

Value Added with Floccin™

By David Wensloff, PE

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“The Floccin reduces Biochemical Oxygen Demand, Total Suspended Solids, Fats, Oils and Greases to lower levels, thereby reducing the surcharges paid to the POTW.”

1. Cost by the Pound

The Floccin™ will always be competitively priced versus alum or Ferric (less than \$0.30/lb.) and polymer \$2.00/lb.), when you consider the trap some chemicals vendors will try to put you in by comparing the Floccin cost/lb. and the conventional chemistry, although Floccin™ may seem costly, here are several value points that prove Floccin™ is a more economical choice.

2. Reduced Surcharges

The Floccin removes BOD, TSS and FOG (Biochemical Oxygen Demand, Total Suspended Solids, Fats/Oils/Greases) to lower levels, thereby reducing the surcharges paid to the POTW. This is usually sufficient to justify the higher chemical costs of the Floccin, but consider all of the value added savings outlined herein.

3. Reduced Quantities of Chemicals Used

Usually the Floccin alone is all that is needed versus 3-4 different products (acid/caustic/coagulant/polymer/Diatomaceous earth).

4. No Diatomaceous Earth

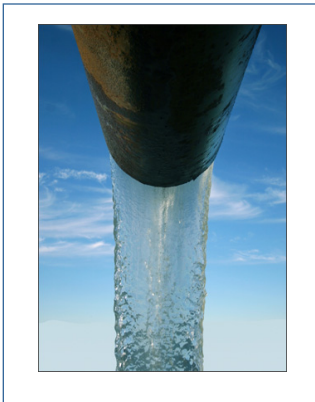
Most of the time DE (Diatomaceous Earth) is not needed as a Filter press pre-coat when they use the Floccin Products. Usually a Filter press will require 1-2 (50) lb. bags of DE as a pre-coat to decrease the sticking of the sludge to the plates. Note, for every pound of DE used, it generates 3 pounds of sludge. DE costs about \$18 per bag and account for the cost of DE sludge disposal as about 10-20% by volume in DE which is eliminated if they use the Floccin. Some facilities have filter cloths that are tighter weave and need the DE even with the Floccin. They will still be able to reduce the DE by 50%, so there is still a quantifiable savings here. What are their sludge disposal costs and what part is from the DE as this can be reduced?

“The Floccin generates less sludge and dewater to a drier dewatered cake.”

5. No Drum Disposal

Every drum has a \$45 deposit that is not returned to the customer and is used as the fee for drum disposal (either disposed by recycling or washed and reused by the chemical supplier). Account for this!

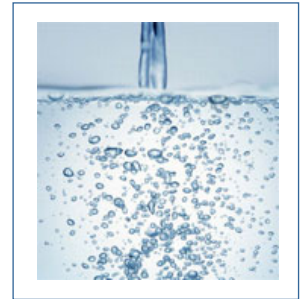
Example: A client uses 5-6 drums each month of chemical which equals 6 times \$45, which is \$270 each month in drum disposal.



Water re-use is done efficiently with the Floccin.

6. No Drum and Tote Storage Cost

Full and empty drums must be stored in a secondary contained area. This means that these chemicals must be stored inside a bermed storage area in case of leakage or spills as they are hazardous. Empty drums and totes need to be stored until they are picked up by the chemical supply company. Does the facility have storage issues or limitations? What does secondary storage and handling cost them?



The Floccin sludge will pass the STL/C/TCLP EPA tests thereby not releasing toxins in a landfill.

7. Hazard Chemicals to Non-Hazardous

The Floccin is nonhazardous, alum, ferric, acid (pH lower than 5.0), and caustic (pH over 10) are all hazardous to the employees.

Your facility must pay extra for workman's Compensation and accident and injury insurances for having hazardous chemical handling onsite. What is this costing you?

8. Reduced Sludge Production

The Floccin generates less sludge and dewateres to a drier dewatered cake. This means there is less sludge disposal cost. So the facility generates less tons/month. Sludge cost is based on weight and volume.

