

VACUUM TRAY DRYER (VTD)

Vacuum tray dryers are widely used in industries such as pharmaceuticals, chemicals, food processing, and more, for the drying of heat-sensitive materials or those that require a low-pressure environment.

Here is an overview of the utilization of vacuum tray dryers and the associated process:

Loading:

The solid material to be dried is spread evenly on trays or shelves inside the vacuum tray dryer. The trays are typically made of heat-resistant material and can withstand the vacuum environment.

Sealing:

Once the trays are loaded, the vacuum tray dryer is sealed to create a low-pressure or vacuum environment inside the drying chamber. The sealing ensures that the drying process occurs under controlled pressure conditions.

Evacuation:

The vacuum pump or system connected to the dryer removes air and gases from the drying chamber, creating a reduced-pressure environment. As the pressure decreases, the boiling point of moisture in the material decreases as well, facilitating the removal of moisture at lower temperatures.

Heating:

Once the desired vacuum level is achieved, the heating system of the vacuum tray dryer is activated. Heat is applied to the trays through conduction, convection, or radiation, depending on the specific design of the dryer. The heat helps evaporate the moisture from the material.

Moisture Removal:

The vacuum environment and the application of heat cause the moisture in the solid material to vaporize. The vapor is removed from the drying chamber by the vacuum system, which helps maintain a low-pressure environment throughout the drying process.



Temperature and Pressure Control:

The temperature and pressure inside the vacuum tray dryer are carefully controlled to ensure gentle and efficient drying. The temperature is maintained at a level suitable for the specific material being dried, considering its heat sensitivity or degradation point. The pressure is regulated to optimize the drying process and prevent moisture condensation.

Monitoring and Control:

The drying process is monitored to ensure that the desired temperature, pressure, and drying time are maintained. Automated controls or manual adjustments may be used to regulate these parameters throughout the drying cycle.

Cooling and Releasing Vacuum:

Once the drying process is complete, the trays may be cooled down using ambient air or a separate cooling system. After cooling, the vacuum within the drying chamber is released gradually, allowing the trays to be safely opened and the dried material to be discharged.

Cleaning and Maintenance:

After use, the vacuum tray dryer is thoroughly cleaned to remove any residual material and ensure proper hygiene. Routine maintenance tasks, such as cleaning filters, inspecting vacuum pumps, and lubricating moving parts, are also performed as needed.

It is important to note that the specific utilization and process of a tray dryer may vary depending on the manufacturer, model, and the specific requirements of the drying process. However, the controlled temperature, uniform airflow, and efficient drying capabilities of tray dryers make them valuable equipment for drying solid materials in various industries.

Technical Specifications Table:-

MODEL	SHELVES NOS	TRAY NOS	TRAY ON EACH SHELF	WATER HEATING SYSTEM		OIL HEATING SYSTEM		VACUUM PUMP
				HEATER KW	CIRC. PUMP	HEATER KW	CIRC. PUMP	
VTD 06	6+1 DUMMY	6	1	3	0.5	6	0.5	2/3
VTD 12	6+1 DUMMY	12	2	6	0.75	9	1	3
VTD 24	12+1 DUMMY	24	2	12	0.75	18	2	5
VTD 36	12+1 DUMMY	36	3	15	1	24	2	5/7.5
VTD 48	16+1 DUMMY	48	3	18	1	36	3	7.5
VTD 96	16+1 DUMMY	96	6	30	1/2	48	3	2/3