

**FORM 5
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
(CHAPTER 499)
SECTION 13(1)**

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

<input checked="checked" type="checkbox"/>	No previous application for variation of an environmental permit.
<input type="checkbox"/>	The environmental permit was previously amended.
Application No. :	

PART B DETAILS OF APPLICANT

B1. Name : (person or company) Drainage Services Department [Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]	
B2. Business Registration No. : (if applicable)
B3. Correspondence Address :	
B4. Name of Contact Person :	B5. Position of Contact Person :
B6. Telephone No. :	B7. Fax No. :
B8. E-mail Address : (if any)	

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

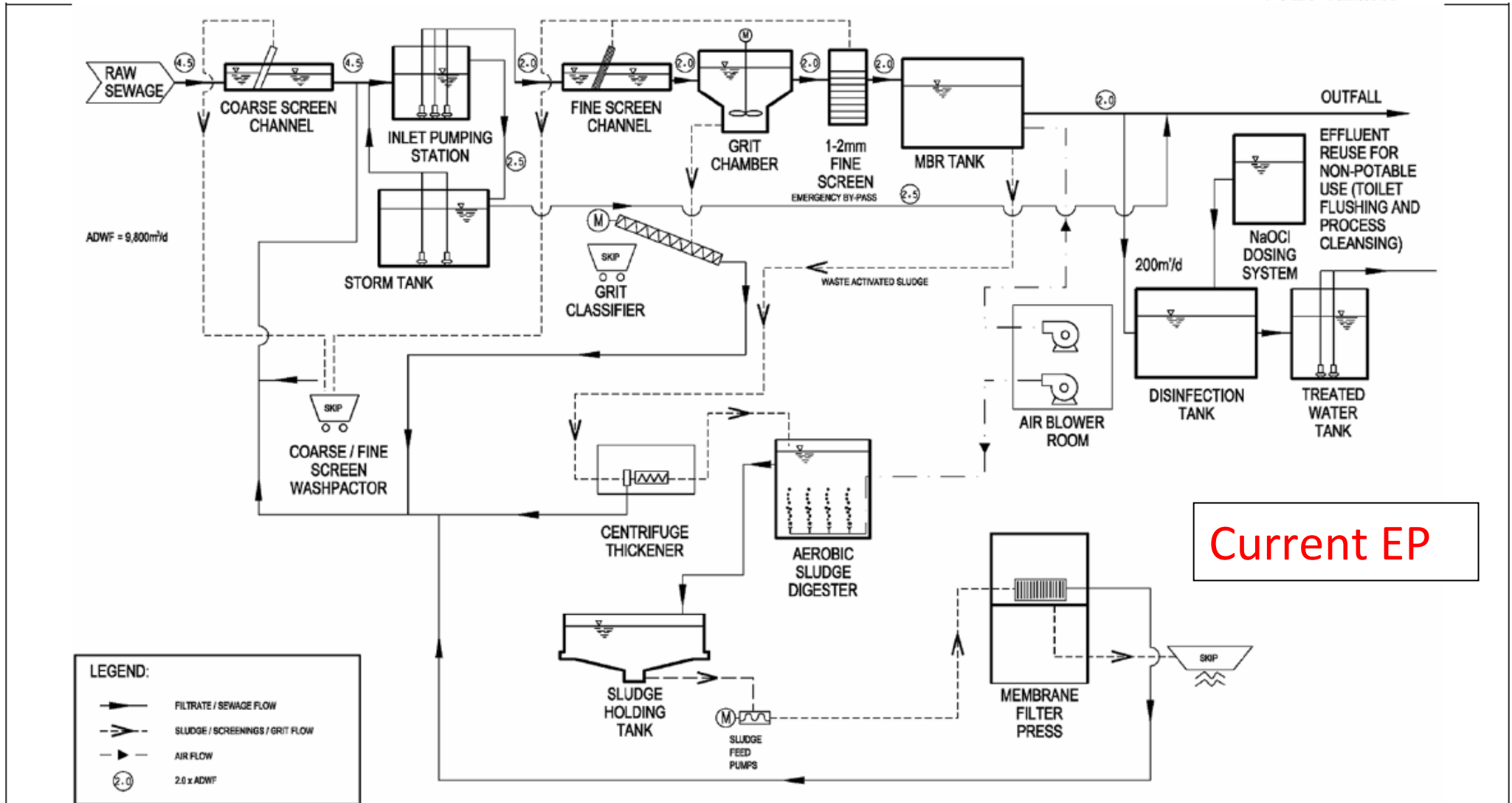
C1. Name of the Current Environmental Permit Holder : Drainage Services Department	
C2. Application No. of the Current Environmental Permit :	EP-488/2014
C3. The Current Environmental Permit was Issued in :	month / year 05 2014

Important Notes : Please submit the application together with
(a) 3 copies of this completed form; and
(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation to the Environmental Protection Department at the following address :
The EIA Ordinance Register Office,
27th floor, Southorn Centre, 130 Hennessy Road,
Wan Chai, Hong Kong.

Tick (✓) the appropriate box

Part D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

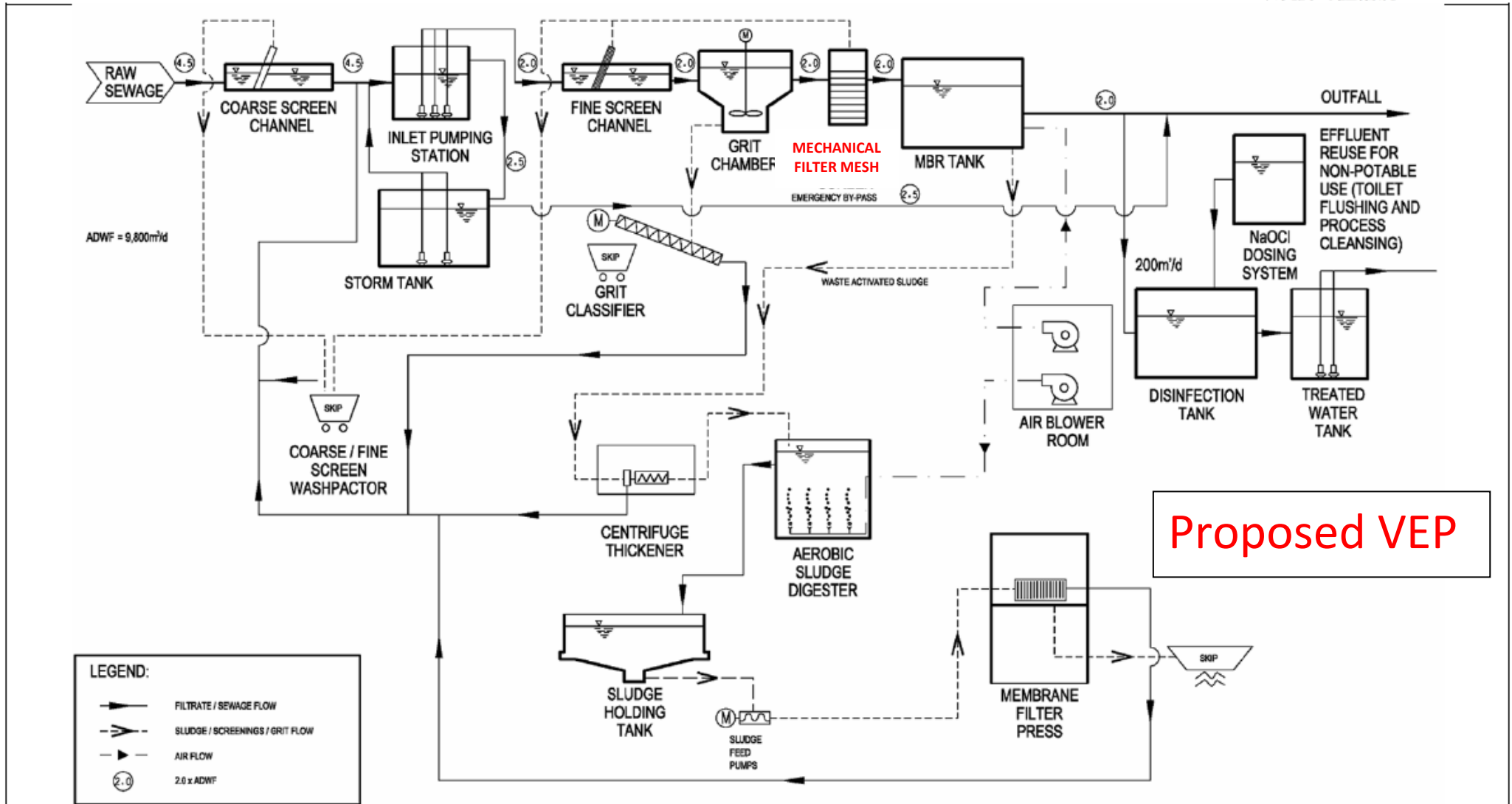
D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Provision of 1-2mm fine screen before MBR Tank	Replace the 1-2 mm fine screen by mechanical filter mesh (MFM)	Enhance the pre-biological treatment solid removal rate to improve the reliability of the downstream biological treatment (i.e. MBR tank)	The filtering capacity of MFM is better than that of the 1-2 mm fine screen (see supporting document) and the proposed variation would not arise any environmental change	The environment and community would be benefited from the proposed variation as the overall reliability of the Cheung Chau Sewage Treatment Works is improved	The environmental performance requirements as set out in the EIA report significantly depends on the performance of MBR tank and the proposed variation would improve its reliability	No additional measure is required



