Appendix 2B: Examples of Mechanical Filters for Primary Treatment

ADVANCED PRIMARY TREATMENT

Eco MAT®

Evergreen Engineering Ltd is an industry leader in delivering wastewater solutions to both municipal and industrial wastewater dischargers. Specializing in water treatment to quality compliance including trace metals and low-level nutrients, Evergreen Engineering is committed to development of processes to satisfy the challenging needs of customers around the world. As an integral piece to wastewater treatment processes Evergreen Engineering provides the most advanced primary treatment and solids recovery option available, the Eco MAT® rotating belt filter (RBF).

Manufactured by Blue Water Technologies, Inc, the Eco MAT® RBF features design features for process enhancement, energy minimization, and ease of maintenance resulting from years of operating experience. Evergreen Engineering customizations each system with proprietary control that interface seamlessly with plant SCADA systems and ancillary equipment designed to complement the Eco MAT® RBF, delivering a solution that saves end users time, space and money.

Industrial screenings applications are equally appropriate for the Eco MAT® RBF. RBFs have a proven track record of reliability in multiple industrial applications.

Eco MAT® models post-fabrication and ready to ship.

Applications

The Eco MAT® Rotating Belt Filter can be effectively used for:

- Primary Wastewater Treatment
- Membrane Pretreatment
- Agriculture
- Aquaculture
- Dairy Industry
- Grit Removal
- Pulp and Paper Industry
- Poultry
- Beef
- Textiles
- Tanneries
- Sludge & Scum Thickening
- Fruit & Vegetable Processing

- **Superior Performance**
- **30-80% TSS and 20-40% BOD reduction**
- **Fully automated, Self-cleaning**
- **Patent-pending cleaning system**
- **1/10 the footprint of traditional clarification**
- **1/5 the life-cycle cost**
- **Integrated Dewatering**
- **20-40% solids dewatered in screenings**

Engineers around the world have found rotating belt filters to be an efficient and economical solution to a variety of wastewater challenges due to its small footprint and its flexibility to be arranged in multiple configurations. In new municipal wastewater plants, the Eco MAT® RBF replaces traditional primary clarification. In existing plants, these filters can be integrated to expand primary clarification, relieve solids and BOD loading to the secondary system, or provide treatment for combined sewer overflow (CSO). Engineers have maximized the use of existing infrastructure while expanding plant capacities by installing the Eco MAT® RBF and thus reallocating the capacity of traditional clarifiers to the secondary system. Contact Evergreen Engineering today for case studies.

A mobile 15 L/s EM-3 for contract treatment projects.

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Evergreen water solutions

Eco MAT® (RBF) Capacities & Dimensions

Model	Treatment Capacity (L/s)*	Length (cm)	Unit Width (cm)	Unit Width & Dewatering (cm)	Height (cm)	Water Depth (cm)	Belt Mesh Width (cm)
EM-1	3.5	124	91	91	86	30	20
EM-3	15	160	107	157	137	41	38
EM-7	25	191	122	170	155	61	56
EM-10	30	241	147	226	183	61	76
EM-15	55	330	147	226	221	89	76
EM-30S	115	330	221	318	221	89	152
EM-30D	115	330	274	356	221	89	76 (2x)
EM-30C	115	305	211	N/Ap	208	89	152

*Hydraulic capacity for RBFs is dependent on solids content and desired removal performance. These loadings reflect 60% TSS removal in typical municipal wastewaters.

