

# CONTACT CLARIFIER™

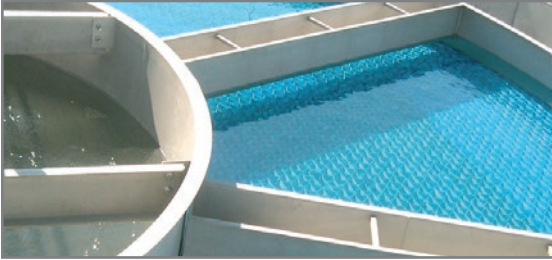
A true solids contact clarifier



**WESTECH®**

 SWIRE WATER

# A True Solids Contact Clarifier



**The solids CONTACT CLARIFIER™** is a mixture of old art and new process technology. Patent art dates back to the 1880s and contemporary solids contact clarifier units have their origins in the 1940s and 1950s. The two most common applications for the solids CONTACT CLARIFIER are cold lime softening, where the unit is used to **maximize the rate of chemical precipitation**, and surface water clarification, where the unit is used as an **enhanced flocculation device**.

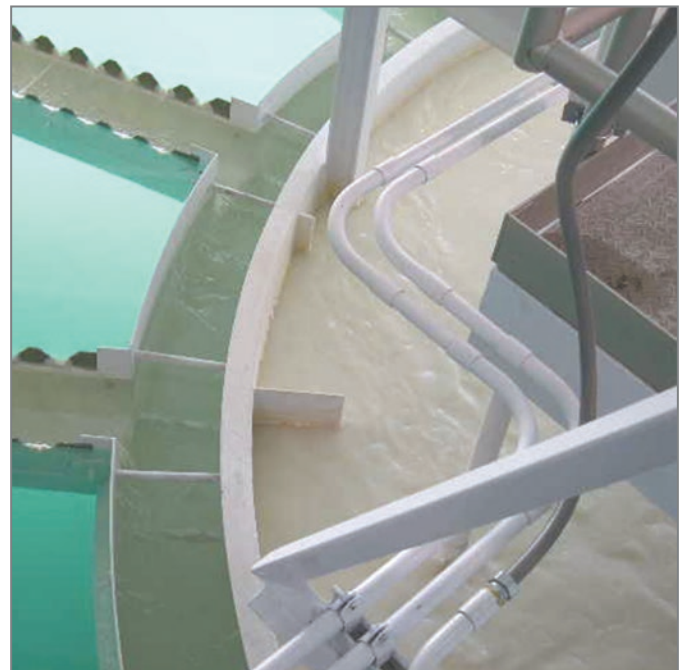
**With thousands of process equipment installations – hundreds of** which are solids CONTACT CLARIFIER units – and more than 40 years of engineering and equipment experience, WesTech offers a unique breadth of expertise through all phases of design, manufacture, installation, and operation. WesTech engineers understand key process design parameters – solids concentration, detention time, recirculation rates, sludge blanket depth, draft tube velocities, chemical addition, blowdown duration / frequency – and how they affect solids CONTACT CLARIFIER sizing and performance. Our installation and field experience in the industrial market benefits the municipal market with fresh insight into design and operations.



