MAGUIRE®
Intelligent Simplicity

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ULTRA DRYERS

The world's first **ULTRA low energy dryers.**

PRODUCT GUIDE

ULTRA® BY MAGUIRE®

“”

The first ULTRA low energy dryer for all plastic raw materials.

The First ULTRA Low Energy Dryer

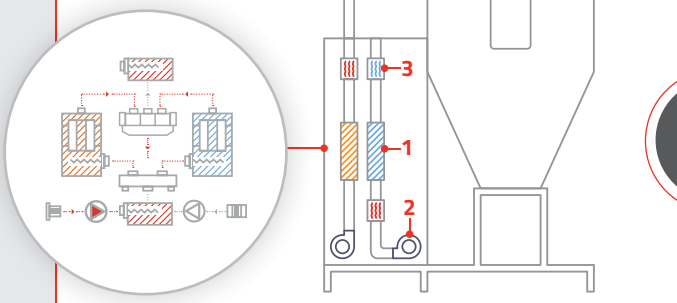
Energy efficiency is the number one criteria for selecting dryers or replacing existing dryers! See below the desiccant high energy components, versus the ULTRA low energy components.

ULTRA
ULTRA LOW ENERGY DRYER

Desiccant | High Energy Componants

ENERGY
INTENSIVE

Intensive energy used to **HEAT** the material.



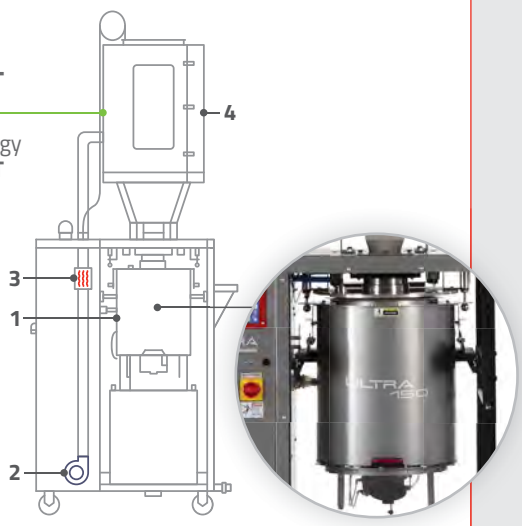
1. **Regeneration Process:** Desiccant beds become saturated with moisture and need to be regenerated which is **energy intensive.**
2. **Extra Blowers & Heating Unit:** Regeneration requires a separate heating unit, and separate blower which is **energy intensive.**
3. **Frequent Maintenance:** Desiccant requires several filters and expensive dew point meters. The desiccant beds also need replacing after 18-24 months.
4. **Capacity Drying Hopper:** Constantly circulating a required level of airflow through large drying hoppers for residence times of 4-6 hours.

Vs

ULTRA | ULTRA Low Energy Componants

ENERGY
EFFICIENT

Minimal energy used to **HEAT** the material.



1. **Vacuum Drying Process:** No regeneration process. No added energy used.
2. **No Extra Blowing / Heating Unit Required:** Energy efficient.
3. **Low Maintenance:** No scheduled maintenance requirements.
4. **Small Heating Hopper:** Less material in process, less energy used.

ULTRA efficient in every way!

ULTRA Also Offers Significant Benefits Over Desiccant In All Of These Criteria

Return On Investment
What is the initial purchase cost of the dryer?

Material Changeover
How quick can you change material?

Time
How long does it take to dry raw materials?

Cost Of Ownership
What is the real cost of the dryer?

Maintenance
How much maintenance & servicing?

Scrap Rate
Drying control & sufficient dry time?

The First ULTRA Low Energy Dryer

DRYER ENERGY COSTS YOU CAN NOW CONTROL

ULTRA
ULTRA LOW ENERGY DRYER

The difference in energy used to dry material, after it's brought up to temperature is huge:

A Desiccant Dryer Uses:

45	100
Watts / lb	Watts / kg

Vs

Our ULTRA Dryers Use:

