

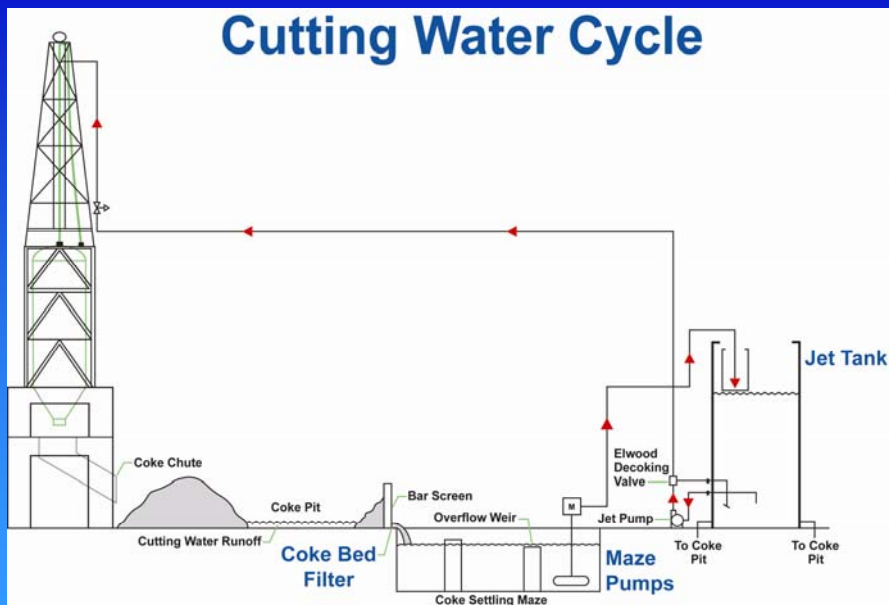
Water Filtration in Coking Systems

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Coking.com
Conference
Galveston 2008



Cutting Water Cycle



Problem

- Coke fines pass settling maze
 - Nozzles
 - Pumps
 - Valves
 - Pipes



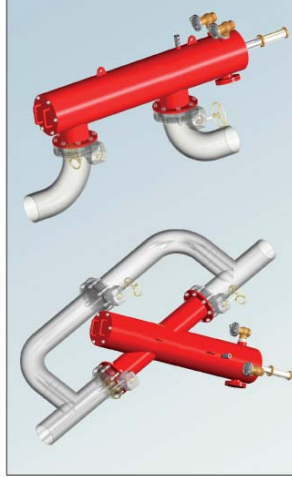
Ideal Solution

- Protect downstream equipment
- High reliability
- Low operation & maintenance
- Recovers coke fines
- Low investment cost
- Easily incorporated into existing system
- Zero impact to environment



