



Maguire

“Sustainability & Productivity Gains – Happen in a Vacuum”

ORIGINALLY DELIVERED AT THE **FESTIVAL OF POLYMER INNOVATION 2024**
VISIT **[HTTPS://WWW.POLYMERFESTIVAL.COM](https://www.polymerfestival.com)** FOR MORE INFORMATION

A HUGE THANK YOU TO PLASTIKCITY FOR SPONSORING OUR MAINSTAGE



“Sustainability & Productivity Gains - Happen in a Vacuum”

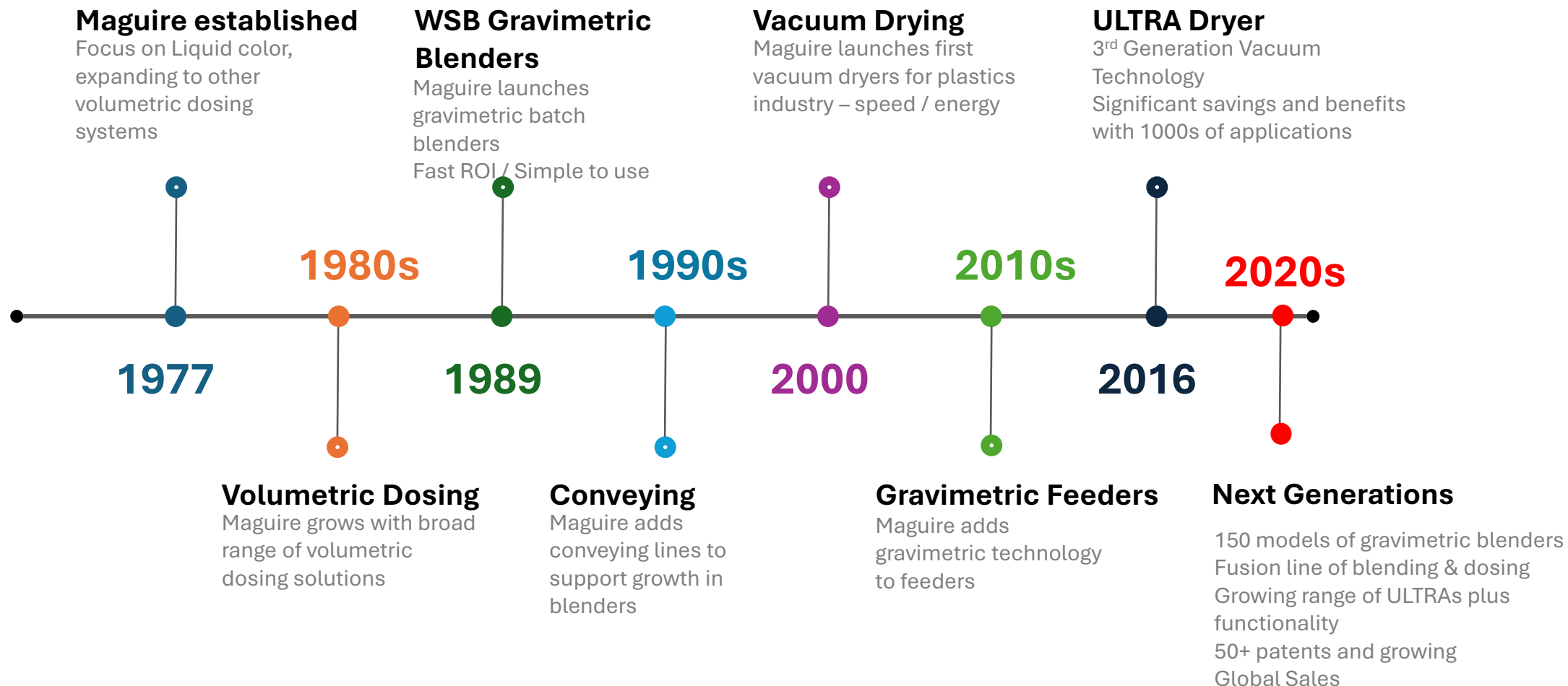
ULTRA Low Energy Dryer

WELCOME





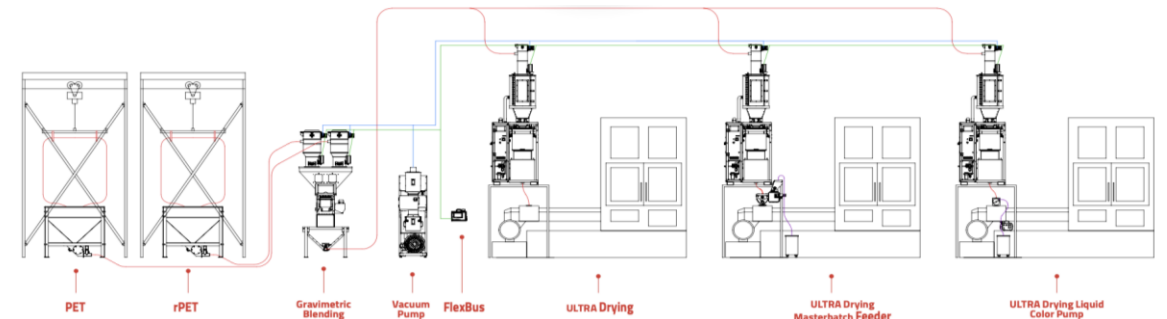
Maguire – company timeline



? Why Dry by Vacuum?

7 The Magnificent Seven

1. 60% - 80% Average Energy Savings
2. 6 x Faster Drying Times
3. Fast Resin Changes – 15 minutes
4. Low Stress / Short Heat Residence Times
