

TREATMENT PRODUCTS CORPORATION

Wastewater Treatment & Recovery Systems
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Heavy Metals Removal

CROSS-FLOW MICRO-FILTRATION

APPLICATIONS

- Electro Plating
- Steel Manufacturing
- Latex processing
- Wire Manufacturing
- Metal Finishing
- Electronics Industry
- Battery Manufacturing
- Laundries
 - Printed Circuit Board Manufacturing
 - Metal Forming and Rolling
 - Can Manufacturing

BENEFITS

- **Agglomeration:** As the solids concentrate in the recirculation tank and the concentration increases natural coagulation and agglomeration occurs. In most applications the concentrate is easily dewatered without sludge conditioning. Typically filter presses or bag filters are used to dewater the sludge.
- **Salt Rejection:** Many Cross-Flow Micro-Filtration users report a reduction in dissolved salts of the filtrate compared to the inlet waste composition. This reduction in dissolved salts is presumed to be a result of a combination of encapsulation of salts within the sludge and membrane boundary layer effects.
- **Recycling, Water Reuse:** In many operating Micro-Filter Systems the filtrate salts are monitored by conductivity and recycled to process with only periodic blowdown to sewer.
- **Chemical Recovery:** Some sludges have value. An example is ferric hydroxide sludge from steel pickling processes. This sludge can be concentrated to a 10% plus slurry while producing a filtrate containing less than 0.2 PPM of Iron. The resulting concentrate is then mixed with the spent pickle liquor and sold to municipal treatment plants. The dissolved solids in the filtrate may also be valuable. An example of this is the recovery of sodium sulfate from electrolytic pickling.
- **Effluent Quality:** Produces a lower effluent metals levels than conventional systems. Most metals typically reduced below 0.5 ppm.
- **Reduction of Sampling Cost:** Sampling cost and laboratory charges can be substantially reduced or eliminated via recycling.
- Easy to Install
- Simple Operation
- Rugged Construction
- Automatic Controls
- Positive physical barrier
- Low Operating Pressure
- Consistent Filtrate Quality
- Semi -Automatic Cleaning
 - 0.2 Micron Absolute Porosity

BACKGROUND

One of the most prominent applications for Cross-Flow Micro-Filtration Systems is the processing of metal finishing and other wastes for the removal of metals by precipitation and filtration.

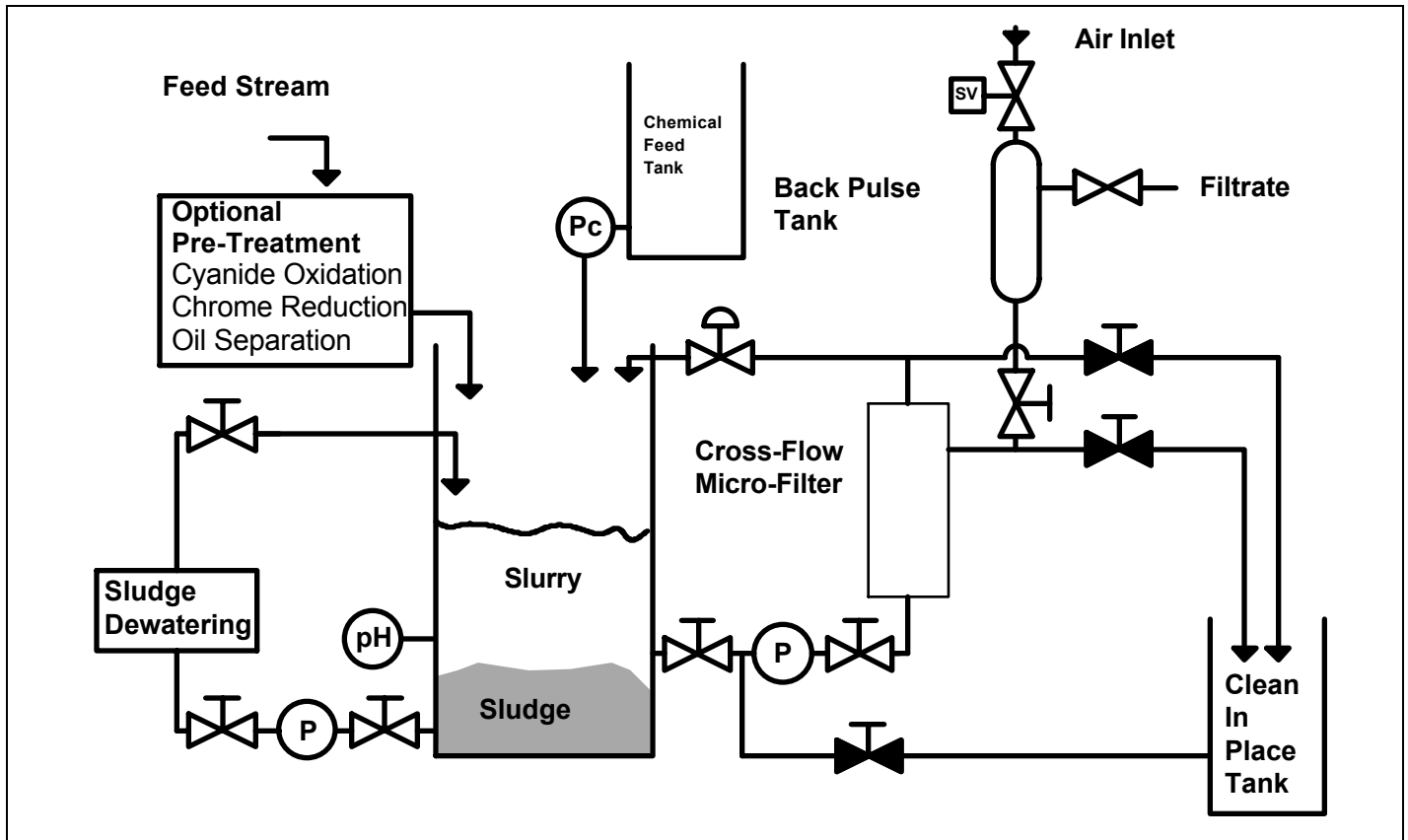
Historically this process has been achieved utilizing continuous clarifiers or batch settling units. Polyelectrolytes (polymers) and/or flocculating agents are added to agglomerate the small particles that form as the dissolved metals precipitate. The size and density of the particle is key to achieving effective separation by gravity settling. Gravity settling methods have the principle drawback that administering the right dosage of polymer and/or flocculant is essential to achieve the proper particle size. Underfeeding results in ineffective removal and overfeeding is costly and often result in ineffective removal and fouling or cementation of post filtration systems. These problems can be difficult even with a wastewater of consistent composition and flow but often become insurmountable when the wastewater composition and flow vary frequently and widely as is common with most combined process streams. Often a full time operator is required to make the constant adjustments that are necessary to maintain compliance with discharge requirements.