SERIES H
AUTOMATIC SELF-CLEANING FILTER SYSTEM

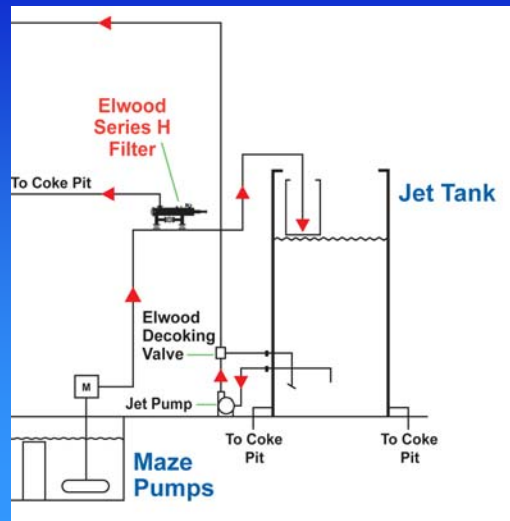
www.elwood.com

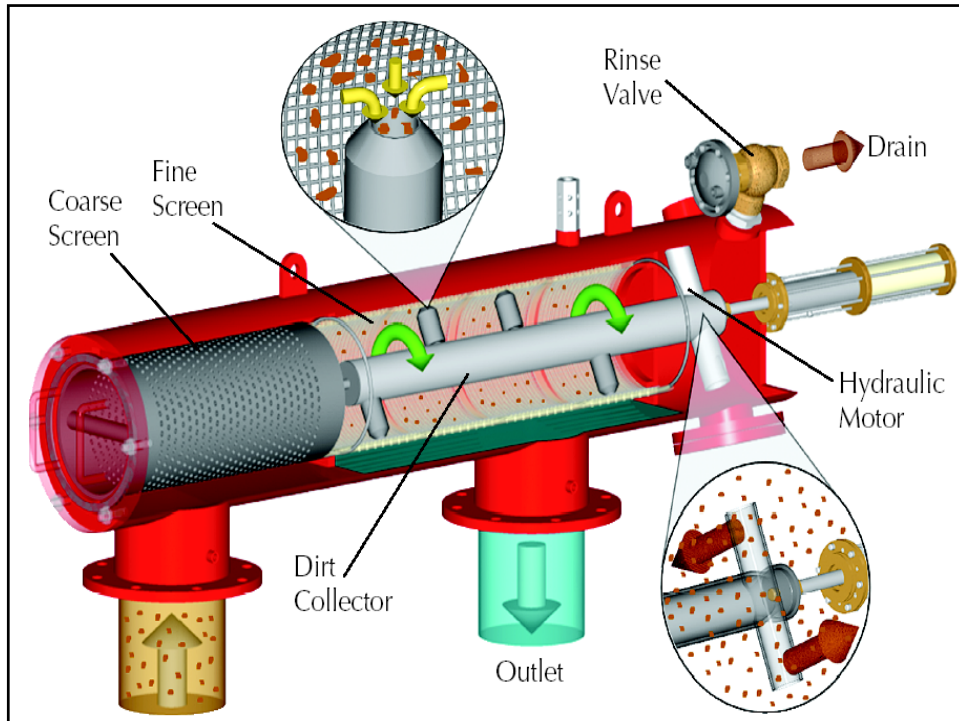


Automatic Self-Cleaning Filter System



Proposed Solution





Technical Specifications

Maximum Operating Pressure	Standard: 150 PSI (10 bar) For higher pressures contact factory
Minimum Operating Pressure	30 PSI (2 bar)
Maximum Flow Rate	See Table 1 (opposite page)
Effective Screen Area	See Table 1 (opposite page)
Operating Fluid Temperature	Standard: 150° F (65° C) For higher temperatures contact factory
Compatible Fluids	Water Based
Body Construction Options	Two Standard Materials Available (1) Carbon steel with polyester epoxy coating (2) Stainless steel (Other options available, consult factory)
Screen Pattern Options	Three Technologies Available (1) Weave-Wire mesh with PVC support (2) Multilayer stainless steel (3) Wedge-Wire
Screen Apertures	Standard: 10 to 3000 microns (Other options available, consult factory)
pH Range	Standard: 4-9 Optional: 1-12
Power	120/240 VAC, 1/2 AMP, 9/12 VDC
Enclosure	NEMA 4X
Backwash Activation	DP, Timer, Manual



Installations & Configurations

I Series



- In-line model
- Inlet and outlet are concentric
- Commonly used in single unit installations and vertical installations

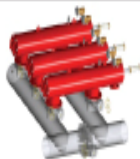
P Series



- On-line model
- Inlet and outlet are parallel
- Commonly used in single and multiple unit installations and upside down installations

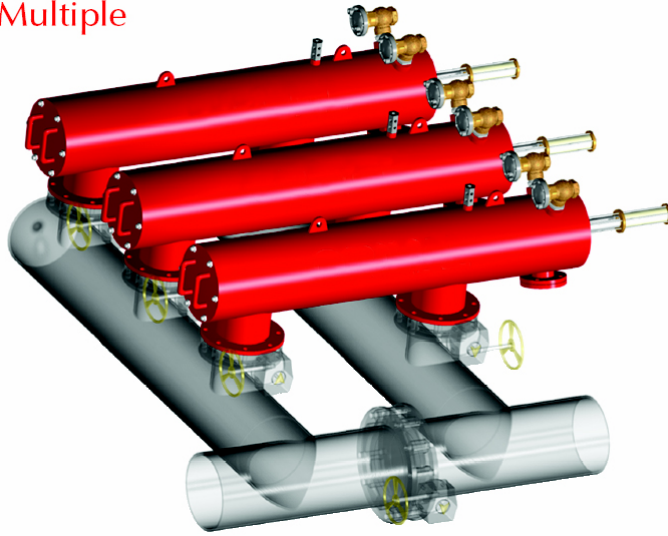
Multiple

B Series



- Bypass model
- Inlet and outlet are parallel
- Commonly used in full flow applications where a constant flow of water is critical

