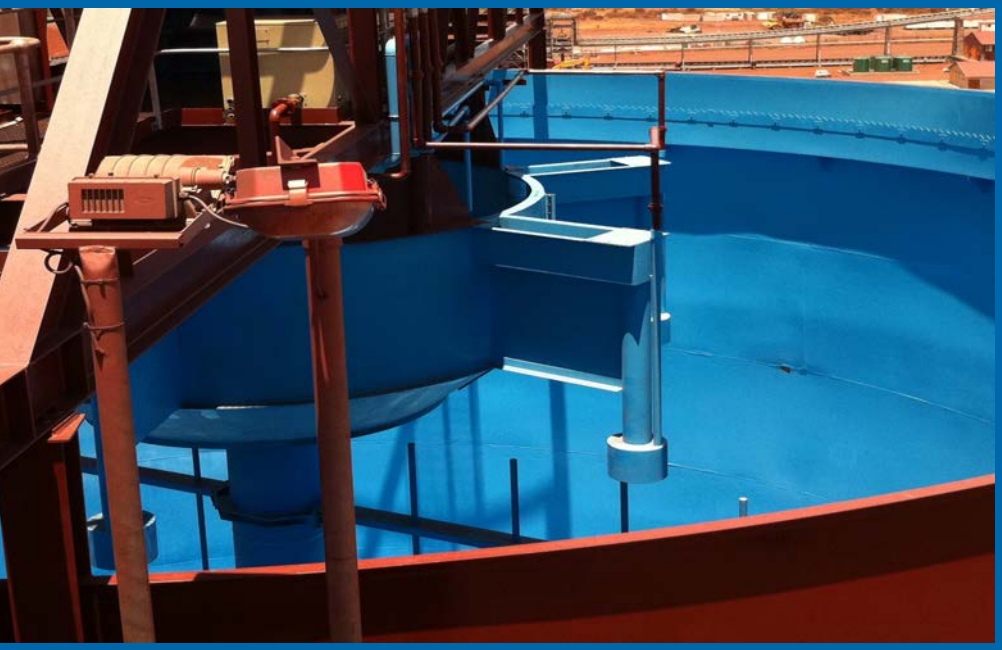
# EvenFlo® Feedwell

## Advanced Feedwell Technology



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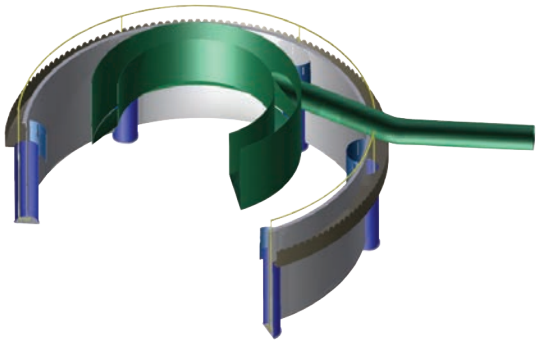
# Improve Your Thickener Performance

WesTech's patented EvenFlo® Feedwell achieves peak performance with its revolutionary two-stage design. It significantly improves the overflow clarity while using a lower flocculant dosage.



## Optimize Your Feedwell, Optimize Your Thickener

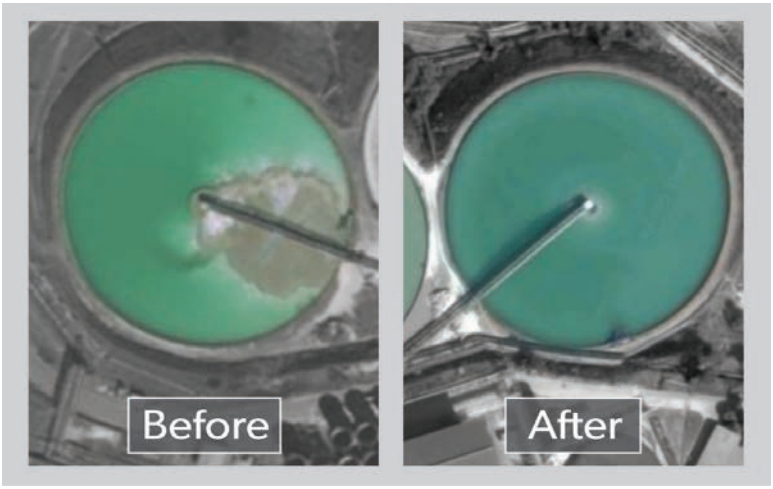
A thickener relies on a feedwell for even distribution of solids and flocculation of suspended particles. The feedwell receives the feedpipe flow and transitions it to a slow vertical downward flow, while flocculating the suspended solids into floccules that settle quickly.

