Equipment and Services
Reference Guide

Rental
Sales
Design
Installation
Operation
Clear Solutions for Water Treatment

Clear Creek Systems, Inc. provides turnkey solutions for a wide range of water treatment projects. For over 20 years, Clear Creek has served civil, commercial, industrial, and residential development clients with custom designed temporary treatment systems and services. Employing our extensive rental fleet and partner resources to address contaminants including but not limited to:

- Suspended Solids
- Turbidity
- pH
- Hydrocarbons
- Metals
- Organic Compounds
- Nitrates

Our strength lies in our ability to move seamlessly from project evaluation to treatment system design, permitting, mobilization and compliance.

We pride ourselves in finding the most cost effective method to solve each project’s unique treatment and operating challenges, while achieving regulatory compliance.

Call us today to discuss your project.
Services

Services Provided
- Full Service System Design, Set-Up & Operation
- Complete System Rental/Sales
- Equipment Rentals
- Emergency Response
- CAD Layout Design
- Discharge Permit Assistance
- Slurry Engineering
- ATS Plans

System Applications
- Construction Storm Water Treatment
- Ground Water Treatment
- Dewatering
- Industrial Storm Water Treatment
- Waste Water Treatment
- Water Recycling/Reuse
- pH Adjustment
- Slurry and Solids Separation
- Site Remediation

Materials
- Particulate Filter Bags & Cartridges
- Carbon and Clay Media
- Chitosan and other Polymer Flocculents
- Ion Exchange Resins

Treatment Technologies
- Activated Carbon Treatment
- Organoclay Treatment
- Chitosan Flocculent
- Specialty Flocculents
- Reverse Osmosis
- Ion Exchange Resin
- CO2/Acid Injection
- Centrifuges
- Slurry Shakers
- Water Quality Monitoring Equipment
- Sand Filtration
- Bag & Cartridge Filtration

Rental Equipment
- Active Treatment Systems/CESF Systems
- Tanks
- Pumps
- GAC & Other Media Vessels
- Bag, Cartridge & Sand Filters
- Slurry Separation Equipment
- pH Adjustment Units/Chemical Metering Systems
- Oil Water Separators
- Water Quality Monitoring
Features

- Skid mounted, high rate automatic backwashing sand filters designed for general-purpose water filtration of organic and inorganic solids
- Ultra 116 automatic filter controller
- Flush activation based on elapsed time, manual activation and/or pressure differential

Technical

- Filtration to 20-30 microns
- Design pressure 80-100 psi maximum
- Requires 110V AC
- Compressed air – 5 cfm minimum at 60 psi supplied by integrally mounted compressor
SF100
• Capacity 95-142gpm (normal flow range)
• 5’ 6” H x 2’ 4” W x 6’ 9” L
• Equipment only weight 860 lbs.
• Media only weight 1,850 lbs.
• Operational weight 3,400 lbs.
• Inlet/Outlet 3” flange, backwash line 2”
• 13.5 sq ft of total filtration area
• Backflush 47gpm
• Design pressure - 100 psi maximum

SF150
• Capacity 147-221gpm (normal flow range)
• 5’ 8” H x 2’ 9” W x 8’ 9” L
• Equipment only weight 1,160 lbs.
• Media only weight 2,850 lbs.
• Operational weight 5,200 lbs.
• Inlet/Outlet 4” flange, backwash line 2”
• 14.7 sq ft of total filtration area
• Backflush 74gpm
• Design pressure - 100 psi maximum

SF200
• Capacity 213-320gpm (normal flow range)
• 6’ 3” H x 3’ 3” W x 9’ 9” L
• Equipment only weight 1,720 lbs.
• Media only weight 4,200 lbs.
• Operational weight 7,000 lbs.
• Inlet/Outlet 4” flange, backwash line 4”
• 21.3 sq ft of total filtration area
• Backflush 107gpm
• Design pressure - 100 psi maximum

SF300
• 4 pod capacity 284 - 426 gpm (norm. flow range)
• One of the 4 pods can be isolated by a valve
• 3 pod capacity - 213 - 320 gpm (norm. flow range)
• 5’ 8” H x 3’ 6” W x 13’ 1” L
• Equipment only weight 2,300 lbs.
• Media only weight 5,600 lbs.
• Operational weight 9,300 lbs.
• Inlet/Outlet 6” flange, backwash line 4”
• 28.4 sq ft of total filtration area
• Backflush 107gpm
• Design pressure - 100 psi maximum
SF400
- Capacity 477-716 gpm (norm. flow range)
- 6’ 4” H x 5’ 0” W x 16’ 1” L
- Equipment only weight 3,600 lbs.
- Media only weight 9,825 lbs.
- Operational weight 19,350 lbs.
- Inlet/Outlet 4” flange, backwash line 3”
- 47.7 sq ft of total filtration area
- Backflush 240gpm
- Design Pressure - 80 psi maximum