Multiple



ELWOOD **FLUID**
POWER

TABLE 1

Flange Size (in.)	Configuration			Length		Max. Flow Rate (GPM)	Effective Screen Area (in.)	
	In-Line	On-Line	Bypass	Standard	Extended		Weave-Wire Mesh	Multilayer
2	N/A	x	N/A	N/A	x	110	64	96
3	x	x	N/A	x	-	175	64	96
3	x	x	x	-	x	175	237	356
4	x	x	N/A	x	-	350	120	180
4	x	x	x	-	x	350	474	713
6	x	x	x	N/A	x	660	474	713
8	x	x	x	x	-	1320	474	713
8	-	x	x	-	x	1320	713	1070
10	x	x	x	x	-	1760	632	950
10	N/A	x	x	-	x	1760	945	1420
12	x	x	x	x	N/A	2640	945	1420
14	x	x	x	x	N/A	3960	1070	1605
16	N/A	x	x	x	N/A	4840	1070	1605
18	N/A	x	N/A	x	N/A	6125	1070	1605
20	N/A	x	N/A	x	N/A	8100	2140	3210
24	N/A	x	N/A	x	N/A	12000	3210	4815

Screen Specifications

Screen Patterns	Weave-Wire Mesh PVC Support	Multilayer Stainless Steel	Wedge-Wire
			
Screen Apertures	10 - 3000 Mic	10 - 3000 Mic	100 - 2500 Mic
Open Screen Area	40%	60%	30%
Hydraulic Collapse D.P.	300 PSI	300 PSI	450 PSI
Temperature Rating	150° F	300° F	700° F
Material	St/St 316L	St/St 316L	St/St 316L
Optional Material	Titanium, Hastelloy and other exotic material		
Fibrous Mat. Filtration	Poor	Poor	Excellent
Price	Low	Medium	High

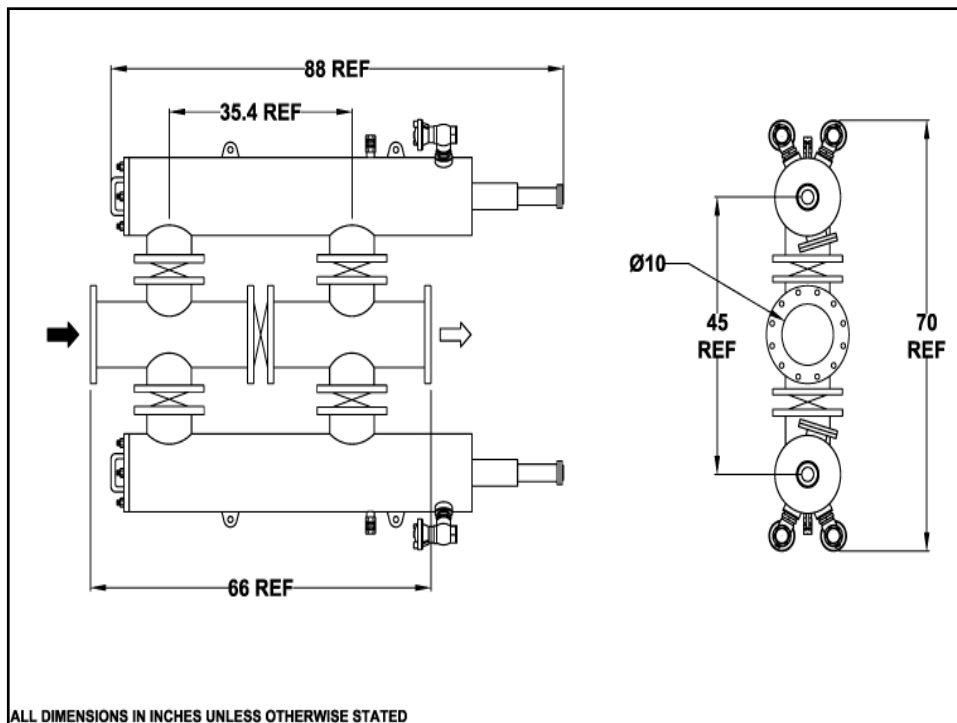


Example Solution



Specifications

- 10" Main
- (2) 8" filters
- 2600 gpm flow
- Wire mesh on PVC screen
- 100-150 micron screen aperture
- 8-10 second flush cycle, 30 to 40 gallons
- Isolation valves
- NEMA 4x control