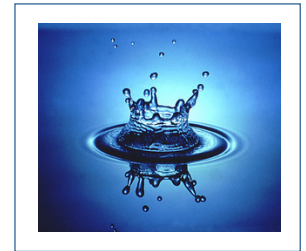
If the sludge is drier, you are paying less for disposing of water that is in the sludge and more for % solids in the sludge. The cost for sludge disposal is in the tipping fee (cost of dumping) and freight costs. Typical tipping fee for a 20 yard roll off box is \$900.

"The Floccin makes a larger floc that settles faster or floats quicker than conventional chemistry..."

9. Sludge Reclassification

The Floccin sludge will pass the STLC/TCLP EPA tests thereby not releasing toxins in a landfill. The facility can reclassify their sludge disposal from hazardous to nonhazardous but regulated. This must be verified with analytical tests and fully documented at each facility.

Result: Reduced cost and elimination of long term environmental liability for landfill leachate and future environmental cleanup as every disposer of sludges into landfills are documented in their manifests (paperwork designating the facility as the hazardous sludge generator). What does this save you? Typically the savings will be around \$3,000-\$5,000 per 20 yard roll-off box.



"The Floccin can reduce the metals to below levels that conventional chemistry can't achieve."

10. Water Re-Use

Many times, a facility can reuse their wastewater. Why, because the Floccin does not contribute to the Total Dissolved Solids (TDS) and Conductivity as compared to conventional chemistry. Some facilities can become zero discharge, what does this mean? They eliminate any wastewater sewer charges, sampling and environmental compliance with the local POTW.

11. Recover Oil

The Floccin has a high affinity for removing oil (FOG, TOG, TPH) from wastewater. Once removed, it is absorbed into the Floc sludge. The oil can be recovered if it is heated to 150 degrees and dewatered in a 3 phase centrifuge (water, oil, solids). Recovered oil can be sold as it has value for refiners, biodiesel and other commodity applications.

"Usually the Floccin alone is all that is needed versus 3 to 4 different products...."

12. Electrical Savings

If the system can increase hydraulic or biological capacity, what is the savings in electricity? For example, if a plant can run the same daily water in 25% less operating hours, what power savings is recognized? What would be the electrical cost for the kilowatts for each hour of use?

“The Floccin releases easily from a Filter Press therefore, reduction in filter press plate pressure washing”

13. Labor Savings

The Floccin saves labor. How? Less chemicals and feed equipment to maintain, no drum handling, no pre-coat of the Filter Press (the DE pre-coat procedure is to pour 1-2 bags into a hopper, add and mix water, run Filter press pump for 45 minutes to pre-coat the press) then switch to load the Filter Press. The Floccin releases easily from a Filter Press therefore, reduction in filter press plate pressure washing which takes about 4 hours/wash.

14. Shear Strength



“Recovered oil can be sold as it has value for refiners, biodiesel and other commodity applications.”

The Floccin sludge has a higher shear strength that allows sludge pumping and dewatering without the addition of polymers to rebuild the floc. The Filtrate from dewatering has lower suspended solids (solids carry thru) thereby reducing the load to the wastewater system by having to retreat these solids for removal before discharge. This means that the filtrate from a Filter Press, Belt Press or Centrifuge can be discharged directly or if the system is designed to return the filtrate to retreat, it will require less chemistry to separate in their process. What is this value?

“The Floccin does not contribute to the Total Dissolved Solids (TDS) and Conductivity as compared to conventional chemistry”

15. Increase System Capacity

The Floccin makes a larger floc that settles faster or floats quicker than conventional chemistry. Many facilities limit their production as they cannot exceed their environmental discharge limits without paying significant surcharges or fines. Is the wastewater system limiting the facilities capacity to increase production? Using the Floccin increases the system hydraulic capacity at no capital cost. What is this worth? Look at labor and electrical savings.