5. Small Footprint – 5 x Less Material in Process
6. Effective Removal of Volatiles [VOC]
7. Extremely Low Maintenance



ULTRA – How does it work?



1

Phase 1: Heat

Residence Time: 40 – 60 minutes

Resin Temp: 340°F / 170°C

Resin Humidity: 100 ppm

2

Phase 2: Vacuum / Dry

Residence Time: 15 – 20 minutes

Vacuum Pressure: 3.15"/Hg / 80mm/Hg

Resin Humidity: >50 ppm

3

Phase 3: Convey

Load Cell Monitoring of Usage

Just in Time

Continuous Feed

i

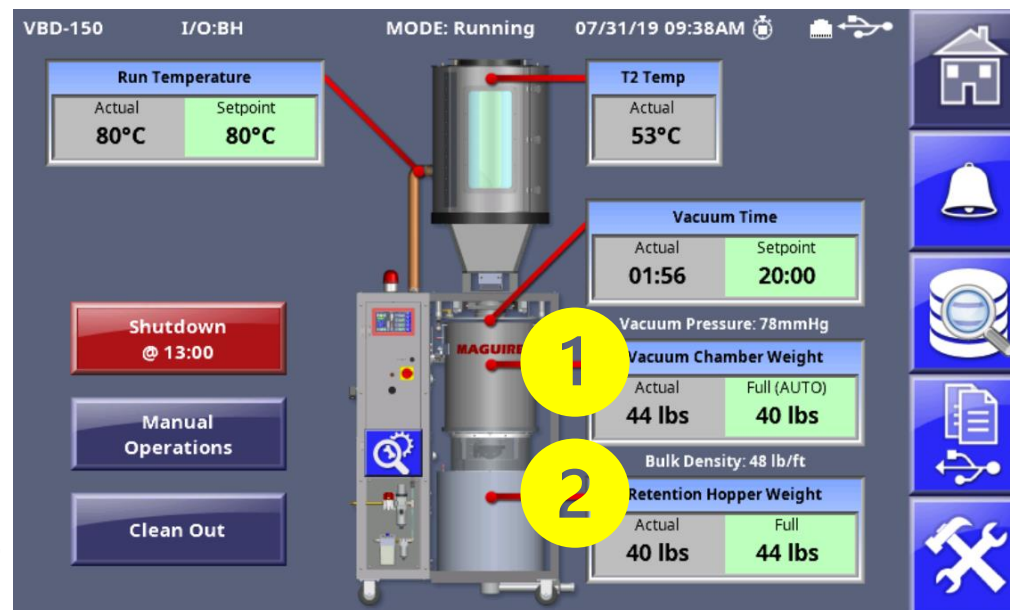
High Temperature material from Phase 1, then placed under **High Vacuum** in Phase 2, reduce the boiling point of any moisture present to 133°F / 56°C leading to moisture to rapidly leave material