How It Works

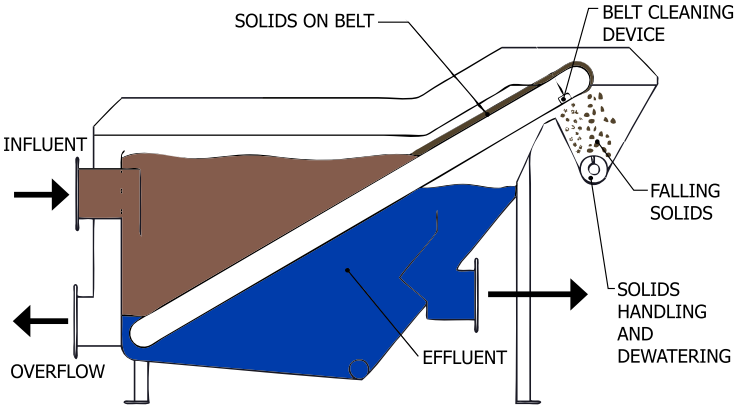
The Eco MAT® RBF removes solids through the use of a continuous-loop fine mesh belt screen. As the screen moves it acts like a conveyer and carries solids out of the incoming wastewater. A patent-pending cleaning system discharges the solids from the belt screen and deposits them into the screenings hopper, virtually eliminating any solids carry-over. Periodic hot-water flushes further clean the belt screen by removing oil and grease that may accumulate over time. An optional screw press dewaters the collected screenings between 20-40% dry solids while screened wastewater continuously passes through the unit.

The solids drop into a hopper and the screen is cleaned as it moves past the rollers. Optional hot water wash cleans oil and grease.

Dewatering screens pass paint filter test. Generally suitable for land filling.

The Eco MAT® RBF removes between 30-80% TSS and 20-40% BOD from wastewater and the unique design allows for removal of organic and inorganic solids as fine as 15-30 micron. The Eco MAT® RBF units are compact, completely enclosed low-maintenance solutions for wastewater. The integral odor containment of the design allows for indoor installation in a clean environment. Blue Water offers additional equipment for conveyance, dewatering, and bio-solids reuse as applications require.

Evergreen Engineering supplies standard equipment ranging in sizes suitable for small communities to large cities. There is no limitation in flow capacity designs. The Eco MAT® RBF is available in eight unique models that can be customized for varying capacities and redundancy, facilitating treatment in excess of 115 L/s in a single unit. Evergreen Engineering also provides the duplex unit designs for redundancy, as well as cartridge units for channel mounting that can be more economical for plants treating 1,000 - 10,000 L/s and beyond.



Eco MAT® RBF Operation Diagram

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salsnes filter™

Municipal Installations

Eco-efficient **solids separation**

ABOUT SALSNES FILTER

Over 25 years ago, we designed the first rotating belt filter to provide customers with a highly efficient and reliable technology that could maximize solids separation and decrease costs. Today, we continue to lead the development of this technology from our office and manufacturing facilities in Namsos, Norway. We are a brand in the Trojan Technologies group of businesses, located in Ontario, Canada.

The Salsnes Filter system provides an alternative to conventional primary treatment and can offer:

