

## NEW BLENDER MILESTONE NEARS: 30,000 UNITS SOLD



Because our Weigh Scale Blender has long been the leading gravimetric dosing system, you would not expect sales to be booming at this late date. But they are indeed. At 250 to 300 blenders a month, sales will reach 30,000 units by the middle of 2005.

First, we continue to innovate and broaden the applicability of this simple, reliable equipment. Second, we keep on expanding international access to sales and service, most recently by reorganizing Maguire Asia, whose 2004 sales to date are double those in 2003. And third, more processors are discovering the capabilities of our blender:

- **REDUCTION OF COSTS AND REJECT RATES.** A small investment, the WSB quickly pays for itself by maintaining material consumption within tight tolerances and ensuring product consistency.

- **QUALITY MANAGEMENT AND DOCUMENTATION.** Molders who manufacture technical components have adopted our WSB because of the wealth of data that it yields on each production run.

- **AUTOMATION.** Processors have gained a new appreciation for the advanced monitoring and control provided by our blender controller—particularly in conjunction with proprietary software for machine networking and raw material management.

Blenders and other raw-material management systems are our only business. We have chosen to focus on continuous improvement of this select group of products, for which we possess unique technology. I believe that this persistence (along with a generous five-year warranty on our equipment) is the ultimate reason for our continuing success.

*Steve Maguire*  
President

# MAGUIRE SOLUTIONS

Advances in Simplicity and Control for Plastics Processors

## Now Every Extrusion Customer Can Afford Precision Yield Control by Terry Good, Product Manager

Extrusion yield control enhances product quality, saves on material, shortens setups, and reduces scrap, but until recently it had been too complicated or expensive for most of our extrusion customers. Maguire eliminated these barriers by developing LineMaster™ software, an affordable, easy to operate, and exceedingly precise yield control system currently in successful commercial use. And now, for customers who do frequent product changeovers or have other operations requiring split-second responsiveness, Maguire offers LineMaster AC, a simple, low-cost extension of LineMaster technology.

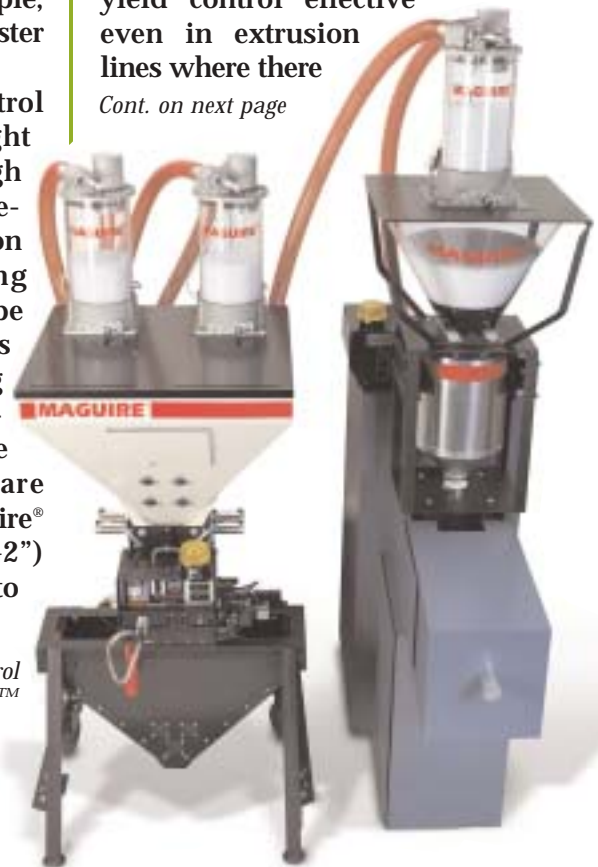
All LineMaster yield control centers on a gain-in-weight blender, the Maguire® Weigh Scale Blender (WSB), which precisely controls batch formulation by sequentially dispensing ingredients, in targeted recipe proportions, from separate bins into a weigh chamber. Using input on raw material consumption generated by the blender, LineMaster software works in concert with Maguire® Gravimetric Gateway™ (“G2”) blender-networking software to simultaneously adjust both

extruder throughput and hauloff speeds, *ensuring consistent weight per length of extruded product*—the essence of true yield control.