Load Cells – Unique ULTRA Benefits



Load Cells:
Vacuum
Chamber

Load Cells:
Retention
Hopper



Intelligent next generation drying



Load cell data combined with the control of ULTRA allows ULTRA to control many other process parameters;

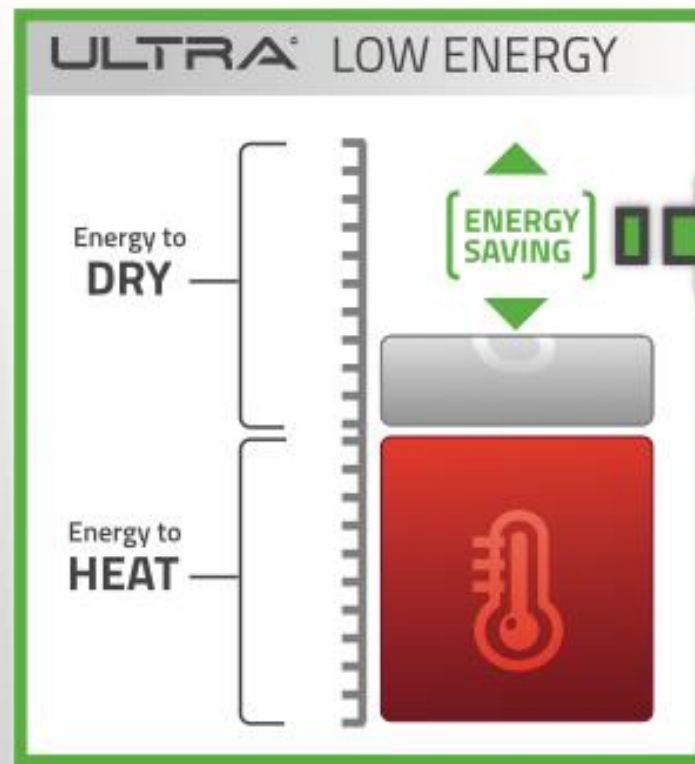
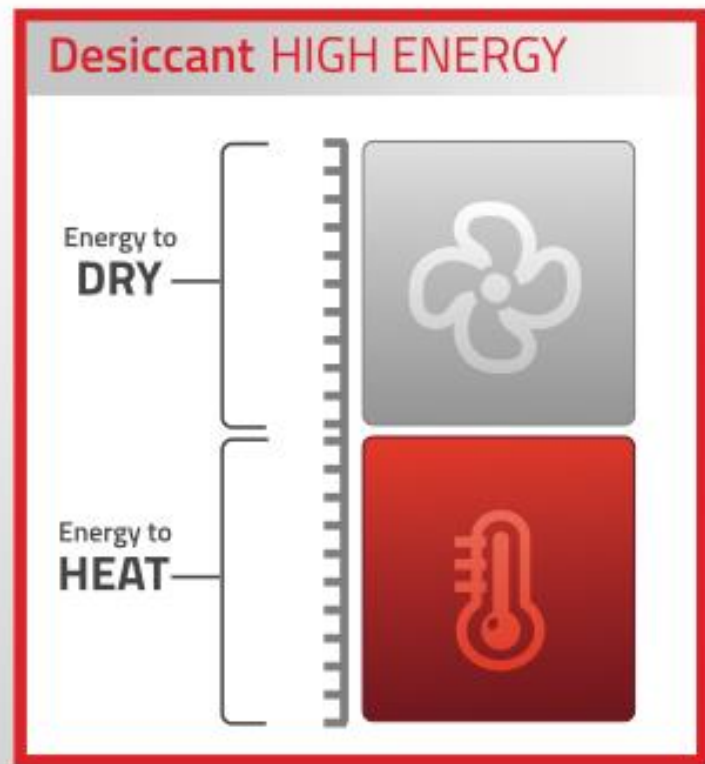
- VC Fill Weight
- RH Materials Usage
- Control w/lb/hr
- Demand Rate

Special Unique Controls;

