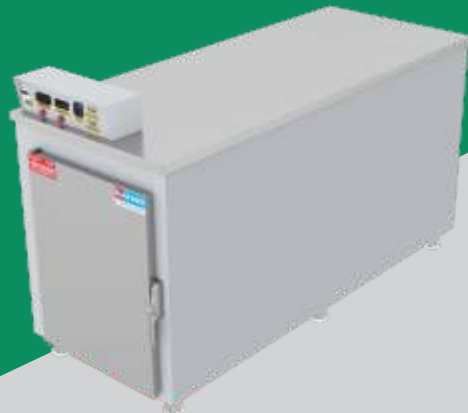


# Heat Pump Food Dehydrator

Capacity Range: 20 Kg to 2000 Kg / Batch

HPD 20



HPD 50



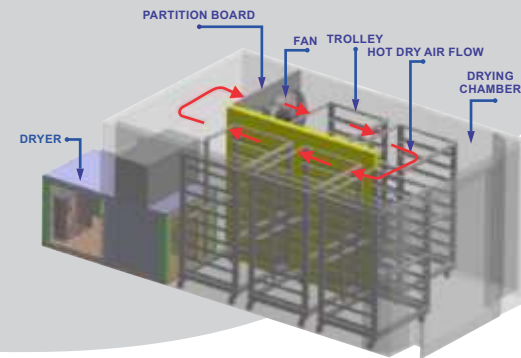
HPD 100



HPD 500



HPD 1000



## ICE MAKE REFRIGERATION LIMITED

Commercial & Industrial Refrigeration Equipment Manufacturer & Exporter

An ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certified Company

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CT117/02-26/SP



# Heat Pump Food Dehydrator



### Vegetables & Fruits



Apple - Fresh



Apple - Dried



Papaya - Fresh



Papaya - Dried



Garlic - Fresh



Garlic - Dried



Banana - Fresh



Banana - Dried



Kiwi - Fresh



Kiwi - Dried



Beetroot - Fresh



Beetroot - Dried



Mango - Fresh



Mango - Dried



Potato - Fresh



Potato - Dried



Carrot - Fresh



Carrot - Dried



Strawberry - Fresh



Strawberry - Dried



Tomato - Fresh



Tomato - Dried



Ginger - Fresh



Ginger - Dried



Grapes - Fresh



Grapes - Dried



Bitter Gourd - Fresh



Bitter Gourd - Dried



Turmeric - Fresh



Turmeric - Dried



Guava - Fresh



Guava - Dried



Bhindi - Fresh



Bhindi - Dried



Red Pepper - Fresh



Red Pepper - Dried

### Herbs & other Products



Coriander - Fresh



Coriander - Dried



Rose - Fresh



Rose - Dried



Spinach - Fresh



Spinach - Dried



Mushroom - Fresh



Mushroom - Dried



Methi - Fresh



Methi - Dried



Moringa leaves - Fresh



Moringa leaves - Dried



Mint - Fresh



Mint - Dried



Rice - Cooked



Rice - Dried



Fennel Seeds - Fresh



Fennel Seeds - Dried



Noodles - Fresh



Noodles - Dried



Basil - Fresh



Basil - Dried



Shrimp - Fresh



Shrimp - Dried

Ice Make Refrigeration Limited provides total cooling solutions with HCFCs/HFCs and Ammonia Refrigerants for various industry segments, now offers an innovative HEAT PUMP FOOD DEHYDRATOR to improving food preservation technique for quality and reducing wastage of horticulture and floriculture produces, as well as it can be an eventual preserving technology for sustainable development and rural empowerment for small and marginal food processing entrepreneurs & farmers for products like fruits, vegetables, spices, herbs and other food products.

What is Heat Pump Food Dehydrator?

A device that transfer heat from a colder area (ambient temperature) to a hotter area (drying chamber)by using mechanical energy (refrigeration technology).

