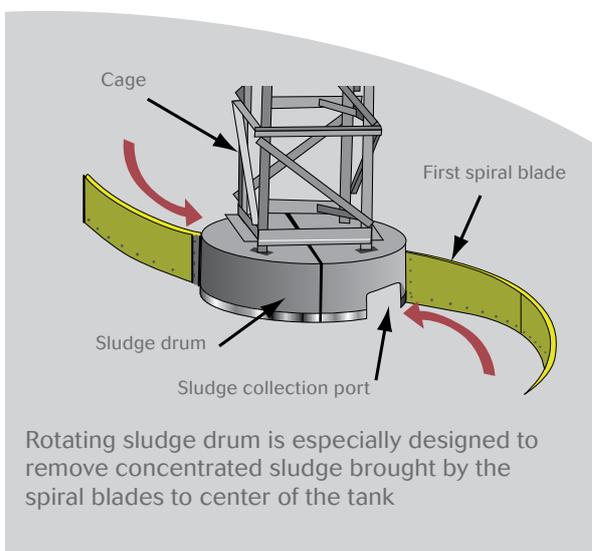
## Spiral Blades and Sludge Collection Drum

The Spiral Blade Clarifier features a spiral blade design coupled to a rotating sludge collection drum. The blades are constructed to a logarithmic spiral curve with a constant 30 degree angle of attack. They are supported by two sludge removal arms of steel truss construction. Blades are equipped with adjustable 20 gauge 304 stainless steel squeegees for a better resistance to abrasion. Blade depth varies with the clarifier size and the bottom slope; the best raking performance is achieved with 1:12 floor slope.

The mechanism is designed for rapid sludge removal. Ovivo can provide an optional variable frequency drive for the adjustment of the raking speed and a better control of the sludge blanket.

The sludge drum is a circular manifold attached to the bottom end of the center cage. It is sealed around the center column and to the tank floor. The drum rotates with the cage and turns above the openings of the RAS (Returned Activated Sludge) pipe. The drum has one opening located in front of each rake blade, 180 degrees apart.

The sludge drum removes highly concentrated sludge that is brought by the spiral blades to the center of the tank. Shipped to the site in just two pieces, the sludge drum is easy to handle and install. The drum does not clog and requires little maintenance.



Rotating sludge drum is especially designed to remove concentrated sludge brought by the spiral blades to center of the tank

## Drive Units

Ovivo provides strong, highly reliable drive mechanisms. The strength of our drives is due to their design, the materials used, full oil bath lubrication and the proper alignment of their components.

### Drive

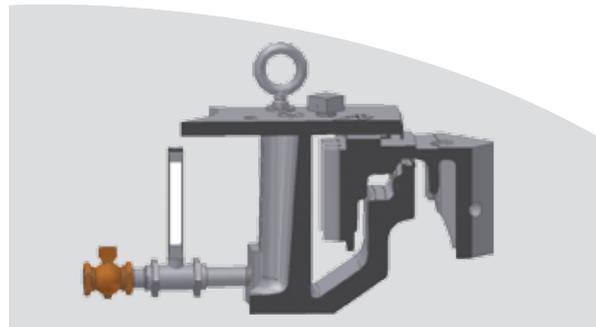
- Cast iron housing
- Oil lubrication
- Deep oil reservoir
- Strip liner bearings
- Worm gear reducer
- Single pinion
- Solid one piece main gear
- Meets latest AGMA standards



### Cast Iron

Our drives are built in cast iron per ASTM A48 Class 40A. Cast iron offers:

- Excellent corrosion protection. Cast iron has a natural resistance to corrosion and will not rust
- Resistance to heavy loads. Complex cross sections with a high degree of structural rigidity are more precisely formed than fabricated plates. Sections are easily varied to provide massive support in high load areas.
- Full inner and outer walls form a deep 'U' cross section, offering exceptional rigidity and an ample oil reservoir.
- Extra bulk under the main bearing, pinion bearing and intermediate reducer mounting surfaces ensures proper alignment under peak loads.



### Oil Lubrication

Ovivo drive design includes a deep oil reservoir with full side wall. This design offers many advantages. The full sidewall avoids the possibility of oil leaking and provides good weather protection for the gear. The deep oil reservoir minimizes heat buildup, provides an area for condensate to accumulate well away from the main gear and bearings and allows complete immersion in the lubricant. The drain is located away from the main pinion gear at the lowest point to allow extraction of contaminants.



### Strip Liner Bearings

Ovivo drives use strip liner bearings and the largest chrome alloy bearing balls on the market. The strip liners are specially designed for wastewater treatment applications. These high quality strips are manufactured in AISI E4140, vacuum degassed and carbon deoxidized steel and offer high strength (43-46 Rc hardness).

