

# INFILCO

# DENSADEG®

Clarifier / Softener



- CLARIFICATION
- PHOSPHOROUS REMOVAL
- SOFTENING
- INDUSTRIAL APPLICATIONS
- ← Applications



- Wastewater:
  - CSO/SSO
  - BOD, COD, TSS Reduction
  - Primary and Tertiary Clarification
  - Phosphorous Removal
  - Wastewater Reclamation
- Drinking Water:
  - Clarification and Softening
  - Membrane/Filter Backwash
  - Thickening
  - Organics Removal
- Industrial Water:
  - Process Water
  - Softening/Silica Removal
  - Metal Precipitation
  - FGD Wastewater

The DensaDeg® Clarifier/Thickener is a high-rate solids contact clarifier which combines optimized flocculation, internal and external sludge recirculation, and plate settling in two conjoined vessels.

## MAIN FEATURES

- High loading rate equals small footprint
- Compact layout: Integration of clarification and thickening in a single system
- Highly efficient use of chemicals
- External sludge recirculation and high solids concentration reduces start-up time
- Superior effluent quality
- Thickener provides sludge storage and sludge thickening
- Easily handles influent solids variations
- No maintenance concerns related to abrasive wear by external ballast



## SEPARATION TECHNOLOGY: DensaDeg® 2D CLARIFIER/THICKENER

The DensaDeg® Clarifier, Softener and Thickener is the water and wastewater industry's most robust, versatile process on the market. This high-rate system combines optimized flocculation, internal and external solids recirculation, thickening in two conjoined vessels to maximize hydraulic loading and treatment efficiencies. The proprietary blend of energy input and high volume solids

recirculation reduces waste volumes and results in rapid settling operation and high quality treated water. The DensaDeg® process is proven in hundreds of installations on nearly all physical-chemical separation applications in the municipal drinking water, wastewater and industrial markets.

