Micro Drum Filters

AUXILL Nederland
filters • filtratietechniek • separatietechniek
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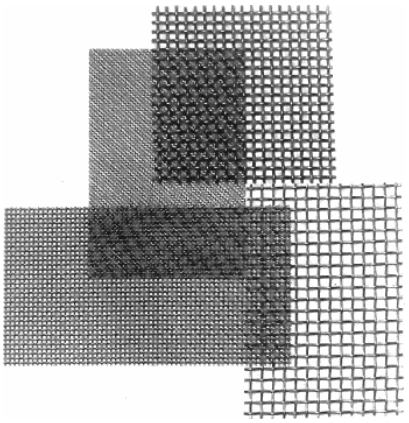
Micro Drum Filters

Micro Drum Filters offer an efficient and reliable method for the separation of fine solids and organic material out of various types of liquids.
Auxill Nederland has developed this process one step further and now offers a range of rugged, efficient and economical drum filters, used in water filtration, process water circulation processes and liquid circulation.

Photo 1: Terneuzen (NL), project De Drie Ambachten (source: Waterforum Media)

Micro Drum Filters briefly:

- Filtration of surface water
- Effluent polishing in waste water
- Removal of organic and fibrous solids
- Filtration of (source and well) water for irrigation
- Easy maintenance and low operation costs
- Capacity from 10 m³ up to 4500 m³/h
- Screens from 20 µ up to 3000 µ made from Stainless Steel



Applications

Micro Drum Filters originate from the fish farming industry, which requires is a constant take in of clean water. Environmental regulations made on the effluent of such farms obligate the use of these filters to clean waste water, which loads of organic matter, such as food rests, fish droppings, scales etc.
Nowadays the application of the Micro Drum Filter has expanded to other area's. In the overview written below you will find the areas in which the drum filter is used.

Fish farming
- Filtration intake water
- Removal of solids in effluent

Cooling process
- Filtration intake water
- Removal of mussel seeds, algae etc.

Waste water treatment
- Effluent polishing, removal of suspended solids
- Pre filter for Membrane Bio Reactors (M.B.R.)

Laundries
- Removal of Fibers

Textile companies
- Removal of fibers
- Pre filter to UF for indigo recovery

Wood processing
- Removal of fibers

Irrigation
- Filtration of intake water, drip irrigation protection
- Algae removal

Industry general
- All processes, where light solids may cause problems
- Pre filter for water making installations
- Pre filter for Membrane Bio Reactors (M.B.R.)

Food processing
- Removal of starches and fibrous materials
- Removal of coagulated solids out of cooking processes

Recreation parks & zoo
- Cleaning of swimming pools and recreational ponds and waterworks (mobile units)

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Brief process description

The liquid, mixed with solid particles, flows into the drum through the inlet flange (➔). The Micro Drum Filter contains a rotating drum, equipped with variable netting that filters the solid particles from the liquid. Through the outlet flange (➔) the clean liquid flows further into the process.
With the use of a cleaning element dirt is removed from inside the drum. Solid particles are collected and disposed through a sludge conveyor screw (➔). The sludge conveyor screw is connected directly to the drum transmission. Dewatering insert is optional (see photo 4).

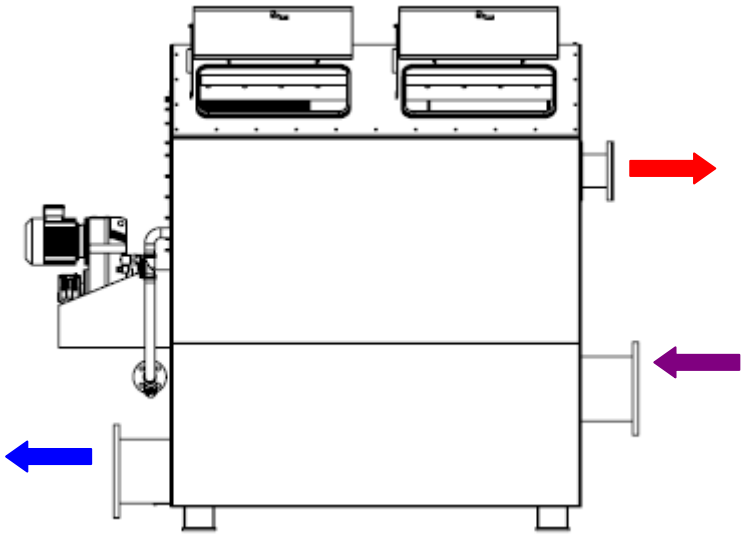

Photo 4

General data	
Screen size	20 µ - 3000 µ
Capacity	Up to 4500 m³/h
Material	SS
Power consumption	Very low
Maintenance	Limited
Operation	Unattended

