



# HEAT PUMP DRYER

**50<sup>+</sup> Years**  
*Of experience*



# ABOUT US

Kerone Engineering Solutions Ltd is a global leader in advanced industrial heating, drying, cooling & end to end process engineering solutions. With over five decades of proven expertise, we specialize in designing, manufacturing, and delivering highly customized, cutting-edge systems tailored to the evolving needs of industries worldwide.

Our commitment to engineering excellence, sustainability, digitalization, and technological innovation has positioned us as a trusted partner for businesses across multiple sectors. By integrating Artificial Intelligence (AI), Machine Learning (ML), and Internet of Things (IoT) technologies into our systems, Kerone ensures smarter automation, real-time monitoring, predictive maintenance, and data-driven process optimization—empowering our clients to achieve greater productivity, efficiency, and reliability.



**50+**

Years of Experience



**10,000+**

Satisfied Clients



**500+**

Employee



**100+**

Experts



**50+**

Global Presence



**50+ Years Manufacturing Excellence**



**Great Sale Support**



**Highly Customized Product**



**Adherence to Standards**



**Sound Infrastructure**



**Team of experts Delivering Quality**



**Timely Delivery**



**Cost Effective Solutions**



# INDUSTRIES WE SERVE

- ✓ Food Processing & Agro-Processing
- ✓ Chemicals & Petrochemicals
- ✓ Pharmaceuticals
- ✓ Textiles, Automotive & Aerospace
- ✓ Paper & Packaging
- ✓ Ceramics & Glass
- ✓ Rubber & Plastics
- ✓ Environmental & Waste Management
- ✓ Oil, Gas & Steel Industries



- ✓ Industry Expertise – Over 50 years of global engineering leadership.
- ✓ Custom Solutions – Tailored engineering that meets unique industrial requirements.
- ✓ Global Reach – Trusted by industries across continents with proven reliability.
- ✓ Digital & Smart Systems – AI/ML-powered automation, IoT-based monitoring, and predictive insights.
- ✓ Cutting-Edge Technology – Continuous innovation in heating, drying, and advanced processing.
- ✓ Energy Efficiency – AI-optimized designs for lower energy consumption and sustainability.

## QUALITY & COMPLIANCE

At Kerone, quality and compliance are non-negotiable. All our solutions are engineered in adherence to international standards and industry best practices, ensuring maximum safety, durability, reliability, and efficiency. With integrated digital technologies, we enable smarter quality control and compliance tracking across all operations.





## Heat Pump Dryer

A heat pump dryer uses a closed-loop refrigeration system to dry clothes, similar to how an air conditioner operates. Instead of venting hot, moist air outside like conventional dryers, it recycles the air continuously. The system extracts moisture from clothes using warm air, then passes that humid air through an evaporator where moisture condenses and drains away. The air is then reheated and circulated back through the drum, making the process highly efficient.

Heat pump dryers are significantly more energy-efficient than traditional vented or condenser dryers, using up to 50% less electricity, which translates to lower utility bills over time. They operate at lower temperatures, which is gentler on fabrics and helps clothes last longer. However, they have some trade-offs: drying cycles take considerably longer (often 2-3 hours), the initial purchase price is higher, and they require regular maintenance like cleaning lint filters and condenser units. They're ideal for energy-conscious households willing to invest upfront for long-term savings.

### Key Features

- **Closed-Loop Air Circulation**  
Continuously recycles the same air instead of venting it outside, improving efficiency and eliminating the need for external ducting.
- **High Energy Efficiency**  
Consumes up to 50% less electricity than traditional vented or condenser dryers, significantly reducing energy bills.

- **Low-Temperature Drying**  
Operates at lower temperatures, which protects fabrics from heat damage, shrinkage, and excessive wear.
- **Moisture Condensation System**  
Humid air passes through an evaporator where moisture condenses into water and is drained or collected in a tank.
- **Ventless Installation**  
Does not require an external exhaust vent, making it ideal for apartments and flexible installation spaces.
- **Environmentally Friendly Operation**  
Reduces energy consumption and carbon footprint compared to traditional drying methods.