| Various Drying Energy Economy Comparison Table                                      |                  |              |                  |              |                 |             |
|-------------------------------------------------------------------------------------|------------------|--------------|------------------|--------------|-----------------|-------------|
| Heat energy require to evaporate 100 kg of water is 225000 kJ or 2.6 kW for 24 hour |                  |              |                  |              |                 |             |
| Fuel Type                                                                           | Electric         | Coal         | Diesel           | NG           | LPG             | Electric    |
| Heating Mode                                                                        | Electric heating | Coal Boiler  | Oil-fired Boiler | Gas Boiler   | Gas Boiler      | Heat pump   |
| Heat Value                                                                          | 3600 kj/kwh      | 23027 kj/kg  | 33494 kj/L       | 36006 kj/m3  | 46860 kj/kg     | 3600 kj/kwh |
| Thermal Efficiency                                                                  | 95%              | 30%          | 85%              | 85%          | 90%             | 450%        |
| Effective Thermal Value                                                             | 3420 kj/kwh      | 6908 kj/kg   | 28470 kj/kg      | 30605 kj/kg  | 42174 kj/kg     | 16200 J/kwh |
| Fuel Price                                                                          | 7 ₹/kwh          | 5 ₹/kg       | 65 ₹/L           | 55 ₹/m3      | 60 ₹/kg         | 7 ₹/kwh     |
| Fuel Consumption                                                                    | 62.79 kwh        | 32.57 kg     | 7.9 L            | 7.35 m3      | 5.34 kg         | 13.89 kwh   |
| Fuel Consumption                                                                    | 439.5 ₹          | 163 ₹        | 513.5 ₹          | 404.25 ₹     | 320 ₹           | 97.23 ₹     |
| Labor Management, Warehousing Costs                                                 | Low              | High         | High             | High         | Low             | Low         |
| Safety Performance                                                                  | Unsafe           | Unsafe       | Unsafe           | Unsafe       | Safe            | Safe        |
| Environmental Pollution                                                             | None             | Very serious | More serious     | More serious | Light pollution | None        |
| Life of Equipment                                                                   | 5-8 years        | 6-9 years    | 6-9 years        | 6-9 years    | 8-12 years      | 10-15 years |

Application

Drying Fruits:

Apples, Apricots, Bananas, Coconuts, Dates, Figs, Grapes, Peaches, Pears, Pineapples, Plums, Breadfruit, Mango, Papaya, Nectarines, Jack Fruits, Guava, Pomegranate, Orange, Berry Fruits, Prunes, Cherries, Amla Fruit.

Drying Vegetables:

Cabbage, Carrot, Cauliflower, Beets, Corn, Radishes, Spinach, Potato, Tomato, Sweet Potato, Water Melon, Celeriac, Celery, Collards, Lettuce, Beans, Cucumbers, Garlic, Onions, Peppers, Sweet Corns, Okra, Coriander/cilantro, Cluster beans, Asparagus, Pickled Cucumbers, Bulbous Root, Marrow.

Drying Agriculture Products:

Rose, Chrysanthemum, Mushroom, Edible Fungus, Tobacco Leaf, White Fungus, Red Pepper, Daylily, Capsicum, Herbs, Horseradish, Winter Squash.

Drying Herbs:

Basil, Dill, Fennel, Lavage, Mint, Oregano, Parsley, Rosemary, Sage, Savoury, Scented, Geraniums, Tarragon, Thyme, Tea.

Drying Seafood:

Sea Fish, Squid, Shrimp, Sea ear, Trepan, Cuttlefish, Hippocampi

Drying Food:

Sausage, Preserved Pork, Smoke Fish, Rice, Noodle, Bean curd Sticks, Cooked Food

Working Principle

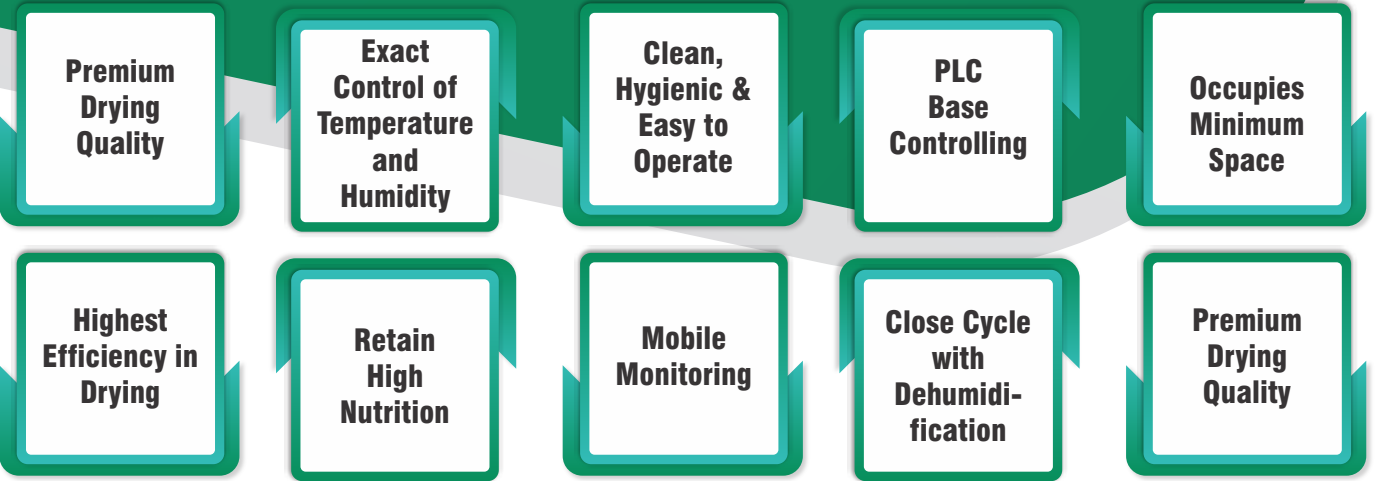
Conventionally, materials are dried either in the field (sun drying) or using high temperature dryers (Electric, Gasfired, etc.) Successful outdoor drying depends upon good weather. High temperature drying can damage the nutrient content, Speciality crops such as Flower, herbs, fruits etc., need to be dried at low temperature (30 to 45 °C) for product quality optimization. This is an important consideration as they have a relatively high commercial value. Heating ambient air to use for drying is a simple cost effective procedure is but at higher ambient air relative humidity, it is not possible to dry products at low allowable maximum temperature condition. High temperature drying deteriorates the material structure and can render it unsuitable for further use. Low temperature drying of specially crops reduces the risk of loss in Nutrient content and damage to physical properties. Ice Make Dehydration dryer incorporate with two systems.

