

## SWENSON WALKER CRYSTALLIZER (EE-1644)

Crystallization is the formation of solid particles within a homogeneous phase. Its wide use has a two-fold basis, a crystal formed from an impure solution is itself pure and crystallization affords a practical method of obtaining pure chemical substances in a satisfactory condition for packing and storing. This operation involves both heat and mass transfer. Crystallization may be analyzed from the standpoints of purity and yield. Swenson Walker crystallizer is a continuous type crystallizer. It is a Jacketed round bottom semi cylindrical trough open at the top. Cooling water flows through the jacket. A ribbon mixer is provided in crystallizer trough, which rotates at low rpm for agitation of saturated solution. The saturated solution is prepared in a tank fitted with heater and a stirrer. This hot feed is fed at one end of the crystallizer and flows slowly towards the other end while being cooled and is allowed to flow back in hot feed tank making the process continuous. The crystals sediments at the bottom of the trough, and can be washed out at the end of process. The pump circulates cooling water and the Rotameter measures flow rate. Instrumentation is provided for measuring the temperatures at different points.

### SCOPE OF EXPERIMENTATION

- To study the performance of a Swanson Walker Crystallizer.
- To determine the crystal yield and the efficiency of crystallizer.

### UTILITIES REQUIRED

- Water Supply and Drain.
- Electricity Supply: 1 Phase, 220 V AC, 3.5 kW.
- Required Chemicals.



### TECHNICAL DETAILS

- Crystallizer Trough : Material Stainless Steel, Capacity 8 Ltrs.  
(Jacketed type)
- Ribbon : Material Stainless Steel (for Trough).
- Drive for Ribbon Mixer : FHP motor coupled with Reduction Gear box and Pulley arrangement to get 8 RPM approx.
- Feed Tank : Made of Stainless Steel, Double Wall, insulated with ceramic wool Cap. 30 Ltrs. Fitted with Nichrome wire heaters.
- Stirrer for Feed Tank : Stainless Steel Impeller and shaft driven by motor.
- Feed Circulation : Magnetic Pump made of Polypropylene to Circulate feed. Maximum working temperature is 80°C.
- Crystal Receiver Tank : Material Stainless Steel, Capacity 20 ltrs. Fitted with Sieve.
- Cooling Water Tank : Material Stainless Steel, Capacity 50 Ltrs.
- Cooling Water Circulation : FHP pump
- Flow Measurement : Rotameter for cooling water
- Temp. Sensors : RTD PT-100 type
- Control panel comprises of Digital Temp. Indicator 0-199.9°C for Feed Tank. Digital Temp. Indicator 0-199.9°C with multi-channel switch and Standard make on/off switch, Mains Indicator etc.
- The whole set-up is well designed and arranged in a good quality painted structure.