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Technical specifications	
Material	
Tank	SS 316 L
Frame	SS 316 L
Drum	SS 316 L
Filter material	Mesh woven SS
Drive axle	SS
Bearing	SKF
Piping	SS
Spray nozzles	Bronze of SS
Ball valve (flush)	SS
Collection tray	SS
Sludge outlet	SS
Connections	
Inlet	Flanged (DIN)
Outlet	Flanged (DIN)
Sludge outlet	Pipe end
Tank - Pump	Optional
Pomp – Spraying system	Fitted
Motor	
Flender or similar	Standard direct drive motor
Optional	Direct drive motor with adjustable gearbox, variable speed
Pump	
Calpeda	Capacity 2.2 l/min. Each spray nozzle. P = 5-6 bar
Optional, screen < 100 µ	Capacity 2.2 l/min. Each spray nozzle. P = 10-12 bar
Level regulation	
Water pressure nozzles	IFM, alternative Vegabar en Vegamet 624
Pressure transmitter	Suco, 1 – 30 bar

Photo 5 Flender motor reductor

Control system

The control of the Auxill Micro Drum Filter is located in a stainless steel Rittal Box (see photo 6). The processor in the control cabinet is controlled by a signal from a pressure sensor, standard manufactured by IFM (see photo 7, an alternative manufactured by Vega).

Photo 6

Photo 7

During the rotation of the Micro Drum Filter with Flender reductor (see photo 5) the nozzles clean the screen from the outside using high-pressure spraying. The screw inside the collector transports the solid out.
This process will lower the level until al low level has been reached. The drum and the pump will continue to clean for about 10 to 20 seconds before it stops. The pump, fabricated by Calpeda (see photo 10), produces a water pressure of 5-6 bar or 10-12 bar intended for the sprayers. Water is sucked from the bottom of the Micro Drum Filter. This water has already been filtered by the MDF. Installing the levels take into account the pump does not run dry.

Spray pressure monitoring

The Suco pressure transmitter (see photo 8) controls the water pressure on the spray bar. Proper operation of the spray bar is very important. This can only be guaranteed if the screen is cleaned orderly. A clogged nozzle can cause capacity problems. Blockage can thus be identified early.

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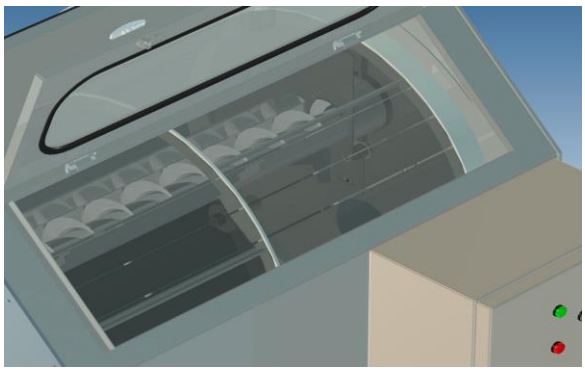
Photo 8: Suco pressure transmitter (above) and water valve (below)

Photo 9: Manometer



Level control
The IFM pressure sensor gives a signal if the level does not decrease, for example due to extreme circumstances during the cleaning process, and keeps on rising even, it will reach high level. At this point the supply will be reduced or entirely closed, until the liquid has reduced to a lower level by means of the cleaning process. When it reaches a lower level, the supply can be opened again.

The filter has been designed and built in such a manner it requires only a minimum of maintenance. Visual inspection although is required every six months.

Photo 10 Pump Calpeda

Screen specifications		
Screens	**Open area (%)**	**Weight (kg/m²)**
0.020 mm – 20 µ - 635 mesh H	25	0.13
0.025 mm – 25 µ - 500 mesh H/D	25	0.16
0.032 mm – 30 µ - 425 mesh H	28	0.17
0.038 mm – 38 µ - 400 mesh H/D	36	0.13
0.040 mm – 40 µ - 350 mesh H/D	31	0.18
0.053 mm – 53 µ - 270 mesh H	35	0.18
0.063 mm – 63 µ - 250 mesh H/D	37	0.20
0.075 mm – 75 µ - 200 mesh H/D	34	0.28
0.100 mm – 100 µ - 150 mesh H/D	36	0.34
0.118 mm – 118 µ - 120 mesh H/D	31	0.54
0.140 mm – 140 µ - 100 mesh H/D	31	0.63
0.212 mm – 178 µ - 80 mesh D	46	0.41
0.265 mm - 200 µ - 70 mesh D	53	0.35

