

# Materials Drying Product Guide



## OVERVIEW

Our dryers are proven to dry all types of polymers in a fraction...



## HOW IT WORKS

The dryer operates with 3 stainless steel canisters that are mounted...



## PRODUCT INFORMATION

View our full technical specification and energy usage comparison...



## CONTACT

Find out your local contacts or where your regional head office is located...

**OUR VACUUM DRYERS  
ARE PROVEN TO DRY  
PLASTICS MATERIALS  
6 TIMES FASTER THAN  
CONVENTIONAL DRYERS**

**MAGUIRE**<sup>®</sup>  
*Intelligent Simplicity*

# OVERVIEW



## A revolution in dryers

Maguire Vacuum dryers are proven to dry plastics materials 6 times faster than conventional dryers and use up to 85% less energy.

### Energy Savings

Side-by-side testing of the vacuum dryer and a desiccant dryer shows reduced energy consumption of 70 - 85%. The key to the reduced energy consumption is that the vacuum dryer does not rely on desiccant. Desiccant, once saturated, must be regenerated by a heating and cooling process so it will again be able to absorb moisture. All energy required to regenerate desiccant is lost to ambient.

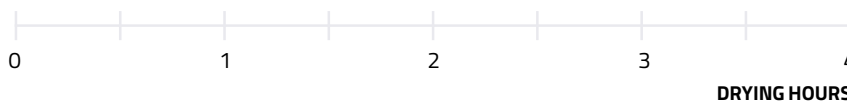
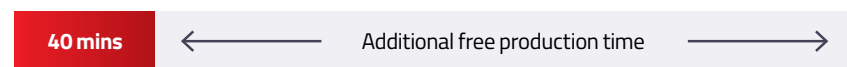
### Speed of Drying

Typically the vacuum dryer will dry materials in one-sixth the time of a desiccant dryer. If your desiccant dryer drying time is 4 hours, the vacuum dryer will do the job in 40 minutes. The result is time-savings of 3 hours and 20 minutes every time you start up a dryer. This not only represents reduced energy cost, but could also represent 3 hours and 20 minutes of additional production time.

**Desiccant Dryer** – drying time



**Maguire Vacuum Dryer** – drying time



**70-85%**

SAVING ON  
YOUR ENERGY  
CONSUMPTION

Maguire  
Vacuum Dryer

Desiccant Dryer

**83%**  
reduction in  
drying time



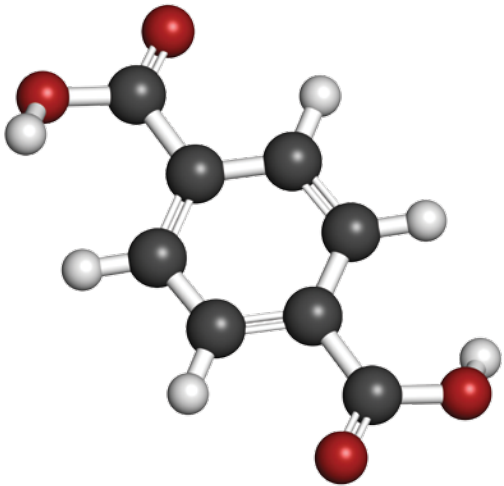
**85%**  
reduction in  
energy use

## Reduced Maintenance

Since desiccant degrades over time it must be replaced on a regular basis. This expense is avoided with a vacuum dryer. In addition the need to monitor the condition of desiccant is eliminated.

## Low Material Stress

Long drying times at elevated temperatures can cause thermal, chemical and physical material degradation. Materials if exposed to prolonged elevated temperature during drying run the risk of degradation including discoloration and/or IV drop which leads to reduced physical properties of the end product.



The reduced drying time required with the vacuum dryer dramatically reduces the risk of material degradation. Since the vacuum dryer first heats up the material, then applies vacuum to accomplish drying, the heating cycle is only 20 to 30 minutes.



