

The background of the image shows a complex industrial water treatment facility. It features several large, cylindrical tanks, likely for ion exchange, connected by a network of pipes and metal walkways. The scene is brightly lit, possibly from natural light, and the overall color palette is dominated by metallic greys and light blues, with a slight blue tint over the entire image.

REMCO ENGINEERING

ION EXCHANGE SYSTEMS

www.remco.com

Since 1987 Remco Engineering has worked with
our customers creating a better environment.

Innovation and value enhancement have been the
keys to our success.





Remco Engineering has systems on 4 continents providing solutions for industrial waste water and purifying water for industrial and commercial use.

Worldwide Systems

- American Embassy, Tajikistan - 100 gpm
- Eden, Uganda - juice bottler
- Pulsatora, Cali, Columbia - 30 gpm metal recovery.
- Astron Circuits, Zuhai, China - 180 gpm chelate resin ion exchange waste water treatment system.
- Laboratory water - Hanoi Technical University, Hanoi, Vietnam

Ion Exchange Systems

- Groundwater remediation, heavy metal recovery.
- Heavy metal removal from waste water
- Water recycling.
- Decationization system for the pharmaceutical and chemical industries

Groundwater remediation, heavy metal recovery.

- Bay Zinc, zinc recovery. (Washington state) 10 gpm
- Army Corp of Engineers, runoff treatment for manganese and zinc (Pittsburg) 60 gpm
- Exxon, Zinc recovery from groundwater, Alabama
- Hanford Nuclear Site, Uranium and Chrome recovery from groundwater 60 gpm
- Lawrence Livermore Laboratories, Chrome recovery from groundwater 60 gpm

Heavy metal removal

- Joslyn Manufacturing, Chicago Zinc recovery, 800-2000 ppm input 20 gpm
- Velie Printed Circuits, Costa Mesa, Ca, 25 gpm
- R squared printed Circuits 10 gpm
- Astron Printed Circuits (China) 180 gpm
- Pulsatora, Columbia, Mixed heavy metals (lead, Nickel, Copper) from recycling operation 25 gpm
- Gorilla Circuits, San Jose 20 gpm
- Pioneer Circuits, Santa Ana 25 gpm

Water recycling

- Perfection Plating - 80 gpm , Copper Nickel Chrome
- Carter Plating, Burbank- 25 gpm
- A-Dec, Portland, Oregon – 30 gpm paint precoat line with Chrome

Army Corp of Engineers

- 60 gpm
- Zinc and Manganese
- Limit, 10 ppb
- Groundwater runoff
- Built in 10 weeks
- Fully Automatic



Astron Printed Circuits (China)

- Chelated Resin Ion Exchange
- 180 gpm
- Batch Waste Treatment
- Fully Automated
- Built in 10 weeks



BAY ZINC

- Groundwater remediation
- Zinc 5-6 ppm, 10 gpm
- Remote, unattended
- Fully automated
- Remotely monitored
- Compact



Metal Recovery Ion Exchange

- Compact systems
- Minimal waste, rinse water is reprocessed
- Specific for target ions, infrequent regeneration
- Minimal chemical costs, only acid and caustic
- Unique air purge minimizes waste generation
- Proven concept, 15 years operating experience
- Control Automation and remote monitoring and logging

Cost To Operate MRIX

- Example, 30 gpm (24 hrs/day) for 20 ppm Copper
- Acid/Caustic to pH adjust to 4.5
- Capacity, 27 lb. Copper per regeneration
- 3.8 days between regenerations, pump power
- Acid per regen – 90 lb. sulfuric
- Caustic per regen – 7.5 gallons, 50%
- Volume of waste – 180 gallons, CuSO₄ acid solution

Ion Exchange Systems

- De-ionization for water treatment and Recycling.
- Decationization for the pharmaceutical and chemical industries
- Chelated Resin systems for heavy metal recovery and contaminant removal



Decationization Systems

- Removes cations, usually sodium in exchange for H^+ on resin
- Multiple column train acts as one column and prevents channeling
- Air purge saves product and minimizes regenerant volume



Water Recycling

- From 10 to 300 gpm automated systems for water purification and recycling with minimal waste.