4	8
Watts / lb	Watts / kg

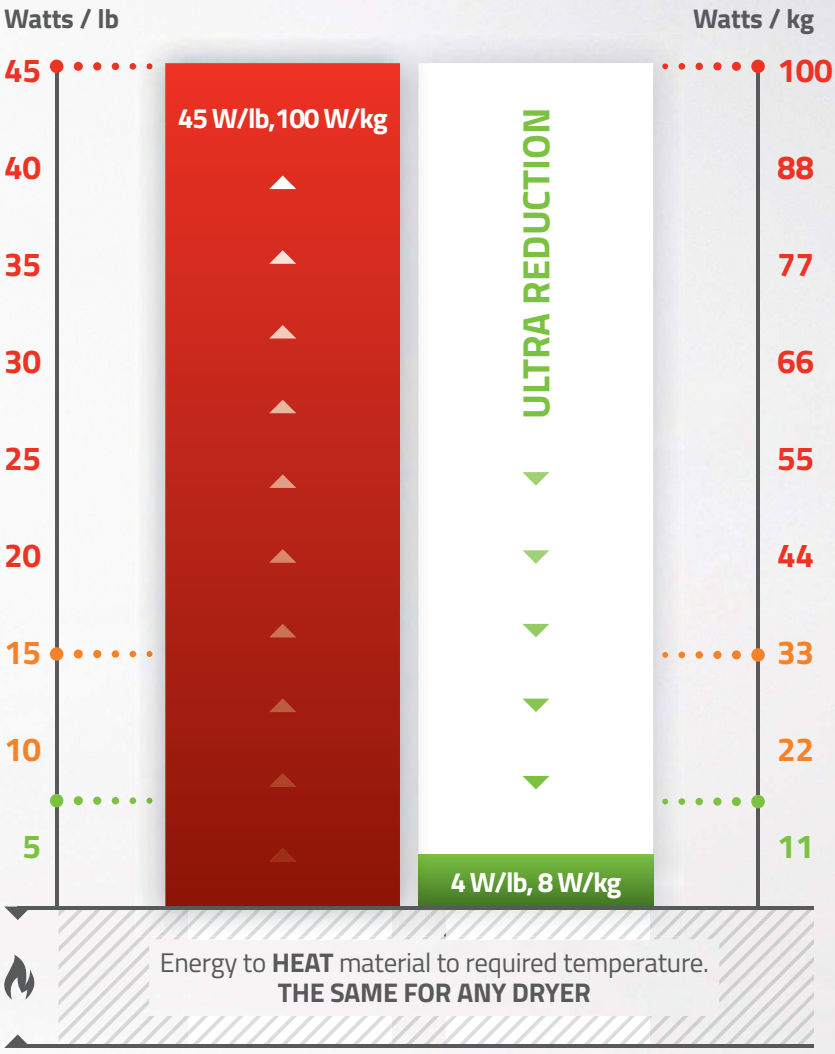
Switching From Desiccant To ULTRA

Saves You:

41	92
Watts / lb	Watts / kg

Key Benefit: Energy Savings

The ULTRA low energy dryer is significantly more energy efficient than any other energy efficient dryers available in the market today!



THIS IS ENERGY USED TO DRY MATERIAL

This Is Where The Difference Occurs!

Desiccant

Desiccant dryers re-circulate hot air for hours, which is energy intensive and slow.

Vs

ULTRA

Our ULTRA dryers use a minimal amount of energy in this process, saving time, energy and money.

← **THIS IS ENERGY USED TO HEAT MATERIAL**

Desiccant ULTRA

$7,128* **$634***

ANNUAL COST TO DRY MATERIAL*

*Based on 220 lb/hr (100 kg/hr), 6000 hours per year, kW cost at national average of $0.12 per kW. This chart shows the EXCESS ENERGY required to DRY the material.

Savings Year On Year

With a kW difference of 41 Watts / lb, 92 Watts / kg using an ULTRA dryer, you can save **$6,494** annually doing the exact same job. **Savings year on year:**

After 5 Year Period	$32,470
After 10 Year Period	$64,940
After 15 Year Period	$97,410

ULTRA Efficient Drying Process

What makes the ULTRA low energy dryer the most efficient drying system on the market?

ULTRA Low Maintenance

- Touchscreen detects any issues by highlighting in red service boxes.

  For example: Low air pressure
- System will not RUN if the process requirements are not met:

1. No vacuum / no heat
2. System throws an alert

✔ ULTIMATE PROCESS EFFICIENCY

By design the ULTRA low energy dryer has no scheduled maintenance requirements:

- No desiccant beds to replace
- No process filters to clean and change
- No regeneration cycles
- No cooling requirements
- No chilled water connections

ULTRA Energy Saver

Temperature Sense: Temperature is controlled efficiently with energy saver modes built in as standard.

✔ ENERGY EFFICIENT DRYING

ULTRA Green

ULTRA dryers provide further savings from reduced CO_2e - Global Warming Potential (GWP). Running 220.2 lb/hr (100 kg/hr) provides a saving of 54,120 kW a year

This equates to saving:

38.6 tons CO_2e/year

ULTRA Smart Drying

- FlexBus Lite integrated to touchscreen - to allow control directly of your loading system to and from the ULTRA dryer - full feature materials conveying control
- Smart feeding of material to process
- Load cells monitor process demand by live lb/hr (kg/hr) consumption
- Automatic adjustment of amount of material under vacuum and in retention hopper feeding the process
- ULTRA signals when to release the next fresh batch
- Retention Insulation: The retention hopper is heavily insulated and enclosed to minimize heat loss and moisture reabsorption

✔ ULTIMATE PROCESS EFFICIENCY

ULTRA Heating Hopper

Less raw material in process thanks to a smaller pre-heat hopper.