### Quality Components

EWT drives are equipped with bearings, worms and pinion mounted on a precisely machined surface. In every drive a high quality solid pinion maintains alignment and gives better resistance to bending and deflection under loads. Mating parts are machined to precise tolerances to assure precise fit and alignment. Every drive part is fully restrained (top and bottom) with no overhung loads. Main bearings are fully restrained into base.

### AGMA Standards

Worm gear reducer, single solid pinion, single solid worm / worm shaft and main gear all meet the latest AGMA (American Gear Manufacturers' Association) standards.

### Drive Control

Each drive is equipped with an overload control device activated by thrust from the worm shaft. This drive control includes a clear plastic enclosure and a weatherproof enclosure of epoxy coated aluminum construction with electro-mechanical switches.

Drive Components Material	
Main gear housing	Cast iron ASTM A48
Worm gear housing	Cast iron ASTM A48
Main gear	Ductile iron ASTM-A536 class 100-70-03
Worm gear	Cast alloy bronze
Worm	Alloy Steel AISI 4140/42H
Pinion	Alloy steel 4150 (26-33 Rc)
Strip liners	Steel AISI E4140
Bearing ball	Chrome alloy steel
Control enclosure	Cast aluminium



## EquaFlo 360™ Energy Dispersing Inlet

The EquaFlo 360 Energy Dissipating Inlet (EDI) for clarifiers differs substantially from conventional practice by using the entire EDI circumference to discharge flow rather than just a few openings in the EDI shell. The quiescent tangential flow that results provides a uniform velocity profile and promotes flocculation within the feedwell.

### EDIs: uses

The influent discharges from the center column at relatively high energy levels must be dissipated to reduce the influent velocity in feedwell and provide a uniform distribution in the clarification zone.

### Existing EDIs

Scoop design, baffled design or TEE outlets design dissipate energy but produce flow streams. Flow streams cause turbulences and preferential jets in the feedwell resulting in reduced clarifier performance. These designs are also associated with deep feedwells to reduce the possibility of short circuiting under the feedwell.

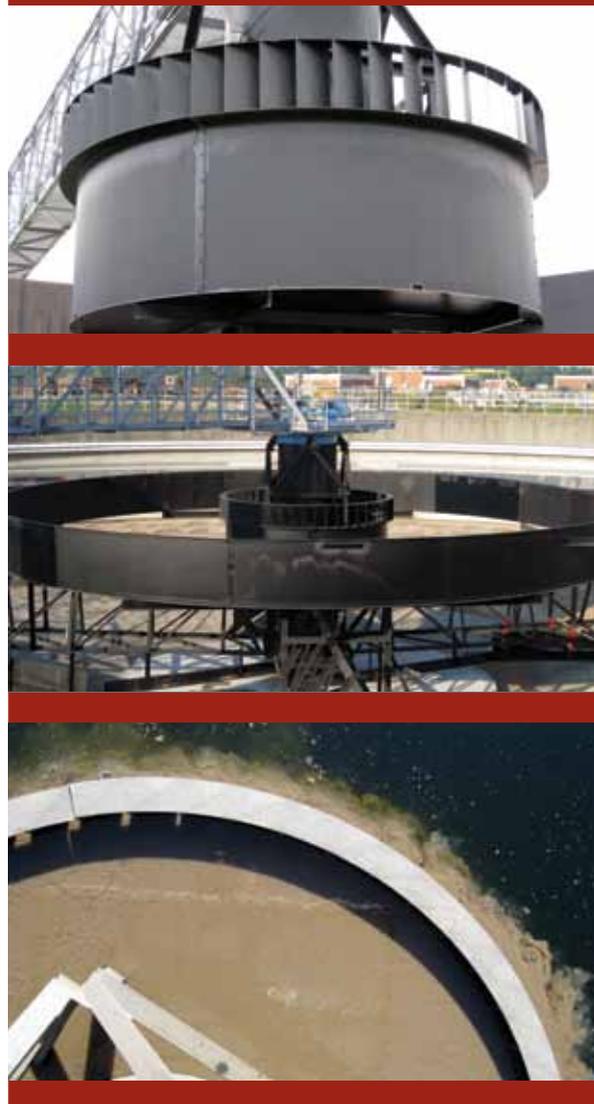
### The EquaFlo 360™

With its extended inner rim and evenly spaced tangentially orientated vanes along the entire 360 degrees of the EDI circumference and, the new EquaFlo 360 offers the following advantages:

- Eliminates the distributing effects of the discrete flow streams jetting into the feedwell from the EDI
- Produces uniform flow into the feedwell around its full 360 degree circumference
- Achieves a controlled tangential flow velocity which promotes flocculation in the feedwell
- Minimizes the depth of the inlet discharge into the feedwell so the feedwell can have a minimum depth in the clarifier to avoid scouring of the sludge blanket on the clarifier floor
- Creates a tapered velocity profile for the flow that enters the clarification zone
- Increases the active clarification volume and retention efficiency of the clarifier through the use of a tangential discharge from the feedwell.