SF500
- Capacity 504-756 gpm (normal flow range)
- 7’ 4” H x 4’ 5” W x 17’ 1” L
- Equipment only weight 3,920 lbs.
- Media only weight 11,250 lbs.
- Operational weight 18,000 lbs.
- Inlet/Outlet 8” flange, backwash line 4”
- 50.4 sq ft of total filtration area
- Backflush 189gpm
- Design Pressure - 80 psi maximum

SF600
- Capacity 636-954 gpm (normal flow range)
- 6’ 4” H x 5’ 2” W x 20’ 1” L
- Equipment only weight 4,900 lbs.
- Media only weight 14,500 lbs.
- Operational weight 26,900 lbs.
- Inlet/Outlet 6” flange, backwash line 4”
- 63.6 sq ft of total filtration area
- Backflush 240 gpm
- Design Pressure - 80 psi maximum
Features

- Flows from 50 gpm thru 1,000 gpm
- Replaceable filtration bags from 1 to 800 micron nominal rating
- Inlet and outlet pressure gauges
- Skid mounted
- 1” dump drains
- Stand-alone unit for sediment removal
- Unit can be used in combination with other filtration units

Technical

- Initial pressure drop is less than 5psi @ max gpm
- Units hold standard Type II, 7” x 30” bags
- Maximum operating temp 225 F
- Maximum operating pressure range 100 to 150 psig
- Filters constructed of 304 stainless steel or carbon steel
**B200**
- Flows Up to 200 gpm
- Two (2) 304 stainless steel bag filter housing
- Estimated weight – 900 lbs.
- Manifolds with valves for chamber isolation
- 3” Cam lock inlet and outlet
- 65” H x 56” W x 31” L
- Skid mounted with lifting lug

**B500**
- Flows Up to 500 gpm
- One single 304 stainless steel filter housing
- Estimated weight – 450 lbs.
- 5 Bag capacity
- 4” Cam inlet and outlet
- 78” H x 39” W x 48” L

**B1000**
- Flows up to 1000 gpm - high flow filtration
- One single carbon steel filter housing
- Estimated weight – 900 lbs.
- 8 Bag capacity
- 8” Flanged inlet and outlet
- 92” H x 36” W x 48” L
Features

• Replaceable filtration cartridges rated from 0.5 to 100 micron
• No moving parts
• Skid or trailer mounted
• Valves for isolation and ease of use

Technical

• Units fitted with air bleed valves and pressure gauges
• Unit can be used alone or in combination with other filtration units
• Initial pressure drop is less than 5 psi at the unit’s maximum listed flow rate
• Cartirdge filters for suspended sediment removal
**PF50**
- Up to 50 gpm
- Dual bag and cartridge filtration
- One single bag filter capacity chamber
- Bag/cartridge filter chambers connect in series
- 304 stainless steel chambers
- Estimated weight – 550 lbs.
- 2” Camlock inlet and outlet
- 71” H x 36” W x 66” L
- Uses one 7” x 30” double-stitched bag filter
- Uses five 40” double open ended cartridges
- Maximum operating pressure 75 psi

**PF200**
- Up to 200 gpm
- Dual bag and cartridge filtration
- Two single bag filter chambers
- Bag and cartridge filter chambers connect in series
- Chambers and piping are 304 stainless steel
- Estimated weight – 1,100 lbs.
- 3” Camlock inlet and outlet
- 84” H x 48” W x 75” L
- Uses two 7” x 30” double-stitched bag filter
- Uses twelve 40” double open ended cartridges
- Maximum operating pressure 75 psi

**PF400**
- Up to 400 gpm
- Dual bag and cartridge filtration
- Bag and cartridge filter chambers connect in series
- Chambers and piping are 304 stainless steel
- Estimated weight – 2,200 lbs.
- 3” Camlock inlet and outlet
- 54” H x 82” W x 91” L
- Uses four 7” x 30” double-stitched bag filter
- Uses twenty four 40” double open ended cartridges
- Maximum operating pressure 75 psi
PF500
- Up to 500 gpm
- String wound cartridge filtration
- Multiple cartridge filters provide large surface area for longer service life
- Excellent for removal of particles, sediment, shavings, sand, or other material from water
- One filter chamber
- Chamber constructed of carbon steel
- Estimated weight – 450 lbs.
- 6” 150# flanges on inlet and outlet
- 78” H x 39” W x 48” L
- Uses 45 replaceable 40” double open ended cartridges
- Maximum operating pressure 150 psi

PF1000
- Up to 1000 gpm
- String wound cartridge filtration
- Multiple cartridge filters provide large surface area for longer service life
- Excellent for removal of particles, sediment, shavings, sand, or other material from water
- One filter chamber with 90 filter capacity
- Chamber constructed of carbon steel
- Estimated weight – 900 lbs.
- 6” 150# flanges on inlet and outlet
- 92” H x 36” W x 48” L
- Uses 90 replaceable 40” double open ended cartridges
- Maximum operating pressure 150 psi
- Maximum operating temperature 250 degrees
- Initial pressure drop is less than 5 psi @1,000 gpm
Media Filters
Media Filters

