The Maguire LPD™: A revolution in resin drying.

The LPD dryer reduces the time needed to properly dry resin from as much as four hours to only 40 minutes and cuts energy consumption by up to 80%.

The Maguire Low Pressure Dryer™ (LPD) is a revolutionary device that uses vacuum to accelerate the resin drying process. The use of vacuum provides many benefits compared to conventional drying technology.

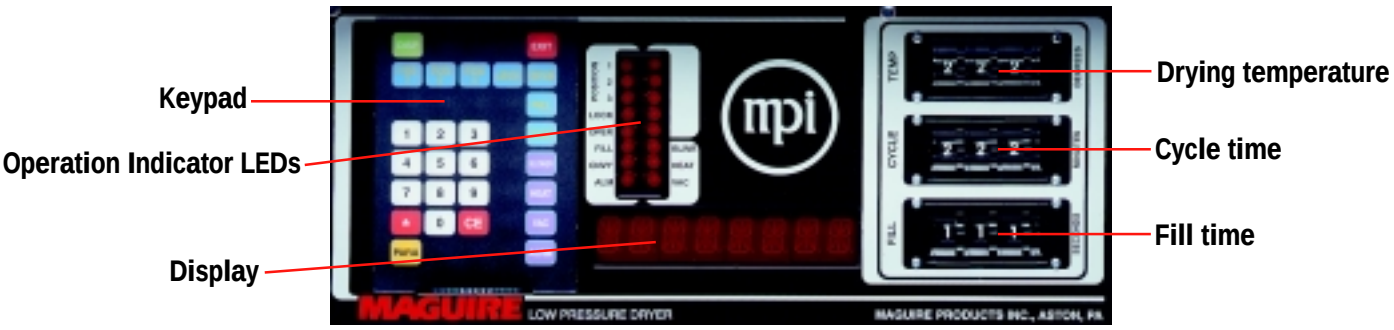
Maguire Products did not invent the science of low pressure (vacuum) drying. In fact vacuum drying has been used in the manufacturing process of plastic resins, chemicals, food and pharmaceuticals for many years. But, Maguire Products is the first to bring this technology to the plastics industry in a package that is affordable, reliable and simple to operate.

While conventional dryers merely heat pellets and keep them hot as moisture works its way to the surface (a very energy intensive process), the LPD Dryer uses vacuum to literally pull moisture out of resin pellets. As a result, the LPD dryer reduces the time needed to properly dry resin from as much as four hours to only 40 minutes and cuts energy consumption by up to 80%.

Why is the LPD™ Dryer better?

- The LPD System costs about the same or a little less than conventional dryers.
- Operating costs are much lower than desiccant dryers; in some cases 80% lower.
- Drying time is reduced from 4 hours to 40 minutes.
- Material or color changes can be made “on-the-fly” with no down time.
- The routine maintenance associated with desiccant dryers is eliminated.

The LPD™ Dryer microprocessor controller.



Dry resin in 40 minutes, not 4 hours.

Simple physics explains the outstanding efficiency of vacuum drying. As air pressure drops, water boils or volatilizes at lower and lower temperatures. While water boils at 212° F (100° C) under normal sea-level atmospheric pressure of 29.92 inches (760 mm) of mercury, the boiling point falls to only 133° F (56° C) when pressure is reduced to 25 inches (635 mm).

In practice the LPD Dryer heats most resins to temperatures in the range of 160 to 240° F (71 to 115° C) before drawing the vacuum. It takes about 20 minutes to raise the pellet temperature enough to exceed the reduced boiling point. The LPD dryer generates a very strong vacuum of up to 29 inches (737 mm) which does the real work, and needs only about 20 minutes to reach required resin dryness.

■ Result: dry resin in 40 minutes!