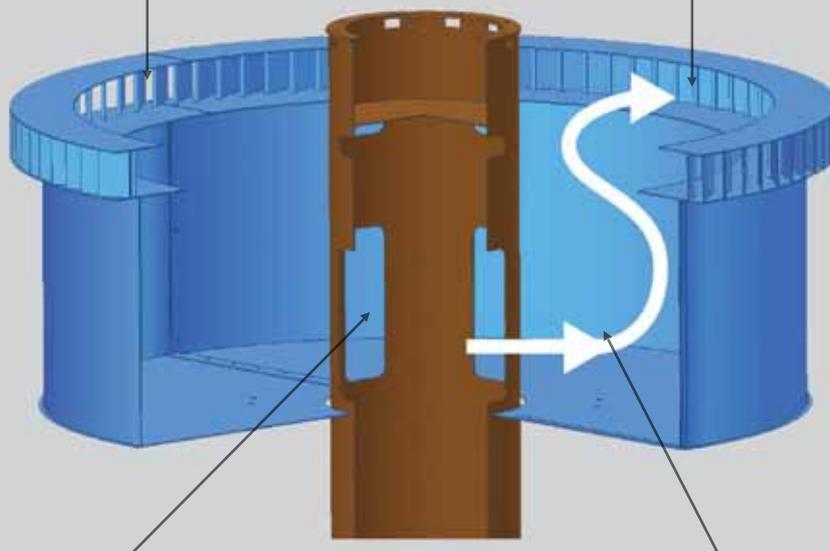
### Features & benefits

- Discharge on full 360
- Evenly spaced tangentially orientated vanes
- Extended inner rim
- Double set of influent ports on influent column
- No stream jetting
- Enhanced flocculation
- Shallower feedwell
- No sludge scouring



The EquaFlo 360™ EDI discharge is ringed with evenly spaced tangentially orientated vanes along the entire 360 degree of the EDI circumference

The lower rim of the vane support ring extends back towards the column, forming a lip that provides additional flow baffling and energy dispersion



The influent column discharge ports are set below the EDI vanes, providing immediate containment and baffling of the influent via the EDI floor and cylindrical shell

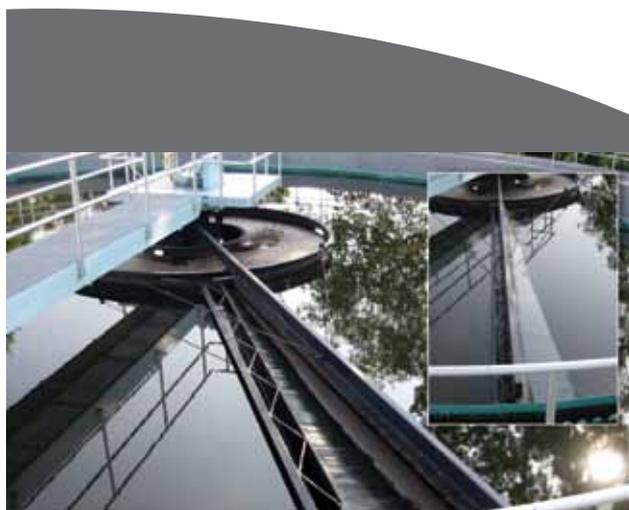
Flow leaving the column ports encounters the EDI wall, then must travel around the lower support ring prior to quiescently discharging into the feedwell trough tangentially orientated vanes

## Full Trough Skimmer (FTS)

### Key features & benefits

- Heavy duty skimmer arms
- Increased removal rate decreases odor
- Prevents surface scum carry-over into effluent stream
- Effective removal of heavy surface scum loads in one pass
- Can be retrofitted into existing bridge and column mounted clarifiers and thickeners
- Flush valve assembly mounted at the feedwell end automatically rinses out the scum trough
- Heavy duty skimmer arms do not have pivots, hinges or springs that wear out and break
- Can be customized to fit any manufacturer's mechanism
- Eliminates the need to direct scum to the tank periphery with a hose or spray system
- Radial design enables the full length of the skimmer wiper to make simultaneous and continuous contact with the entire ramp at each revolution of the skimmer arm

The Full Trough Skimmer (FTS) mechanism is a performance enhancing skimming design that has been effectively proven and retrofitted into many existing clarifiers. This mechanism covers the entire annular space between feedwell and scum baffles and can eliminate scum quickly and effectively, at a rate faster than that of the standard scum box and skimmer design. This innovative design incorporates a radial approach ramp and an automatic flush valve. The (FTS) is an effective device that will enhance the overall performance of any clarifier of 110' in diameter or smaller.



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