In the LineMaster AC system, the blender batch is fed into a loss-in-weight (LIW) hopper mounted at the extruder throat. The load cell in the hopper provides updates on material consumption at the rate of one every half-second to the WSB, which is mounted either atop the hopper or on a floor stand (*see photo below*).

The high-speed responsiveness of the LIW hopper makes LineMaster yield control effective even in extrusion lines where there

*Cont. on next page*



Equipment set-up for high-speed yield control system achieved with Maguire® LineMaster™ AC software includes **loss-in-weight** hopper (shown mounted atop model “extruder” at right) and Maguire® Weigh Scale Blender, a **gain-in-weight** gravimetric system.

## SHORT RUNS

LOADER CAPABILITY EXPANDS. The concept of the Clear-Vu™ vacuum loader as a “mini-central” system for loading multiple processing lines now has broader applicability:

1) A single unit still loads eight stations, but by linking of the controllers in series, automated loading can be extended to 24 or more stations. 2) Blower horsepower has been doubled to ten, increasing capability from 420 to 1,400 kg/hr (925 to 3,100 lb.hr.) over 120 m (400 ft.). And 3) there is now the option of a 10 kg (22 lb.) material receiver, in addition to the 5 and 0.5 kg (11 and 1.1 lb.) receivers. While conventional integral-motor loaders are limited to one station each, other multi-station systems are less flexibly deployed than the Clear-Vu loader.

MICROBLENDER: MORE RUGGED, MORE RELIABLE. While passing the 3,000-unit sales landmark after seven years on the market, the MicroBlender™ has been enhanced:

1) Stainless steel hoppers are now standard, avoiding the surface damage and corrosion that could occur with the previous powder-coated carbon steel. And 2) improvements in the design of the pneumatic vertical valves that dispense ingredients into the blender have eliminated jamming. The use of these valves instead of augers to meter minor ingredients is key to the precision of the MicroBlender. They dispense truly tiny doses of minor additives (as few as two or three pellets of color concentrate at a time) and achieve accuracy within +/- 0.1% for blender batches as small as 400 grams. And, this accuracy is maintained even on a fast-cycling molding press.



Yield Control *Cont. from previous page* are frequent ramp-down/ramp-up cycles, such as for film roll changeovers, or where inconsistencies in extrusion rate pose special problems, such as in coextrusion. Until now, processors with such operations have had to settle for far more cumbersome and costly yield control systems based on LIW blenders. For example, these conventional systems require separate controllers for a LIW blender and a LIW hopper.

The LineMaster AC system is only marginally more expensive than standard LineMaster yield control, which is priced at less than half as much as systems available from other suppliers. The LIW hopper initially available is the Model XC-LIW 10 unit, with 22-lb. (10-kg) capacity. It adds USD \$3,500 to the cost of LineMaster yield control, for a total (including hardware and software) ranging from \$5,000 to 8,500, depending on the level of control desired by the processor. By comparison, conventional yield control systems are priced in the range of \$12,000 to more than \$50,000.

Maguire expects to have four different hopper sizes, serving throughputs up to 5,000 lb (2,270 kg) per hour.

**SUCCESSFUL USE ON COMMERCIAL EXTRUSION LINES** In the meantime, the standard LineMaster yield control is in full commercial use by processors that do not require the split-second responsiveness of the LineMaster AC system.

One example is that of Coextruded Film Technologies (CFT), a producer of three-layer blown film in Johannesburg, South Africa.

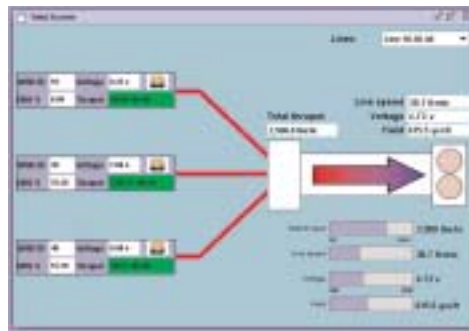
“Maguire’s LineMaster system has enabled us to maintain extremely precise layer ratios and to produce rollstock with weights that are virtually identical from one roll to the next,” says CFT’s managing director Bob Boden. “Our control over layer ratios has resulted in films with consistent heat sealing and mechanical properties—an achievement which has proved invaluable for supplying quality film for high-speed wicketted bag production.”