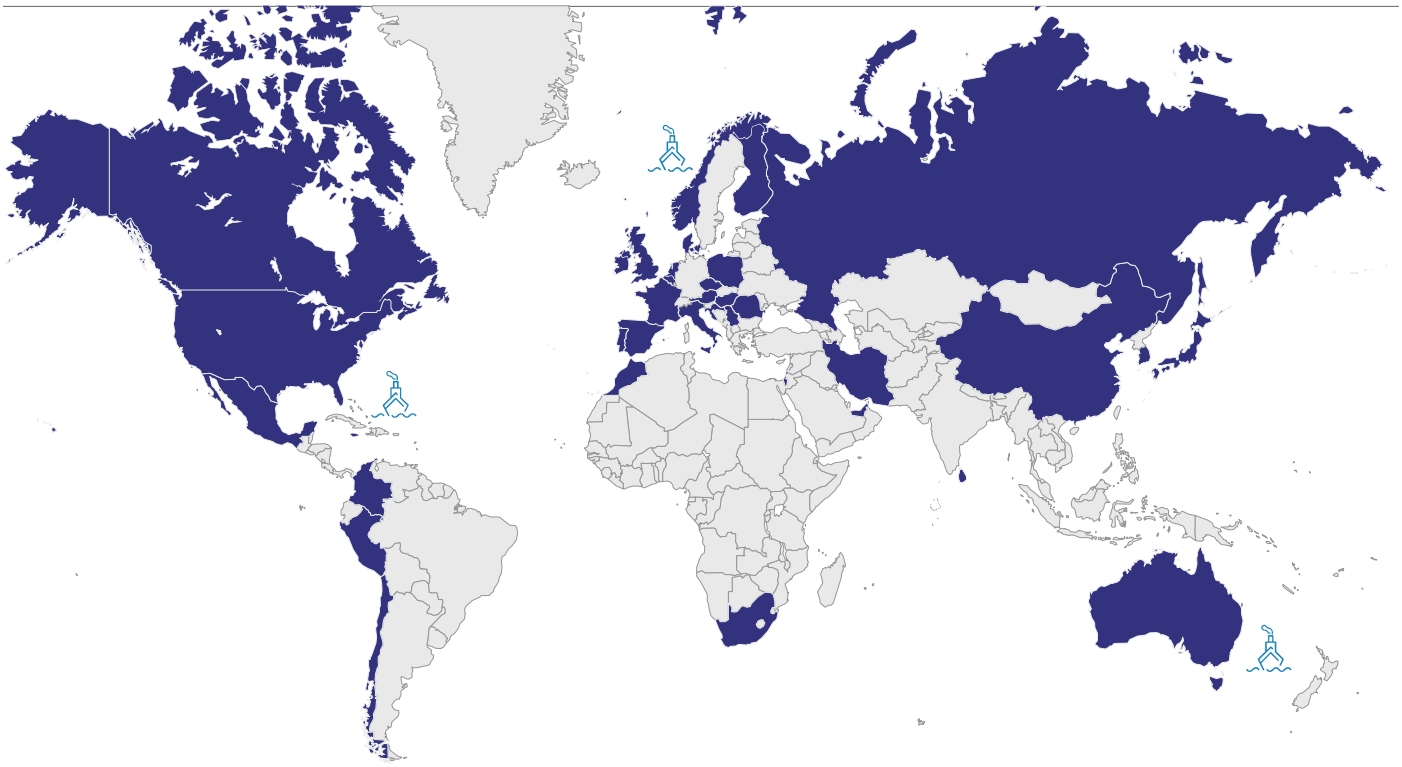
- 30-60% lower investment costs
- 1/10th the land requirements
- Integrated thickening and optional dewatering
- Significantly lower lifecycle costs
- Smaller volume of drier sludge that reduces disposal costs
- Less civil works
- Fully automated equipment
- Optimal removal of TSS to ease demand on downstream biological treatment
  - 30-60% removal in a typical municipal installation
  - up to 80% removal when a polymer is used
- Higher Volatile Solids content in primary sludge for biogas production
- Fast and easy maintenance
- Lower operating costs

Product Overview

	Enclosed Models		Channel Model
			
	SF1000	SF2000 SF4000 SF6000	SFK200 SFK400 SFK600
Maximum Hydraulic Flow	Up to 54 m^3/h (0.3 MGD)	54 - 576 m^3/h (0.3 - 3.7 MGD)	Up to 576 m^3/h (3.7 MGD)
Average Treated Flow	35 m^3/h (0.2 MGD)	90 - 325 m^3/h (0.6 - 2 MGD)	90 - 325 m^3/h (0.6 - 2 MGD)

SALSNES FILTER SYSTEMS AROUND THE WORLD

We have installed over 900 filters around the world, giving us a global footprint in municipal and industrial markets. Our customers use the Salsnes Filter system in municipal wastewater treatment plants, and for a host of industrial applications such as tanneries, cruise ships, aquaculture, biofuel production, pulp & paper and food & beverage.



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Russia
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South Africa
South Korea
Spain
Sri Lanka
Tasmania
UAE
UK
USA

MUNICIPAL INSTALLATION | Cellulose Recovery

Aarle-Rixtel Wastewater Treatment Plant
Netherlands

The European Commission has offered grants through its Eco-innovation program since 2008. The program was developed to give companies the opportunity to reduce their environmental impact and make better use of their resources.