1. Heat Pump

2. Dehumidifier

Heat Pump Function is to add the latent and sensible heat with low energy consumption. The running cost comparison of various system shown in Table.

Dehumidifier function is to remove moisture from drying chamber to maintain low relative humidity.



Technical Specifications:

| Model   | Fresh (Wet) Product Capacity (kg) | Power Supply               | Connected Power (kW) | Average Running Power (kW) | Heating Capacity (kW) | Cooling Capacity (kW) | Dehumidification Capacity (L/H) | Total No's of Trays | Total Tray area (m2) | Chamber Temp. (°C) | Dimension of Dryer (mm) |
|---------|-----------------------------------|----------------------------|----------------------|----------------------------|-----------------------|-----------------------|---------------------------------|---------------------|----------------------|--------------------|-------------------------|
| HPD0020 | 20 to 60                          | 1 ph, 230 V                | 1.5 kW               | 1 kW                       | 3.4                   | 2.4                   | 1.9                             | 16                  | 2.8                  | 30 to 60           | 2100 x 810 x 1000       |
| HPD0050 | 50 to 100                         | 1 ph, 230 V<br>3 ph, 415 V | 3 kW                 | 2 kW                       | 6                     | 4.5                   | 6                               | 20                  | 10                   | 30 to 75           | 3120 x 1400 x 1425      |
| HPD0100 | 80 to 100                         | 1 ph, 230 V<br>3 ph, 415 V | 4.5 kW               | 3 kW                       | 8.5                   | 6.5                   | 10                              | 40                  | 20                   | 30 to 80           | 3120 x 1450 x 1800      |
| HPD0200 | 200 to 250                        | 3 ph, 415 V                | 8.5 kW               | 6 kW                       | 15                    | 11                    | 15                              | 64                  | 32                   | 30 to 80           | 5250 x 2320 x 1660      |
| HPD0300 | 300 to 400                        | 3 ph, 415 V                | 10 kW                | 6 kW                       | 21.5                  | 17.5                  | 27                              | 96                  | 48                   | 30 to 80           | 5100 x 2350 x 2200      |
| HPD0400 | 400 to 450                        | 3 ph, 415 V                | 11 kW                | 6.5 kW                     | 22                    | 18                    | 28                              | 128                 | 60                   | 30 to 80           | 6170 x 2340 x 2200      |
| HPD0500 | 500 to 700                        | 3 ph, 415 V                | 14 kW                | 9 kW                       | 29                    | 23.5                  | 37                              | 192                 | 96                   | 30 to 80           | 9700 x 2320 x 2200      |
| HPD0700 | 700 to 900                        | 3 ph, 415 V                | 21 kW                | 15 kW                      | 45                    | 37.5                  | 60                              | 256                 | 128                  | 30 to 80           | 8000 x 3240 x 2220      |
| HPD1000 | 1000 to 1200                      | 3 ph, 415 V                | 26 kW                | 17 kW                      | 58                    | 47                    | 74                              | 320                 | 160                  | 30 to 80           | 11830 x 3230 x 2220     |
| HPD1500 | 1500 to 1700                      | 3 ph, 415 V                | 42 kW                | 30 kW                      | 90                    | 75                    | 100                             | 504                 | 241                  | 30 to 80           | 11830 x 3600 x 2220     |
| HPD2000 | 2000 to 2500                      | 3 ph, 415 V                | 47 kW                | 32 kW                      | 103                   | 85                    | 120                             | 648                 | 324                  | 30 to 80           | 14500 x 4750 x 2220     |

\* Product capacity is the fresh (wet) product loading capacity and it depends on product condition  
\*\* Connected power, Heating capacity and cooling capacity is given at 15 °C Evaporating temperature And 60 °C condensig temperature