AUTOMATED CONTROL

- Programmable logic controllers (PLC) always control the system at the skid. If remote connection is lost, the system keeps operating.
- A computer with monitoring and control software is connected by an ethernet cable to the skid.
- The computer logs data, allows remote control of the system, and monitors the status of the system



AUTOMATED CONTROL 2

- Indicating process controllers (pH, conductivity, etc.) are on the skid control panel.



AUTOMATED CONTROL 3

- A touch screen local control is mounted on the main control panel on the skid.



Automated Control 4

(Following screens)

- Control screen allows pump and regeneration control.
- System display screen shows system status, control parameters, and regeneration status.
- Regeneration screen allows complete control of regeneration parameters.
- Data display with up to 1 year history by moving slider.

MRIX ON

MRIX_RESET

You must reset flow direction and restart pumps if you press this button!
This resets everything included the regen cycle!

System Mods

DATA RECORDS

HELP! - ONLINE MANUAL

PUMP START/TOGGLE

MRIX PUMP A 

MRIX PUMP B 

WELL PUMP 

SET FLOW DIRECTION

SET FLOW A>B | **SET FLOW B>A**

YOU MUST RESET SYSTEM TO SWITCH BETWEEN COLUMN PAIRS A-B.

- MRIX SYSTEM**
- MRIX DATA**
- REGEN DISPLAY**
- MRIX CONTROL**

START REGENERATION CYCLE

REGENERATE A | **REGENERATE B**

REFRESH A | **REFRESH B**

REGENERATION CYCLE IN PROGRESS

REGEN A | **REGEN B**

REFRESH A | **REFRESH B**

BACKWASH MEDIA FILTER

BACKWASH MEDIA FILTER 

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REGEN CYCLE

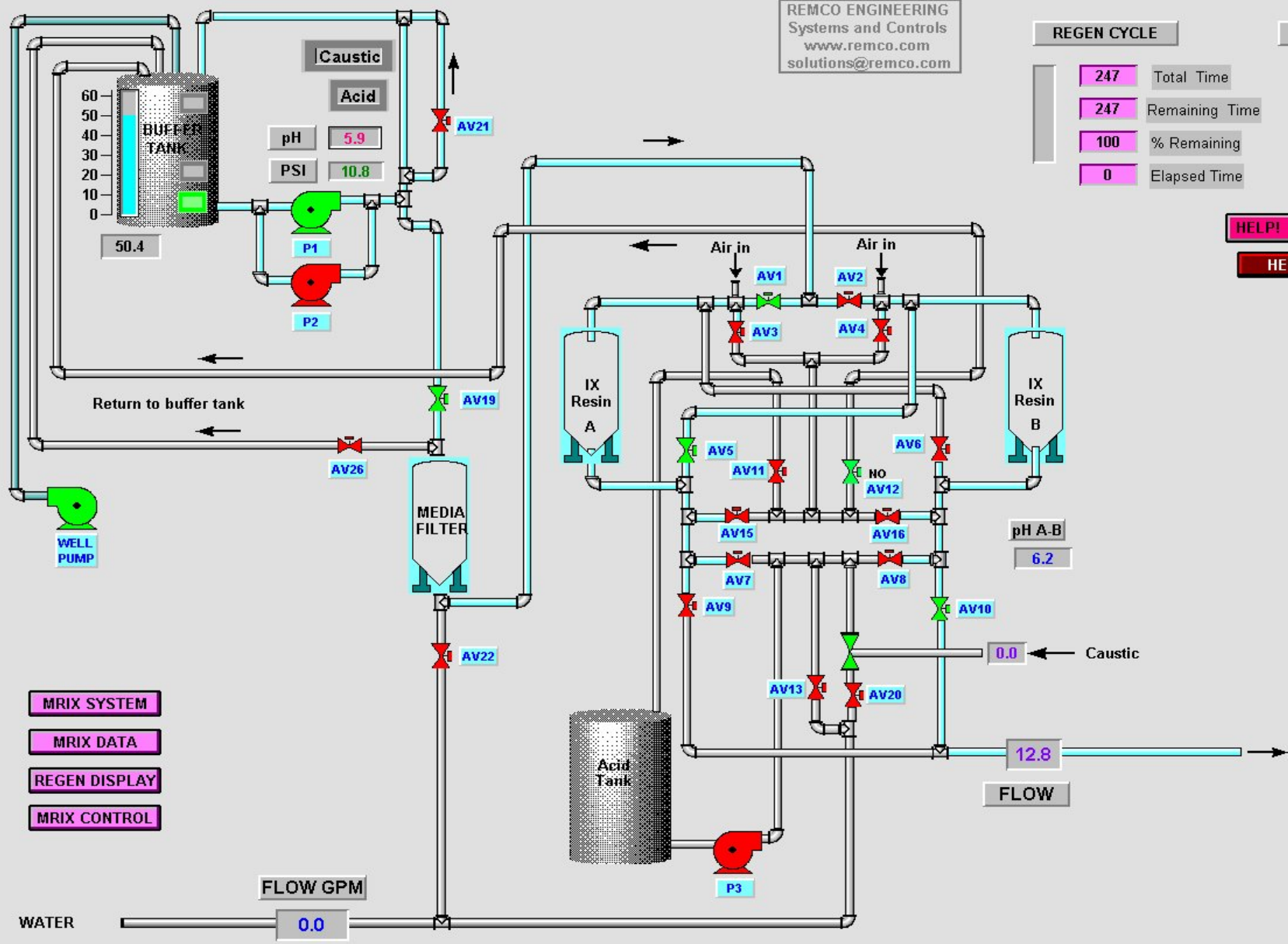
REFRESH CYCLE

247	Total Time
247	Remaining Time
100	% Remaining
0	Elapsed Time

146
146
1

HELP! - ONLINE MANUAL

HELP! - SYSTEM



- MRIX SYSTEM
- MRIX DATA
- REGEN DISPLAY
- MRIX CONTROL

SWITCH DATA GROUPS

BAY ZINC MRIX SYSTEM DATA

HELP! - DATA DISPLAY



10.7 6.0 6.2 Caustic