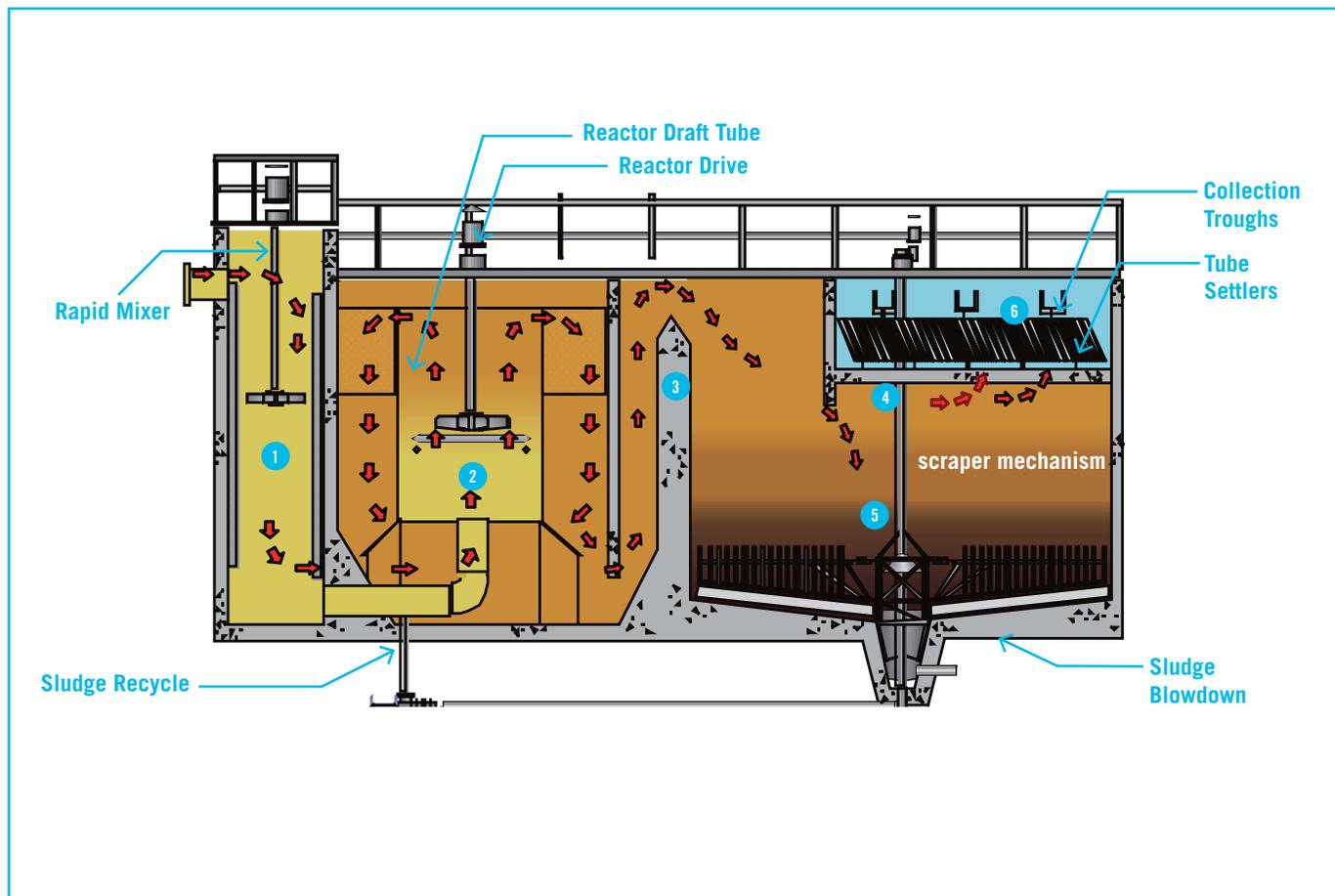


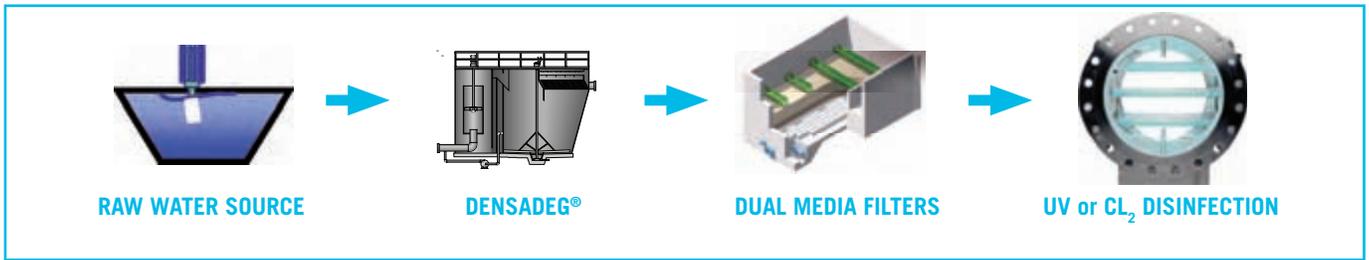
## HOW IT WORKS

### An Integrated Three-Stage Process

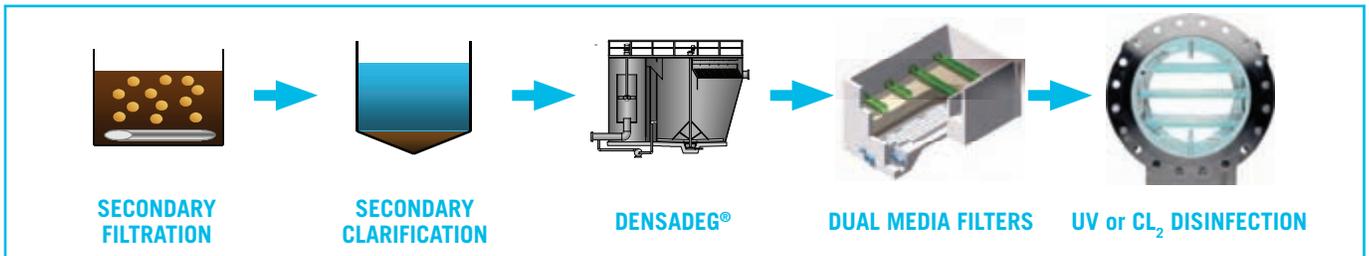
- 1 **RAPID MIX STAGE:** Raw water flows into the rapid (flash) mix zone where a coagulant is added. Coagulation is the destabilization of colloidal particles, which facilitates their aggregation and is achieved by the injection of a coagulant such as alum or ferric chloride.
- 2 **REACTOR ZONE:** Coagulated water then flows into a second reactor zone for intense internal recirculation and mixing by an axial-flow turbine. Water and solids are recirculated in and out of a cylindrical draft tube, promoting solids contact and particle growth. A flocculating agent (polymer) is injected inside the reactor draft, together with thickened sludge recycled from the thickening zone. The recycled sludge accelerates the flocculation process and ensures the formation of dense floc particles of homogeneous size.
- 3 **TRANSITION ZONE:** The transition to the settling stage is accomplished through an up-flow piston zone. Additional flocculation takes place in this zone, as dense particulate transitions upward and over an internal weir wall.
- 4 **SETTLING & SEPARATION ZONE:** Flocculated solids enter the settling zone, over a submerged weir wall, where dense, suspended matter settles to the bottom of the clarifier. Clarified water is displaced upward from the downward moving slurry, through inclined tube settlers. The tube modules act as a polishing step for lighter, low density solids.
- 5 **SLUDGE DENSIFICATION & THICKENING:** Settled sludge is thickened progressively in the bottom of the clarifier through the use of a rotating scraper mechanism. A small portion of this thickened sludge is recycled to the reactor zone and the remainder is periodically blown down through an automatic blowdown valve.
- 6 **EFFLUENT COLLECTION:** Uniform collection of clarified water is accomplished in effluent launders above the settling tube assembly.

