5. SYSTEM STARTUP

5.1 Startup Checks

1) Inspect the following connections:

Connection	To
C1	Feed inlet
C2	Water Displacement (waste)
C3	Product
C4	Water supply
C5	Waste
C6	Sulfuric acid supply
C7	Air supply

2) Make sure that ALL isolation valves on the above lines are OPEN

3) Inspect the following valves:

Valve	Position
HV1	Open
HV2	Closed
HV3	Closed
HV4	Open
HV5	Closed
HV6	Closed
HV7	(3-way valve) arrow points to sulfuric acid reservoir
HV8	Closed
HV9	Closed
HV10	Open

4) Valves should be in the positions noted above.

5) Turn the 'POWER' switch to the 'ON' position. The 'POWER ON' light should be illuminated. The HMI panel should power up and start.

6) Make sure that the air supply to the ChromaPur unit is at a pressure of 6.5 – 6.2 bar (80 - 90 psi).

7) Open air regulator ‘R1’ and set to 3.5 bar (50 psi). This regulator controls the unit’s feed pump and will be adjusted later on in this section.

8) Open air regulator ‘R2’ and set to 2.1 bar (30 psi). This regulator controls the regenerant flow rate (i.e., sulfuric acid reservoir pressure) and will be adjusted later on in this section.

9) With the air pressures set, check ALL air supply pipe work for air leaks. Minor air leakage can be rectified by carefully tightening the fittings and couplings.

10) IMPORTANT: Fill the chrome reservoir with water up to the #3 float switch (refer to drawing # 25822). Ensure that the float switch is fully immersed.

The same water source that is supplied to the unit can be used.

NOTE

11) Open air bleed off valves ‘HV3’ and ‘HV6’ at the top of cartridge filters ‘F1’ and ‘F2’. Place the tubing into a suitable container.

12) Initiate 'RUN' from the HMI screen.

13) Initiate 'SHUTDOWN' from the HMI screen.

Use personal protective equipment and care!

WARNING

When venting filters, MAKE SURE that the flexible drain tubing connected to the vent hand valve is secured.

When venting, the pressure within the filter may cause the drain tubing to flail and spray chromic acid about the surrounding areas, unless it is held or fastened in place.

CAUTION

14) As soon as a steady stream of water begins exhausting from the air bleed off valves, close valves ‘HV3’ and ‘HV6’ on cartridge filters ‘F1’ and ‘F2’.

15) Check all piping for leaks. Visually inspect all threaded connections carefully.

16) When the ‘CYCLE COMPLETED’ light on the HMI panel is illuminated, drain the water out of filters ‘F1’ and ‘F2’ by opening ‘HV5’ and ‘HV2’ into a suitable container. Also, open ‘HV3’ and ‘HV6’ to help drain the filters. When both filters have drained, close all of the valves.

17) Turn the power ‘OFF’.

The procedure completed to this point is very important to the startup of the ChromaPur unit.

- First, the unit can be carefully and safely checked for leaks in piping using only water.
- Secondly, water is introduced into the ChromaPur reservoir to dilute the initial chrome feed solution during the first on-stream cycle.
- Lastly, the cartridge filters need to be rinsed with water before a chrome cycle. Refer to the *Manual Maintenance Procedures* for changing filter cartridges.

18) Next, the sulfuric acid pump must be primed with sulfuric acid before the ChromaPur can operate. Bring up a sulfuric acid carboy and place under the hose from 'HV7' to collect displaced sulfuric acid. Turn the handle on valve 'HV7' so that the arrow on the handle points to the sample hose.

19) Turn the switch on the sulfuric acid pump to 'INTERNAL'.

20) The sulfuric acid addition pump has two main dials, one for speed and one for stroke. Set the speed dial on the pump to '100'. The pump must be operating before adjustments to the stroke dial can be made.

21) Initiate 'ACID SAMPLING' through the HMI. This will start the sulfuric acid pump.

22) Once the pump is pumping, adjust the stroke to '100'. Again, the stroke dial should only be adjusted when the pump is operating.

Stroke = volume/pulse. ***Speed = pulses/time.***

NOTE

23) The sulfuric acid pump will pump for 8 minutes. During this time, the pump should be drawing acid from the sulfuric acid drum. Ensure that all of the air in the line has been removed. If the pump is not fully primed at the end of the 8 minutes, or if there is still some air left in the line, repeat steps 19) to 21) until the pump is properly primed (any acid collected may be returned to the sulfuric acid drum as long as the container used is clean and dry).

24) To set up the sulfuric acid dump volume you will require a container or graduated cylinder, and a stopwatch. Repeat step 19 and 21) and collect a sample over the cycle time. Measuring this volume in ml and then dividing by 30,280 is equal to the flow rate in USG/min., or divide by 8,000, which is equal to the flow rate in L/min. Compare this number with the flow rate given in the ChromaPur Flow rates section of this manual. If the flow rate is too high or too low, adjust the speed and/or stroke dials to adjust the flow rate accordingly. Dump the sample and collect another one until the flow rates match.

25) The required volume is as follow (a maximum of 5% greater than shown is acceptable):

CP10	1,986 ml

26) Once the volume matches, turn ‘HV7’ so that the arrow on the handle points to the sulfuric acid reservoir.

27) A manual regeneration must be done twice, so that the resin can be conditioned and the regenerant solution can achieve its proper concentration. Refer to the Manual Maintenance Procedures.

28) The ChromaPur unit should be fine-tuned to operate efficiently. Each step should be adjusted accordingly to the list shown below. ‘1R’ adjusts the feed pump flow rate, ‘2R’ adjusts the sulfuric acid reservoir flow rate and the water flow rate will determine the wash steps.

STEP NUMBER	STEP	PARAMETER MEASURED	METHOD OF ADJUSTING
1	Water Displacement	Volume	R1 air regulator
2	Product	Volume	R1 air regulator
3	Wash	Volume	Water flow according to FI1
4	Regeneration	Volume	R2 air regulator
5	Water Refill	Volume	Do not adjust
6	Waste	Timer	Water flow according to FI1
7	Acid Makeup	Timer	Metering pump

29) Check all equipment thoroughly and adjust as necessary. When the unit is prepared and there is confidence that it is fully operational, initiate ‘RUN’ from the HMI.

30) To turn off the ChromaPur unit; simply initiate "SHUTDOWN” from the HMI. Do not switch power off as a shutdown method when the unit is in mid-cycle. Acid left in the piping without taking corrective action can cause damage. Only after the "CYCLE COMPLETE" light has been illuminated is it safe to turn off power to the unit.