16. Recover Precious Metals

The Floccin removes metals from wastewater, all metals. If the industry has precious metals (Gold, platinum, silver, etc.) these can be removed and the sludge generated that holds these metals, smeltered and full recovery of these metals. What can this save the customer?



“The Floccin is nonhazardous, alum, ferric, acid (pH lower than 5.0), and caustic (pH over 10) are all hazardous to the employees.”

17. Metals Removal

The Floccin can reduce the metals to below levels that conventional chemistry can't achieve. What is this worth? It allows the plant to run their system at a higher flow and increase facility production with no capital costs. Follow the Metals Removal Jar testing Procedure.

Example: Food Processing Plant

Current Conditions:

A food processing facility has a DAF with a daily flow of 200,000 gallons per day or 208 gallons per minute for 16 hours. They use (8) 275 gallon totes of alum, 4 drums of caustic, 3 totes of polymer and generate (8) 20 yard roll off boxes of dewatered sludge. They use 8 pallets of (50) 40 lb. bags of DE per month. The operators work 3 shifts and spend all day mixing polymer, changing drums, running the filter press, blowing down settled solids, etc.

Surcharges are \$0.30/lb. for BOD and TSS. The effluent has a BOD of 2,500 ppm and a TSS of 700 ppm. The sludge is dewatered with a plate and frame press and conveyed to the roll off boxes. Tipping Fees at the landfill for the sludge are \$900 per 20 yard roll off box plus \$400 in freight. The system requires a total of 100 hp to run and the utility rate is \$0.16/kw-hr.

Current Considerations:

After a thorough site evaluation and jar tests and before running the trial, a sales person using the above listed value added steps makes an educated estimation of the current costs:

Consider: reduced surcharges, sludge volume, number of chemicals, and hazardous chemicals, less chemicals = less labor, system hydraulic capacity, electricity, dewatering, sludge dryness, drum disposal costs.

Do Not Consider: Since it is a food plant - Water Reuse, Metals removal, Sludge reclassification and oil recovery. These aforementioned should be considered if your facility is considering any of them.

Floccin Trial Results:

Using the Floccin 1105, the usage rate was determined to be 500 lbs/day. During the trial, it was tested and confirmed that the DAF could run at 275 gpm due to good floc formation and the resulting effluent BOD was 900 ppm and the TSS was 60 ppm. It was noticed that the sludge generated was reduced to an estimated 5 20 yard roll off boxes/month and it was drier and no DE was used. Since the operator did not have to attend to the DE pre-coat, chemical tote/drum changes, they were able to unload and load trucks with the forklift as well as other tasks.

Food Plant Cost Scenario:

With Conventional Chemistry

Factors	Cost Description
Chemical Cost \$32,820 per month	<ol style="list-style-type: none"> 8 totes of alum at \$0.32/lb. at 2,400 lbs each = \$6144 per month Freight for alum at 4 totes each delivery at \$0.10/lb. = \$960 per load = \$1,920 per month 4 drums of caustic at 0.48/lb. x 700 lbs each = \$1,344 per month Freight for 4 drums caustic each delivery @ \$0.10/lb. = \$280 per month 3 totes polymer at \$2.00/lb. at 2,275 lbs each = \$13,650 Freight for 3 totes of polymer at \$0.10/lb. = \$682 per month D.E at 8 x 50 bags at \$18/bag = \$7,200 Freight for 8 pallets of DE = \$1,600
Surcharges \$40,038 per month	<p>Typical BOD that is 2,500 ppm at \$0.30/lb. = \$1,251 per day = \$37,350 per month</p> <p>Typical TSS that is 700 ppm at \$0.30/lb. = \$350 per day = \$10,508 per month</p>
Less Chemical Used	Site Dependent, but could be an extra cost for unused chemicals sitting in storage
DE Used \$1625 per month	<p>16,000 lbs of DE makes 48,000 lbs of sludge = 1-1/4 20 yard dumpsters per month</p> <p>Disposal cost = 1.25 roll off x (\$900 tip + 400 frt) = \$1,625 per month</p>
Drum & Tote Disposal or Return \$1,005 per month	<p>8 totes alum at \$75/tote = \$600 per month</p> <p>4 drums of caustic at \$45 per drum = \$180 per month</p> <p>3 totes of polymer at \$75 per tote = \$225 per month</p>
Hazardous Chemicals \$3,600 per month	Alum, caustic, polymer are hazardous = Est. value at \$5 per man hour x 24 hours x 30 days per month = \$3,600 per month.
Sludge Production \$10,400 per month	<p>(8) 20 yard roll offs at \$900 tipping fee = \$7,200 per month</p> <p>(8) 20 yard roll offs at \$400 freight each = \$3,200 per month</p>
Labor Costs \$3,600 per month	3 operators with 4 man hours less labor each per day at \$25 per hr = 100 per day: \$3,600 per month.
Increases System Capacity	Test this during the trial, see if it is a limitation currently with production
Electricity \$5,700 per month	100 hp = 74.6 kW at 16 hours at \$0.16 per kw-hr = 190 per day = \$5,700 per month
Shear Strength \$3,600 per month	In facilities other than food processing they may need to use polymer as a floc additive prior to dewatering for a drier cake.
Recover Oil	The facility has low oil as they cook very little, so probably not. If it is a cooking plant, check
Overall Costs	\$102,388 per month