- ✔ INCREASED EFFICIENCY

ULTRA avoids heating material that is not required for the process.

- ✔ LESS ENERGY USAGE

ULTRA Load Cells

- Use of load cells in the vacuum chamber and retention hopper allow the drying rate to match the process rate.
- As lb/kg demands go up or down, the ULTRA matches the process requirements accordingly.

- ✔ COMPLETE PROCESS DATA
- ✔ EFFICIENT PRODUCTION

ULTRA Quick Drying

ULTRA dryers use vacuum as the main method to dry versus air dew point. Drying by vacuum drops the boiling temperature of water to 133°F / 56°C. This creates a temperature and pressure differential that means moisture is **rapidly** released from the material.

- Typically, **1/6th** of the drying time of conventional desiccant dryers.
- This dramatically reduces the energy required to **DRY** material.

- ✔ MORE PRODUCTION TIME
- ✔ FASTER MATERIAL CHANGES
- ✔ MORE MACHINE UPTIME

Example:

Using the ULTRA, Polycarbonate can be dried from cold start-up in **30-40 minutes** compared to **3 hours** in a desiccant dryer.

Dryer Range: Wide Range Of Models Available

Maguire offers 4x ULTRA models and 3x LPD models to cater for small and large lb/hr (kg/hr) throughputs.

ULTRA RANGE

ULTRA® 150

ULTRA® 300

ULTRA® 600

ULTRA® 1000

LPD RANGE

The LPD-30 as the standard solution for small lb/hr and kg/hr technical drying requirements.

LPD 30

LPD 100

LPD 200

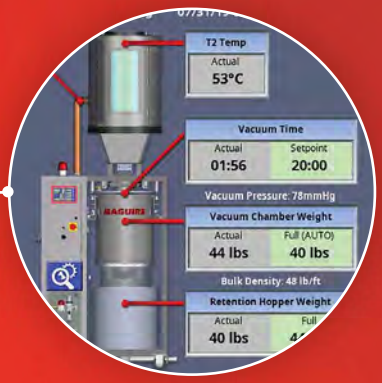
5 YEAR WARRANTY

Throughput Ranges - the ULTRA dryers drying output are determined by the combination of the preheat time and vacuum drying time. Throughputs illustrate typical averages but please refer to expected drying times for specific materials for more accurate information.

Please visit www.maguire.com to download our product data sheets.

ULTRA Smart Controls And Features

The addition of the touchscreen has allowed us to show the drying process graphically and simply.



ULTRA Smart Controls

Simple Export Function & Program Updates

- Constant development of software features and functions
- Automatic program updates
- USB port provided
- Program updates via flash memory using a standard USB memory device

Monitoring Of Numerous Alarm Conditions

- Maintain consistent vacuum level, temperature & cycle time
- Problem indication on display and via alarm light & horn

Easy Retrofittable

- Easy removable for service or replacement
- Multilingual support

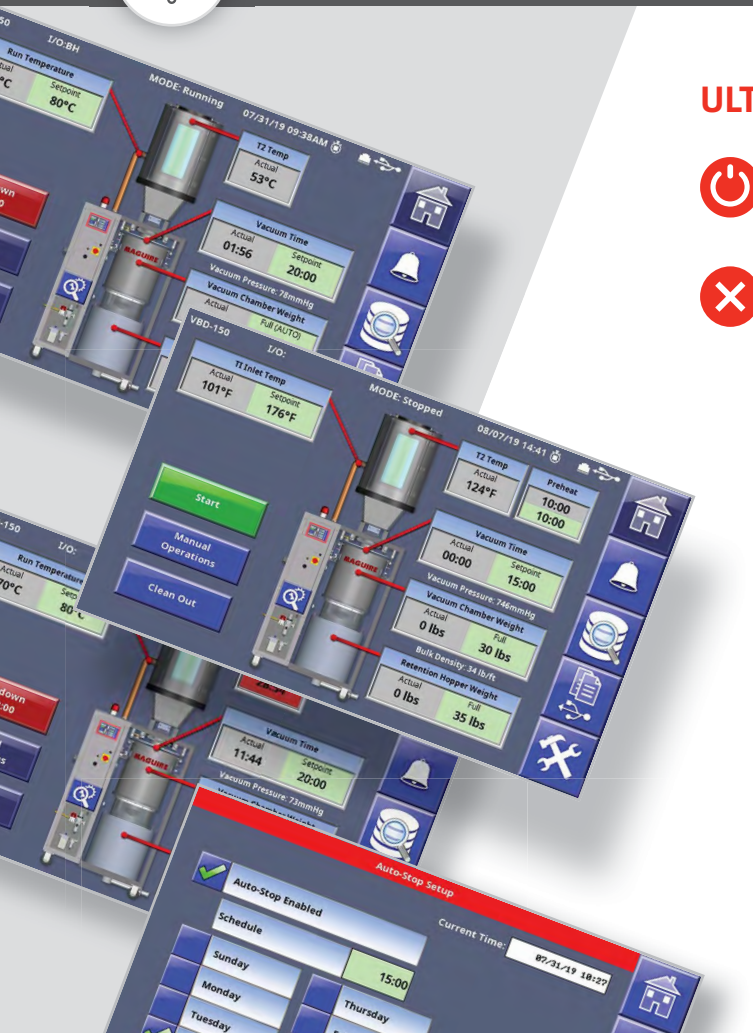
Access To All Production Parameters In One Screen