The Challenge

The Aarle-Rixtel Wastewater Treatment Plant (WWTP) wanted to utilize funds from the Eco-innovation program to install a Salsnes Filter system for:

- optimization of their current treatment processes
- increasing plant capacity
- recovering cellulose from the wastewater

The Solution

Eight SFK600 Salsnes Filters, with 350 micron filtermesh and integrated sludge dewatering, were installed into channels. The system treats one of the two activated sludge trains at the WWTP. They left the second train untreated which allows them to see the effect of the Salsnes Filter system.

Removal efficiencies are 30-50% TSS and 10-25% COD, which has helped to increase plant capacity and ease demand on the activated sludge system. The cellulose recovered from the raw wastewater can be processed further to create other products such as bioplastics and biofuels.

An added benefit is the small footprint of the Salsnes Filter system, which is 1/10th the size of conventional primary treatment. Installation required much less concrete which reduced construction costs and environmental impact.

System Parameters

Salsnes Filter: SFK600
Type of Treatment: Primary Treatment & Cellulose Recovery

P.E.: 320,000
Particle Size: 0 - 100 mm
Dry Weather Flow Rate: 1600 m^3/h (10 MGD)
Max. Flow Rate: 3200 m^3/h (20.2 MGD)
TSS Removal: 30 - 50%
COD Removal: 10 - 25%
Dewatered Sludge: 28% Total Solids

Four of the eight SFK600 Salsnes Filters installed at the plant

Filters are installed in channels and have integrated dewatering.

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MUNICIPAL INSTALLATION | Primary Treatment

Breivika Wastewater Treatment Plant
Tromsø, Norway

Tromsø Municipality, with a population of over 70,000 people, is considered one of the largest urban areas north of the Arctic Circle. The Municipality operates several wastewater treatment plants, five of which have Salsnes Filter systems.

The Challenge

The influent at the Breivika Wastewater Treatment Plant (WWTP) is a typical mix of wastewater from schools, households, shops, restaurants, hospitals, gas stations and small and medium-sized industry.

They discharge wastewater to the fjord, which requires them to comply with the very stringent criteria of the European wastewater directive for less sensitive recipients. Removal rates for primary treatment must be at a minimum 50% TSS and 20% BOD.

The Solution

The Breivika WWTP installed sand and grit removal, followed by three SF6000 Salsnes Filters with 350 micron filtermesh. TSS removal rates are 50-65%, allowing the Plant to comply with the European wastewater directive. The system's external dewatering unit treats sludge from all three filters to a dry content level of 27%.

System Parameters

Salsnes Filter: SF6000
Type of Treatment: Primary Treatment

P.E.: 18,700
Influent TSS: 100 - 350 mg/L
Effluent TSS: 50 - 120 mg/L
Particle Size: 0 - 100 mm
Dry Weather Flow Rate: 230 L/s (5.25 MGD)
Dewatered Sludge: 27% Total Solids

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MUNICIPAL INSTALLATION | Cellulose Recovery

Beemster Wastewater Treatment Plant

Middenbeemster, Netherlands

Wastewater treatment plants have traditionally been a cost-center for municipalities as treated effluent is often discharged back into the environment with little to no beneficial reuse. This is starting to change as wastewater professionals are finding innovative ways to produce a resource to use or sell. By doing this, operating costs can be cut and ideally Plants can become profit-centers.

For the Netherlands, resource recovery is a main priority and the Beemster Wastewater Treatment Plant (WWTP), near Amsterdam, is an example of this. They decided to optimize their treatment plant by taking advantage of funding from the Eco-innovation program through the European Commission.

The Challenge

With funding from the Eco-innovation program, the Beemster WWTP wanted to put into place equipment that would generate sludge with a high concentration of cellulose. Recovered cellulose would be reused for the production of other products.

The Solution

Eight SFK600 Salsnes Filters were installed - with 350 micron filtermesh and integrated sludge dewatering - to separate fine cellulose fibers from toilet paper in the wastewater. Fibers are collected and further processed into sugar and in a next stage to lactic acid as a base material for bioplastic.

The WWTP also discovered an added benefit of removing cellulose from the wastewater. The organic loading on their downstream biological process has been reduced, which has lowered the Plant's aeration requirements and energy consumption.