Features

• Durable carbon steel construction
• Epoxy lined interior
• Maximum operating pressure of 75 psi
• Lifting lugs and fork guides to facilitate moving/placement
• Manifold valves, sample ports and pressure gauges

Technical

• Equipped with air relief valve and pressure gauges
• Units handle the following media:
  • Carbon
  • Clay
  • Ion Exchange Medias
CM18
- Media capacity – 18 cubic feet
- Maximum recommended flow rate – 25 gpm
- Estimated weight empty – 450 lbs.
- Media capacity by weight – GAC- 500 lbs.
- 12” x 16” elliptical manways for easy access
- 2” NPT inlet and outlet
- Design pressure- 75 psi max
- 2’ 8” W x 5’ 2” T

CM36
- Media capacity – 36 cubic feet
- Maximum recommended flow rate – 50 gpm
- Estimated weight empty – 650 lbs.
- Media capacity by weight – GAC- 1,000 lbs.
- 12” x 16” elliptical manways for easy access
- 2” NPT inlet and outlet
- Design pressure - 75 psi max
- 3’ 8” W x 5’ 4” T

CM72
- Media capacity – 72 cubic feet
- Maximum recommended flow rate – 70 gpm
- Estimated weight empty – 925 lbs.
- Media capacity by weight – GAC - 2,000 lbs.
- 12” x 16” elliptical manways for easy access
- 2” NPT inlet and outlet
- Design pressure- 75 psi max
- 4’ W x 8’ T
CM360
- Media capacity – 360 cubic feet
- Vessel diameter – 6 ft
- Inlet/outlet- 150# 6” flange
- Shipping weight - 5,500 lbs.
- Operating weight - 80,000 lbs.
- 72” W x 117” H (on supports)

CM720
- Media capacity – 720 cubic feet
- Vessel diameter – 10 ft
- Process pipe- 3” or 4” 125# ANSI flange
- Shipping weight - 15,000 lbs.
- 19’ T x 9’ W
- Vent connection - 3” flange
Tanks

Features

• 21,000 gallon storage capacity
• Sloped bottom units available
• Coated smooth interior walls
• Multiple flanged front and back end ports
• High visibility stairs, railings and catwalk with non-slip safety features
• Side manways for easy access and cleaning
• Compact footprint
Open Top
- Dimensions - 39’ 9” L x 8’ 5” W x 11’ 4” H
- (4) 6” Front ports and (2) 6” rear ports
- Rear stairwell
- Internal high discharge riser tube (adjustable)
- 25,000 lb. dry weight
- Over the road height 12’ 10”
- Full length observation walkway with OSHA handrails - rail height 44”
- 20” curbside manway
- No internal bracing for ease of cleaning

Open Top w/Weir
- Dimensions - 39’ 9” L x 8’ 5” W x 11’ 4” H
- (4) 6” Front ports and (2) 6” rear ports
- Steel bisecting over-weir with 6” bypass
- Rear stairwell
- Internal high discharge riser tube
- 25,000 lb. dry weight
- Over the road height 12’ 10”
- Full length observation walkway with OSHA handrails - rail height 44”
- 20” curbside manway
- No internal bracing for ease of cleaning

Vapor Tight
- Vapor tight
- Dimensions - 47’ 8” L x 8’ 6” W x 10’ 6” H
- 20,000 lb. dry weight
- Jayco pressure/vacuum thief hatch
- Internal high discharge riser tube
- (3) 22” side hinged access hatchways
- (1) 6’ and (1) 4” front port with valve
- (1) 8” Flanged front port
- (3) 6” Rear ports with valve
- 3” Top fill tube and 4” top flanged port

Closed Top
- Closed Top – 21,000 Gallon
- Overall Dimensions - 45’ 2” L x 8’ 6” W x 9’ 10” H
- 20,000 lb. dry weight
- (2) 20” side hinged access hatchways
- (3) 6” Inlet front and back with Low/Mid/High
- 3” Top fill tube and 4” top flanged port
- Front Stairway with Handrails
Features

- Real time continuous monitoring:
  - pH
  - Turbidity
  - Flow
  - Data Logging
  - Available in insulated and non-insulated containers
  - Remote monitoring and control capabilities
  - Custom designs available
Active Treatment System Modules
• Complies with Attachment “F” of CGP
• CESF systems meet the requirements of the WA State Dept. of Ecology’s (Ecology) best management practice (BMP) C250
• Monitors for:
  - pH
  - Turbidity
  - Flow rate
  - Data Logging
  - Remote Access Capable

Auto Power Transfer Switch
• Size range up to 600 amps

Cellular Auto Notification System
• Programmable
• Assignable Alarm Conditions

pH Adjustment
• Gas or liquid
• Automatically raise or lower pH
• Local or remote alarms available
Oil Water Separation

