

Battery electrode coater dryer generated SRS Engineering model VRS-450, N-Methyl Pyrrolidone vapor recovery system operational logic

Description of operation

- 1. . The substrate foil is pulled through the coater head while the precision coating of the wet slurry containing the NMP solvent is applied to the surface.**
- 2. The battery element coater, 3 stage dryer system operates at max. 150C heater temperature, and air blowers move approx. 1000-1200 cfm of air over the wet coating surface. It is a partial recirculation process, thus a max of 600 cfm may be exhausted from the heating system, the exhausted air replaced from the air intake manifolds.**
- 3. The solvent laden exhaust is conveyed to the solvent recovery system thru a 4" dia. pipe.**
- 4. The saturated air stream feeds into the 17 ft tall spray column.**
- 5. The system works with a refrigerated chiller system (located on the roof) to refrigerate the process fluid to 0-20F working temperature in order to condense all the the NMP solvent in the saturated air exhausted from the coater dryers, into liquid.**
- 6. The system works with all normally closed valving that automatically stops the process in case of power failure.**
- 7. The SRS is equipped with an automatic operating PLC with human interface (HMI) touch panel to control and monitor the system operation.**

- 8. The recovery system is charged initially with ~300 gal of NMP. This liquid is pumped thru a set of refrigerated (-20deg F) heat exchangers that chill the liquid. The chilled liquid NMP is continuously pumped from the holding tank thru the refrigerated heat exchangers into the top of the spray column and allowed to cascade down through several levels of packed metal baffle media to the bottom of the column. The solvent saturated air stream from the coater is fed into the side of the column, intermixing with the chilled liquid NMP and converted into liquid. This process continues such that the temperature of the liquid reaches 0-20F.**
- 9. The air, now stripped of the solvent continues to exit the system through the carbon filters to the roof exhaust point. The exiting air will have a VOC content of ≤ 50 ppm**
- 10. At the point just past the 3 ea. 200 lb/canister carbon filters there is a sensor connection for the VOC monitor system. This has a multiple light indicator that triggers the Green/yellow/red lights according to the condition of the carbon filters. Green means <20 ppm, yellow means >50 ppm and red means >100 ppm of exiting VOC content.**
- 11. The carbon replacement frequency is min. 6 months at full operational output.**