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Flow capacity Auxill Micro Drum Filters (MDF)

Type number		MDF 801	MDF 802	MDF 1202	MDF 1203	MDF 1603	MDF 1604	MDF 2004	MDF 2005
Filter area in m²		1,1	2,2	3,4	5,0	6,9	9,2	11,7	14,6
Solids load 10 mg/litre									
	Maximum flow in m³/hour*								
	Screen size								
	20	56	112	174	259	355	474	596	749
	30	86	173	268	402	553	737	924	1.163
	40	104	207	322	482	663	884	1.109	1.395
	60	130	259	402	602	829	1.105	1.398	1.744
	90	156	311	482	723	995	1.326	1.663	2.093
Solids load 15 mg/litre									
	Maximum flow in m³/hour*								
	Screen size								
	20	51	101	157	235	323	431	548	680
	30	78	156	241	361	498	663	843	1.047
	40	95	190	195	442	608	811	1.031	1.279
	60	121	241	375	562	774	1.032	1.312	1.628
	90	147	294	456	683	940	1.253	1.593	1.977
Solids load 25 mg/litre									
	Maximum flow in m³/hour*								
	Screen size								
	20	31	62	97	145	199	265	499	623
	30	52	104	161	241	332	442	832	1.038
	40	69	138	214	321	438	589	1.017	1.269
	60	95	190	295	442	608	811	1.294	1.615
	90	121	242	375	562	774	1.032	1.571	1.960
Solids load 40 mg/litre									
	Maximum flow in m³/hour*								
	Screen size								
	20	8	18	27	41	58	76	96	120
	30	17	35	53	81	110	147	187	234
	40	36	79	108	165	234	320	407	509

* Kind of solids load (TSS) in incoming flow can have an effect on the final capacity. Above numbers are always an indication.
If your application is not mentioned in above list, please contact Auxill Nederland.

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Test results

Waste water treatment – effluent polishing
As a result of various tests in waste water treatment plants we have compiled the following analyses of results; using the Auxill Micro Drum Filter in effluent polishing.

Waste Water Components	Before Filter	After Filter	Reduction
Fosfor, total DS 292	0.35 mg/l	0.08 mg/l	**77.14%**
BOD 5 DS 254 DS 2206	5.36 mg/l	2.70 mg/l	**49.63%**
Ammonia- Nitrogen ISO 7150/1	0.82 mg/l	<0.1 mg/l	**87.80%**
Suspended solids	9.18 mg/l	1.00 mg/l	**89.11%**

Test performed in Denmark December 1996

Suspended solids content			
Before installation MDF		**After installation MDF**	
January 22th, 1997	5.1	February 22th, 1998	2.8
February 12th, 1997	12.0	April 27th, 1998	2.1
March 18th, 1997	2.0	June 8th, 1998	1.4
April 1st, 1997	2.4	July 1st, 1998	1.7
May 26th, 1997	37.0		
June 6th, 1997	6.0		
August 25th, 1997	22.0		
September 17th, 1997			
September 30th, 1997	8.0		
October 22th, 1997	3.9		
November 17th, 1997	4.4		
December 1st, 1997	11.0		
Average	**10.5**	**Average**	**2.0**

The installation consisted of a MDF 2003 – 18 µ - after 4 tests the results were satisfying so that further testing was not requested by customer

Potato processing plant – removal of starch out of washing water
As a result of various tests in industrial production plants we have compiled the following analyses of results, using the Auxill Micro Drum Filter in effluent polishing.

Waste Water Components	Before Filter	After Filter	Reduction
Flow (total)	1800 l/h	1674 l/h	126 l/h (slurry)
Flow	100 %	93 %	7 %
COD	17400 mg/l	8960 mg/l	48.5 %
N-Ki	319 mg/l	185 mg/l	42.0%
Suspended solids	6890 mg/l	180 mg/l	97.4 %

Tests performed at the Danisco Food Factory in Holland May 1999 with MDF 801-20µ
Objective to save on waste water treatment charges was achieved by a possible saving of € 450,=/day

Potato processing plant – removal of starch out of washing water

Waste Water Components	Before Filter	After Filter	Reduction
Flow (totaal)	800 l/h	764 l/h	36 l/h (slurry)
Flow	100 %	95.5%	4.5 %
Suspended solids	25 mg/l	8 mg/l	68 %

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