Costs

- \$42,000 for filter system
- Additional costs
 - Installation costs
 - Costs associated with environment



Preventative Maintenance

- Monthly
 - Activate by-pass & isolation valves
- Quarterly
 - Check & clean coarse screens
 - Trigger manual rinse



Wear Items

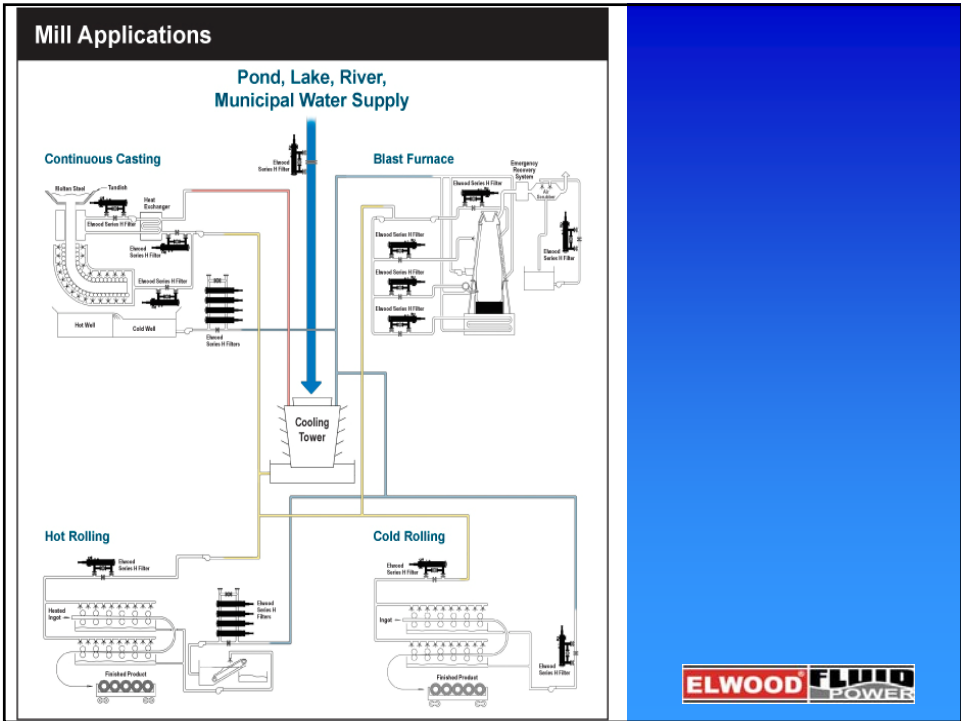
Description	List Price	Typ. Lifetime
Shaft Bearings	\$37.00 ea. (2)	1-2 yrs.
Hydraulic Repair Kit	\$96.00 ea.(2)	5 yrs.
Solenoid	\$105.00 ea. (2)	5-10 yrs.
Flush Valve Actuator	\$198.00 ea. (4)	5-10 yrs.
Fine Screen	\$1,194.00 ea. (2)	5-10 yrs.
Dirt Collector Assm.	\$556.00 ea. (2)	5-10 yrs.
Coarse Screen	\$310.00 ea. (2)	10 yrs.



Typical Maintenance Costs

\$950 to \$1,000 per year





CitiSteel



ELWOOD **FLUID**
POWER

Birmingham Steel



ELWOOD **FLUID**
POWER

Expandable



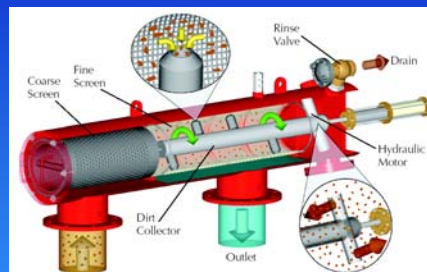
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Other Filtration Products



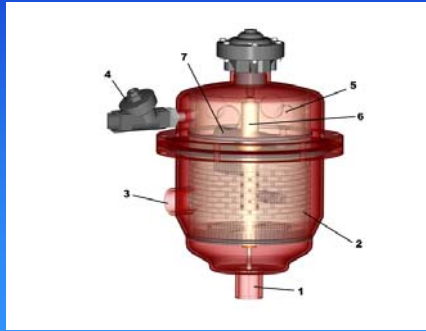
Series E



- Electric motor
- High dirt loads or sticky particulate
- Same features and benefits of Series H