- Auto Stop
- Dynamic Drying
- Pit Stop



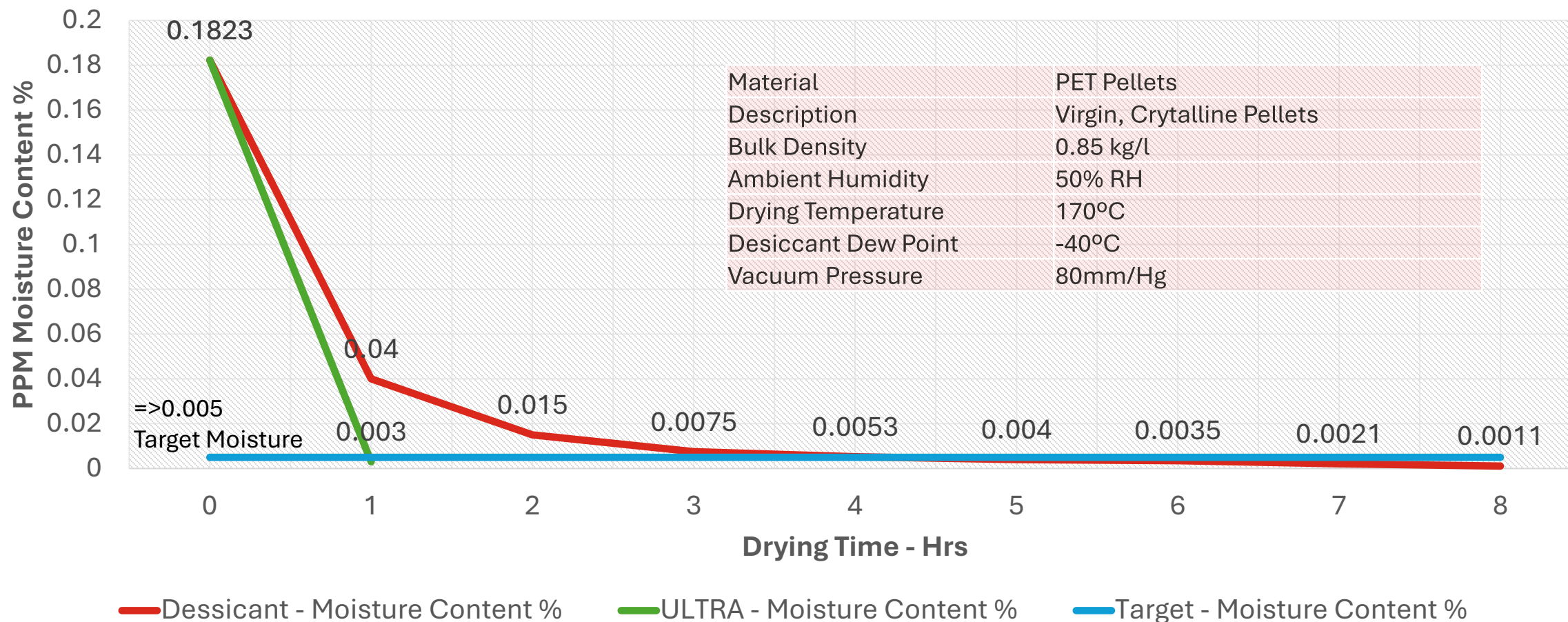
ULTRA - HOW MUCH ENERGY SAVING?



60-80%
ENERGY SAVING
EVERY
TIME!

ULTRA - How Fast?

PET example - Moisture Loss during Drying



ULTRA - Faster Start Up & Resin Changes



Based on a 100kg/h process

Continuous process

Fast material changes

Improved health and safety at work

Avoids multiple dryers – buffer arrangements

Eliminates material wastage / conveying / storage

Aids planned material changes

60 – 80% energy savings

	Desiccant	ULTRA
Temperature	180°C	180°C
Energy to Dry	165 w/kg/h	73.8 w/kg/h
Heating / Drying Time	4 to 6 hours	40/20 minutes
Start-up Time	4 to 6 hours	1 hour
Energy Cost / Year	£29,691.70	£13,281.05
Material in Process	860kg	160kg

