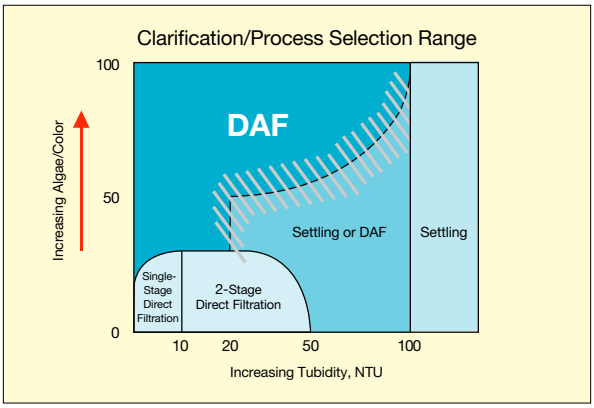
The Leopold® Clari-DAF® PW System

The Leopold® Clari-DAF® PW (Potable Water) system is a clarification technology for the pretreatment of rapid gravity filter feedwater. It is a proven, highly effective technology for removing low-density particulates as well as Giardia and Cryptosporidium. Its performance is superior to conventional clarification in providing consistent water quality, producing consistently high sludge solids, and operating at high loading rates– results that can lower your total cost of operation.

Applicable to Virtually Any Stored Body of Water

The Leopold® Clari-DAF® PW system can be used to pretreat virtually any stored body of water, particularly

- Highly colored water
- Algae-laden water
- Turbid water
- High TOC (Total Organic Carbon) water
- Cold, difficult-to-flocculate water
- Arsenic-containing water



Source: Jansenns, J. and Buekens, A. 1993. Assessment of Process Selection for Particle Removal in Surface Water Treatment. Aqua.

Improved Water Quality . . .

Water treatment plants where the Clari-DAF® PW system is installed are experiencing a dramatic improvement in the quality of water produced. For example, a water treatment plant in Pennsylvania processing raw water with a turbidity of 2.0 to 5.0 NTU and using a recycle flow of only 7.8% achieved an effluent turbidity of 0.2 NTU with a Clari-DAF® PW system compared to an effluent turbidity of 1.0 NTU achieved with the solids contact upflow system it formerly employed–an 80% improvement! Algae removal with the Clari-DAF® PW system reached 85%, resolving taste and odor problems. Manganese removal improved 60%.

The result of improved effluent water at this plant is reflected in remarkably improved filter performance. Filter run lengths tripled– from 24 hours to 72 hours. Filter effluent quality also showed a marked improvement. With the conventional clarification system, filter effluent turbidity was 0.1 NTU and filter effluent manganese was 0.05 ppm. With the Clari-DAF® PW system, filter effluent turbidity was 0.04 NTU, a 60% improvement, and filter effluent manganese was 0.02 ppm, a 60% improvement..

. . . at a Lower Cost

The increase in filter run lengths has meant a reduction in power costs because of less frequent filter backwashing. There has been a reduction of in-plant water use and less filter-to-waste. Less treated water is discarded, meaning a savings in lost expense.

The change from conventional clarification to the Clari-DAF® PW system has also saved chemical costs. The conventional clarification plant consumed coagulant at the rate of 15 to 20 ppm and polymer at 1 ppm while the Clari-DAF® PW system consumes only 8 to 15 ppm of coagulant and 0.5 ppm of polymer. That's a 47% reduction of coagulant and a 50% reduction of polymer.

Improved Sludge Solids . . .

Water treatment plants where the Clari-DAF® PW system is installed are realizing a considerable improvement in solids handling. The Pennsylvania water treatment plant improved its cake solids in the dewatering process from 5% when the solids contact upflow system was in use to as much as 22% with the Clari-DAF® PW system.

. . . at a Lower Cost

The average number of man-hours spent handling the sludge output of the plant dropped dramatically from 54 to 12 per week–nearly 80%! The cost savings due to lower sludge disposal costs and lower labor costs are obvious.

Effective at Removing Pathogenic Organisms

Leopold® pilot Clari-DAF® PW systems have demonstrated effective removal of Cryptosporidium and Giardia. At a water treatment plant in Texas, for example, Cryptosporidium at feedwater levels of 87,967/100 L were reduced to between 2.2 and 5.7/100 L, or 3.7 to 4.1 log removal. Giardia at feedwater levels of 36,812/100 L were reduced to between 0 and 3.2/100 L, or 3.6 to 4.0 log removal.

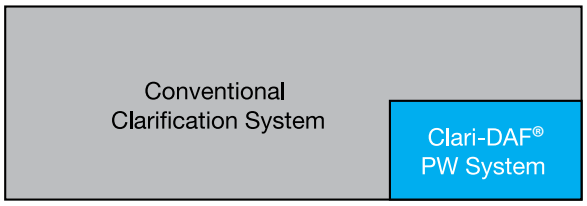
Smaller Plant with a Clari-DAF® PW System Handles More Water . . .

The Leopold® Clari-DAF® PW system can accommodate much higher loading rates than conventional clarification systems. This enables a compact design with flow-through rates increased by as much as four times that of conventional clarification tanks.

This is well demonstrated by a comparison of two water treatment plants in a South Carolina city. The footprint of a 15 MGD train including rapid mix, flocculation, settling basin, and filtration is 36,835 ft^2. The footprint of a 6.25 MGD train including in-line rapid mix, flocculation, DAF, and filtration is 2,659 ft^2. Comparing the ft^2/MGD, the plant with conventional clarification is nearly six times larger in size than the plant with the Clari-DAF® PW system.

. . . at a Lower Cost

The total operating cost comparison for the two South Carolina plants is convincing. The Clari-DAF® PW system handles a total annual flow that is twice that of the plant with the conventional clarification system (14.687 billion gallons versus 7.092 billion gallons). The expense to treat 14.687 billion gallons at the plant with the Clari-DAF® PW system is $2.99 million while the expense to treat only 7.092 billion gallons at the plant with the conventional clarification system is nearly as much at $2.41 million. That translates into a cost per thousand gallons of 34¢ for the conventional clarification system versus only 20¢ per thousand gallons for the plant with the Clari-DAF® PW system– a 41% savings.



At one-sixth the footprint of a conventinal clarification system, the Clari-DAF® PW system in South Carolina handles twice as much annual flow at a treatment cost that is 41% less.

How the Leopold® Clari-DAF® PW System Can Lower the Overall Cost of Potable Water Treatment Plant Operation

Improved effluent water quality	Longer filter runs, less backwash water, less media breakdown, less filter-to-waste Lower energy cost Lower chemical cost
Improved solids handling	High percentage sludge solids for lower chemical cost, less time to dewater, lower energy cost Higher cakes solids for lower disposal cost

Call Leopold® to learn more about how the Clari-DAF® PW system can lower your total cost of water treatment plant operation.

xylem
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