Current EP

Schematic Flow Diagram of the Project
工程項目流程示意圖

(本圖是根據申請環境許可證申請文件 (No. AEP-488/2014) 編制)
(This figure was prepared based on EP Application Document (No. AEP-488/2014))



Proposed VEP

Schematic Flow Diagram of the Project
工程項目流程示意圖

(本圖是根據申請環境許可證申請文件 (No. AEP-488/2014) 編制)
(This figure was prepared based on EP Application Document (No. AEP-488/2014))

PART E DECLARATION BY APPLICANT

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

[Redacted Signature]

Signature of Applicant

[Redacted Name]

Full Name in Block Letters

[Redacted Position]

Position



on behalf of Drainage Services Department
Company Name and Chop (as appropriate)


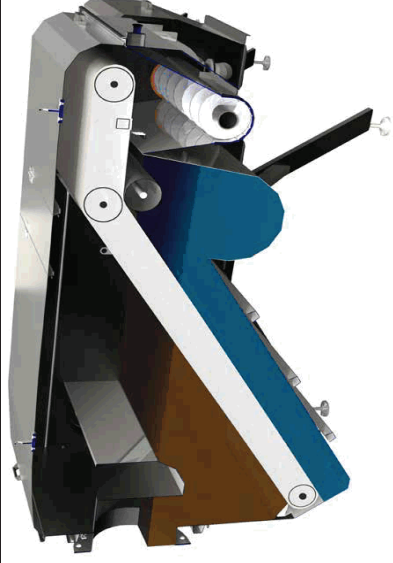
20 Apr 2021
Date

NOTES :

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of \$5,000,000 and to a maximum imprisonment for 2 years.
2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of \$5,000,000 and to a maximum imprisonment for 2 years.

Supporting Documents

Comparison table of the two types of equipment

Equipment	1-2 mm Fine Screen		
Brand Name	HUBER		
Technical Particulars			
Filter Material	Stainless Steel		
Opening / Pore Size	Perforated plate: 1.5 – 3mm		
Illustration (from potential suppliers)			
Suppliers' technical brochures	Appendix A	Appendix B	
Performance			
TSS Removal Efficiency	Average: 55%	Up to 80%	
BOD Removal Efficiency	Up to 20%	Up to 40%	
Performance of DS after Dewatering	Up to 40%	3 – 8% (20 – 30% with integrated dewatering unit)	

HUBER Rotary Drum Fine Screen ROTAMAT® Ro2 / RPPS / STAR



Reliable and well-proven inlet screen for municipal sewage treatment plants and industrial wastewater and process water screening

- with integrated screenings press
- with integrated screenings washing
- more than 2000 installations worldwide

►► The challenge – Our solution

Both municipal wastewater treatment plants and industrial applications (for process and wastewater treatment) require mechanical treatment as a first treatment step to remove as much as possible of the floating, settling and suspended material.

The aim is to achieve the maximum separation efficiency under the prevailing hydraulic conditions. Operating reliability, efficiency and hygienic operation are important factors for a mechanical separation plant.

The HUBER Rotary Drum Fine Screen ROTAMAT® operation is based upon a unique system that allows combination of screening, washing, transport, compaction and dewatering in a single unit.

Depending on the screen bar spacing (0.5 - 6 mm) or perforation (1 - 6 mm) and screen size (screen basket diameter of up to 3000 mm), the throughput can be individually adjusted to specific site requirements.

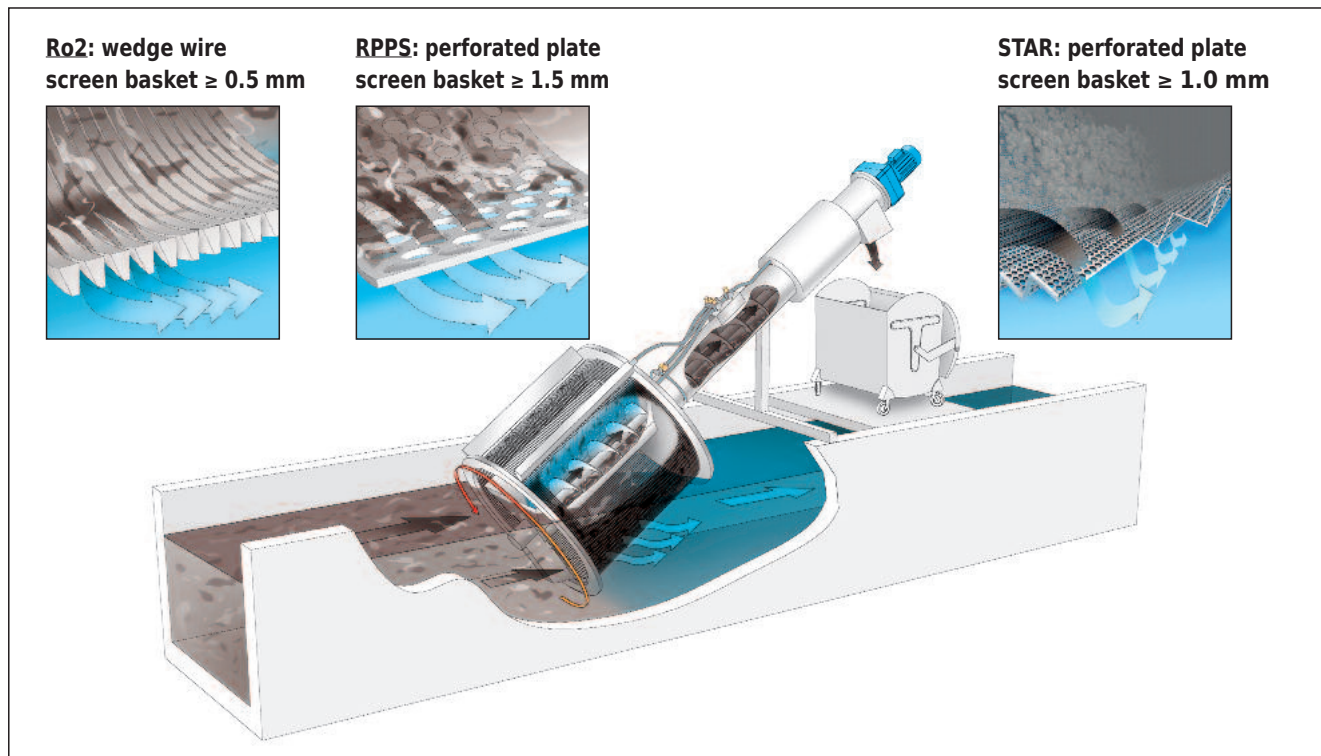
The HUBER Rotary Drum Fine Screen ROTAMAT® is completely made of stainless steel and acid treated in a pickling bath.