15-Yr Period - £246,159.71 Energy Saving



ABS

PC

PA

PMMA

TP
U

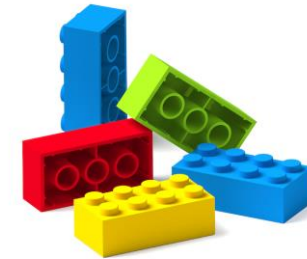
TPE

PET

Heat Sensitive Damage

Technical Materials / Regrinds / PCR / Recycled

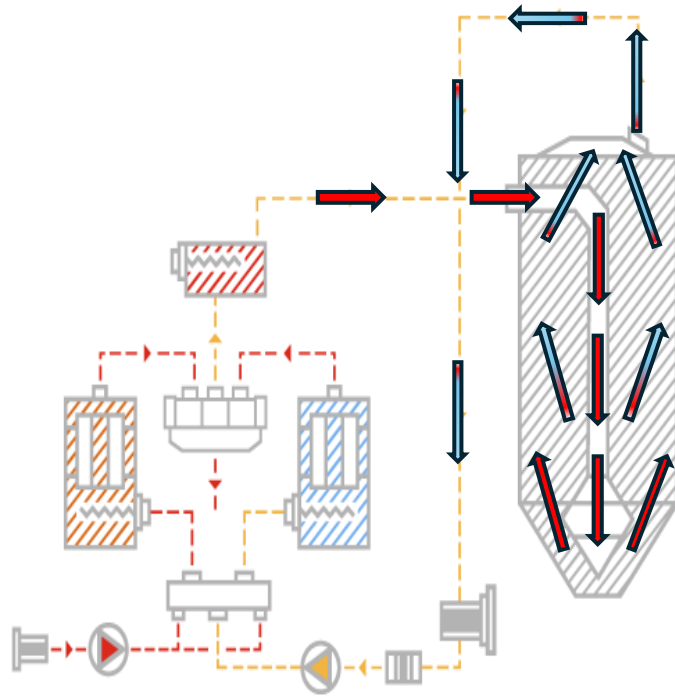
- Low stress / short heat history for multigenerational materials
- Growing consumer demands for blends of Virgin and Recycled
- ULTRA Heat hopper design - open circuit design vaporizes VOC
- Improves product characteristics – clarity, durability, processing
- No desiccant degradation, no filter changes, no water connections
- No oil condenser / simpler material specific maintenance



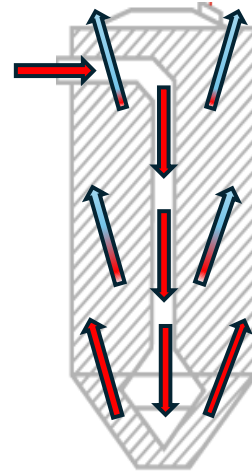
New image – cold trap



ULTRA – Unique Benefits - PCR Drying



Typical Desiccant Heat **Closed Loop**
Airflow Circuit



ULTRA Heat **Open** Airflow
Circuit

Benefits in reality - drying
with ULTRA
improvements are in:

- Heat Exposure
- Material Properties
- Color
- Dust & Fines
- Degassing
- Deodorizing
- Clarity

Space Saving

- Faster Drying means less material in process
- This means more compact drying equipment
- Example – 2 identical preform machines at up to 1,000lb/h
- Easier material changes – more responsive drying process



ULTRA: Low Maintenance

No desiccant to replace

No process filters

No water connection

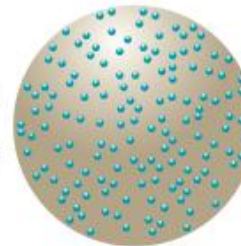
No oil condensors

New Desiccant Media



Desiccant Deterioration on 18 to 24 months

Clay bead
showing
desiccant
crystals



Cracks &
flaking
appear



Dust forms



Case Study - Berry Plastics

Principle materials – PET, RPET
multiple material changes / month

Major concerns – energy cost and material
change times exceeding 1 hour

ULTRA-150 at 42.74 kg/h / ran side by side
with existing wheel dryer system over a 24-
hour period