How it works:

In normal operation, the dryer utilizes an indexing carousel containing three material chambers, which automatically rotate through 3 positions or stages:

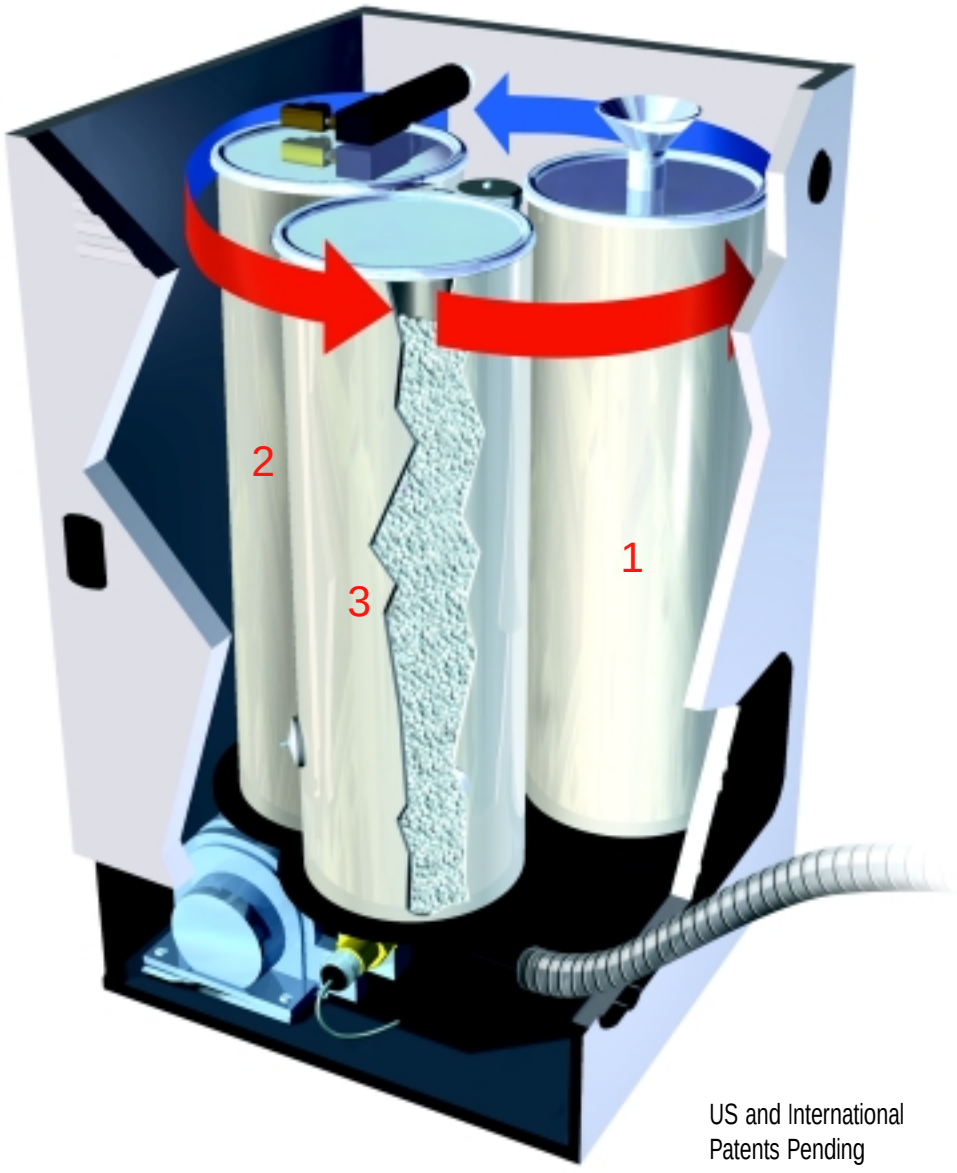
STAGE 1: Resin is loaded into the vacuum chamber and is heated by hot air for about 20 minutes.

STAGE 2: A second vacuum chamber containing a batch already up to temperature is sealed at top and bottom, a vacuum is drawn for 20 minutes, and moisture is evacuated to ambient air.

STAGE 3: Dried resin in the third sealed chamber is pneumatically conveyed to the receiver mounted on the processing machine.

On a 100 lb/hr (45 kg/hr) unit there is never more than 70 to 100 lb (32 to 45 kg) of material in the system. This is 75% to 83% less than a conventional dryer. Even processors who fail to plan ahead are left with a minimum amount of unused material.