Conventional feedwell designs have two main shortcomings: **short circuiting**, where the feed stream momentum carries the flow prematurely down and around the feedwell, past the shelf and deflector, and out of the feedwell; and **inefficient flocculation**, where only a small area around the inlet of the feed provides good mixing.

Due to these issues, most sites experience the following problems:

- Solids leave the feedwell under-flocculated
- Fine particles can be carried directly to the overflow
- Premature flow release forms a "sand bar" to one side in the thickener
- Poor clarity results from a mixing intensity and duration that is insufficient to capture the fines
- Over dosing of flocculant to compensate for poor feedwell performance

*Short-Circuiting Flow*




The benefits of retrofitting three 135-meter traction thickeners is shown on the left; the short-circuiting flow seen in the Before photo is corrected by retrofitting an EvenFlo Feedwell in the thickener in the After photo.

A thickener that operates efficiently can actually be an untapped source of lowering plant costs.

## Benefits

- Lower polymer usage
- Enhanced overflow clarity
- Increased capacity
- Even distribution

## Applications

- Concentrate thickening
- Tailings thickening
- CCD circuits

*We are process experts providing innovative and customized solutions for the minerals market.*

# EvenFlo Corrects Thickener Issues

## The two-stage EvenFlo feedwell design solves the inherent problems of other standard feedwells.

With the WesTech EvenFlo patented design, the feed stream enters tangentially into an inner raceway (first stage) and is then directed radially into the outer feedwell (second stage). The simple design – without shelves, vanes, or deflectors – corrects inherent feedwell problems over an exceptionally wide operating range.

***Exceptional clarity of the overflow***

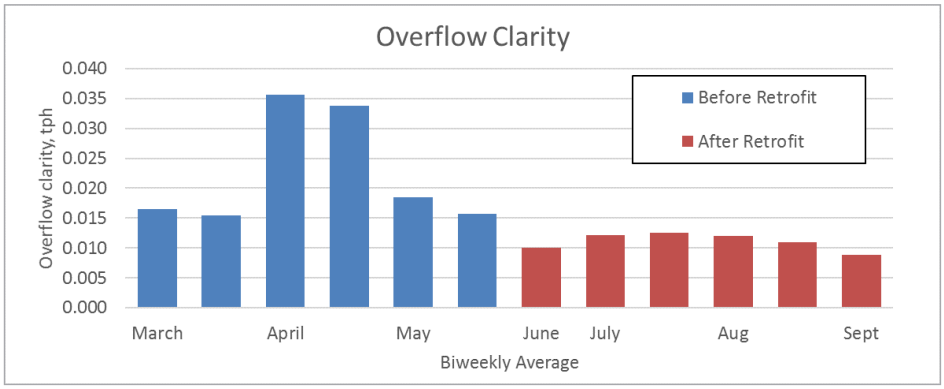
### Short Circuiting and Distribution

Effective flocculation of the full feed flow provides improved overflow clarity and increased underflow density, all while reducing the flocculant dosage. Three-month averages from before and after retrofitting a primary clarifier show:

- **Overflow clarity improved by 50 percent or more**
- **Underflow wt percent increased by 2–3 percentage points**
- **Flocculant consumption reduced by 40 percent**

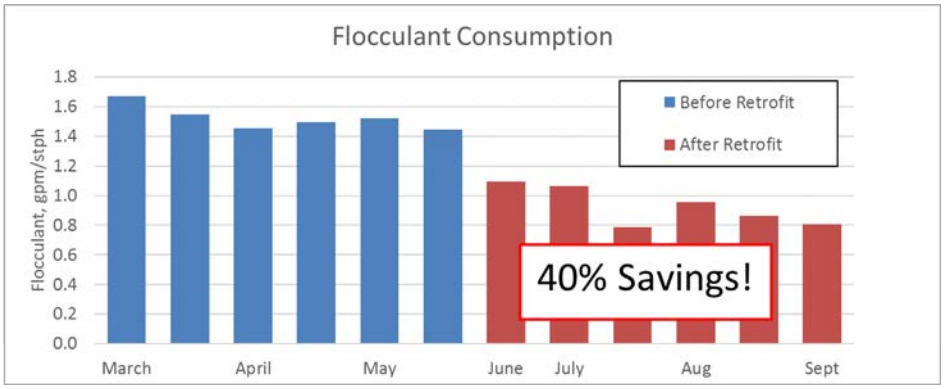
### Overflow Clarity

The EvenFlo features a large optimal mixing zone that produces excellent clarity, provides optimal collision velocity to build floccules, and increases the mixing duration to gather the difficult-to-collect ultra-fine solids and sweep them from the flows. The before and after retrofit data presented shows a greater than 50 percent reduction in suspended solids.