- lb/kg in vacuum chamber
- lb/kg in retention hopper
- Live current lb/h (kg/h)
- Total lb/kg used in a process or batch

FlexBus Lite Materials Conveying Control

- Control up to 10 material receivers & 1 vacuum pump
- Full features like line cleaning
- Visual and easy to see conveying status to and from ULTRA dryer
- Works with Maguire & third party loading equipment

Our Touchscreen Automates Many Routine Functions



ULTRA Unique Features

Auto Start

Scheduled and automatic start-ups controlled by time.

Auto Stop

Use of load cell data to automatically finish a drying run of a batch of material.

Result: Leaving all hoppers empty & ready for faster / more efficient material changes, simpler production stop.

Dynamic Drying

Use of load cell data to automatically adjust drying rate to process rate.

Energy Saver Mode

Energy saver mode is a standard feature for ULTRA. The heater and blower are automatically regulated to ensure that only the required amount of heat and air flow are used to bring material up to temperature.

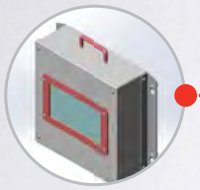
Controller Variations

ULTRA Standard Controller

ULTRA Touchscreen Controller

ULTRA Options

Maguire offers a range of options for the ULTRA dryer to meet production and installation requirements.



Remote HMI Option

- For remote locations
- Standard cable length '50
- Available for touchscreen only

Membrane Dry Air Purge Option

- Provides a supply of -20°C / -68°F dew point air to purge vacuum chamber and blanket the retention hopper
- Prevents moisture re-absorption
- Recommended for highly hygroscopic materials

Gravity Feed Option

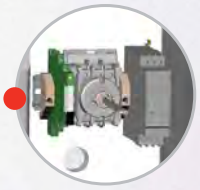
- Standard later VTA replaced with downward-facing drop tube
- Used for mezzanine / elevated installations

FlexBus Lite Materials Conveying Control

- Materials conveying to dryer & machine or small group of machines made easy
- Integrated full feature conveying control for up to 10 material receivers & 1 vacuum pump
- Visual and easy to see conveying status to and from ULTRA dryer
- Works with Maguire & third party loading equipment

Heating Hopper Extension Option

- Higher throughput capacity of additional 1 cu.ft / 30 L
- Allows for increased heat residence time
- Suitable when drying difficult materials
- Typical materials: PA, PET



3-Phase Monitoring Option

- Prevents running of dryer if 3-phase rotation is backwards
- Prevents running if case of phase drop out
- Protects blower motor from damage
- Recommended for highly mobile units

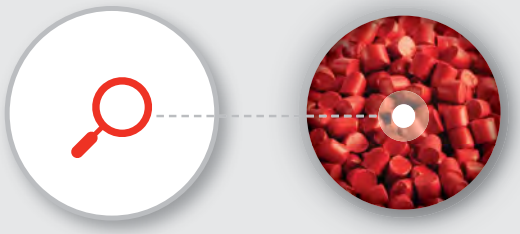
Multi-Point Convey Option

- Lateral convey to more than one receiver

Material Savings Focus

Costs So Low, It's Almost Free!

ULTRA dryers use energy to dry all type of resin at a drastically lower rate than a comparable new desiccant dryer. Savings with the ULTRA dryer are even greater in comparison with a low-efficiency old dryer.



Desiccant Vs ULTRA®

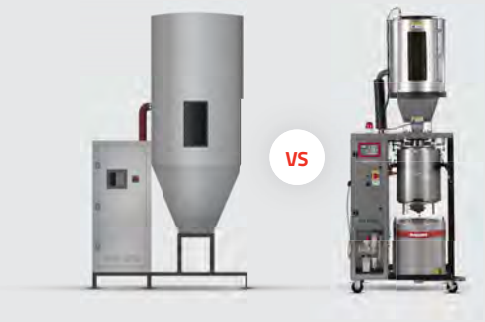
Material Example	Drying System	Energy To DRY		Energy Cost To DRY*
		Watts/lb/hr	Watts/kg/hr	
ABS At 180°F / 80°C	Desiccant	45	100	$7,165.00
	ULTRA®	4	8	$605.00
PC At 250°F / 120°C	Dessicant	59	130	$9,355.00
	ULTRA®	5	11	$795.00
PET At 350°F / 180°C	Desiccant	86	190	$13,655.00
	ULTRA®	7	15	$1,095.00

Save thousands every year with ULTRA drying!