The screen can be installed either directly in the channel or in a separate tank.

Design and function:

HUBER Rotary Drum Fine Screen ROTAMAT® units are either installed directly into the channels, or are supplied as tank-mounted units, with an inclination of 35°. The wastewater flows into the open end of the inclined screen basket and then through the screen. Floating and suspended materials are retained by the screen basket. Blinding of the screen surface generates an additional filtering effect so that solids can be retained that are smaller than the bar spacing or perforation.

The basket starts to rotate when a certain upstream water level is exceeded due to screen surface blinding. The rotating screen drum lifts the screenings and drops them into the centrally arranged trough. Screenings removal from the drum is supported by a scraper brush and a spray nozzle bar. A screw conveyor in the trough rotates with the drum and transports the screenings through a closed and inclined pipe. The conveying screw transports, dewateres and compacts the screenings, without any odour nuisance, and discharges them into the customer's container or a subsequent conveying unit.



Compared to one-dimensional wedge wire screens (left picture), the two-dimensional screening element of the HUBER Rotary Drum Fine Screen ROTAMAT® RPPS (picture in the middle) achieves a significantly higher separation efficiency.

Due to its star-shaped screen drum the HUBER Rotary Drum Fine Screen ROTAMAT® STAR (right picture) has a by about 30% larger screening surface, with the same small nominal diameter and with the result of significantly increased hydraulic throughput capacity.

►► Integrated Screenings Washing System IRGA

To optimise the treatment process an integrated screenings washing system IRGA can be provided. It improves the carbon/nitrogen ratio of the pretreated wastewater. In addition, the IRGA reduces the costs of screenings disposal.

The HUBER ROTAMAT® principle allows for integration of the screenings washing system directly in the trough and/or the lower end of the rising pipe. As the soluble matter is separated from the inert material, faeces are virtually completely washed out which leads to a significant weight reduction.

- Optimal cost/performance ratio
- Easy retrofit
- Minimised disposal costs
- Improved operating and hygienic conditions
- Virtually complete washout of faeces
- Weight reduction by approx. 50 %
- Dewatering performance of up to 40 % DS

The dewatering performance can be increased to more than 45 % DR by adding a **high pressure unit (HP)** to the integrated screenings washing system IRGA. This combination guarantees the maximum dewatering performance and reduces disposal and operating costs.



HUBER Rotary Drum Fine Screen ROTAMAT® with integrated screenings washing IRGA

►► Advantages of the HUBER Rotary Drum Fine Screen ROTAMAT® Ro2 / RPPS / STAR

a) Low headloss – High separation efficiency

Due to the drum's shape and 35° installation the screen area is much larger than that of a vertical or steeply inclined screen, which results in a low headloss, high separation efficiency and maximum throughput.

b) Completely made of stainless steel

The machine is completely made of stainless steel and pickled in an acid bath which eliminates corrosion and thus reduces maintenance.

c) No by-passing

The entire flow enters the screen drum through its open front end and can only leave the drum through its screen area. This prevents plant overflow and guarantees that the screenings are always retained within the screen drum.

d) Several functions combined in one system

The ROTAMAT® Screens perform the functions of screenings removal, transport, washing, dewatering and compaction in a single space-saving unit. An additional bagging unit guarantees operation of the entire system without odour nuisance.

e) Outdoor installation

For frost-proof outdoor installation, the HUBER Rotary Drum Fine Screen ROTAMAT® can be supplied with a heating wire and thermal insulation.

f) Retrofitting

The design of the ROTAMAT® Screens allows for later modification so that the systems can be adapted to changing requirements. The heating and/or integrated screenings washing can be retrofitted. The bar spacing can also be reduced to meet more stringent requirements.

g) Low maintenance

No lubrication. Regular checking and visual inspection are sufficient.

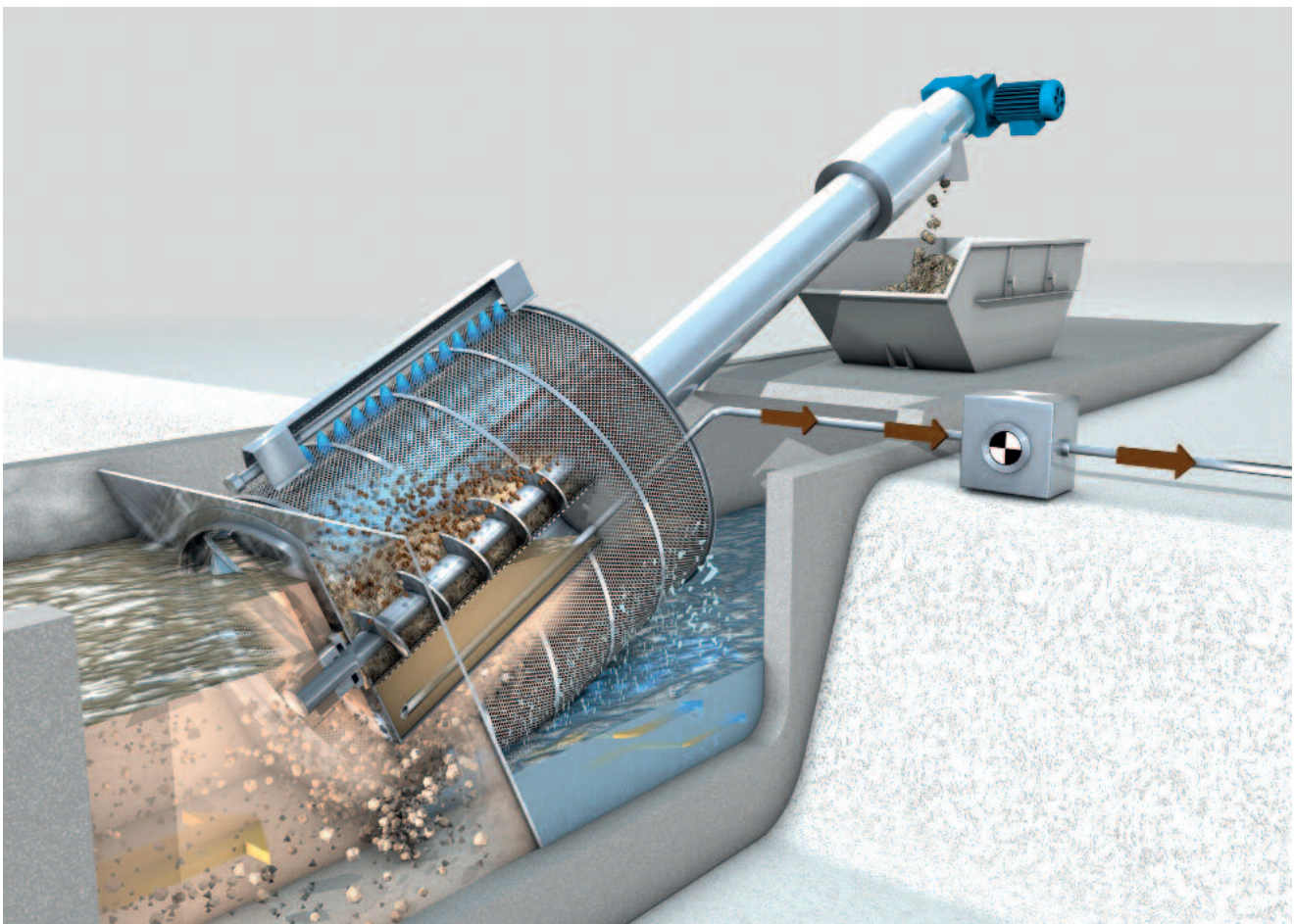
➤➤ HUBER Rotary Drum Fine Screen ROTAMAT® PRO