**Industrial Surface Water Clarification**

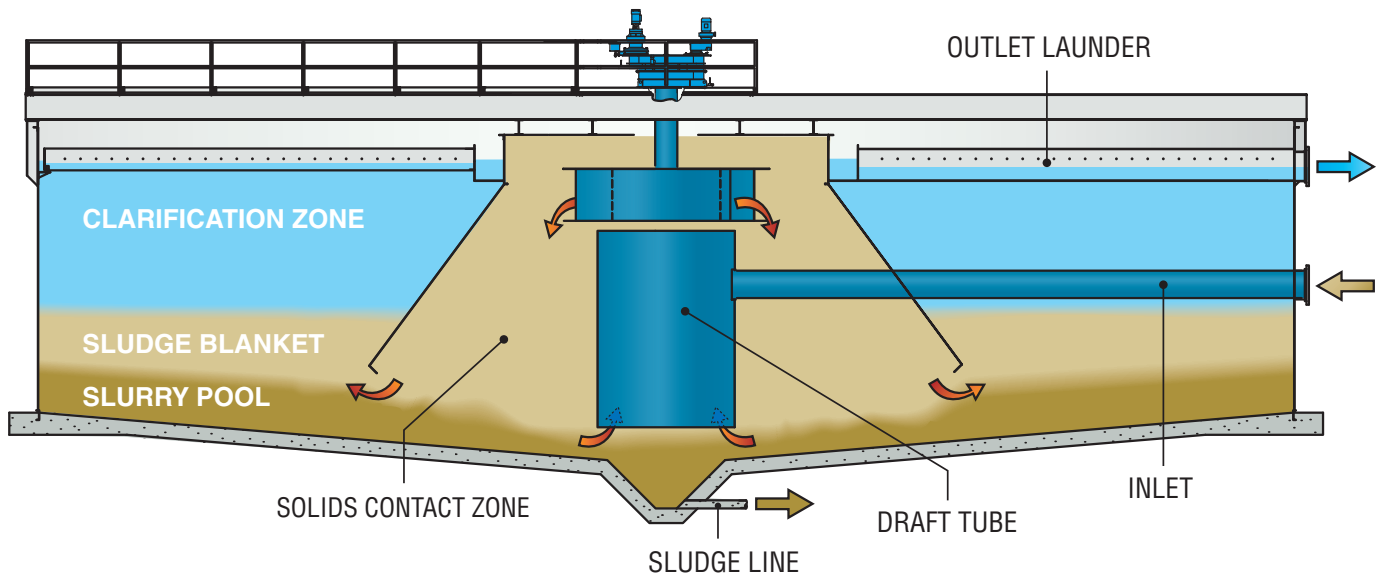


**Surface Water Clarification**



**Cold Lime Softening**

# Slurry Settling Properties are Key



## Zones in a True Solids CONTACT CLARIFIER

**Solids Contact Zone** - where chemical precipitation and /or enhanced flocculation occurs.

**Sludge Blanket Zone** - where further flocculation occurs.

**Slurry Pool** - where settled solids are transported to the draft tube entrance.

**Clarification Zone** - where liquid-solids separation occurs and clear supernatant is removed.

Cold lime softening and surface water clarification produce widely differing slurry properties. Understanding these slurry properties is crucial to understanding the importance of solids inventory and proper operational control.

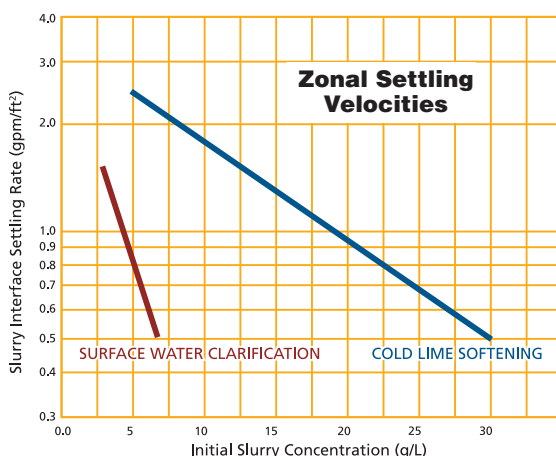
Depending upon whether the plant flow rate is constant or variable, operational control of solids produced and retained within the CONTACT CLARIFIER is accomplished by utilizing different approaches:

### Constant Flow Rate

- Controlling the slurry pool or sludge blanket elevation (when applicable) within a desirable range.
- Controlling the solids contact zone solids concentration ( $\%Vol@Min$ ) within a desirable range for effective treatment and performance.

### Variable Flow Rate

- Controlling the solids inventory (tons of dry solids) within the CONTACT CLARIFIER below a desirable maximum level that can be retained within the unit at the peak rise rate.





# Elements of a True Solids CONTACT CLARIFIER

## Laundry System

Provides uniform collection of clarified water over the entire clarification zone and transports it out of the basin. Launderers can be radial or peripheral.