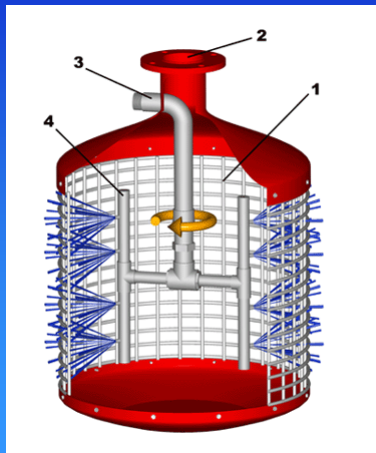
Series G



- Heat exchanger applications.
- 10 to 3000 micron
- No coarse screen
- 1.5" to 8" pipes
- Flows 65 to >1000 gpm
- Vertical mount
- Self cleaning operation



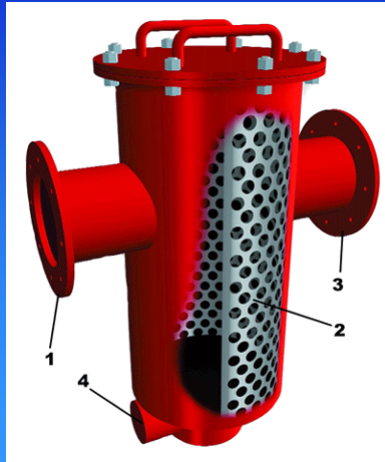
Series S



- Intake strainer
- 1200 or 2500 micron
- 4" to 16" pipes
- Flows 350 to 5300 gpm



Series V



- Coarse screen filter
- 3000, 5000 & 8000 micron screens
- 4" to 16" pipe
- Flows 450 to 5000 gpm
- Automatic cleaning cycle



Water Maintenance



Fluid Maintenance

- Dilution
- pH
- Bacteria & fungi levels
- Water hardness
- Filtration



Fluid Guidelines

pH 8.0 to 9.5

Hardness 50 to 200 ppm

Filtration	Servo, proportional valves	40 micron
	Directional, pressure control valves	75 micron
	Descale, stop valves	150 micron





Summary



Proposed vs. Ideal Solution

- Protect downstream equipment
- High reliability
- Low operation & maintenance
- Recovers coke fines
- Low investment cost
- Easily incorporated into existing system
- Zero impact to environment



Getting Started

- Fluid type
- Viscosity if not water
- Min/Max fluid temperature
- Min/Max environmental temperature
- Min/Max system pressure
- Flow rate
- Piping size
- Size of particulate to filter
- Fluid sample
- System schematic



Decoker Valve Products



The Nordberg Guys



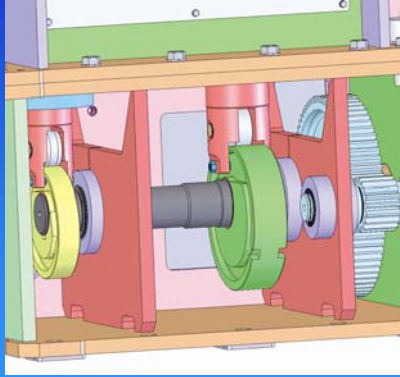
Decoking Valve



- Pressures 6000 psi
- Flows up to 3400 gpm
- Water temp. 75°C
- Sizes;
 - 8" x 4"
 - 6" x 3"
 - 4" x 2"
 - Custom
- Spindle Design
 - Low Maintenance



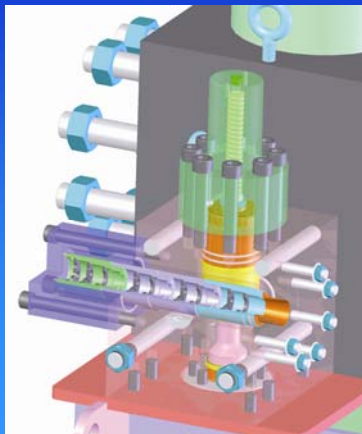
Precise Valve Control



- No valve chatter
- Reverse capability
- Positive pre-fill positioning
- No pilot valves
- No external air supply



Integrated Orifice Design



- Easy maintenance
- Single sleeve design



Worldwide Base



Photo courtesy of NASA

- Argentina
- Brazil
- Canada
- Chile
- Germany
- India
- Indonesia
- Russia
- South Korea
- Spain
- United States
- Venezuela



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