The special design of the HUBER Rotary Drum Fine Screen ROTAMAT® PRO series isolates the water level in the trough from the water levels upstream and downstream of the screen. This is achieved with a closed system below the perforated plate of the trough. The liquid phase is removed from the closed system by a suction pump which pumps the the flow back to upstream of the machine. The solids are washed, compacted and discharged by a conveying screw. This operation method permits continuous screen operation with a constant water level upstream of the machine. Continuous system operation significantly increases throughput capacity.

The PRO system can even be applied with high downstream water levels. As backup of water into the trough is impossible, screenings discharge via the removal screw can reliably be ensured.

➤➤ The user's benefits

- Decoupled water levels
- Increased throughput capacity due to continuously/constantly high water levels
- Reliable operation even with high backwater levels
- Especially suitable for pump applications
- Easy to retrofit into any type of HUBER Rotary Drum Fine Screen ROTAMAT®
- Perforation: 1 – 6 mm, rolled design or folded basket design ('Star' design)
- Screen basket diameter: 780 – 3000 mm
- Application: for mechanical screening and to protect downstream membrane systems



HUBER Rotary Drum Fine Screen ROTAMAT® PRO design, the liquid phase in the trough is pumped off.

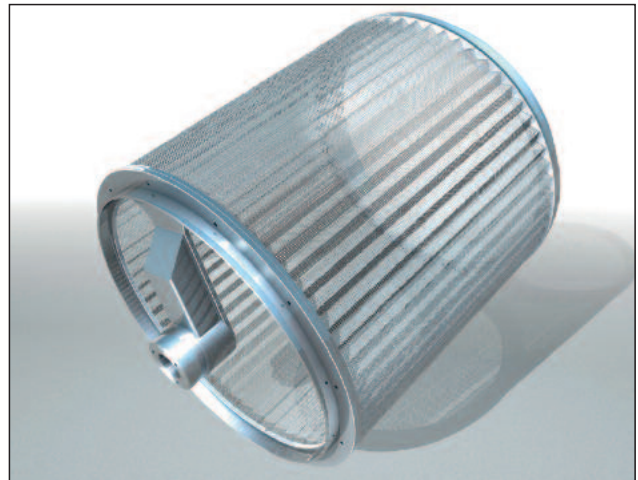
➤ HUBER Perforated Plate Screen ROTAMAT® STAR

The HUBER Perforated Plate Screen ROTAMAT® STAR is especially designed for fine apertures. Its design is based on the well-proven ROTAMAT® principle: screenings separation, washing, transport, and compaction in one unit. To improve screen throughput capacity, the RPPS-Star screen has a star-shaped screen basket with a zig-zag folded surface. The star-shaped folded plate of the HUBER Perforated Plate Screen ROTAMAT® STAR provides an increased free screen surface and an approximately 30% increase in throughput capacity with the same nominal diameter. The STAR design combines the benefits of maximum free screen surface and very high separation efficiency. This efficiency-improving innovative development permits for optimal and economical system dimensioning, it is space-saving and reduces civil costs.

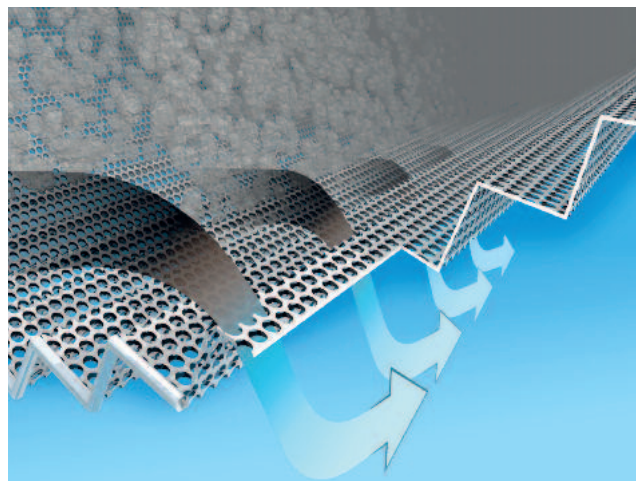
HUBER Perforated Plate Screen ROTAMAT® STAR units are preferably used with perforations of 1 / 1.5 / 2 mm for installation on municipal and industrial wastewater treatment plants. The screens are also applied to protect downstream membrane systems. They can be installed in the mechanical treatment stage or downstream of grit traps. Special PRO design screens are available for applications where an additional increase in throughput capacity is required.

➤ The user's benefits

- Removal of hair and fibres to protect downstream membrane filtration plants
- Fine screening of large wastewater volumes in a gravity line with low headloss
- Approximately 30% increase in throughput due to the zig-zag folded screen basket
- Very high separation efficiency
- Perforation: 1 / 1.5 / 2 mm
- Suitable for installation into existing channels or for tank installation
- Sturdy design, low maintenance requirements
- Screen basket diameter: 780 – 3000 mm



Schematic drawing of a HUBER Perforated Plate Screen ROTAMAT® STAR with folded screen basket surface

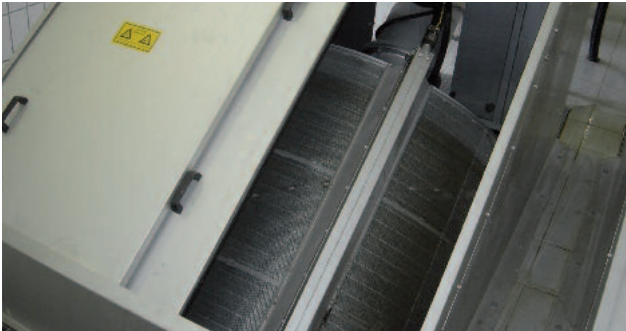


Significant increase in hydraulic throughput capacity (approx. 30%) due to the folded screen basket design



HUBER Perforated Plate Screen ROTAMAT® STAR, 2600 mm diameter, 1 mm perforation

➤ A few examples from thousands of installations



HUBER Rotary Drum Fine Screen ROTAMAT® installed in the channel with a movable stainless steel cover, size 600 to 3000



Individually adapted installation with lateral screenings discharge directly into a container



Tank-mounted HUBER Rotary Drum Fine Screen ROTAMAT®...