The increased control over line operation also made possible raw material savings that Boden estimates roughly at 12%. In addition,

LineMaster software simplifies setups by downloading recipes and settings, provides extensive documentation of raw material consumption for inventory control, cost accounting, and quality assurance, and permits remote access for monitoring extrusion line operation.

Founded in December of 2000, Coextruded Film Technologies is focused on developing specialized multi-layer polyolefin films. “We set up our plant to maximize three capabilities: technological excellence for innovation, quality assurance for customers, and efficient, precision control of all operations by management,” Boden says. “Maguire equipment and systems are at the heart of these capabilities and play a critical role in our current program to institute ISO 9002, EN ISO 14001, and OHSAS 18001.”

In addition to three WSBs and LineMaster software, CFT uses a Maguire® Clear-Vu™ loader and a Maguire® LPD™ resin



**LineMaster™ computer screen** schematizes deployment of three Maguire® Weigh Scale Blenders on three extruders in coextrusion line. LineMaster software maintains target yield (weight per length of product) by simultaneously adjusting extruder throughput (weight processed per unit of time) and line speed (length of product per unit of time).



# LPD™ Resin Dryers: Worldwide Boom In Sales Has Begun

By B. Patrick Smith, Vice President of Marketing and Sales

Get set for another Maguire revolution. First it was the Weigh Scale Blender, which forever changed the way thousands of processors mix and meter raw materials. Now it's the LPD™ resin dryer, the first vacuum dryer for processors. Sales of the dryer have reached 800 units and are growing so rapidly that we have expanded by one-third our capacity to build it, adding 700 m<sup>2</sup> (7,500 sq.ft.) to our facility in Aston, PA.

Not that revolutions happen overnight. The LPD dryer is a fundamental departure from conventional hot air/desiccant dryers. After we introduced it in 2000, three years passed before a significant number of processors proved for themselves that this system actually does require *only one-sixth of the time and 20% of the energy* to dry resin properly.

**NEW CONCEPTS IN RESIN DRYING.** These improvements result from radical differences between the

LPD and conventional dryers: 1) instead of flowing hot, dry air over the pellets to slowly draw the moisture out, the LPD dryer uses vacuum to reduce the boiling point of water, quickly turn moisture into water vapor, and literally pull the water vapor from within the pellets; and 2) the LPD dryer carries out heating and vacuum drying simultaneously in three separate indexing stations, making possible small batches while in effect transforming a batch process into a continuous one that keeps pace with the throughput of the processing machine.

The small batch size and short drying cycle of the LPD dryer make it possible to *shorten Monday morning cold startups* from several hours to less than an hour, adding that much more to weekly production time. Also increasing productivity is the three-station indexing system of the dryer, which makes possible *color and material changes*

*on the fly*, eliminating downtime.

Another source of cost savings is the *elimination of desiccant*, which becomes saturated and must be regenerated by a heating and cooling process so it will again be able to absorb moisture. In addition, desiccant degrades over time and must be replaced on a regular basis.

**TWO SUCCESS STORIES.** Typical of the productivity gained by switching from conventional to LPD dryers is the experience of an Italian manufacturer of injection blow molded PET bottles for cosmetic packaging. A member of the global Alcan group, this company reduced Monday-morning cold startup time by four hours, bringing resin to target dryness in just 40 minutes and at a drying temperature of only 150°C, compared with 6 hours at 180°C with a desiccant dryer. The reduction in startup added 7.5% more production time, or 70,000 more bottles per month.

Another case history comes from Melet Plastics Inc., a custom injection molder in Winnipeg, Manitoba, Canada. "We used to have problems molding glass-filled nylon parts that require a total absence of humidity," says the company's Tony Melendez. "With the LPD dryer, our reject rate went from 25% to 1%."

**NEW REASONS TO SWITCH TO VACUUM DRYING.** Reports from other customers have taught us that conventional dryers have more limitations that we anticipated:

- **ENVIRONMENTS WITH HIGH HUMIDITY.** Desiccant dryers used under conditions of high relative humidity work extra hard because they must remove moisture from both ambient air and resin. Often the result is improper drying and high reject rates. A vacuum dryer, however, removes ambient air from the drying canister, eliminating its effect on the drying process.