# VBD Vacuum Dryer

## Improved design obsoletes moving canisters and minimizes moving parts

- Continuous batch drying process.
- **-40° dew point air is bled into vacuum and retention hoppers.**
- Vertical design minimizes footprint.
- **No heat loss is guaranteed with double-insulation on all chambers.**
- Reduced Maintenance – no desiccant to change – no filters to clean.
- **Faster drying improves production planning.**
- “No stress” material drying – means no material degradation.
- **Process temperatures up to 350°F (176°C).**
- Vacuum take-off or gravity feed material discharge available.
- **Backed by same 5-year warranty as all Maguire products.**

**LOW**  
maintenance

Dry up to  
**1000<sub>lb</sub>**  
per hour in 1/6  
of the time

**60%**  
less energy  
than desiccant  
dryers

**MODEL  
VBD-1000**



**MODEL  
VBD-300**



**MODEL  
VBD-150**



Our VBD range dries resin 6 x faster than desiccant dryers and uses 60% less energy with our unique, patented 3-stage drying technology.

*The vacuum chamber and retention hopper are easily removed for cleaning.*



# VBD Vacuum Dryer

## Our VBD vacuum dryers use our proven gravimetric technology

### Adaptive drying

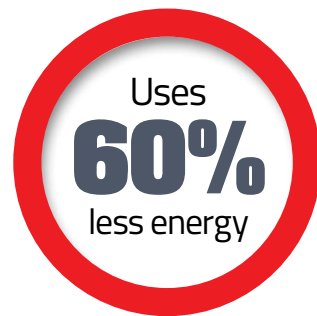
This clever technology prevents material from over drying and uses 60% less energy.

### Quicker material changes

Load cell control allows for controlled dryer stops with an empty vacuum chamber and retention hopper – when production stops, no material clean out is required, allowing the next production run to start immediately.

### No cross contamination

No material is left in the retention hopper or vacuum chamber once the dryer is programmed to stop, ensuring no material cross contamination.



proven  
gravimetric  
technology

## LPD Vacuum Dryer

### Proven technology with over 2400 LPD installed globally.

The LPD-30 Dryer is part of the first series of Vacuum Drying Systems from Maguire, a range with over 2,400 dryers installed worldwide.

While larger kg/h applications benefit from the new design of the VBD series, for small kg/h technical drying requirements the LPD-30 remains the standard solution given how popular the system design has been for a range of tool making and prototyping processes.

A key attraction of the 3 canister standard design is the fact that multiple materials can be processed through the dryer in sequence – in the form of on-the-fly material changes.

#### ON-THE-FLY MATERIAL CHANGE

- Since the vacuum dryer dries in batches a material or color change can be accomplished on-the-fly.
- This means no downtime related to clean-out of the drying hopper during a material change.
- Every time you have a material change with a desiccant dryer the dryer must be shutdown and the drying hopper cleaned. This is normally a time consuming and labor-intensive process.
- The LPD vacuum dryer will automatically notify the operator when it's time to conduct an on-the-fly material change.
- No interruption of the drying process occurs during the on-the-fly material change.
- This makes the LPD-30 size and portability ideal for tool makers and rapid prototyping, alongside small technical moulding also.

**No interruption of the drying process occurs during the on-the-fly material change.**





# HOW IT WORKS



## 3 Stage drying process

The dryer operates in a 3 step process and the material goes through the drying steps accordingly.

### STAGE 1

Material in the heating hopper is brought to set point by means of a centrifugal blower through a 40 Kw heating element. The requested heating temperature is adjusted on the control panel and the cycle lasts 45 minutes (60 minutes for PET).

### STAGE 2

Upon reaching the desired set point, heated material is discharged from the heating hopper into the vacuum chamber. The vacuum is brought to 90% of full vacuum and maintained for the set time period. The vacuum cycle typically lasts for about 15 minutes so you have ready-to-process material in as short as 35 minutes.