... from size 600 to size 2400



3 ROTAMAT® STAR units size 1000 with 1.5 mm perforation protecting the downstream membrane plant



ROTAMAT® STAR screen basket, 2600 mm diameter, 1 mm perforation, acid-treated in a pickling bath and passivated

➤ Screen sizes

Screen basket diameter: 600 - 3000 mm

Installation angle: 35°

Bar spacing: 0.5 - 6 mm

Perforation: 1 - 6 mm

HUBER SE

Industriepark Erasbach A1 · D-92334 Berching
Phone: +49-8462-201-0 · Fax: +49-8462-201-810
info@huber.de · Internet: www.huber.de

Subject to technical modification
0,15 / 9 - 5.2016 - 4.2004

ROTAMAT® Rotary Drum Fine Screen
ROTAMAT® Ro2 / RPPS / STAR

Appendix B

saisnes
Filter™

Product Overview



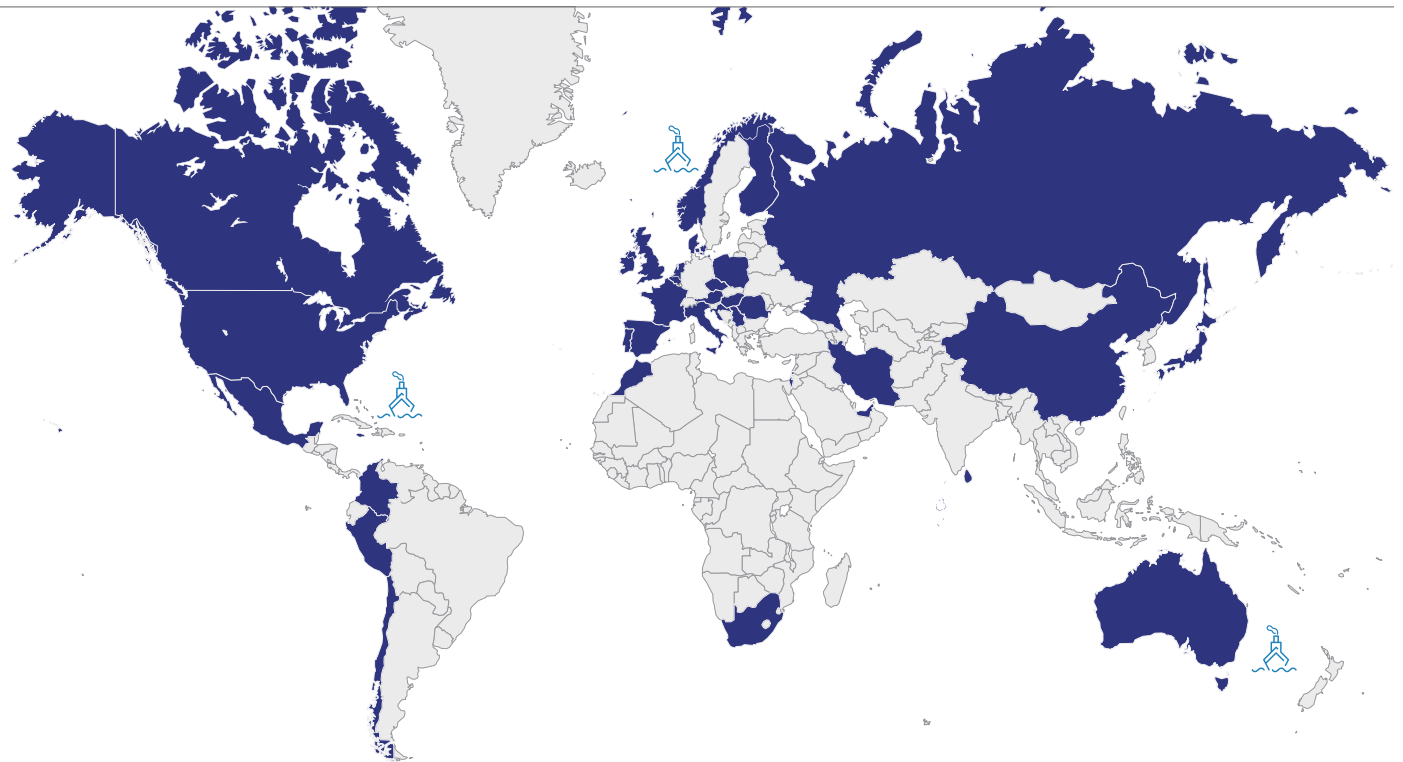
Eco-efficient **solids separation**

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.

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.



Appendix B

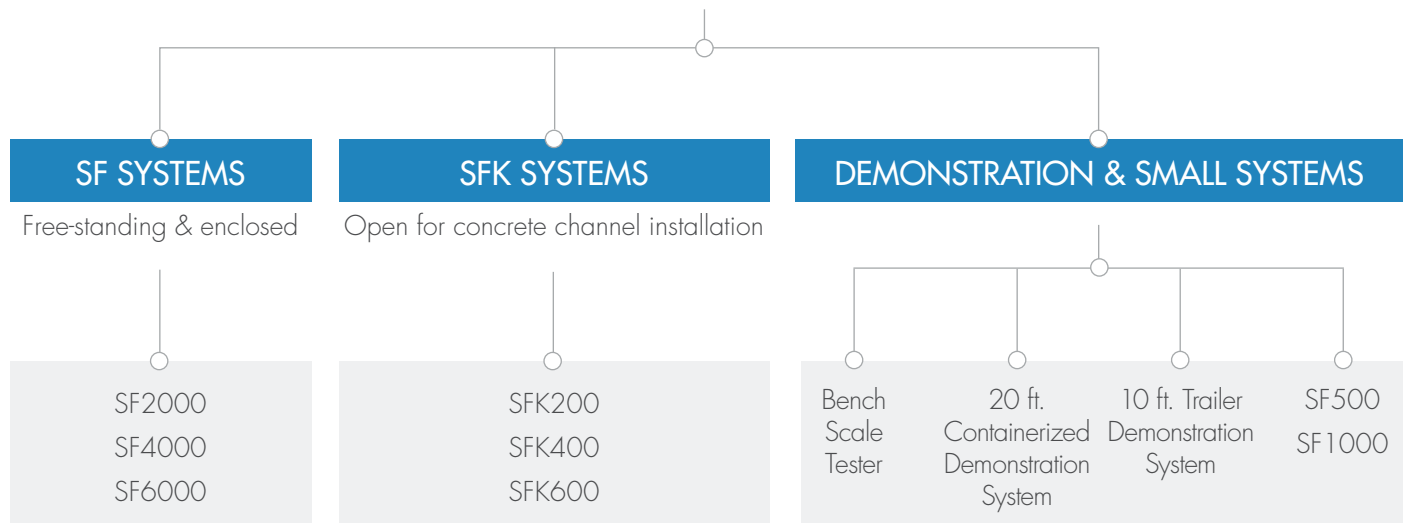
AN ALTERNATIVE TO CONVENTIONAL PRIMARY TREATMENT

A Salsnes Filter system can completely replace conventional primary solids separation. Or, it can augment existing primary treatment to improve plant performance and reduce overall costs.