### Flocculant Consumption and Underflow Density

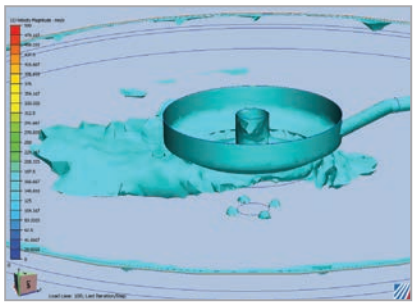
Polymer dosage and mixing conditions are interdependent. Mixing that is too weak, too strong, or too brief will result in poor flocculation. With poor mixing, flocculant dosage must be increased to compensate. An optimization study after the retrofit is still trending down and shows EvenFlo increased the underflow wt percent solids by more than 15 percent while reducing the flocculant consumption by 40 percent.



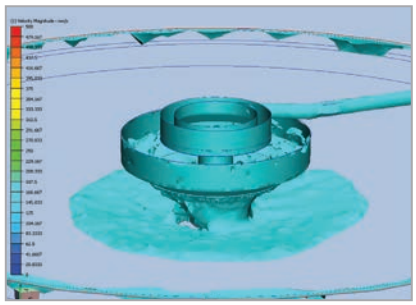
## Proven Advantages: CFD Analysis and Third-Party Study

EvenFlo's dramatic improvement in optimal mixing intensity, extended duration, and preventing of short circuiting is confirmed with computational fluid dynamics (CFD) analysis.

- The inner EvenFlo raceway separates the two steps of receiving the feed stream and distributing it into the feedwell. This buffers the feedwell performance from feed stream momentum, providing steady mixing in the outer feedwell regardless of the feed stream velocity. Conversely, other tangentially-fed feedwells cannot effectively manage the feed momentum, and they greatly lose efficiency at low or high velocities.
- Short circuiting is eliminated with the two-stage feedwell design, which keeps the feed flow in the feedwell for the designed time and produces even distribution into the thickener or clarifier (see CFD comparison).
- Optimal mixing, driven by the radially distributed flow into the outer feedwell, gives the largest optimal mix zone of any feedwell design. Optimal mixing intensity rapidly builds floccules, while the increased duration is able to sweep hard-to-collect, ultra-fine particles.
- Improvement in mixing reduces flocculant dosage requirements.

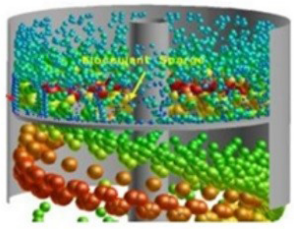


***The short-circuiting flow prematurely exits to one side from a typical tangential-feed feedwell.***

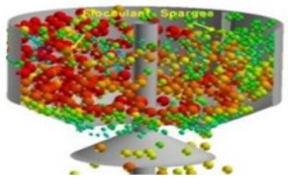


***WesTech's EvenFlo feedwell prevents short circuiting and produces even distribution of solids into the thickener.***

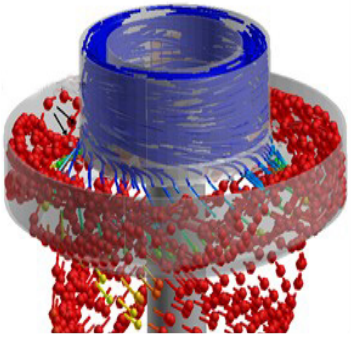
CISRO studied floccule generation as a function of feedwell design and mixing intensity (feed velocity). The floccule growth results were displayed, with optimum flocculation depicted as large red spheres and poor flocculation as small blue spheres. Compare the small, effective flocculation area in the shelfed and deflector feedwells to the large, efficient area of the EvenFlo design.



Shelfed Feedwell



Deflector Feedwell



Two-Stage Feedwell (EvenFlo)

## Self-Diluting Feedwell

Optimal feed solids concentration is needed in the feedwell for optimal flocculation. An EvenFlo Feedwell provides effective self-dilution: Clear water from the clarification zone is returned to the feedwell through ports, diluting the feed slurry. The head differential inside and outside the feedwell forces clarified water through the ports. This self-regulating dilution method responds as needed to feed variations.

To enhance capability for highly variable or extreme dilution rates, consider AirLift™ Feedwell Dilution from WesTech. With this equipment, air lift pumps optimize feedwell dilution to minimize chemical consumption while maximizing the solids settling rate.

***WesTech Self-Diluting Feedwell***

WESTECH®
Tel: 801.265.1000
westech-inc.com
Salt Lake City, Utah, USA