### STAGE 3

The dried material is discharged into an insulated retention / take-off hopper for consumption. A positive pressure heated dry air purge is maintained on the material.



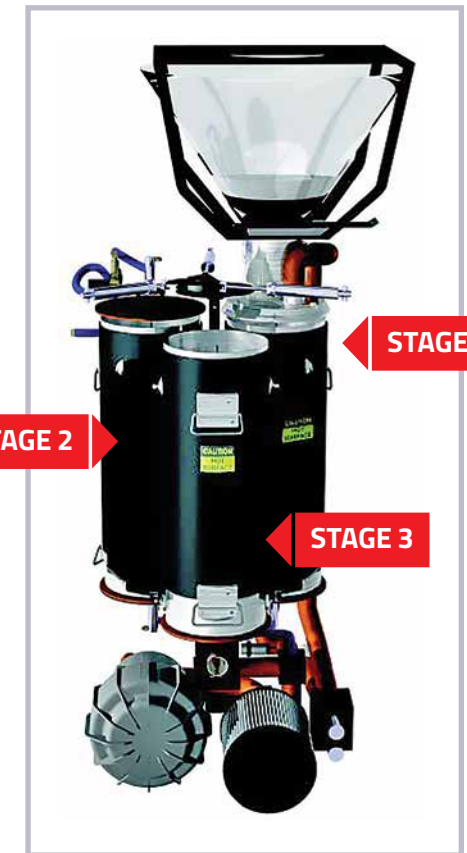
## Maguire VBD 3 Stage drying process

STAGE 1

STAGE 2

STAGE 3

## Maguire LPD 3 Stage drying process



STAGE 1

STAGE 2

STAGE 3

## Controllers

# Simple is better

## Intuitive touchscreen controls

- Our **NEW** intuitive VBD touchscreen controller is simple to operate and uses icon driven controls for ease of operation. See all drying features from just one screen and start your batch, conduct a clean out and set your drying parameters with just a touch.
- The controller monitors numerous alarm conditions to ensure proper performance. Comparable to a dewpoint monitor, vacuum level is always monitored to ensure proper vacuum level is maintained.
- Alarms are shown on the display and signaled by an alarm light and horn with silence function.
- As an aid to monitoring dryer performance and documenting operation, reports can be generated via a USB port to either a memory stick or printer. A printer port is provided on the controller.
- Program updates via flash memory using a standard USB memory device.
- The display will indicate temperature and elapsed cycle time or, if preferred, temperature and vacuum level. If a problem occurs during operation an alarm strobe and horn will be activated and the nature of the problem will be indicated on the display.
- Our VBD models will display the material weight in the vacuum and retention hopper, as well as the actual throughput.
- The LPD controller can be easily removed for service or replacement. If you have a controller problem a complete new control panel may be installed in minutes.



### LPD CONTROLLER

The display will indicate temperature and elapsed cycle time or, alternatively, temperature and vacuum level.

### NEW VBD TOUCHSCREEN CONTROLLER



Simple, intuitive touchscreen controller; operators can manage all drying parameters from just one screen.

**ONLY ONE**  
SCREEN TO  
MONITOR

### STANDARD VBD CONTROLLER



Four buttons provide access for setting operation mode, adjusting dryer parameters and many additional program functions.