Compared to conventional systems, a Salsnes Filter system can offer:

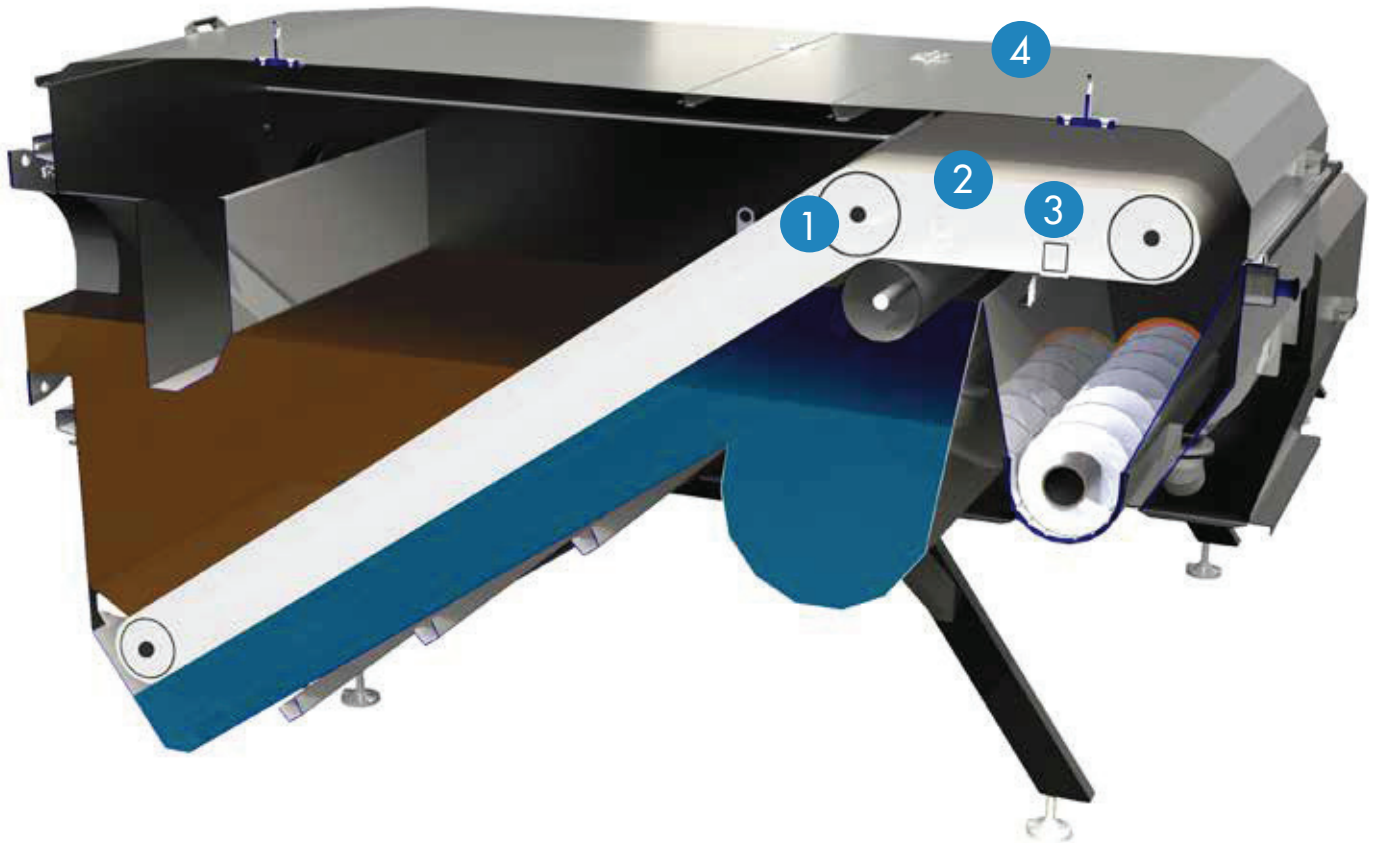
- 30-60% lower investment costs
- 1/10th the land requirements
- Integrated thickening and optional dewatering
- Significantly lower lifecycle costs
- Smaller volume of drier sludge that reduces disposal costs
- Less civil works
- Fully automated equipment
- Optimal removal of TSS to ease demand on downstream 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

OUR PRODUCTS



Appendix B

SF & SFK PRODUCT COMPONENTS



1 Filtermesh & Cogwheel

The filtermesh is made of polyethylene and is very durable. The way it's mounted and tensioned to the cogwheel is patented - it improves performance and allows the filter to handle higher flow rates and solids loadings, increasing treatment capacity in a smaller footprint.

2 Hot or Cold Water Flush

A hot water or cold water high pressure flush is available to those facilities that have a high concentration of fat, oil and grease (FOG) in their wastewater. Operating only two – four times daily, this flush effectively cleans the hard-to-remove FOG from filtermesh openings.

3 Air Knife

The Air Knife filtermesh cleaning system starts automatically when the mesh begins to rotate. It uses compressed air to clean, which has many benefits compared to scrapers, brushes or water-based cleaning systems. Air is gentler on the mesh (to elongate its life) and on particles (so they don't break into smaller pieces). Air cleaning also keeps sludge drier for more effective dewatering.

4 Access Hatch

Enables quick visual inspections of performance and internal components.

Appendix B

Integrated Dewatering

To save space and money, the enclosed SF systems contain an optional integrated dewatering process. Sludge drops into the collection area from the thickening process at 3 – 8 % DM and is conveyed across the unit by an auger. It can then be fed to a sludge stabilization process (e.g. direct digester feed); Or processed further through the dewatering unit to produce sludge that is 20 – 30% DM (without the need for any additional dewatering equipment).



Control Power Panel (CPP)

The CPP houses a Programmable Logic Controller (PLC) that makes this a completely automated system, ideal for remote or unstaffed facilities. A water pressure sensor tells the unit when to rotate the filtermesh (and at what speed), while the PLC simultaneously starts the Air Knife and sludge screw press.



Quick Connects

You will find only quick connects on the system for fast and easy maintenance.



External Dewatering

Common Dewatering:

For larger installations, this unit is available to dewater sludge from multiple filters. It can apply a higher pressure to produce even drier sludge (20 – 40% DM typical).



Vacuum System:

Ideal for sludge that is harder to dewater, our vacuum system can be installed to produce sludge as dry as 30% DM before the integrated dewatering auger.



Appendix B

salsnes

SF SYSTEMS

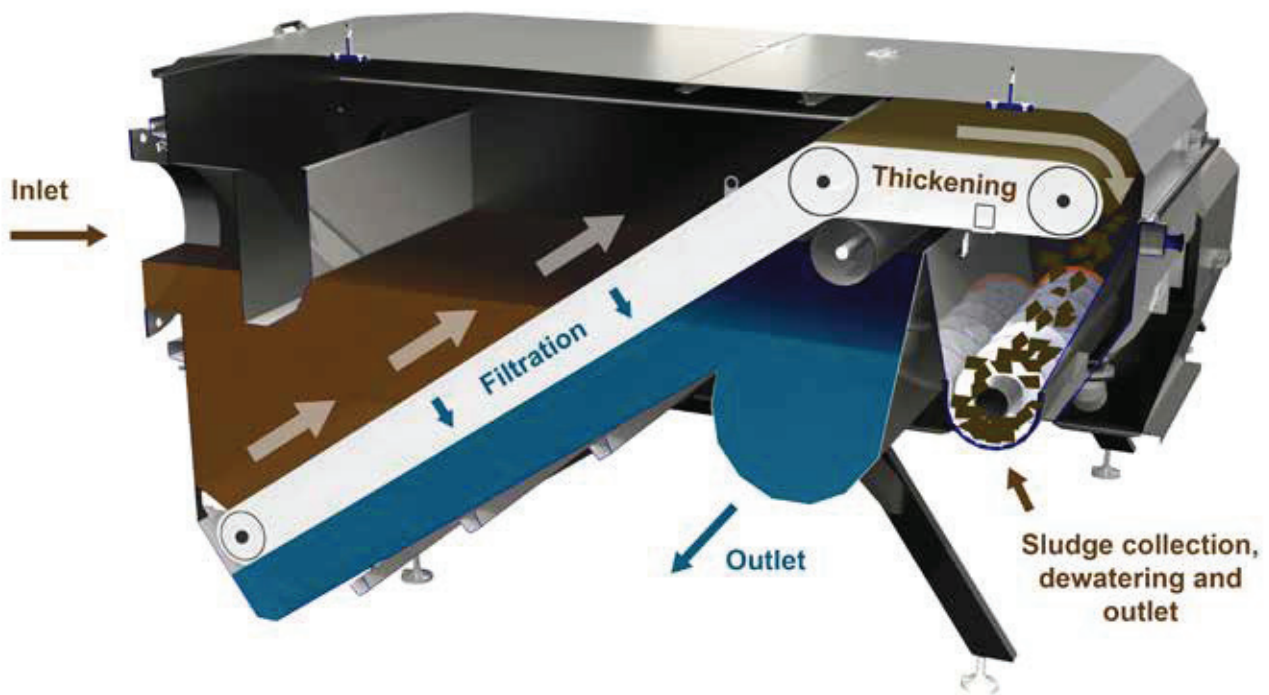
SF:60

Free-standing and enclosed systems for municipal and industrial applications.