Food Plant Cost Scenario:

With Floccin™ Chemistry

Floccin Factors	Floccin Cost Description
Chemical Cost \$52,500 per month	<ol style="list-style-type: none"> 1,000 lbs. of Floccin 1105 per day at \$1.65/lb. = \$1650 per day = \$49,500 Freight for 30,000 lbs Floccin = \$3,000 per month
Surcharges \$11,408 per month	<p>BOD is now 900 ppm at \$0.30/lb. = \$350 per day = \$10,508 per month</p> <p>TSS is now 60 ppm at \$0.30/lb. = \$30 per day = \$900 per month</p>
Less Chemical Used	Site Dependent, but a value that can be replaced
No DE Used \$0 per month	16,000 lbs of DE makes 48,000 lbs of sludge = 1-1/4 20 yard dumpsters per month
Drum & Tote Disposal or Return \$0 per month	Zero
Hazardous Chemicals Savings -\$3,600 per month	Zero
Sludge Production \$6,500 per month	<p>(5) 20 yard roll offs at \$900 tipping fee = \$4,500 per month</p> <p>(5) 20 yard roll offs at \$400 freight each = \$2,000 per month</p>
Labor Costs \$0 per month	In a scenario of 3 operators with 4 man hours, less labor each, per day at \$25 per hr. - \$100 per day = \$3,600 per month
Increases System Capacity (Savings) -\$3,600 per month	System ran @ 275 gpm at 200,000 gpd run time is now 12.2 hours/day vs. 16 hours. Savings of labor @25/hour x 4 hours = \$100/day.
Electricity \$4296 per month	100 hp = 74.6 kW at 16 hours at \$0.16 per kw-hr = 190 per day = \$5,700 per month
Additional Savings Factors	
Shear Strength Cost \$0	In facilities other than food processing they may need to use polymer as a floc additive prior to dewatering for a drier cake.
Recover Oil Resell for profit +\$	Check to see if the oil is recoverable for reuse and/ or resell. Not only is the facility saving money in treatment, but recoverable oil can be sold as an additional profit.
Overall Costs	\$67,504 per month
Estimated Net Savings	\$34,884 per month not counting profit from the resell of recovered oil.

Conclusion

In summary, it is possible to lower wastewater treatment expenditures. By understanding the surcharges and how they are assessed, secondly by optimizing your facilities entire wastewater system including chemistry, equipment and system operation. Overall savings can show up as lower chemical costs and/or lower surcharge costs. By simply taking the time to properly evaluate your wastestream, and optimizing any existing pretreatment system already in place, you can create substantial savings for your facility with this method and by using the Floccin™.