How Does Desiccant Compare To **ULTRA?**

Savings

The savings provided by the ULTRA translate to fast return on investment, without considering other benefits of faster drying, heating & start-up times, significantly lower maintenance, and intelligent operation.



10 Year ULTRA Drying Saving**	Heating Time Savings	Overall Drying Time Savings	Material In Process Savings
X	180 Mins	Drying Time: 180 Mins Start-up Time: 180 Mins	760 lb | 360 kg
$65,595.00	20-30 Mins	Drying Time: 20 Mins Start-up Time: 55 Mins	233 lb | 105 kg
X	180 Mins	Drying Time: 180 Mins Start-up Time: 180 Mins	750 lb | 350 kg
$85,610.00	20-30 Mins	Drying Time: 20 Mins Start-up Time: 55 Mins	270 lb | 125 kg
X	300 Mins	Drying Time: 300 Mins Start-up Time: 300 Mins	1,100 lb | 500 kg
$125,570.00	40 Mins	Drying Time: 30 Mins Start-up Time: 70 Mins	250 lb | 115 kg

ULTRA RETURN ON INVESTMENT

*__DRY__ - This is the net energy used in the drying process to DRY the raw material. HEATING a lb or kg, energy usage is the same for ALL types of drying system and therefore excluded from these examples.

** Typical energy costs & savings calculated on lb and kg data and rounded to nearest $5 usage example based on 220 lb/hr or 100 kg/hr, based on 6000 production hours per year, at an energy kW cost of $0.12.

ULTRA Dryer Case Study

How ULTRA dryers helped improved drying efficiency at Greiner Packaging, Austria.

Greiner Packaging, a major manufacturer of packaging for food and non-food applications pursues a clear sustainability strategy.

From recyclable products with a high recyclate percentage through to an energy efficient production process with reduced CO_2 emissions.

For their raw material drying process in injection stretch blow molding, the company has tested the ULTRA low energy dryer as a replacement for conventional desiccant dryers.

Main Benefit: Energy Savings

Side by side energy trials at Greiner's production facilities have shown a clear reduction in energy consumption compared to conventional desiccant dryers.

ENERGY TO **DRY**

ULTRA Requires:

7 Watts/lb/hr
15 Watts/kg/hr

to DRY PET at 180°C / 350°F

THIS IS:

79 Watts/lb/hr
175 Watts/kg/hr

LESS than an average desiccant dryer

THAT'S A SAVING OF **90% ENERGY** VERSUS A DESICCANT DRYER

Additional Benefit: Reduced Drying Time And Quick Material Changeovers

Drying time has been drastically reduced after switching from conventional desiccant dryers to Maguire ULTRA dryers!

Quick material changeovers within **40 mins** compared to **3 hours** with a desiccant dryer.

03 : 00 | Hrs
00 : 40 | Mins

Result

More material trials per day. 8 material trials per day with the ULTRA, compared to 2 material per day with a desiccant dryer.

8 2

Additional Benefit: Reduced Footprint

By choosing the ULTRA dryer, Greiner have considerably reduced their footprint thanks to ULTRA's vertical, slim and compact design.

ULTRA dryers require **50% less space** than Greiner's conventional dryers where the hopper has to be placed separately.

50%

Material Drying Table

ULTRA Versus Desiccant Drying By Material Type.