SF2000, SF4000, SF6000

Solids Separation with Integrated Sludge Thickening and Dewatering

In SF systems, wastewater enters the inlet and is distributed (to prevent particle breakage) onto the filtermesh for solids separation. The filtermesh rotates like a conveyor belt, transporting sludge and enabling the thickening process. Sludge then drops into a collection area and goes through a dewatering unit (optional) before it exits the system.



Modular, Flexible Design

The modular design of the Salsnes Filter system allows for installation configurations to serve practically any capacity requirement. Single or multiple filters can be easily installed in new or existing facilities thanks to flexible design options.





Appendix B

SF2000/4000/6000

Bedford, United Kingdom

2,365 m³/h (15 MGD)



Specifications	SF2000	SF4000	SF6000
Maximum Hydraulic Flow	144 m ³ /h (0.9 MGD)	288 m ³ /h (1.8 MGD)	576 m ³ /h (3.7 MGD)
Average Treated Flow	90 m ³ /h (0.6 MGD)	160 m ³ /h (1 MGD)	325 m ³ /h (2 MGD)
TSS Removal Efficiency	30 – 80% (design dependant)		
Sludge Dry Content After Thickening	3 - 8 %		
Sludge Dry Content After Integrated Dewatering	20 -30 %		
Typical Operating Power Consumption	1.8 - 3.6 kW	2.1 - 4.5 kW	2.8 - 5.5 kW
Dimensions (L x W x H)	2.0 x 1.7 x 1.3 m (7 x 5.5 x 4.5')	2.5 x 2.0 x 1.6 m (8 x 6.5 x 5.2')	2.8 x 2.5 x 1.8 m (9 x 8.1 x 6')
Filtermesh Sizes	850, 500, 350, 250 micron		

Appendix B

SFK SYSTEMS

Systems for concrete channel installation in municipal and industrial markets.

SFK200, SFK400, SFK600

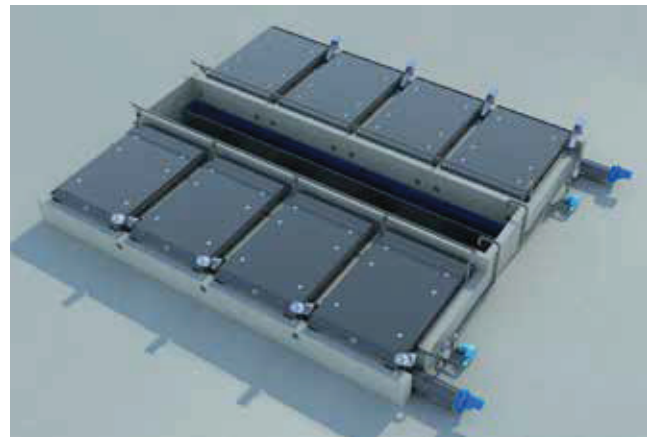
Solids Separation, Sludge Thickening and Dewatering

In SFK systems, wastewater flows through the channel and meets the filtermesh, where solids are separated. The filtermesh rotates, transporting sludge above the channel's water level to the thickening stage. Thickened sludge is then dropped into a collection area when it can optionally go through a dewatering process before it exits the system.

Modular, Flexible Design

SFK Systems can be easily retrofitted into the channels at existing facilities. A group of filters can form a module which allows for a variety of installation configurations that service practically any capacity requirement.

One Module



Eight SFK600 Salsnes Filters treating 2000 m³/h (12.6 MGD) at the Egå Wastewater Treatment Plant in Aarhus, Denmark.

SFK Type	Number of Units	Typical hydraulic capacity (L/s) for 50 - 60% TSS removal	Typical hydraulic capacity (L/s) for 40% TSS removal	Net footprint in m ² incl. channels and sludge tanks	Energy consumption (kWh) at 40% TSS removal
Module 4	1	200	400	30	17
Module 6	1	300	600	40	25
Module 8	1	400	800	60	34
Module 10	1	600	1200	80	42
Module 12	1	800	1600	100	51
Module 12	2	1600	3200	230	102
Module 12	4	3200	6400	460	204

SFK modules and change in treatment plant capacities

Appendix B

SFK200/400/600



Salmar, Follafoss, Norway

2,850 m³/h (18 MGD)



Specifications	SFK200	SFK400	SFK600
Maximum Hydraulic Flow	144 m ³ /h (0.9 MGD)	288 m ³ /h (1.8 MGD)	576 m ³ /h (3.7 MGD)
Average Treated Flow	90 m ³ /h (0.6 MGD)	160 m ³ /h (1 MGD)	325 m ³ /h (2 MGD)
TSS Removal Efficiency	30 – 80% (design dependant)		
Sludge Dry Content After Thickening	3 - 8 %		
Sludge Dry Matter After Common Dewatering Unit	20 - 40 %		
Typical Operating Power Consumption	1.3 - 3.1 kW	1.6 - 4.0 kW	2.3 - 5.0 kW
Dimensions (L x W x H)	2.4 x 1 x 1.2 m (8 x 3.3 x 4.2')	3 x 1.3 x 1.3 m (9.6 x 4.3 x 4.5')	3 x 1.8 x 1.4 m (9.6 x 5.9 x 4.7')
Filtermesh Sizes	350, 250, 150, 100, 40 micron		

Appendix B

DEMONSTRATION & SMALL SYSTEMS

Bench Scale Tester

A simple and quick way to characterize your wastewater and show the efficacy of solids removal using various-sized filtermesh.

The Bench Scale Tester is easy to transport and can be mounted on a regular water testing work bench. Filtermesh ranging from 11 to 840 microns can be tested.

Total suspended solids are measured before and after the wastewater is put through the Tester. Charting this information in the provided Excel template will show the particle size distribution of your wastewater, and how each filtermesh performed. This data helps determine which system would be best suited in a demonstration or full-scale installation.

The Bench Scale Tester comes with:

- Collection of standard meshes
- Excel template for calculations
- Procedure to execute the testing

Bench Scale Tester



Appendix B

SF500 & SF1000

The SF500 and SF1000 are small-scale systems, but boast many of the same features as the SF systems used for larger applications. Our patented Air Knife filtermesh cleaning system, automated sampling, water level sensors and flow distribution in the inlet, are all incorporated. The SF1000 has integrated sludge thickening and dewatering processes.

