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User Testing Report

Iced.Tech / Master Vapor Pumps

Products Tested:

Iced.Tech Tube N° Shell

- Single Column Condenser, Largest Unit

Master Vapor Pumps

- MVP150, Single Phase, 208/220v

Copeland Compressor

- FFAP-020Z-TFC-071

HFC, R-404A, 60Hz, 3- Phase, 208/230 V

Duration of Testing:

6 Months

Hours of Operation:

1,800 Hours

Testing Objective:

Utilizing the given equipment (Iced.Tech heat exchanger, Master Vapor Pump and Copeland Compressor) to evaluate and conclude performance capabilities.

Included but not limited too: Standard solvent recovery rates(Lbs/min), Advanced solvent recovery rates(Lbs/min), Operating Efficiency, Durability, User Ability, Safety, Set-Up and Compliance.

Initial/ Standard Product Testing:

Utilize all components as designed for production per instructions and record data. The initial solvent recovery achieved during standard testing concluded a .75-1.25 Lbs/min recovery. Variance depended on solvent used, ambient temperatures, equipment conduction temperatures, pump C02 pressure measured in Psi(150), etc.

Hypothesis:

This product combination under standard hydrocarbon temperature and solvent parameters yielded an average/ above average recovery rate compared to other products currently on the market.

Course of Action:

Change temperatures, solvents and specific pump parameters to yield a higher, more efficient recovery rate within safe conditions to maintain the integrity of the desired oleoresin.

Advanced Product Testing:

The MVP150 standard C02 psi(150psi) seemed to be restricting the recovery flow rate. Due to the set pressure on the pump; in theory, was causing the pump pneumatics to open and close faster than the rate of evaporating solvents, thus restricting the flow rate. Testing different pump C02 pressures in correlation to the input pressures before entering the pump and changing accordingly... resulted in much faster recovery rates. I.e. If the pump inlet pressure gauge was reading 30psi, I turned the C02 pump pressure to 60psi. This 30psi variance in correlation to the input pressure allowed for a more efficient flow rate compared to the standard, restrictive set pressure of 150psi. This technique yielded the best recovery rates in every concluding operations test performed. Depending on different solvents, ambient temperatures, product temperatures and varying pressures accordingly. I concluded a minimum recovery of 1.5 Lbs/min and a maximum of 2.23 Lbs/min recovery rate. The maximum yielded recovery rate was recorded under these conditions: Pure Instrument-Grade Propane, high heat temperatures via collection vessel conduction(80c/176F), cold ambient temperatures(12.7c/55F), 30psi variance from pump inlet pressure to pump C02 set pressure, and a cannabinoid free recovery(Solvent Run Only). When performing this Advanced testing technique under cannabinoid safe temperatures... the recovery rate concluded an average of 1.81 Lbs/min solvent recovery.

Conclusion:

The Iced.Tech Tube N' Shell Heat Exchanger, Master Vapor Pumps MVP150 cascaded with the Copeland Compressor yielded impressive "Active" recovery rates when conducted in the Advanced Testing Technique in the proper ambient conditions. This combination is very user friendly, durable and efficient when operating under the defined conditions. Extremely satisfied with all components, safety, durability and production efficiency.