System Parameters

Salsnes Filter: SFK600
Type of Treatment: Primary Treatment & Cellulose Recovery

P.E.: 170,000
Particle Size: 0 - 100 mm
Dry Weather Flow Rate: 1200 m^3/h (7.6 MGD)
Max. Flow Rate: 3600 m^3/h (22.8 MGD) Rain weather flow
TSS Removal: 50%
COD Removal: 30%
Dewatered Sludge: 40% Total Solids

Eight SFK600 Salsnes Filters installed into channels

Integrated system dewatering produces sludge with 40% Total Solids.

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MUNICIPAL INSTALLATION | Primary Treatment

Geiranger Wastewater Treatment Plant
Stranda, Norway

The Geiranger Wastewater Treatment Plant (WWTP) is located in Norway's Stranda municipality, which for many years has been a popular tourist destination. Geiranger is visited by 160 cruise ships every summer making it the second largest cruise ship port in Norway.

The Challenge

On a typical day, the WWTP treats the wastewater for 300 permanent residents. However, in the summer months, treatment capacity must increase substantially to account for a large influx of over 7000 tourists per day.

Treated wastewater is discharged to the Fjord of Geiranger, which is a UNESCO world heritage site. This requires them to meet removal rates of at least 50% TSS and 20% BOD stipulated by the European wastewater directive for less sensitive recipients.

The Solution

The Geiranger WWTP installed two SF2000 Salsnes Filters that remove 55-70% TSS from the wastewater. Each filter has a 350 micron filtermesh and integrated sludge dewatering. The way in which the Salsnes Filter system is designed allows it to handle the significant variations in incoming flow that the Plant experiences.

A Control Power Panel that houses a Programmable Logic Controller (PLC) automates system operation. A sensor tells the unit when, and at what speed, to start rotating the filtermesh based on the amount of incoming wastewater. The PLC will then simultaneously start the Air Knife filtermesh cleaning system and the sludge dewatering unit.

System Parameters

Salsnes Filter: SF2000
Type of Treatment: Primary Treatment

P.E.: 2000
Influent TSS: 100 - 400 mg/L
Effluent TSS: 45 - 120 mg/L
Particle Size: 0 - 100 mm
Max. Flow Rate: 40 L/s (0.9 MGD)
Dewatered Sludge: 25% Total Solids

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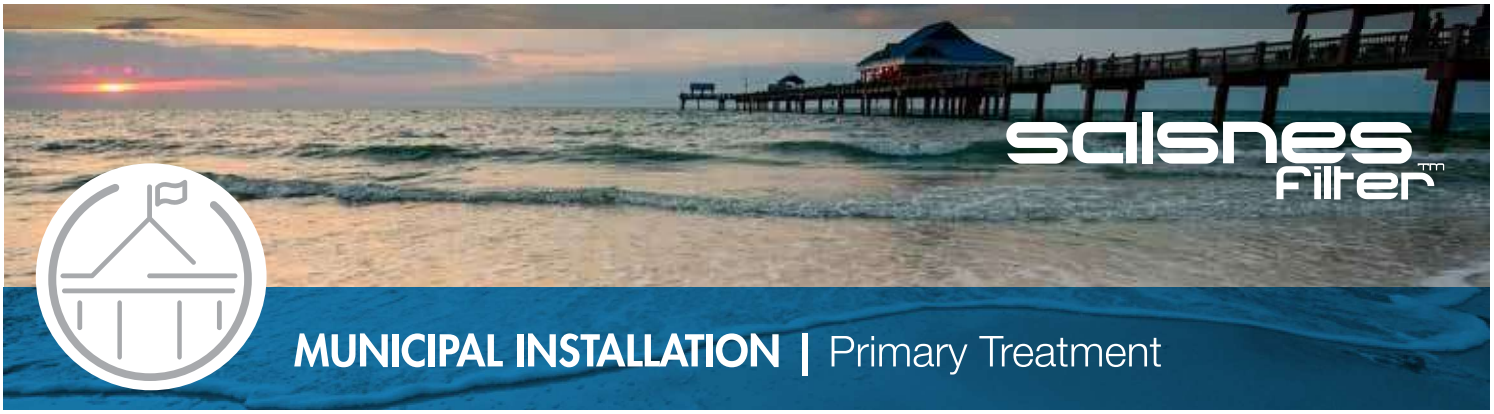