Wheel dryer consumed in 24hrs - 177.64 kW

ULTRA consumed 24hrs - 70.12 kW

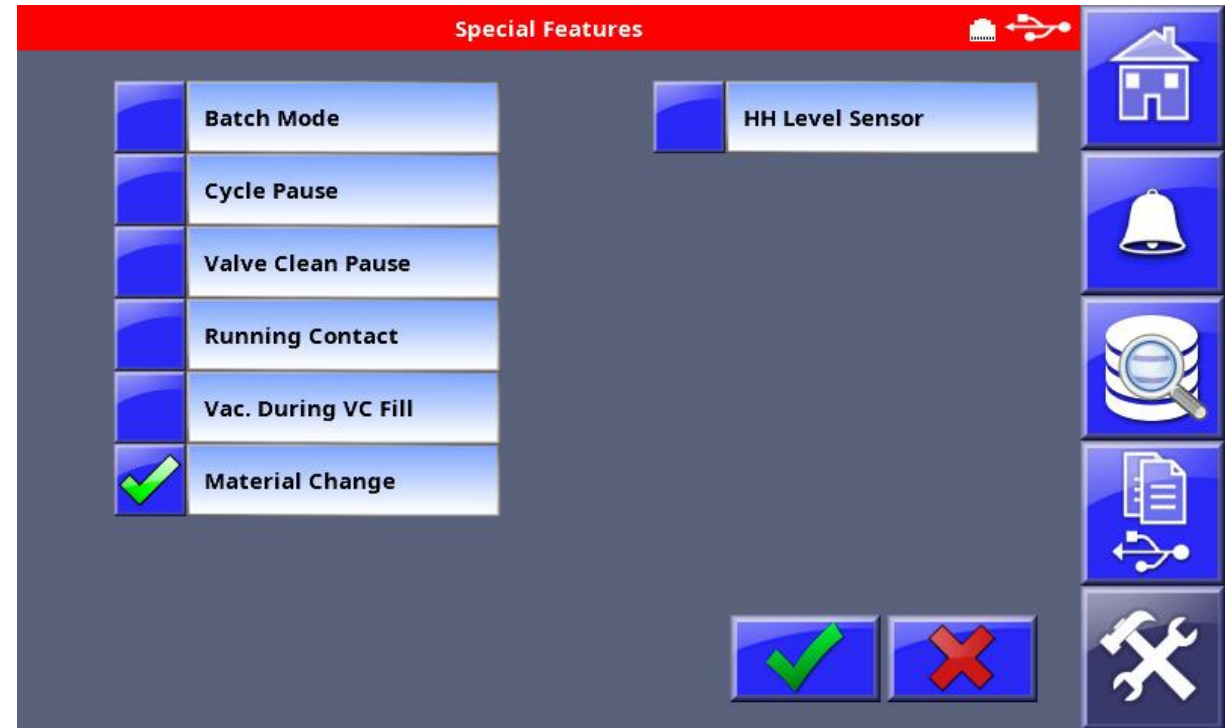
Total Energy saving of 60.5%



Berry Plastics – 15 MINUTE MATERIAL CHANGE

Material Change on the Fly or “Pit Stop”

Ultra uses load cells, which monitor material consumption and enable a special feature to deliver significant Productivity Gains.





Berry Plastics – 15 MINUTE MATERIAL CHANGE

Continuous process
Fast material changes
Improved health and safety at work

Avoids multiple dryers – buffer arrangements
Eliminates material wastage / conveying / storage
Aids planned material changes



Berry Plastics

– User experience

“ The feedback from our technicians is good which is always a welcome benchmark.

We can confirm that the 15min changeover “on the Fly” does seem to be consistent and we are very pleased with the gains in production this provides.”

John Fulcher

Manager - Injection Stretch Blow Mold
Department, Berry Plastics



Ultra Low Energy Dryers



- Ultra Quick
- Ultra Smart
- Ultra Simple
- <https://ultra.maguire.com/>

Contact Us

Maguire Products Inc.

11 Crozerville Road
Aston,
PA 19014, USA

Tel: +1 610 459 4300

Fax: +1 610-459-2700
info@maguire.com

Maguire Europe

Tame Park
Tamworth
Staffordshire
B77 5DY, UK

Tel: +44 1827 338 280

Fax: +44 1827 338 285
info@maguire-europe.com

Maguire Products Asia

PTE LTD

15 Changi North Street 1
#01-15, I-Lofts
Singapore 498765

Tel: +65 6848-7117

Fax: +65 6542-8577
magasia@maguire-products.com.sg

Maguire Canada

299 Basaltic Road, Unit 1
Vaughan, Ontario, L4K 4W8,
CANADA

Toll Free: 866-441-8409

Tel: +1 905-879-1100

Fax: +1 905-879-1101
info@maguirecanada.com

Maguire IMEA

India, Middle East & Africa

Lobby 18, Floor 7,
Office 6, JAFZA View 18,
Jebel Ali Downtown
PO Box 17493, Dubai, UAE

Tel: +971 4 881 6700

info@maguire-imea.com

THANK
YOU