Material	Generic Name	Target Moisture Content	Drying Temp °C	Drying Temp °F	Bulk Density kg/liter	Bulk Density lb/ft³	Desiccant Drying Time Hrs	Vacuum Drying Time Mins
ABS	Acrylonitrile Butadiene Styrene	<0.04	80	176	0,6	37.5	2 to 3	15 - 30
ASA	Acrylonitrile Styrene Acrylate	-	80	176	0,65	40.6	2 to 4	20 - 30
ASA+PC	Acrylonitrile Styrene Acrylate & PolyCarbonate Blend	<0.10	100-110	212 - 230	0,65	40.6	2 to 4	20 - 30
CA*	Cellulose Acetate	<0.15	60-65	140-150	0,5	31.2	2 to 3	N/A
LCP	Liquid Crystal Polymer	<0.02	150-160	302-320	0,6	37.5	4	20 - 30
PA 6	Polyamide 6	<0.04	80	176	0,65	40.6	3 to 5	30 - 40
PA 6.6/ 6.10	Polyamide 6.6 / 6.10	<0.04	80	176	0,65	40.6	3 to 5	30 - 40
PA 11/ 12	Polyamide 11 / 12	<0.04	80	176	0,65	40.6	4 to 6	30 - 40
PAA	Polyarylamide 30GF	<0.10	80	176	0,65	40.6	4	30 - 40
PAEK	Polyaryletherketone	<0.05	150	302	0,65	40.6	4	20 - 30
PAEK-HT	Polyaryletherketone HT	<0.05	180	356	0,65	40.6	4	20 - 30
PAI	Polyamide-imide	<0.05 - 0.01	180	356	0,65	40.6	4	30 - 40
PAR	Polyarylate	<0.02	150	302	0,65	40.6	4	20 - 30
PAS	Polyarylsulfone	<0.05	135	275	0,65	40.6	4 to 5	20 - 30
PBT	Polybutylene Terephthalate	<0.03	120	248	0,7	43.7	2 to 3	20 - 30
PC	PolyCarbonate	<0.02	120	248	0,7	43.7	2 to 3	15 - 30
PC+ABS	PolyCarbonate & Acrylonitrile Butadiene Styrene Blend	<0.04	100-110	212 - 230	0,7	43.7	2 to 3	20 - 30
PC+PBT	PolyCarbonate & Polybutylene Terephthalate Blend	<0.02	105-115	221 - 239	0,7	43.7	2 to 4	20 - 30
PC+PET	PolyCarbonate & Polyethylene Terephthalate Blend	<0.02	105-115	221 - 239	0,75	46.8	2 to 4	20 - 30
PE	Polyethylene	-	90	194	0.6	37.5	1 to 2	20 - 30
PE, Black	Polyethylene, Black Compound	-	90	194	0.6	37.5	1 to 2	15 - 30
PEC	Polyethylene Carbonate	<0.02	130	266	0,7	43.7	4 to 6	20 - 30
PEEK	Polyetheretherketone	<0.05	150	302	0,6	37.5	2 to 3	20 - 30
PEI	Polyetherimide	<0.01	150	302	0,6	37.5	3 to 4	20 - 30
PEK	Polyetherketone	<0.05	160	320	0,6	37.5	4	20 - 30
PESU	Polyarylsulfone	<0.05	120	248	0,7	43.7	3 to 4	20 - 30
PET-a	Polyethylene Terephthalate - Amorphous	<0.02	120	248	0,85	53.1	3	30 - 40
PET-c	Polyethylene Terephthalate - Crystaline	<0.004	170	338	0,85	53.1	6	30 - 40
PETG*	Polyethylene Terephthalate Glycol	<0.05	60	140	0,6	37.5	3 to 4	N/A
PETP	Polyethylene Terephthalate	<0.02	120	248	0,85	53.1	3	30 - 40
PI	Polyimide	-	120	248	0,6	37.5	2 to 3	20 - 30
PMMA	Polymethyl Methacrylate	<0.04	80-100	176-212	0,65	40.6	2 to 3	20 - 30
POM	Polyoxymethylene	<0.10	100	212	0,6	37.5	2 to 3	20 - 30
PP	Polypropylene	-	90	194	0,6	37.5	1 to 2	15 - 30
PP Talc	Polypropylene, Talc Filled 10%	<0.03	100	212	0,7	43.7	3	20 - 30
PP, Black	Polypropylene, Black Compound	<0.03	105	221	0,7	43.7	3 to 4	20 - 30
PPA	Polyphthalamide	<0.15	80	176	0,65	40.6	6	20 - 30
PPE	Polyphenylene Ether	<0.03	110-120	230-248	0,65	40.6	3 to 4	20 - 30
PPE/SB	Polyphenylene Ether & Styrene Butadiene Blend	-	-	-	0,65	40.6	-	20 - 30
PPO	Polyphenylene Oxide	<0.02	110	230	0,5	31.2	2	20 - 30
PPS	Polyphenylene Sulfide	<0.03	150	302	0,6	37.5	3 to 4	20 - 30
PPSU	Polyphenylsulfone	<0.10	150	302	0,65	40.6	2 to 3	20 - 30
PS	Polystyrene	<0.05	80	176	0,5	31.2	1 to 2	20 - 30
PSU	Polysulfone	<0.04	120-135	248-275	0,65	40.6	2 to 3	20 - 30
PUR	Polyurethane	<0.02	90-100	194-212	0,7	43.7	2 to 3	20 - 30
PVC*	Polyvinyl Chloride	<0.20	70	158	0,5	31.2	1	-
SAN	Styrene Acrylonitrile	<0.10	80	176	0,6	37.5	2 to 3	20 - 30
SB	Styrene-butadiene	<0.05	80	176	0,6	37.5	1 to 2	20 - 30
TPE	Thermoplastic Elastomer	<0.03	110	230	0,65	40.6	2 to 3	20 - 30
TPU	Thermoplastic Polyurethane	<0.03	100-110	212 - 230	0,65	40.6	1 to 2	20 - 30