MUNICIPAL INSTALLATION | Primary Treatment

Daphne Utilities Water Reclamation Facility

Daphne, Alabama

Daphne Utilities, situated on the eastern shore of Mobile Bay in Alabama, provides water, sewer and natural gas service to a population of approximately 25,000. Their Water Reclamation Facility (WRF) treats residential and light commercial wastewater at a peak flow of 9 MGD.

Two independent biological treatment trains (activated sludge systems) are serviced by a common headworks and a TrojanUV disinfection system. Treated wastewater is then discharged by gravity into Blakely River.

The Challenge

During a process review in 2009, the headworks and effluent outfall lines were found to be areas of concern that were preventing the WRF from reaching its permitted capacity of 4.17 MGD. Peak flows were exceeding hydraulic capacities and high influent BOD and TSS concentrations exceeded design and were negatively impacting downstream treatment processes. Sand and trash were making their way through the headworks which plugged and damaged aerators.

Permit compliance was being maintained since flow and ammonia loadings had not yet exceeded design parameters. However, Daphne Utilities knew they had improvements to make. An upgrade project began, starting with staff members and consulting engineers reviewing various equipment options.

Equipment Selection

The foundation of Daphne Utilities centers on providing uninterrupted service to their customers using innovative, efficient and cost-effective solutions. As a result, equipment reliability, durability and ease of maintenance were important considerations. Small footprint was also a key factor, as the WRF had space limitations for expansions. Overall, finding a long-term solution with the lowest possible cost would help provide the best value to their customers.

The Salsnes Filter system met their criteria and was piloted for grit removal, solids separation, sludge thickening and dewatering. It proved to be highly effective delivering significant BOD (30%) and TSS (50%) reductions in influent loading during normal operating conditions. This outcome was able to reduce total loading back to within original plant design. With these positive pilot results, two SF:6000 Salsnes Filters were added to the upgrade plan.

System Parameters

Salsnes Filter: SF6000
Type of Treatment: Primary Treatment

Treatment Capacity: 5 MGD (220 l/s)
TSS Removal: 50 - 65%
BOD Removal: 30 - 40%

Daphne Utilities' Water Reclamation Facility had space limitations for new equipment

The Solution

Once installed, their Salsnes Filter system was even more effective than during piloting. Today, BOD loadings are reduced by 30 - 40% and TSS is reduced by 50 - 65%. Sludge is thickened and dewatered within the unit and then transported by screw conveyors into a dumpster. These operations are all automated by a Programmable Logic Controller (PLC). A sensor tells the PLC when to initiate filtermesh rotation which then automatically starts the Air Knife filtermesh cleaning system and sludge dewatering.

The Air Knife cleaning system automatically cleans the rotating filtermesh using a blade of compressed air. Compared to scrapers, brushes or water-based cleaning systems, air is gentler on the mesh to prolong its life and keeps sludge drier for more effective dewatering.

TSS and BOD reductions from the Salsnes Filter have improved the performance of downstream processes. Aerators are virtually trash and sand free which has drastically cut back on maintenance and repairs. It has also eased the demand on blowers which has reduced energy consumption.

Loading reductions have not only restored previously lost capacity but have created surplus capacity. This gained capacity, while not reflected in the current permit, can be utilized in the future to reduce the amount of "new plant construction" required during future upgrades.

Conclusion

The Salsnes Filter system was able to cost-effectively integrate with other complex and innovative systems in the plant upgrade to successfully address the concerns identified in the headworks. It is part of the best long-term solution for Daphne Utilities, designed to meet current and future wastewater flows, loadings, and wet weather flows.