## Concentric Dual Drive

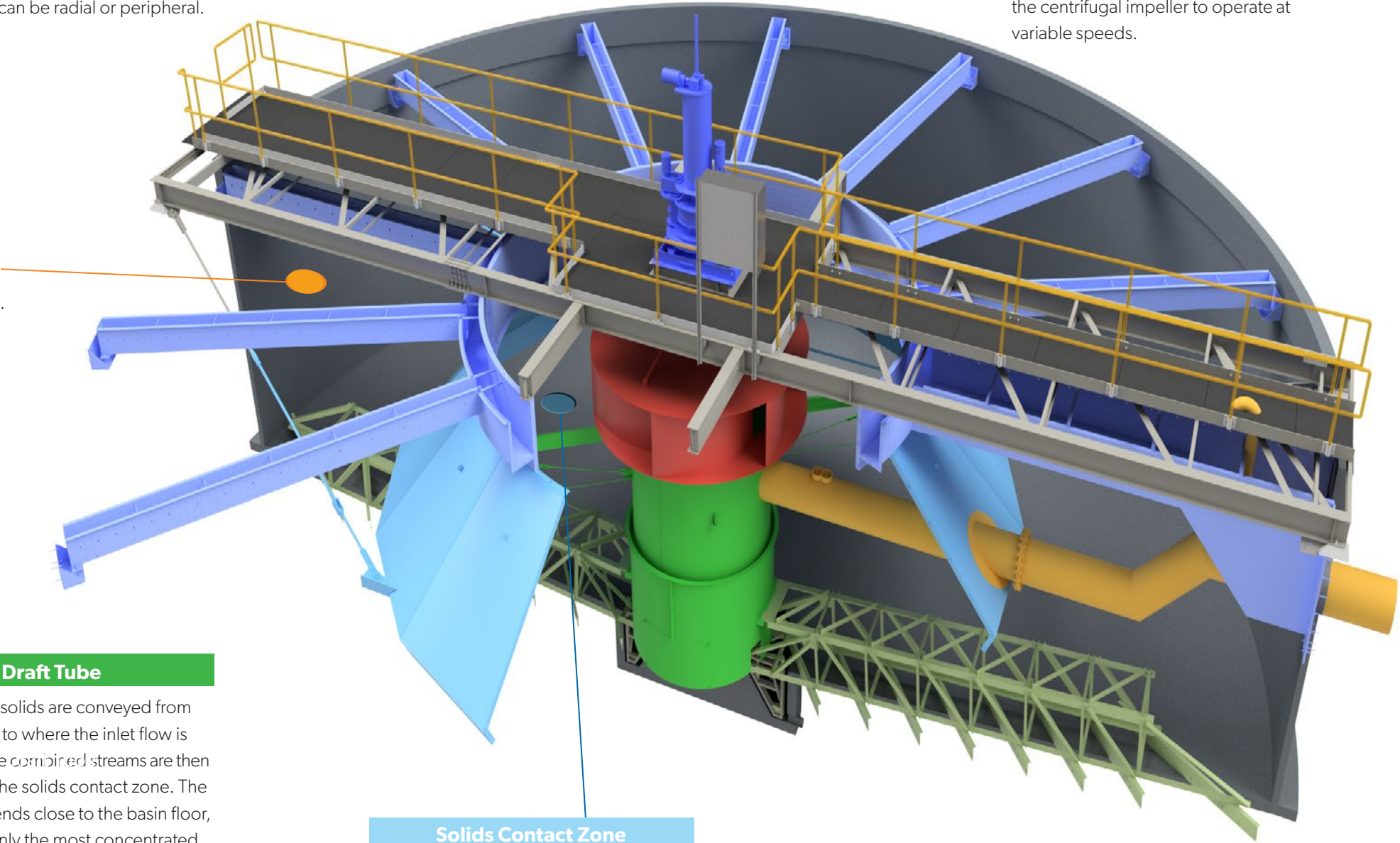
Our highly efficient, robust, maintenance-friendly drive rotates the sludge scrapers at a slow constant speed while allowing the centrifugal impeller to operate at variable speeds.

## Centrifugal Impeller Pump

The heart of a true solids CONTACT CLARIFIER is WesTech's uniquely efficient, high-volume, low-head, low-shear pump which lifts concentrated settled solids to mix with the low-solids concentration inlet flow and disperses the mixture into the upper solids contact zone. WesTech's recirculation impeller has lower horsepower draw and less shear than any other impeller on the market.

## Clarification Zone

Where clarified water rises and solids settle. Often a sludge blanket is maintained low in this zone to improve clarity by providing low-energy flocculation.



## Draft Tube

Concentrated solids are conveyed from the basin floor to where the inlet flow is introduced. The combined streams are then pumped into the solids contact zone. The draft tube extends close to the basin floor, recirculating only the most concentrated solids and making the WesTech unit a true solids CONTACT CLARIFIER.

## Solids Contact Zone

A slow mix zone where chemical precipitation and / or enhanced flocculation occurs. Velocities decrease due to the size and shape of the reaction well, resulting in tapered flocculation. Both conical and cylindrical-shape reaction wells are available.

## Sludge Scrapers

Transport settled solids along the basin floor to the draft tube entrance and to the sludge sump.

## Inlet Pipe

Conveys the raw water directly into the draft tube and often provides provisions for injecting and mixing treatment chemicals into the process stream.

# Sensible Design Approach



**Centrifugal Impeller Pump and Draft Tube**

The key components of WesTech's CONTACT CLARIFIER are the result of a sensible design approach. From the low-shear impeller to properly located sample taps and sludge sump sizing, WesTech's decades of engineering, manufacturing, installation, and operating experience bring you value-added performance.



**Laboratory Jar Testing**



**Radial Flow Launder**

WesTech offers laboratory and pilot plant services to determine recommended process equipment design and performance. WesTech has several 8' dia. x 16' high CONTACT CLARIFIER pilot plants which have process similitude, allowing operation and performance to be scaled up directly to full-size units.