 ACCUM MRIX MRIX BREAK Acid
 FLOW PSI pH pH

12.6 50.1
 FLOW LEVEL

MRIX SYSTEM REGEN DISPLAY
 MRIX DATA MRIX CONTROL

LOG DATA



DATA GROUP 2

315
 Accum Accum
 Flow A Flow B

(X 1000)

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CYCLE TIME SETTINGS

SET TIME

MINUTES

SETPOINTS

6	0	6	FIRST RINSE
AIR ON	0	900	AIR PURGE
60	0	60	ACID
AIR ON	0	3000	ACID PURGE
Sets hold time			
30	0	30	ACID LEACH
0	0	0	REPEAT X TIMES
20	0	20	ACID RINSE
60	0	60	CAUSTIC
20	0	20	CAUSTIC RINSE
5	0	5	CAUSTIC LEACH
0	0	0	REPEAT X TIMES
20	0	20	FINAL RINSE
	0		PIPE RINSE
3600 x 0.1 seconds fixed time			
10	0	10	ALT RINSE TIME
5	0	5	RECYCLE TIME
10	0	10	MEDIA FILTER

SET TIME

0.1 SECONDS

3000	AIR PURGE TOTAL	Air on + Drain
900	AIR ON	
600	ACID ON	
600	ACID PAUSE	
3000	REGEN PURGE	Air on + Drain
900	REGEN PURGE AIR	
300	LEACH WATER FILL	
3000	LEACH PURGE	Air on + Drain
600	LEACH AIR ON	
0	CAUSTIC ON	
600	CAUSTIC OFF	
600	RINSE ON	
50	RINSE OFF	
300	LEACH WATER FILL -NAOH	
3000	LEACH PURGE	Air on + Drain
600	LEACH AIR ON	

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- MRIX SYSTEM
- MRIX DATA
- REGEN DISPLAY
- MRIX CONTROL

REGEN CYCLE

247	Total Time
247	Remaining Time
100.0	% Remaining
0	Elapsed Time

REFRESH CYCLE

146
146
100.0

Advantages of our Control System

- Data is logged two ways:
 - one graphs on screen and has up to 1 year data available
 - the other logs to a “csv” file and can be displayed and graphed in any spreadsheet program.
- The system can be monitored and adjusted remotely.
 - An internet or dialup connection will allow us to train new employees, update and change programs making problem resolution a 10 minute solution vs. 24-36 hours and a plane ride away.

CUSTOMER SATISFACTION

- Reliable products, time tested
- Fast to install and startup
- Low operating and maintenance cost
- Short lead times
- Extendable warranty
- Reasonable pricing

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