**Features**

- Removes free and disperseased non-emulsified oil
- Removes settleable solids
- Gravity flow oil skimmer
- Easy cleaning via removable vapor tight cover & bottom drains
- No moving parts
- No power required
- Portable - skid mounted

**Technical**

- Parallel corrugated plate gravity displacement type separator gpm
- Design in accordance with AP1421 to remove free and dispersed non-emulsified oil and settleable solids
- Coalescing pack is polypropylene with 1/2” media standard
**OWS100**
- Flows Up to 100 gpm
- Meets API 421 specifications
- Chambers constructed of 304 stainless steel
- 3” NPT inlet and outlet
- Trailer mounted unit has leveling jacks

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**OWS200**
- Flows Up to 200 gpm
- Meets API 421 specifications
- Chambers constructed out of steel
- 6” 150# flange inlet and outlet
- 2” Sludge Drain

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**OWS250**
- Flows Up to 250 gpm
- Meets API 421 specifications
- Chambers constructed out of steel
- 6” 150# flange inlet and outlet
- 2” Sludge Drain

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**OWS300**
- Flows Up to 300 gpm
- Meets API 421 specifications
- Chambers constructed out of carbon steel
- 8” 150# flange inlet and outlet
- 2” Bottom drain
Features

- Submersible pumps
- Diesel driven, solids handling, sound attenuated, trailer mounted
- Electric skid mounted booster
- High head and high volume
- Head capacities to over 300’
- Flow rates over 6,000 gpm
- Auto start/stop control panels available
- Durable construction
- Floating suction available
**Electric Submersible**
- Size Range 1/2” to 12”
- Power Range .5 hp thru 95 hp
- Voltage:
  - 115v/1phase
  - Single or 3-phase
  - 460v/3-phase

**Electric Centrifugal Drive**
- Size Range 2” thru 8”
- Power Range 5hp thru 50hp
- Voltage:
  - Single or 3-phase
  - 460v/3-phase

**Diesel Drive Centrifugal**
- Size Range 4” thru 12”
- Flow Rates > 6,000 gpm
- Trailer Mounted
- Self-Prime
- Vacuum Prime Assist
- CARB compliant

**Diesel Drive Centrifugal Sound Attenuated**
- Size Range 4” thru 12”
- Flow Rates > 6,000gpm
- Quiet Operation
- Vacuum Prime Assist
- CARB compliant
### Submersible Pumps Range

<table>
<thead>
<tr>
<th>Submersible Pump Performance in GPM</th>
<th>Total Dynamic Head Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10'</td>
</tr>
<tr>
<td>1HP 2&quot; Single Phase</td>
<td>78</td>
</tr>
<tr>
<td>3HP 2&quot; Single Phase</td>
<td>125</td>
</tr>
<tr>
<td>4HP 2&quot; 3 Phase</td>
<td>145</td>
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<tr>
<td>5HP 3&quot; 3 Phase</td>
<td>210</td>
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<tr>
<td>7.5HP 4&quot; 3 Phase</td>
<td>425</td>
</tr>
<tr>
<td>10HP 6&quot; 3 Phase</td>
<td>800</td>
</tr>
<tr>
<td>15HP 6&quot; 3 Phase</td>
<td>1500</td>
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<tr>
<td>20HP 6&quot; 3 Phase</td>
<td>1550</td>
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<tr>
<td>20HP 6&quot; 3 Phase HH</td>
<td>625</td>
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<tr>
<td>30HP 4&quot; 3 Phase HH</td>
<td>590</td>
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<tr>
<td>40HP 6&quot; 3 Phase HH</td>
<td>600</td>
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<tr>
<td>40HP 4&quot; 3 Phase HH</td>
<td>325</td>
</tr>
<tr>
<td>40HP 12&quot; 3 Phase</td>
<td>4000</td>
</tr>
<tr>
<td>58HP 8&quot; 3 Phase</td>
<td>3700</td>
</tr>
<tr>
<td>95HP 10&quot; 3 Phase</td>
<td>5500</td>
</tr>
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</table>
# Diesel & Electric Centrifugal Pump Range

<table>
<thead>
<tr>
<th>Pump Performance GPM @ Various RPM</th>
<th>Total Dynamic Head</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>20'</td>
</tr>
<tr>
<td>4&quot; x 4&quot; Diesel</td>
<td>1300</td>
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<tr>
<td>4&quot; x 4&quot; HP Diesel</td>
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<tr>
<td>6&quot; x 6&quot; HP Diesel</td>
<td></td>
</tr>
<tr>
<td>6&quot; x 6&quot; Diesel</td>
<td>2300</td>
</tr>
<tr>
<td>8&quot; x 8&quot; Diesel</td>
<td>3800</td>
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<tr>
<td>10&quot; x 8&quot; HP Diesel</td>
<td>4700</td>
</tr>
<tr>
<td>12&quot; x 12&quot; Diesel</td>
<td>8800</td>
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## Skid Mounted Electric Booster Pumps