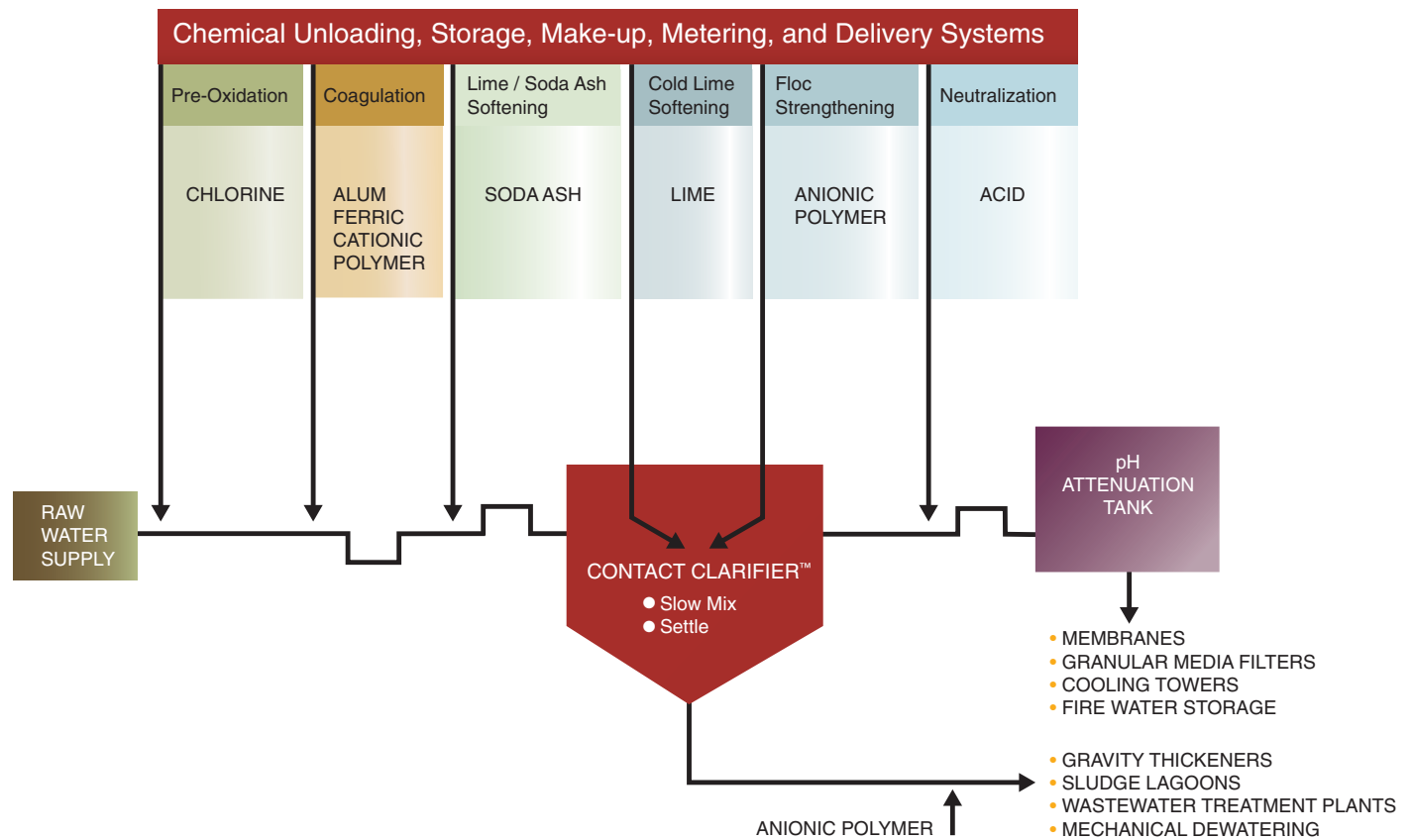
**Heavy-Duty Concentric Dual Shaft Drive**



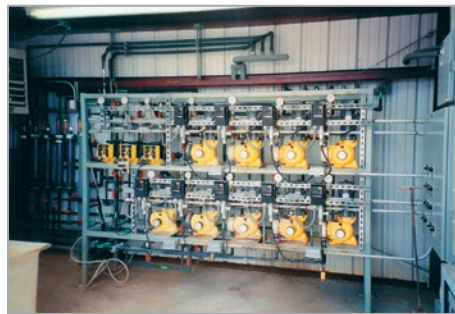
**Pilot Plant**



# Systems Integration



**Lime / Soda Ash Storage**



**Coagulant / Polymer / Acid Feed System with Dilution Water**



**Chemical Mixing and In-line Dispersion Units**

The solids CONTACT CLARIFIER is the heart of a chemical treatment and clarification system. However, successful performance is highly dependent upon the effective integration of chemical make-up, mixing, metering, and delivery sub systems.



**Turnkey Applications**



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