# PRODUCT INFO



## Technical Specification

Model	LPD-30		VBD-150		VBD-300		VBD-1000	
	U.S.	Metric	U.S.	Metric	U.S.	Metric	U.S.	Metric
Maximum Throughput	up to 30 lb/hr	up to 15 Kg/hr	up to 150 lb/hr	up to 68 Kg/hr	up to 300 lbs/hr	up to 136 kg/hr	Up to 1000 lb/hr	up to 455 Kg/hr
Heating Hopper Volume	0.32 cu ft	9 L	95 lb (2.5 ft <sup>3</sup> )	43 Kg (70 L)	4.25 cu ft	120 L	1200 lb (26 ft <sup>3</sup> )	544 Kg (735 L)
Vacuum Chamber Volume	0.32 cu ft	9 L	38 lb (1 ft <sup>3</sup> )	17.3 Kg (28 L)	2.0 cu ft	57 L	397 lb (10.5 ft <sup>3</sup> )	180 Kg (297 L)
Retention Hopper Volume	0.32 cu ft	9 L	50 lb (1.3 ft <sup>3</sup> )	22.5 Kg (37 L)	2.25 cu ft	64 L	397 lb (10.5 ft <sup>3</sup> )	180 Kg (297 L)
Max. Temperature	360°F	190°C	350°F	176°C	375°F	190°C	350°F	176°C
Power Requirements	460V/3Ph/60Hz 3.47 kW / 16 A	400V/3Ph/50Hz 3.47 kW / 16 A	240, 480, 575V/3ph/60Hz 20 A Service	400V/3ph/50Hz 15 A Service	480 VAC / 27 AMP	380 VAC / 33 AMP	480V/3ph/60Hz 60 A Service	400V/3ph/50Hz 100 A Service
Process Heater	3 KW		11 KW		18 KW		35 KW	
Blower	0.5 hp / 2.5 A	0.37 kW / 2.5 A	1.1 HP, 105 scfm	.75 KW, 2973 L/min	3.5 HP	2.2 kW	10 HP, 600 scfm	7.5 KW, 16990 L/min
Compressed Air Pressure	70-90 psi	6 - 8 bar	80 psi	5.5 bar	85 PSI	5.86 bar	80 psi	5.5 bar
Compressed Air Usage	0.4 cfm	0.7 m3/h	5.2 scfm	135 NI/min	6.5 scfm	169 NI/min	19.8 scfm	490 NI/min
Product Weight	550 lb	250 Kg	501 lb	228 Kg	918 lbs	416 kg	2500 lb	1135 Kg

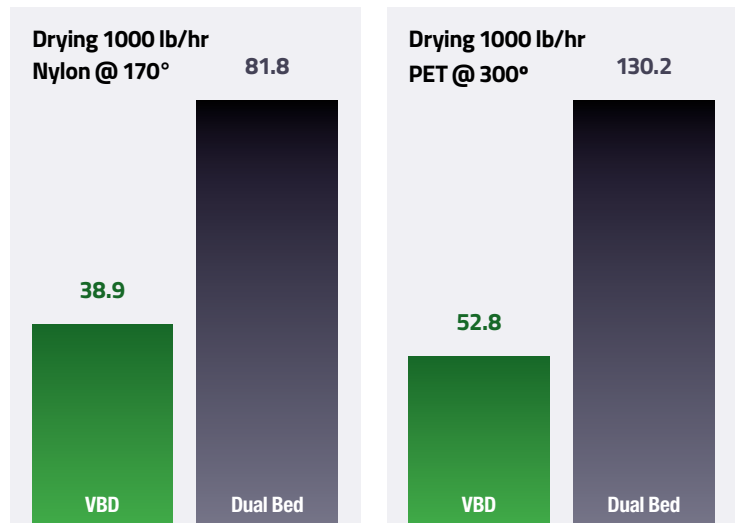
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## Energy Usage Comparison