DensaDeg®





DRINK/PROCESS WATER



TERTIARY TREATMENT (PO<sub>4</sub> REMOVAL AND CLARIFICATION)



## PERFORMANCE ADVANTAGES

### Excellent Effluent Quality

Combined solids recirculation and high reactor concentration optimize unit operation and overall treatment results.

Treated water turbidity is normally less than 1.0 NTU.  
Tertiary phosphorous removal to less than 0.1 mg/l TP.

### Construction Economy

Integrated functions within a single unit require approximately 50% less space than conventional solids contact clarifiers.

### Accelerated and Optimal Chemical Efficiency

Combined internal and external sludge recirculation and high reactor solids concentration reduce startup time and chemical usage and increase treatment rates.

### Thickened Sludge and Reduced Waste Volume

Thickened solids from 2 to 10% and extremely low waste volume.

### Consistent, Flexible Performance

Hydraulic loading management and high reactor solids enables operation over a broad range of flows and raw water characteristics.

### Long Service Life

No abrasive material is added to the system so there is no wear on pumps, mixers, or scrapers.

## Technical Features

- Loading Rates: 6.0 to 15.0 gpm/ft<sup>2</sup>
- Steel tank or concrete units available
- Highly efficient use of chemicals
- Flexible layout options - Customize to any size plan
- Unit heights of 15 to 22 feet
- 10 times less waste volume vs. ballasted systems
- No additional thickening equipment required
- Automatic control of start-up, shutdown and sludge systems
- No abrasive ballast material to handle, dispose of or replace
- Enhanced TOC removal with softening

## DESIGN SPECIFICATIONS

DensaDeg®	Single Unit Capacity
	MGD
Concrete Units	1.0 to 22
Steel Tank Units	0.15 to 15

## DESIGN SPECIFICATIONS

- Concrete or Steel Tank construction
- Mechanism Internals: Painted carbon steel, stainless steel or special coatings



## COMPLETE TREATMENT SOLUTIONS

Infilco Degremont offers an array of water, wastewater and industrial treatment solutions for any size client. Headworks, clarification, filtration, biological and disinfection systems are several of the product disciplines in our portfolio.

If interested in this product, check out some of the complementary SEPARATIONS products:

- Superpulsator® Clarifier
- AquaDAF® Clarifier
- Accelator® Clarifier/Softener
- Greenleaf Filter System
- Tetra™ Block Underdrains

With a variety of filtration and clarification products in our SEPARATIONS department, Infilco engineers carefully evaluate each application to provide the most cost-effective and efficient treatment solution.

- Monoflor® Nozzle Underdrains
- ABW® Automatic Backwash Filter
- PulsaPAK® Package Clarifier/Filter System
- AquaPAK Package Clarifier/Filter System
- AccelaPAK® Package Clarifier-Softener/Filter

## PILOTING SERVICES

Infilco offers pilot systems and services for the equipment in this brochure as well as many of our other product offerings. Pilot studies are a practical means of optimizing physical-chemical and biological process designs and offer the client several benefits, such as:

- Proof of system reliability
- Optimal design conditions for the full-scale system
- Raw water lab analysis
- Regulatory approval assistance

If interested in a pilot study for your system, please contact us for a proposal.



## SERVICES INFILCare®

### Part Sales

Infilco Degremont sells parts and components for most INFILCO brand equipment as well as parts for demineralizers, thickeners, nozzles, pressure filters, and valves. We offer reliable spare parts at competitive prices. We maintain records of previous installations to quickly identify your requirements. Many items are shipped directly from stock for quick delivery.



### Rebuilds, Retrofits and Upgrades

Infilco Degremont offers cost-effective rebuilds and upgrades for INFILCO provided systems, no matter what year they were built. If you are interested in an economical alternative to installing a whole new system, contact us for a proposal.



### Contacts

[www.DEGREMONT-TECHNOLOGIES.COM](http://www.DEGREMONT-TECHNOLOGIES.COM)

**Infilco Degremont Inc.**  
8007 Discovery Drive  
Richmond, VA 23229-8605, USA  
Tel: +1 804 756 7600  
Fax: +1 804 756 7643  
info-infilco@degtec.com

**Degrémont Limitée**  
1375, route Transcanadienne,  
Bureau 400  
Dorval (Qc) H9P 2W8, Canada  
Tel: +1 514 683 1200  
Fax: +1 514 683 1203  
info-canada@degtec.com

Manufacturers' Representative: