

## Features (cont'd)

### Financial Performance

- High capacity to footprint ratio
- Short payback period--ROI
- Dramatically extends useful life of water and chemicals
- Greatly reduces operation & maintenance costs
- Greatly reduces wastewater treatment costs
- Low energy consumption with energy-efficient design

## Applications

**Clariflo**® heavy metal extraction systems now offer industry an affordable clarification technology for significantly reducing water consumption and wastewater treatment.



Custom Fabrication Services

**Testing:** Sample testing is conducted on-site at your facility for preliminary system sizing and to determine suitability for your application.

**Product Warranty:** **Clariflo** systems and subsystems are warranted to be free from defects for a period of one (1) year from the date of installation or 18 months after shipment, whichever occurs first.

**Performance Guarantee:** All products and services offered by **ENGINEERING FLUID SOLUTIONS, LLC** are guaranteed on quality and performance. Performance guarantees are written to meet owner-driven specifications.

## ENGINEERING FLUID SOLUTIONS

11190 W Center Ave  
Lakewood, Colorado 80226

Phone: 303.478.7201

Email: [info@efsfilter.com](mailto:info@efsfilter.com)

Website: [www.efsfilter.com](http://www.efsfilter.com)



Complete-packaged Clarification Systems

### Product Registration

The **Clariflo**® name and logo are registered trademarks owned by **ENGINEERING FLUID SOLUTIONS, LLC**. **Clariflo**® systems and subsystems (hydraulic & electrical controls) are the intellectual property of **ENGINEERING FLUID SOLUTIONS, LLC**.



Contact **EFS** and let us show you how to improve product quality at a much lower cost--**Clariflo** sales, service and support are provided directly by **ENGINEERING FLUID SOLUTIONS, LLC**. This brochure may be downloaded and printed from the **EFS** website.

 **Clariflo**® is proudly made in the USA

©2017 **ENGINEERING FLUID SOLUTIONS (EFS, LLC)**



[www.clariflo.com](http://www.clariflo.com)

## HEAVY METAL EXTRACTION SYSTEM

*Industrial Clarification Systems by ENGINEERING FLUID SOLUTIONS*

*SAVING WATER, CHEMICALS & ENERGY*



**ENGINEERING FLUID SOLUTIONS (EFS, LLC)** announces its revolutionary **Clariflo**® heavy metal extraction system. **EFS** developed **Clariflo** in response to pressing industry needs—simply, industry wanted a more affordable clarifier requiring only minimal effort to operate, maintain and control. **Clariflo** is a complete-packaged clarification system that includes all tanks, pumps, piping, controls and dewatering equipment. The system relies on enhanced physio-chemical sedimentation for removing salts, heavy metals and suspended solids from industrial process waters. **Clariflo** allows industry to significantly extend the life of process water and thereby reduce operation costs and maintenance-related costs. With **Clariflo**, soluble heavy metals are desirably precipitated as metal hydroxides and disposed more amenably in



CLARIFLO Systems Tested On-site

### CLARIFLO Heavy Metal Extraction System



## The Solution

Original manufacturers and remanufacturers are bound by ever-increasing discharge limits for heavy metals, making it more and more difficult to sustain viable profit margins. Typical industrial clarification systems use permanent lamella plate packs and conventional pH probes—this approach to heavy metal extraction carries high initial capital investment and also high incremental cost in maintaining and replacing conventional pH probes. Additionally, performance of conventional systems may be erratic in response to temperamental pH probe readings.

Instead of heavy permanent plate packs, **Clariflo**<sup>®</sup> uses light, yet durable polypropylene tube modules that are easily removed for tank cleaning and inspection. **Clariflo** offers versatility in making easy on-site adjustments to optimize your process. Using enduring control parameters under flow-paced hydraulics, **Clariflo** now satisfies industry's need for more affordable clarification.

### Product Description

The packaged system includes the following standard equipment:

#### Tanks

- Reaction chamber
- Clarifier tank w/ removable tube modules



Plastic Tube Module Removed from CLARIFLO Tank



Top View of CLARIFLO Tank with Tube Media Installed

#### Hydraulics & Pneumatics

- Head & transfer pumps w/ inverter
- Strainers
- Control valves
- Chemical dosing system
- Pneumatic control system
- Pipe, valves & fittings

#### Controls

- Instrumentation
- Local system controller w/ operator interface

#### Structural

- Service platforms
- Access stairs & handrails

#### Solids Dewatering Options

- Centrifuge (fully automatic or semi-automatic)
- Settling tank
- Filter press
- Pump station

### Engineering Services

**Clariflo** comes as a complete-packaged system that includes the following Project Management services:

- On-site consultation & application engineering
- Contracting & project specifications
- System design
- Engineered equipment selection
- Equipment procurement
- Fabrication
- On-site trial & performance testing
- Final design package
- Shipping & transport
- Equipment erection, arrangement & installation
- System start-up, adjustment, monitoring, testing, verification & validation
- System turn-over to Owner complete w/ final test results and IOM Manual



Turnkey Clarification Systems

### Specifications

- **Principle of Operation:** enhanced physio-chemical sedimentation
- **Footprint:** Minimum--4' x 6' (1m x 2m)
- **Clarifier Tank:** carbon steel with electrostatically applied epoxy coat (option in stainless steel or polypropylene)
- **Settling Media:** polypropylene tube modules (optional in removable stainless steel plates)
- **Packaging:** fully assembled on-site, tested & validated
- **Installation:** no specialty tools required; easily disassembled, transported and reassembled
- **Hydraulic Capacity:** zero gpm to limitless
- **Particle Removal Efficiency:** greater than 90%
- **Particulate Size Removal:** submicron
- **Electrical Power Input:** 240/480 VAC 3-phase, 60 hz (alternative voltage, phase and frequency available)
- **Control Voltage Output:** 120 VAC (optional 24 VDC or 24 VAC)
- **Compressed Air Supply:** 50 psig (345 kPa)
- **Temperature:** up to 211° F (99° C)
- **Instrumentation:** temperature, flowrate (optional: pH, conductivity & TSS)
- **pH Control:** flow-paced (other pH control options available)
- **Four Modes of Operation:** 1) normal run mode, 2) blowdown mode, 3) drain mode and, 4) fill mode
- **Control:** local system controller (system easily relinquishes control to a master controller)



CLARIFLO Controller

#### \*\*Hydraulic Options\*\*

1. Filter-to-waste (manual or automatic)
2. Blowdown (manual or automatic)
3. Sampling stations
4. Cascaded hydraulics w/ other process tanks

### Cost Savings

With **Clariflo**<sup>®</sup>, Operators are not stopping operation, dumping the process tanks and descending into them every day to clean and refresh. Instead, daily operation

is uninterrupted, realizing higher product throughput. Product quality is improved and consistent. In operating **Clariflo** systems, industrial users have realized significant cost savings that include the following:

- On-site waste treatment costs
- Municipal waste treatment costs
- Environmental cost burden
- Incremental costs greatly reduced as no consumable filtration media required and no disposable pH probes
- Purchasing, administration and inventory costs
- Disposal costs
- Water supply costs
- Operation & maintenance costs
- Opportunity costs with greater product throughput
- Fewer product returns and less rework
- Less chemical consumption
- Less solid carryout and carryover

### Features

#### Operation

- Greatly reduces total suspended solids (TSS)
- Greatly reduces total dissolved solids (TDS)
- Greatly reduces heavy metal concentrations
- Increases product throughput
- High temperature applications
- Improves and maintains consistent product quality
- Manual or automatic blowdown
- Manual or automatic filter-to-waste
- Easily relinquishes local control to a master controller

#### Maintenance

- Open design allows easy access to all components
- Easily retrofits or outfits as original equipment
- Easily disassembled and reassembled with no specialty tools required
- Minimal moving parts
- Controls adjustable and easily understood
- Tube modules easily removed for cleaning and inspection

#### Hydraulic Performance

- Handles high loading rates (influent TSS>1000 mg/L)
- Easily adapts to existing process configurations & ergonomically orients to Operator
- May be connected hydraulically in-line or in sidestream
- Integral flow switches and alarms prevent pumps from running dry
- Solid purge system integrally arranged with blowdown
- Capable of reclaiming liquids and/or solids
- Environmentally sound with filter-to-waste option
- Self-priming pump good for low suction head and lift applications
- No strict physical property requirements of solids in specific gravity, size, shape or character