<table>
<thead>
<tr>
<th></th>
<th>10HP Electric</th>
<th>20HP Electric</th>
<th>50HP Electric</th>
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<tr>
<td></td>
<td>340</td>
<td>330</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td>320</td>
<td>280</td>
<td>2400</td>
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<tr>
<td></td>
<td>280</td>
<td>240</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td>280</td>
<td>240</td>
<td>2300</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>270</td>
<td>2200</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>270</td>
<td>1900</td>
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<td>200</td>
<td>270</td>
<td>1600</td>
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<td>200</td>
<td>270</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>

|                      | 650           | 500           | 200           |
|                      | 650           | 500           | 500           |
|                      | 650           | 500           | 500           |
|                      | 650           | 500           | 500           |
|                      | 650           | 500           | 500           |
|                      | 650           | 500           | 500           |
Generators
Generators

Features

• 15kW - 1 megawatt
• CARB Certified
• Sound attenuated
• Trailer mounted
• On-board fuel tank
• Auto start/stop capable
• Simultaneous single and three phase power
• Complete instrumentation
• Completely lockable enclosure
• Available with spill-guard secondary containment
## Generator Specifications

<table>
<thead>
<tr>
<th>Output</th>
<th>15KVA</th>
<th>25KVA</th>
<th>45KVA</th>
<th>60KVA</th>
<th>75KVA</th>
<th>125KVA</th>
<th>150KVA</th>
<th>220KVA</th>
<th>300KVA</th>
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</thead>
<tbody>
<tr>
<td>Standby Output</td>
<td>16.6KW</td>
<td>22KW</td>
<td>37.4KW</td>
<td>57.6KW</td>
<td>60KW</td>
<td>110KW</td>
<td>132KW</td>
<td>194KW</td>
<td>264KW</td>
</tr>
<tr>
<td>Prime Output</td>
<td>15KW</td>
<td>20KW (25kVA)</td>
<td>36KW (45kVA)</td>
<td>48KW (60kVA)</td>
<td>56KW (75kVA)</td>
<td>100KW (125kVA)</td>
<td>120KW (150kVA)</td>
<td>76KW (220kVA)</td>
<td>240KW (300kVA)</td>
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<tr>
<td>Voltage, Single Phase</td>
<td>120/240V</td>
<td>120, 127, 139, 240, 254, 277V Switchable</td>
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<tr>
<td>Voltage, Three Phase</td>
<td>208, 220, 240, 416, 440, 480V Switchable</td>
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<td>Sound Level dB</td>
<td>62</td>
<td>65</td>
<td>64</td>
<td>66</td>
<td>65</td>
<td>70</td>
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<td>Fuel Consumption</td>
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<tr>
<td>Full Load</td>
<td>1.4 GPH</td>
<td>1.7 GPH</td>
<td>2.7GPH</td>
<td>3.4GPH</td>
<td>4.7GPH</td>
<td>8.3 GPH</td>
<td>9.2 GPH</td>
<td>13.6 GPH</td>
<td>19.0 GPH</td>
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<tr>
<td>3/4 Load</td>
<td>1.1 GPH</td>
<td>1.3 GPH</td>
<td>2.0 GPH</td>
<td>2.7GPH</td>
<td>3.5 GPH</td>
<td>6.2 GPH</td>
<td>6.9 GPH</td>
<td>10.4 GPH</td>
<td>15.5 GPH</td>
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<tr>
<td>1/2 Load</td>
<td>0.8 GPH</td>
<td>0.9 GPH</td>
<td>1.5 GPH</td>
<td>2.2 GPH</td>
<td>2.6 GPH</td>
<td>4.2 GPH</td>
<td>4.8 GPH</td>
<td>7.7 GPH</td>
<td>11.1GPH</td>
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<tr>
<td>1/4 Load</td>
<td>0.6 GPH</td>
<td>0.6 GPH</td>
<td>1.1 GPH</td>
<td>1.3 GPH</td>
<td>1.6 GPH</td>
<td>2.8 GPH</td>
<td>3.2 GPH</td>
<td>4.5 GPH</td>
<td>5.9GPH</td>
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<tr>
<td>Amps</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Phase 120V</td>
<td>62.5A (2 sets)</td>
<td>55.5A (4 wire)</td>
<td>100A (4 wire)</td>
<td>133.3A (4 wire)</td>
<td>155.5A (4 wire)</td>
<td>277.5A (4 wire)</td>
<td>333.3A (4 wire)</td>
<td>489.9A (4 wire)</td>
<td>666.7A (4 wire)</td>
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<tr>
<td>Single Phase 240V</td>
<td>50A</td>
<td>27.5A (4 wire)</td>
<td>50A (4 wire)</td>
<td>66.7A (4 wire)</td>
<td>77.8A (4 wire)</td>
<td>138.9A (4 wire)</td>
<td>166.7A (4 wire)</td>
<td>244.4A (4 wire)</td>
<td>333.3A (4 wire)</td>
</tr>
<tr>
<td>Three Phase 240V</td>
<td>60A</td>
<td>108A</td>
<td>144A</td>
<td>168A</td>
<td>301A</td>
<td>361A</td>
<td>529A</td>
<td>722A</td>
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<td>Three Phase 480V</td>
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<td>54A</td>
<td>72A</td>
<td>84A</td>
<td>150A</td>
<td>150A</td>
<td>265A</td>
<td>361A</td>
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</tbody>
</table>
Features