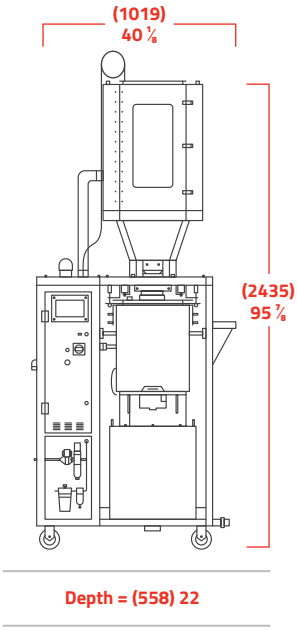
All Materials listed are detailed as per general typical requirements regarding typical drying temperature, time and density. Users should always refer to the specific material technical data sheet to confirm specific details for a specific grade of material.

* = Low drying temperatures are not recommended applications for vacuum drying due to proximity of boiling temperature under vacuum being close to 56°C/133°F.

ULTRA Specifications

ULTRA low energy dryers are available for throughputs of 173, 355, 970, and 1,760 lb/hr (78, 160, 437, and 793 kg/hr). Like all Maguire products, they are protected by our 5 Year Warranty.

ULTRA 150

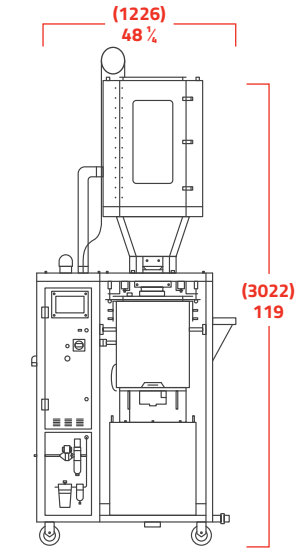


Depth = (558) 22

	US	Metric
Heating Hopper Volume	2.5 cu. ft.	70 L
Vacuum Chamber Volume	1 cu. ft.	28 L
Retention Hopper Volume	1.3 cu. ft.	37 L
Max. Temperature	350°F	176°C
Power Requirements	240V, 480V, 575V /3Ph / 60Hz, 16A, 8A, 7A	400V / 3Ph / 50Hz 10A
Process Heater	10 kW	
Blower	1.1 HP, 105 scfm	0.75 kW, 2973 L/min
Compressed Air Pressure	85 psi	5.86 bar
Compressed Air Usage	5.2 scfm	135 Nl/min
Product Weight	501 lb	228 kg

For more information, download the ULTRA-150 data sheet at: www.maguire.com

ULTRA 300



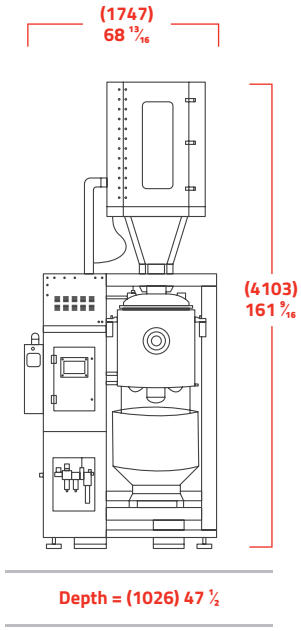
Depth = (660) 26

	US	Metric
Heating Hopper Volume	4.25 cu. ft.	120 L
Vacuum Chamber Volume	2 cu. ft.	57 L
Retention Hopper Volume	2.25 cu. ft.	64 L
Max. Temperature	350°F	180°C
Power Requirements	240V,480V,575V / 3Ph / 60Hz 52A, 27A, 22A	400V / 3Ph / 50Hz 33A
Process Heater	15 kW	
Blower	3.5HP	2.2kW
Compressed Air Pressure	85 psi	5.86 bar
Compressed Air Usage	3.6 scfm	5.6 N m3/hr
Product Weight	918 lb	416 kg

For more information, download the ULTRA-300 data sheet at: www.maguire.com

For LPD specifications, please visit www.maguire.com to download our product data sheets.