Frequently the traditional clarification system is quite larger and consumes a large amount of valuable floor space. To achieve compliance with today's discharge standards it is often necessary to use polishing filtration for removal of residual suspended solids.

PROCESS OPERATION

The Cross-Flow Micro-Filter resembles a shell and tube heat exchanger with porous tubular membranes. The sludge concentrate is recirculated at high axial velocities through the tubes and clean filtrate passes radially through the tube walls. The sludge is periodically or continually removed from the recirculation tank for dewatering or disposal. The 0.2 micron porous tubes provide a positive physical barrier to the metal precipitant. The precipitated metals are removed without the aid or use of agglomerating agents.

The recirculation flow helps to continuously clean the tube walls. Eventually solids foul the membrane and reduce the filtrate rate. To maintain high filtrate rates a backpulse system is often utilized. The backpulse system uses pressurized air to periodically force filtrate momentarily backward through the tube walls. The solids are pulsed off the interior tube wall surface and are swept from the filter by the recirculation stream. Eventually the membranes are fouled to the point where chemical cleaning is required. For metals removal applications the membranes are typically cleaned by pumping dilute acid backward through the tubular membranes. Typical cleaning frequency based on 24 hour a day operation is once a week and requires approximately 20 minutes.



Schematic Representation of a Typical Cross-Flow Micro-Filtration Heavy Metals Removal System

GENERAL SPECIFICATIONS

MODEL	TYPICAL FLOW GPD	PUMP TYPE	UNIT DIMENSIONS Inches			SHIPPING WEIGHT Pounds
			Length	Width	Height	
CFMF-HMR-05-CC	540 - 720	electric	36	24	72	725
CFMF-HMR-1-CC	1080 - 1,440	electric	36	24	105	750
CFMF-HMR-1-LC	1080 - 1,440	electric	52	40	110	750
CFMF-HMR-2-CC	2,160 - 2,880	electric	36	24	105	900
CFMF-HMR-2-LC	2,160 - 2,880	electric	52	40	110	900
CFMF-HMR-4	4,320 - 5,760	air	132	24	78	2,100
CFMF-HMR-8	8,640 - 11,520	air	192	24	78	2,200
CFMF-HMR-8E	8,640 - 11,520	electric	192	24	78	2,200
CFMF-HMR-16	17,280 - 23,040	electric	192	24	78	2,500
CFMF-HMR-24	25,920 - 34,560	electric	210	36	90	2,900
CFMF-HMR-32	34,560 - 46,080	electric	210	36	90	3,200

MATERIALS OF CONSTRUCTION: Units are fabricated completely of corrosion resistant materials. The cross-flow micro-filter module and tubular membrane are of polypropylene construction. Piping is schedule 80 PVC. The structural steel skid is coated with epoxy phenolic paint. The controls are housed in a NEMA-4X fiberglass enclosure.

For further information contact.

Represented By:



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