• Pipe sizes from 1” to 48”
• Hose sizes from 1” to 12”
• Suction and Discharge
• Fire Hose
• HDPE Certa-Loc
• Wide range of materials for compatibility
• Rental and sales
• Road crossings available
• Temporary hydrants
**PVC Pipe**
- Pipe Size from .5” to 12”
- Gravity or Pressure Systems
- Operating pressure up to 300 psi
- Flexible System Design
- Durable
- No Special Equipment Required

**HDPE Pipe**
- Pipe Sizes 4” thru 48”
- Gravity or Pressure Systems
- Flexible System Design
- Durable

**Certa-Loc Yelomine**
- Pipe Sizes 2” thru 16”
- Gravity or Pressure Systems
- Flexible System Design
- Durable
- No Special Equipment Required

**Suction Hose**
- 10’ or 20’ sections
- Light weight
- Quick installation
- Size range 2” to 12” diameter
Lay-Flat/Discharge

<table>
<thead>
<tr>
<th>I.D.</th>
<th>MAX WP</th>
<th>LENGTH</th>
<th>WEIGHT</th>
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<tbody>
<tr>
<td>(IN)</td>
<td>(MM)</td>
<td>(PSI)</td>
<td>(MPA)</td>
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<tr>
<td>1 1/2</td>
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<td>1.38</td>
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Suction/Discharge

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<th>PITCH</th>
<th>MIN. BENDING BACKUP</th>
<th>WORKING PRESSURE</th>
<th>BURSTING PRESSURE</th>
<th>VACUUM</th>
<th>WEIGHT</th>
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<tbody>
<tr>
<td>(IN)</td>
<td>(IN)</td>
<td>(IN)</td>
<td>(IN)</td>
<td>(PSI)</td>
<td>(PSI)</td>
<td>(IN/HG)</td>
<td>(LB/FT)</td>
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<td>5.54</td>
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<td>130</td>
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<td>0.69</td>
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</tbody>
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Valves & Fittings

- Sizes 1/2” thru 24”
- PVC
- Cast Iron
- Brass
- Aluminum
- Stainless Steel

Cam & Groove Hose Ends

- Quick Connect Couplings are commonly used for Liquid and Solid Material applications.
- Size Range from 1/2” to 12”
- Available in Aluminum, Brass, Stainless Steel, Ductile Iron, Polypropylene or Nylon
Spill Containment
Rental Berms

Spill containment units that are easy to install and ready to use in minutes. Manufactured with bracketed, pop up or foam side walls, Berms are manufactured from UV and chemical resistant materials that are flexible, lightweight and durable. Optional accessories, such as protective ground matting, track guards and hose support bridges, ensure complete investment protection.

Features

• Three standard sizes available
• Custom solutions available
10’W x 10’L x 12”H
• Ideal for generators/pumps

10’W x 15’L x 12”H
• Ideal for generators/pumps

10’W x 50’L x 12”H
• Ideal for Frac Tanks
• Includes Berm Liner
We provide a wide variety of filtration medias and polymers to support your treatment project.

Polymers for flocculation and coagulation include:

- FlocClear™ Chitosan Biopolymer
- Cationic and Anionic Polymers
- Specialty polymers

Filtration Media

- Granular Activated Carbon (Virgin and Reactivated)
- Organoclay, including specialty blends
- Ion Exchange Resins
- Specialty medias for the removal of iron, manganese, nitrates and other constituents

Cartridge and Bag Filter Media

- Cartridge filters from 0.5 to 100 micron range
- Bag filters from 0.5 to 100 micron range
- Standard and custom sizes available
- Specialty materials for specialty project needs
**FlocClear™ Chitosan Polymer**
- CESF systems meet the requirements of the WA State Department of Ecology’s best management practice (BMP) C250
- General Use Level Designation (GULD)
- Onsite qualitative field residual test available
- Biopolymer

**Carbon & Clay Filtration Media**
- Virgin and reactivated granular activated carbon
- Liquid & Vapor Phase Carbon
- Organoclay, including specialty blends

**Ion Exchange Resin**
We supply specialized ion exchange resins and adsorbent solutions focused on reducing waste and operating costs.