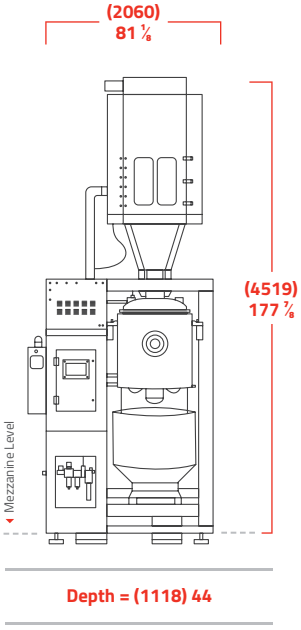
ULTRA 600



	US	Metric
Heating Hopper Volume	12 cu. ft.	340 L
Vacuum Chamber Volume	5.5 cu. ft.	156 L
Retention Hopper Volume	6.1 cu. ft.	173 L
Max. Temperature	350°F	176°C
Power Requirements	480V,575V / 3Ph / 60Hz 49A, 22A	400V / 3Ph / 50Hz 54A
Process Heater	20 kW	
Blower	8.5 HP, 400 scfm	5.5 kW, 5380 L/min
Compressed Air Pressure	85 psi	5.86 bar
Compressed Air Usage	11.2 scfm	17.4 N m3/hr
Product Weight	1824 lb	827 kg

For more information, download the ULTRA-600 data sheet at: www.maguire.com

ULTRA 1000



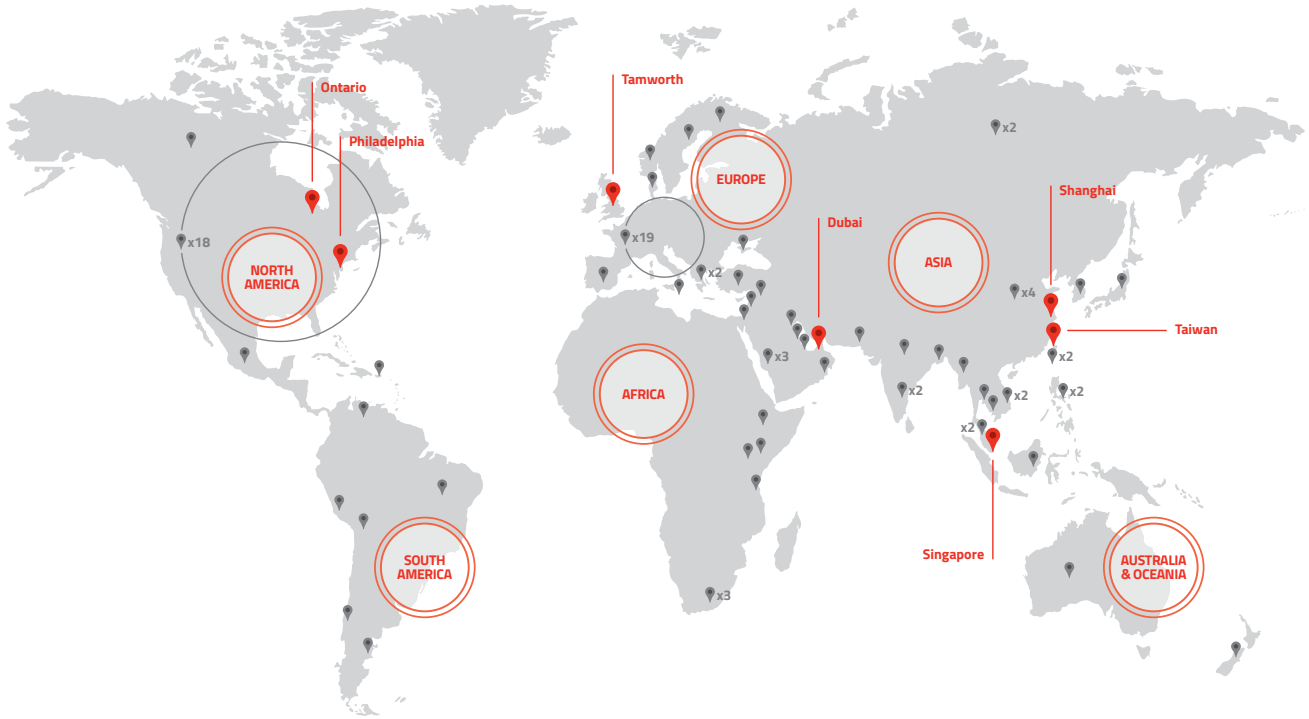
	US	Metric
Heating Hopper Volume	26 cu. ft.	739 L
Vacuum Chamber Volume	10 cu. ft.	283 L
Retention Hopper Volume	11 cu. ft.	311 L
Max. Temperature	350°F	180°C
Power Requirements	480V,575V / 3Ph / 60Hz 67A, 37A	400V / 3Ph / 50Hz 75A
Process Heater	25 kW	
Blower	10 HP, 600 scfm	7.5 kW, 16990 L/min
Compressed Air Pressure	85 psi	5.86 bar
Compressed Air Usage	18.9 scfm	29.4 N m3/hr
Product Weight	2950 lb	1338 kg

For more information, download the ULTRA-1000 data sheet at: www.maguire.com

Where To Find Us

With our extensive network of agents and distributors across the globe, we aim to support our customers locally as much as possible.

Maguire Headquarters
Agents & Distributors



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