"We are extremely pleased with the performance of our Salsnes Filter system. It has been reliable, easy to maintain and it has significantly reduced TSS and BOD loadings. This has enabled us to recover lost treatment capacity at our facility in a cost effective manner. Another plus is the small footprint of the system which allowed it to easily fit into a very limited space within our plant."

Danny Lyndall
General Manager
Daphne Utilities

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MUNICIPAL INSTALLATION | Primary Treatment

Egå Wastewater Treatment Plant
Aarhus, Denmark

Aarhus Water is a large inter-municipal company responsible for water and sewage in the Aarhus Municipality of Denmark. Wastewater treatment plants can be large consumers of energy, and Aarhus Water's vision is to turn their Plants into modern, energy-producing facilities that are both self-sufficient and even provide green energy to the grid.

To make their vision a reality, they set up an International Ideas Competition that acted as a non-traditional procurement process for the refurbishment of one of their plants; the Egå Wastewater Treatment Plant (WWTP). The winners of the competition would tender their equipment for the plant.

The Challenge

One of the objectives of the Egå WWTP refurbishment was to install energy-producing treatment equipment that could generate 50% more electricity than what was needed for daily plant operation. At the same time, they wanted to recover 50% of the phosphate load to be reused as fertilizer.

This meant that primary treatment would need to remove and send 60% of incoming carbon to digesters.

The Solution

Salsnes Filter was one of three winners of Aarhus Water's International Ideas Competition, and in 2016 installed a system for primary treatment at the Egå WWTP. The system consists of eight SFK600 units in a single module treating 2000 m^3/h (12.6 MGD).

The system helps to produce energy for the plant by providing carbon-rich solids to the digester. A filtermesh with a 350 micron pore size was chosen to allow the system to capture the required 60% of carbon from the wastewater.

System Parameters

Salsnes Filter: SFK600
Type of Treatment: Primary Treatment

Influent TSS: 290 - 390 mg/L
TSS Removal: 60 - 80%
Influent COD: 400 - 550 mg/L
COD Removal: 45 - 60%
Max. Flow Rate: 2000 m^3/h (12.6 MGD)

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MUNICIPAL INSTALLATION | Primary Treatment

Saulekilen Sewage Plant
Arendal, Norway

The Challenge

The Saulekilen Sewage Plant in Arendal, Norway is an existing wastewater treatment plant treating a typical municipal mix of wastewater from households, and small and medium-sized industry. The Plant was looking to upgrade plant capacity from 45,000 p.e. to 80,000 p.e, while meeting the following criteria.

Equipment needed to be:

- Compact - in order to fit inside the existing building
- Capable of optimizing sludge production to produce more biogas
- Cost-effective compared to alternatives
- A proven, reliable technology
- Easy to operate

The Solution

The Plant chose to install biofilters and a Salsnes Filter system to meet the new 80,000 p.e. capacity requirement.

The Salsnes Filter system performs primary solids separation and consists of six SFK600 units, each with a 350 micron filtermesh and integrated sludge dewatering unit.

Due to its small physical footprint, the system easily fit into the existing building. It was installed on top of the biofilters so that former basins could be available for new bioreactors and clarification of biological solids by Dissolved Air Flotation.

The system removes TSS to reduce loadings on the downstream biological treatment process. The resulting dewatered sludge is sent to methane reactors where biogas is produced for electricity to operate the Plant. Sludge will also be sold as fertilizer to the agriculture market.

Saulekilen estimates that the upgrade cost half that of conventional treatment technologies, saving them approximately 4$ million USD (25 million NOK).

System Parameters

Salsnes Filter: SFK600 Hybrid
Type of Treatment: Primary Treatment

P.E.: 80,000
Influent TSS: 234 mg/L
Effluent TSS: 95 mg/L
Particle Size: 0 - 100 mm
Max. Flow Rate: 589 L/s (13.4 MGD)
Dewatered Sludge: 25% Total Solids

Three of the six SFK600 Salsnes Filters installed at the Plant

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MUNICIPAL INSTALLATION | Primary Treatment

Tiendeholmen Wastewater Treatment Plant
Namsos, Norway

The Tiendeholmen Wastewater Treatment Plant (WWTP), located in Namsos, Norway, was the first plant in the country to install primary treatment to meet the European Commission's wastewater direction 91/27/EEC in May 1991. The WWTP is fully automated and electronically supervised, which allows the operator to run the plant remotely.