The wide variety of contaminants needing removal often requires a customized approach. Some contaminants are removed by relying largely on the ion exchange properties of our resins (e.g. nitrate and uranium) while others (e.g. perchlorate and TOC) rely on the combination of unique ionic, adsorptive and hydrophobic characteristics of our specialty resins.

**Cartridge & Bag Filters**
- Size ranges from 0.5 to 100 Micron
- Job specific materials available
By applying our 18 years of experience in water treatment, we have developed a unique approach to the treatment of contaminated industrial storm water. Our CONSTANT COMPLIANCE™ approach provides the most reliable and cost effective method for solving your water discharge problems.

Our site-specific design includes:
- A site visit
- Storm water modeling
- Water treatment evaluation
- System pricing
- O & M estimating
- Rental and sales available

Our Constant Compliance™ System removes:
- Turbidity
- Hydrocarbons
- Metals – copper, zinc, nickel
- BOD and COD
- Bacteria and viruses
Clear Creek’s Constant Compliance™ Systems can also address issues such as pH adjustment, insufficient dissolved oxygen and water recycling.

The advantage of our pressurized sand filtration approach over gravity sand filtration is the ability to automatically backwash the system when the media loads up with solids. Gravity sand filtration systems require operators to inspect the system and remove the solids to prevent the raw water from backing up and overflowing into the discharge line.

Clear Creek’s Constant Compliance™ Systems can include these features for worry-free operations.

• System Monitoring
• Auto Start and Stop
• High Water Alarms
• Turbidity Probes
• pH Probes
• System Automation
• Containerized Enclosure
• Back up pumps

Clear Creek Systems designs, builds, permits, installs and supports all of our systems. We work with our clients and/or their consultants to provide the best solutions to meet your NPDES requirement.
Industry Terms and Definitions

ATS
Active Treatment System: A system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment. The ATS shall be designed by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a California Registered Engineer to capture and treat, within a 72-hour period, a volume equivalent to the runoff from a 10-year, 24-hour storm event.

BACT
Best available control technology is a pollution control standard mandated by the United States Clean Air Act. The U.S. Environmental Protection Agency (EPA) determines what air pollution control technology will be used to control a specific pollutant to a specified limit.

BMP
Best Management Practices is a term used in the United States and Canada to describe a type of water pollution control. Historically the term has referred to auxiliary pollution controls in the fields of industrial wastewater control and municipal sewage control, while in stormwater management (both urban and rural) and wetland management, BMPs may refer to a principal control or treatment technique as well.

CESF
Chitosan Enhanced Sand Filtration: Chitosan is a coagulant derived from waste crab and shrimp shells, designed for colloidal sediment suspensions in water. Once introduced, the water with suspended particles can be filtered through a sand bed, producing a clear filtrate that may be discharged to surface water. Unique to CESF, the chitosan becomes bound to the sediment particles and is completely captured in the sand filter so that only clear, clean water is discharged.

NPDES
As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

NTU
Nephelometric Turbidity Units (NTU) specified by United States Environmental Protection Agency is a special case of FTU, where a white light source and certain geometrical properties of the measurement apparatus are specified. (Sometimes the alternate form “nephelos turbidity units” is used).

Water Turbidity
The turbidity of a water sample is a measure of the extent to which the intensity of light passing through water is reduced by the suspended matter.

The turbidity of water is based upon a comparison of the amount of light passing through a given water sample with that passing through a standard sample. Traditionally, Turbidity is measured in standard units defined in terms of the depth of water to which a candle flame can be clearly distinguished.
Water Turbidity (cont.)
The sources of turbidity in natural water are attributable to suspended and colloidal material, the effect of which is to disturb clearness and diminish the penetration of light. Turbidity may be caused by several factors such as microorganisms and organic detritus, silica and other sands and substances including zinc, iron and manganese compounds, clay or silt. In addition, the result of natural processes of erosion or as waste from various industries such as mining, dredging, logging and others.

**Conversion and Measurement**

**Volume Conversion Chart**

<table>
<thead>
<tr>
<th>1 Million Gallons</th>
<th>1,336 Hundred Cubic Feet (HCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cubic Foot (CF)</td>
<td>3.06 Acre Feet (AF)</td>
</tr>
<tr>
<td>1 Hundred Cubic Feet (HCF)</td>
<td>748.05 Gallons</td>
</tr>
<tr>
<td>1 Acre Inch (AI)</td>
<td>27,154 Gallons</td>
</tr>
<tr>
<td>1 Acre Foot (AF)</td>
<td>3,630 Cubic Feet (CF)</td>
</tr>
<tr>
<td></td>
<td>325,851 Gallons</td>
</tr>
<tr>
<td></td>
<td>43,560 Cubic Feet (CF)</td>
</tr>
<tr>
<td></td>
<td>435 Hundred Cubic Feet (HCF)</td>
</tr>
</tbody>
</table>

**Friction Loss Calculations Explained**

Friction loss occurs when water passes through a hose or pipe. Distance, diameter, and the flow rate all affect friction loss. As water passes through a pipe, friction between the water and the inside surface of the pipe causes turbulence. This turbulence reduces the energy produced by the pump (PSI). As a result, the PSI at the other end of the hose will be lower. The higher the flow rate passing through a hose or pipe, the more turbulence and friction loss will result.