SF500

For pilot and lab-scale testing



SF1000

For small-scale municipal and industrial applications and demonstration systems



Specifications	SF500
Maximum Hydraulic Flow	5.4 m ³ /h (24 gpm)
TSS Removal Efficiency	>70%
Dimensions (L x W x H)	1 x 0.75 x 0.55 m (3.3 x 2.5 x 1.8')
Hot water connection	½" NPT
Cold water connection	½" NPT
Filtermesh Sizes	350, 250, 158, 90, 40 micron

Specifications	SF1000
Maximum Hydraulic Flow	54 m ³ /h (0.3 MGD)
Average Treated Flow	35 m ³ /h (0.2 MGD)
TSS Removal Efficiency	30 - 80% (design dependant)
Sludge Dry Content After Thickening	3 - 8 %
Sludge Dry Content After Integrated Dewatering	20 -30 %
Typical Operating Power Consumption	1.4 - 2.8 kW
Dimensions (L x W x H)	1.5 X 1.3 X 1.5 m (5 x 4.4 x 4.9')
Filtermesh Sizes	500, 350, 250, 158, 90, 40 micron

DEMONSTRATION & SMALL SYSTEMS

Containerized and Trailer Demonstration Systems

The next step after bench scale testing. State-of-the art wastewater testing equipment collects data about the performance of the Salsnes Filter system with your specific wastewater.

Demonstration System Features

Our demonstration systems house either a SF500 or SF1000 unit integrated with optional polymer station, coagulation & flocculation tanks and a screw conveyor for the transportation of sludge. External requirements are simple; 3 phase electricity and connections to fresh and wastewater.

The polymer station can use emulsion polymers and is diluted online with freshwater before injection into the flocculation basin. A static mixer is in place for rapid mixing of polymers.

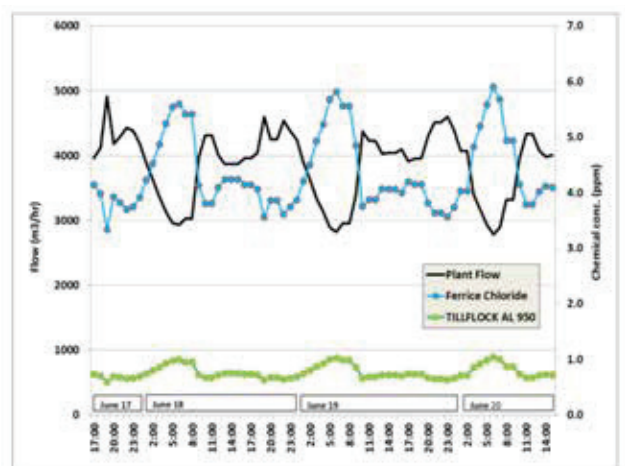
Wastewater Testing Equipment

The latest testing equipment is used in the systems including jar testers, Hach testing equipment, electronic balance and TSS filtration units. A 24-hour composite sampler with built-in refrigerator is also on board. The systems have several control panels, which are used for the collection and storage of data as well as the automatic operation of the system.

At the influent chamber, there are several online sensors (pH, TSS, temperature, turbidity) for automatic readings and for coagulant and polymer dosing.



Control panels automatically operate the systems and also store data collected from the demonstration.



Appendix B

10 Foot Trailer Demonstration System



Can be easily transported with a standard 4-wheel drive car or a truck.



20 Foot Containerized Demonstration System



Designed into a standard shipping container for easy transportation.



SPECIFICATIONS

Appendix B

Model	SF1000	SF2000	SF4000	SF6000
Style	Enclosed, free-standing			
Material of Construction	316L Stainless Steel			
Weight (Dry)	480 kg (1,058 lbs)	530 kg (1,168 lbs)	890 kg (1,962 lbs)	1,230 kg (2,711 lbs)
Standard Electrical Voltages	480/277V 3 ph, 3 wire + gnd, 60 Hz 400/230V 3 ph, 3 wire + gnd, 50 Hz			
Typical Operating Power Consumption	1.4 - 2.8 kW	1.8 - 3.6 kW	2.1 - 4.5 kW	2.8 - 5.5 kW
Accreditations (Electrical)	CE, UL, UL approved for Class 1 Div 1			
Performance				
Maximum Hydraulic Flow	54 m ³ /h (0.3 MGD)	144 m ³ /h (0.9 MGD)	288 m ³ /h (1.8 MGD)	576 m ³ /h (3.7 MGD)
Treated Flow (Municipal Wastewater)	35 m ³ /h (0.2 MGD)	90 m ³ /h (0.6 MGD)	160 m ³ /h (1.0 MGD)	325 m ³ /h (2 MGD)
Maximum Head Loss	440 mm (17")	300 mm (12")	330 mm (13")	350 mm (14")
TSS Removal Efficiency	30 - 80% (design dependent)			
BOD Removal Efficiency	15 - 40% (design dependent)			
Sludge Dry Matter After Thickening	3 - 8%			
Sludge Dry Matter After Integrated Dewatering Unit	20 - 30%			
Dimensions				
Length x Width x Height (complete unit)	1.5 x 1.3 x 1.5 m (5 x 4.4 x 4.9')	2 x 1.7 x 1.3 m (7 x 5.5 x 4.5')	2.5 x 2.0 x 1.6 m (8 x 6.5 x 5.2')	2.8 x 2.5 x 1.8 m (9 x 8.1 x 6')
Inlet Diameter (pumped/gravity)	100 mm DIN (4" ANSI)	150/200 mm DIN (6" / 8" ANSI)	200/350 mm DIN (8" / 14" ANSI)	250/400 mm DIN (10" / 16" ANSI)
Outlet Diameter	150 mm DIN (6" ANSI)	250 mm DIN (10" ANSI)	350 mm DIN (14" ANSI)	400 mm DIN (16" ANSI)
Overflow Diameter	Combined with outlet			
Bottom Drain Diameter	N/A	100 mm DIN (4" ANSI)		
Water Connection	13 mm BSP (1/2" NPT)			19 mm BSP (3/4" NPT) 1/2" NPT for UL Div 1

Appendix B

Model	SFK200	SFK400	SFK600
Style	Concrete open channel (by others)		
Material of Frame	316L Stainless Steel		
Weight	510 kg (1,124 lbs)	630 kg (1,389 lbs)	745 kg (1,642 lbs)
Standard Electrical Voltages	480/277V 3 ph, 3 wire + gnd, 60 Hz 400/230V 3 ph, 3 wire + gnd, 50 Hz		
Typical Operating Power Consumption	1.3 - 3.1 kW	1.6 - 4.0 kW	2.3 - 5.0 kW
Accreditations (Electrical)	CE, UL, UL approved for Class 1 Div 1		
Performance			
Maximum Hydraulic Flow	144 m ³ /h (0.9 MGD)	288 m ³ /h (1.8 MGD)	576 m ³ /h (3.7 MGD)
Treated Flow (Municipal Wastewater)	90 m ³ /h (0.6 MGD)	160 m ³ /h (1.0 MGD)	325 m ³ /h (2 MGD)
Head Loss	400 mm (16")		
TSS Removal Efficiency	30 - 80% (design dependent)		
BOD Removal Efficiency	15 - 40% (design dependent)		
Sludge Dry Matter after Thickening	3 - 8%		
Sludge Dry Matter After Common Dewatering Unit	20 - 40%		
Dimensions			
Length x Width x Height (frame)	2.4 x 1 x 1.2 m (8 x 3.3 x 4.2')	3 x 1.3 x 1.3 m (9.6 x 4.3 x 4.5')	3 x 1.8 x 1.4 m (9.6 x 5.9 x 4.7')
Overflow	Arranged in channel wall		
Water Connection	13 mm BSP (½" NPT)		19 mm BSP (¾" NPT) ½" NPT for UL Div 1