The Challenge

Influent at the Tiendeholmen Wastewater Treatment Plant (WWTP) is a mix of municipal and small to medium-sized industrial wastewater, including a nearby dairy. Septic and external chemically treated sludge is also delivered to the Plant and mixed with incoming wastewater in the pump station. Periodically, high concentrations of the industrial wastewater comes into the WWTP.

Wastewater is discharged to the fjord, which means the WWTP has to comply with the very stringent criteria of the European wastewater directive for less sensitive recipients. Removal rates for primary treatment must be at a minimum 50% TSS and 20% BOD.

The Solution

A 6 mm screen, a sand trap and six SF6000 Salsnes Filters were installed for primary treatment. Each filter has a 350 micron filtermesh and sludge from the system is pumped to dewatering screw presses located above sludge containers.

Removal efficiencies meet or exceed the requirements of the European wastewater directive; 50% TSS and 35% BOD. Due to the flexibility in which the system can operate, it can maintain these removal rates even when the large concentrations of industrial wastewater enter the Plant.

System Parameters

Salsnes Filter: SF6000
Type of Treatment: Primary Treatment

P.E.: 18,000
Influent TSS: 120 - 360 mg/L
Effluent TSS: 60 - 180 mg/L
Particle Size: 0 - 100 mm
Max. Flow Rate: 300 L/s (6.8 MGD)
Dewatered Sludge: 26 - 27% Total Solids

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MUNICIPAL INSTALLATION | Primary Treatment

Tomasjord Wastewater Treatment Plant
Tromsø, Norway

The Challenge

The Tomasjord Wastewater Treatment Plant (WWTP) is required to comply with the European Commission's wastewater directive for less sensitive recipients, as they discharge into the fjord. This requires that before discharge, they remove at a minimum 50% TSS and 20% BOD.

The Solution

Eight SF6000 Salsnes Filters are installed - with 350 micron filtermesh - removing 40-60% TSS. A custom dewatering unit was built for the WWTP. Each line of filters shares one auger that transports sludge to dewatering screw presses, producing sludge with 30-40% dry content.

Cameras, connected to The Cloud, are installed inside the filters to monitor their operation.

System Parameters

Salsnes Filter: SF6000
Type of Treatment: Primary Treatment

P.E.: 38,400
TSS Removal: 40 - 60%
Particle Size: 0 - 100 mm
Max. Flow Rate: 470 L/s (10.7 MGD)
Dewatered Sludge: 30 - 40% Total Solids

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MUNICIPAL INSTALLATION | Primary Treatment

Uithuizermeeden Wastewater Treatment Plant
Netherlands

The Challenge

The Uithuizermeeden Wastewater Treatment Plant (WWTP) needed to expand their existing treatment capacity because a neighbouring WWTP was closing down.

The Solution

They chose to install two SF6000 Salsnes Filters with 350 micron filtermesh and integrated sludge dewatering. The system allows them to meet their new capacity requirements and reduce TSS by 30-50% and COD by 15-30%.

The WWTP also uses the system to separate fine cellulose fibers from toilet paper in the wastewater. This recovered cellulose can be used as an ingredient in the production of asphalt to create roadways. The cellulose helps to stabilize the main component of asphalt - bitumen – preventing it from draining away during transportation and placement.

System Parameters

Salsnes Filter: SF6000
Type of Treatment: Primary Treatment & Cellulose Recovery

P.E.: 21,300
Particle Size: 0 - 100 mm
Dry Weather Flow Rate: 120 m^3/h (0.75 MGD)
Fine Screen Capacity: 750 m^3/h (4.7 MGD) Rain weather flow
TSS Removal: 30 - 50%
COD Removal: 15 - 30%
Dewatered Sludge: 25% Total Solids

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With installations around the world and in a variety of applications, the Salsnes Filter system is synonymous with **eco-efficient solids separation technology.**

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