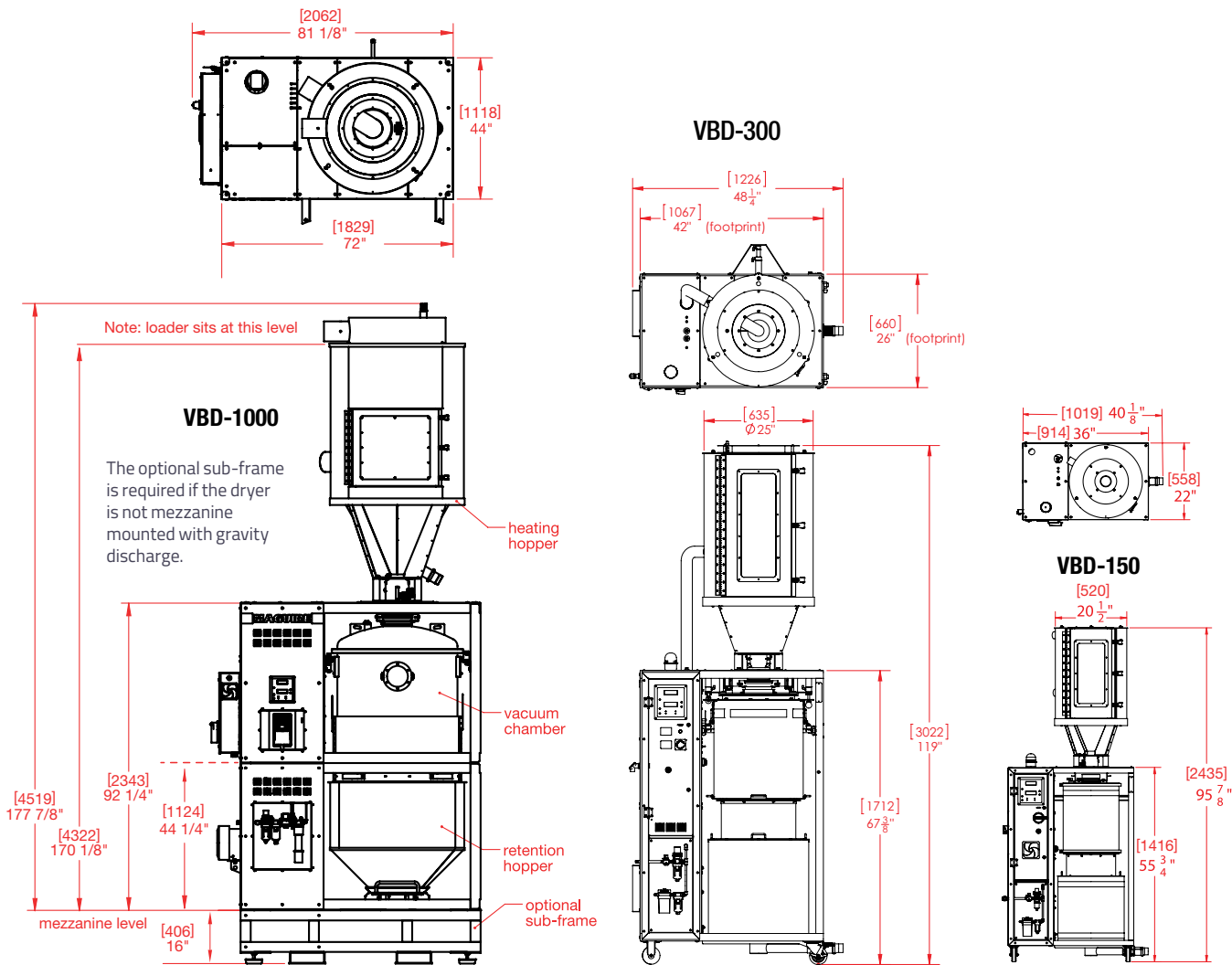
**Dual Bed Desiccant Dryer vs. Maguire VBD-1000 Vacuum Dryer**

Drying 1000 lb/hr (454 kg/hour) of each of the following resins

	Dual Bed	VBD
<b>Nylon at 170°F (77°C)</b>	watts/Kg/hr	watts/Kg/hr
Electrical consumption only	81.8	30.8
Compressed air generation electrical requirement for 9.8 SCFM		8.1
TOTAL True Energy Consumption	81.8	38.9
	<b>ENERGY SAVINGS 53%</b>	
<b>PET at 300°F (148°C)</b>	watts/Kg/hr	watts/Kg/hr
TOTAL True Energy Consumption	130.2	52.8
	<b>ENERGY SAVINGS 60%</b>	



## Dimensions



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