### Advantages

- **High Energy Efficiency**  
Uses significantly less electricity than conventional dryers, helping reduce monthly energy bills.
- **Lower Operating Costs**  
Although the initial price is higher, long-term savings on power consumption offset the upfront cost.
- **Ventless Design**  
No external vent is required, allowing flexible installation in apartments or enclosed spaces.
- **Better Moisture Control**  
Efficiently removes moisture through condensation, preventing excess humidity in the room.
- **Quiet Operation**  
Typically operates more quietly than traditional vented dryers due to lower heat and airflow intensity.
- **Consistent Drying Performance**  
Maintains stable temperatures throughout the cycle for even and uniform drying.

# Types Of Rotary Dryer

Heat Pump Batch Tray Dryer

Heat Pump Continuous Tray Dryer



## Heat Pump Batch Tray Dryer

A Heat Pump Batch Tray Dryer is an energy-efficient drying system designed to remove moisture from materials in controlled, low-temperature conditions. It works by circulating warm, dehumidified air inside an insulated chamber where products are placed on multiple trays. Unlike conventional dryers that rely on direct electric or fuel-based heating, a heat pump system recovers and reuses heat through a refrigeration cycle. This makes it highly energy-efficient and ideal for temperature-sensitive materials.



## Heat Pump Continuous Tray Dryer

A Heat Pump Continuous Tray Dryer is an advanced, energy-efficient drying system designed for continuous production processes. Unlike batch dryers, this system allows materials to move steadily through multiple trays inside an insulated drying chamber, ensuring uninterrupted operation and higher productivity. It operates using heat pump technology, which recovers and recirculates heat through a closed-loop refrigeration cycle. This significantly reduces energy consumption while maintaining precise temperature and humidity control.

## Heat Pump Dryer Process Work Flow

### 1 Material Loading

- Wet product loaded into sealed chamber.



### 3 Moist Air Dehumidification

- Moist Air Cooled & Dehumidified



### 2 Warm Air Circulation

- Circulation Fan blows warm, dry air (40°C–80°C)



### 4 Air Reheating

- Air Reheated & Dried



### 5 Continuous Recirculation

- Dry Air Recirculated to Chamber



### 6 Final Discharge

- Dried Product Unloaded



Warm Dry Air



CLOSED-LOOP SYSTEM – ENERGY EFFICIENT DRYING



- 40–70% Energy Saving
- Low Temp Drying
- No Heat Loss
- Eco-Friendly

## Applications

Industry	Description
Seafood	Preservation maintaining protein quality
Chemical	Moisture removal from plastic pellets
Paper	Dewatering paper mill waste
Wastewater	Volume reduction and sanitization of sewage sludge
Pharmaceuticals	Gentle drying minimizing thermal degradation
Timber Industry	Seasoning lumber with reduced cracking and warping
Food Processing	Gentle dehydration preserving nutrients, color, and flavor
Agriculture	Post-harvest moisture removal with better quality control
Textiles	Industrial drying with lower energy consumption



## Technical Specifications

Parameter	Specification Range	Description
Drying Temperature	40-80°C	Operating temperature range lower than conventional dryers (typically 50-70°C)
Air Flow Rate	100-2000 m <sup>3</sup> /h	Volume of air circulated through drying chamber; varies by dryer size
Drying Capacity	3-500 kg/batch	Mass of material that can be dried per cycle residential to industrial scale
Moisture Removal Rate	1-50 kg/h	Rate of water extraction from material being dried
Energy Consumption	0.5-3.0 kWh/kg water	Specific energy use per kg of water removed from material
Evaporator Temperature	5-25°C	Temperature of heat absorption from exhaust air
Condenser Temperature	50-90°C	Temperature of heat release to fresh drying air
Chamber Volume	50-5000 liters	Process monitoring and automation
Air Velocity	0.5-3.0 m/s	Speed of air movement across material surface



# THANK YOU

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