**Maximum Practical Flow Rates Through Pipe**

Unfortunately no single recommendation will be correct for all possible circumstances, but the table below can be used as a general guidance for the water flow capacity in Schedule 40 PVC pipe.

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Maximum Flow (gpm)</th>
<th>Velocity (ft/s)</th>
<th>Friction Head (ft/100ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50</td>
<td>4.9</td>
<td>4.2</td>
</tr>
<tr>
<td>2 1/2</td>
<td>75</td>
<td>5.1</td>
<td>3.7</td>
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<td>3</td>
<td>125</td>
<td>5.5</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>250</td>
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<td>6</td>
<td>750</td>
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<td>3.3</td>
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<td>2000</td>
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<td>3.1</td>
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<td>2500</td>
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<tr>
<td>12</td>
<td>4000</td>
<td>11.1</td>
<td>2.7</td>
</tr>
</tbody>
</table>
Approximate Full Load Current of Electric Motors

As a “rule of thumb,” amps per horsepower rating can be estimated as:

- 115 Volts motor - single-phase: 14 amps/hp
- 230 Volts motor - single-phase: 7 amps/hp
- 230 Volts motor - 3-phase: 2.5 amps/hp
- 460 Volts motor - 3-phase: 1.25 amps/hp

Always check nameplate information before designing protective devices, wiring and switchgear.

### Single-Phase Motors – HP and Full-Load Currents

<table>
<thead>
<tr>
<th>Motor Size (hp)</th>
<th>Full Load Current (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>115 V</td>
</tr>
<tr>
<td>1/6</td>
<td>4.4</td>
</tr>
<tr>
<td>1/4</td>
<td>5.8</td>
</tr>
<tr>
<td>1/3</td>
<td>7.2</td>
</tr>
<tr>
<td>1/2</td>
<td>9.8</td>
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<tr>
<td>3/4</td>
<td>13.8</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
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<tr>
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<tr>
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<td>56</td>
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</tbody>
</table>

### Three-Phase Motors – HP and Full-Load Currents

<table>
<thead>
<tr>
<th>Motor Size (HP)</th>
<th>Full-Load Current (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Induction Type</td>
</tr>
<tr>
<td></td>
<td>Squirrel-Cage and Wound Motor</td>
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</tr>
<tr>
<td>1/2</td>
<td>4</td>
</tr>
<tr>
<td>3/4</td>
<td>5.6</td>
</tr>
<tr>
<td>1</td>
<td>7.2</td>
</tr>
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<td>9.6</td>
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<td>5</td>
<td>15.2</td>
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<tr>
<td>7 1/2</td>
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<td>75</td>
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<tr>
<td>100</td>
<td>248</td>
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</tbody>
</table>

1hp (English horse power) = 745.7 W = 550 ft. lbs./s = 2,545 Btu/h = 33,000 ft. lb./m = 1.0139 metric horse power = 1.0 KVA
Pump Curve Overview Example

A fluid flow system can in general be characterized with the System Curve, which is a graphical representation of the energy losses and static head in the system. By reducing the pipe size, closing valves, changing elevations, or increasing the pumping distance, the starting point will shift upwards. As the flow rate increases, so does the total head as seen in the diagram below.

The pump characteristics are normally described graphically by the manufacturer as a pump performance curve. The pump curve describes the relationship between flowrate and head for the actual pump. Other important information for proper pump selection is also included, such as the efficiency curves and the pump curves for several impeller diameters. Increasing the impeller diameter increases the head and flow rate capacity, so the pump curve moves upwards. An example is shown below.
A pump can be selected by combining the System Curve and the Pump Curve. The operating point is where the system curve and the pump curve intersect. As shown below, the best operating conditions will be along the best efficiency curve. The head capacity can be increased by connecting two or more pumps in series, or the flow rate capacity can be increased by connecting two or more pumps in parallel.

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**Regulatory Information**

**The Clean Water Act**

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, EPA has implemented pollution control programs such as setting wastewater standards for industry as well as water quality standards for all contaminants in surface waters. The CWA made it unlawful for municipal, industrial, and commercial facilities to discharge any pollutant from a point source into waters of the U.S., unless a NPDES permit is obtained.

More information, including the complete CWA text, can be obtained from [http://www2.epa.gov/laws-regulations/summary-clean-water-act](http://www2.epa.gov/laws-regulations/summary-clean-water-act).

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**Disclaimer**

Clear Creek Systems, Inc. has provided the information for general reference only, we do not warrant the accuracy of the information in this booklet and equipment specifications are subject to change.
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