With a little planning, it is possible to change colors on-the-fly without wasting material or stopping production.



US and International Patents Pending

Energy efficient, simple operation.

The LPD-100 Dryer is intended to be located next to the process and provides the ability to convey dried material to the processing machine. Provision for conveying material to the dryer is not provided.

The dryer requires:

1) Air supply of 80 PSI.
2) 230 Volt, 30 Amp, single phase power source.

Once all connections are made, the operator presses the Cycle Start button to begin the sequence. Operation begins only after lock engagement is confirmed by the lock cylinder sensor. The blower will actuate at least 4 seconds before the heater is turned on. If rising temperature is not detected within 20 seconds the heater will turn off, the system will stop and an alarm will sound. Likewise, if adequate vacuum is not reached within 90 seconds the alarm will sound.

The fill valve in Stage 1 will open for a pre-set time to load the desired amount of material into the chamber. Hot air enters the bottom of the chamber to heat the material as the chamber is filled. The blower and heater are sized to heat a single chamber of material in 20 minutes. The material at the top of the chamber is slightly cooler than the material at the bottom, but the system takes this into account and ensures that resin temperature is sufficient for full drying. After 20 minutes the cycle ends and the chambers index.

The heated material is now in the Stage 2 position and the chamber is sealed and vacuum (a minimum 25 inches of mercury) is applied for 20 minutes. At the same time the filling and heating process in Stage 1 begins. After 20 minutes the chambers index again and dried material is delivered from stage 3 to the processing machine. When the material in Stage 3 is fully consumed, a level sensor will detect the absence of material below the chamber and cause the unit to index, thus providing a constant flow of dry material to the process.

The vacuum receiver provided with the dryer is mounted on the throat of the process machine and is controlled by the dryer. When the receiver's sensor detects a low material level, the dryer controller shifts an air flow valve and uses the heated air to convey material from the dryer to the receiver. Load time is set to about 5 seconds. For this brief time air is diverted from the heating chamber to material conveying.

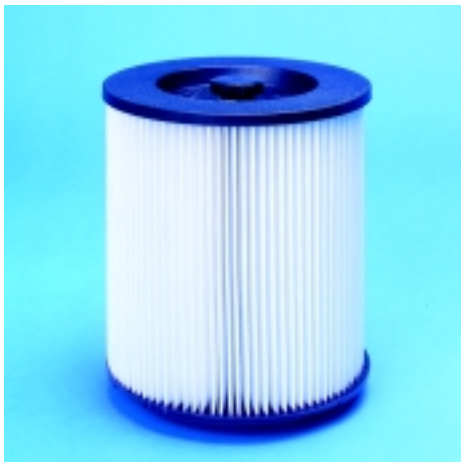
The LPD-100 System components:

1) Three-station indexing carousel with three removable cylindrical vacuum chambers, each of which holds up to 1 cubic foot (0.028 m^3), or about 35 lb. (15.9 kg) of resin
2) Two 1400 Watt heaters and a closed-loop hot air circulating system
3) Venturi vacuum generator
4) A blower that alternately circulates heated air through the resin and transfers dry resin to the processing machine
5) Transparent surge hopper for loading resin into the system (optional)
6) Maguire "Clear-Vu ™" mini-receiver, with resin capacity of 1.1 lb. (0.5 kg), for loading dried resin into the processing machine
7) Controller that makes automated operation of the dryer possible
8) Enclosing cabinet

The LPD™ Controller is easy to use and contains many standard features:

- Three thumbwheels to set temperature, cycle time and fill time.
- Eight character display to show mode of operation, temperature, elapsed cycle time, vacuum level and various alarm displays.
- Alarm strobe light and horn with silence button.
- Printer output.
- Computer port for remote monitoring, control and operation documentation.
- Keypad for setting operation mode, adjusting dryer parameters and many additional program functions.
- The controller is easily removed for any required service.

VACUUM CANISTER
AS7125 LPD-100 heat canister assembly



LPD FILTER
HF06 Cleanstream Filter

LEVEL SENSOR
EHSX03 18mm prox sensor, 10-40 VDC