This advantage is illustrated by a recent comparison of desiccant and vacuum systems in actual production runs by a



Five LPD-30 dryers in LNP lab increased productivity dramatically. Inset shows canister with dried resin, mounted atop molding machine after removal from dryer.

Dryers *Continued from previous page*  
 molder of acrylic automotive parts (see table). Besides drying the resin both more quickly and more thoroughly, the LPD dryer continued to dry at peak efficiency even as the moisture level in resin dropped substantially, becoming closer to that of ambient air.

● **MATERIALS WITH HIGH MOISTURE CONTENT.** In the fast-growing field of plastics/wood-fiber composites, moisture levels of wood composite can range from 3 to 15%, quickly saturating desiccant so that conventional dryers cannot maintain air at the required low dew point. With a vacuum dryer, however, wood flour dries properly in only about 40 minutes.

● **MULTIPLE SHORT-RUN OPERATIONS.** Laboratories that process test specimens, chips for color matching, or samples for customers are discovering that the short drying cycle of the LPD dryer enables them to increase their productivity substantially. A lab technician in a color house may need to do 20 or more color matches in a day, with multiple polymers. Since the LPD dryer takes minutes instead of hours to dry these materials, the technician's output increases, along with the speed of response to customers.

Productivity increased dramatically, for example, in the world-headquarters laboratory of LNP Engineering Plastics, a GE Plastics Company based at Exton, PA, U.S.A. The lab has four injection molding machines for producing specimen plaques and doing trial runs for customers. Output of test specimens nearly doubled after the lab installed five LPD dryers, according to Charles W. Alexander, molding technologies leader. "Before we switched to LPD dryers, we completed five to seven specimens per shift, based on 50 to 75 shots per specimen, but now we're up to ten to twelve specimens," Alexander says.

For the installation at LNP, we designed an adaptor for the throat


of the processing machine that *eliminates need for a hopper* by enabling the operator to remove the canister containing dried resin from the drier and mount it directly at the machine throat (see photo on previous page). The adaptor, applicable with LPD-30 dryer, is designed to seal the canister to prevent moisture regain.

**LARGE MODELS: COMPACT AND INEXPENSIVE.** We entered the dryer market with the LPD-100, followed by the LPD-30; these accommodate processing-machine per-hour throughputs of up to 100 lb. (50 kg) and 30 lb. (13.6 kg), respectively. Since then we've developed two larger models, the latest and largest being the LPD-1000 (1000 lb. or 450 kg per hour), which we expect to be commercially available in 2nd-Quarter 2005. While the LPD-1000 has 33 times the throughput capability of the LPD-30, its footprint and cubic volume are both only about 2.5 times greater.

The reason why the increase in unit dimensions for each larger model is proportionately so much smaller than the increase in throughput is that the simpler design, smaller batch size, and shorter drying cycle of the LPD sys-

tem enable us to scale it up without the substantial increases in the size and weight required for a desiccant dryer. There are no drying hoppers or desiccant beds, and the blowers required are much smaller. The massive hardware of a large-capacity desiccant dryer and the size of the structural components required to support it make this conventional equipment far more expensive than an equivalent LPD unit.

**FAST PAYBACK FOR HIGH-VOLUME PROCESSING.** So great are the energy savings anticipated for the LPD-1000 that they will justify replacing currently installed desiccant systems. We've been told by a PET bottle preform molder that per-plant savings of US\$ 1-million per year would be possible with the LPD-1000.

Yet energy savings are not the only big gain for PET processors. In preform and bottle molding, the reduction in scrap achievable with vacuum drying can be substantial. Vacuum drying subjects resin to **85% less exposure to elevated temperatures** than conventional dryers. This means less property degradation as measured by falloff in intrinsic viscosity and by discoloration. 

In Comparison Test*, Vacuum Dryer Dried More Efficiently and Was Only System to Remove All Moisture and Be Unaffected by Ambient Conditions				
Equipment Set-Up	Resin residence time, hr.	Initial moisture in resin, %	Final moisture in resin, %	Moisture removal rate, % / hr.
<b>Acrylic Part #1</b>				
Three Dehumidifying Dryers in Series (Drying Takes Place in Three Stages)				
Dryer #1	3.9	0.147	0.099	0.0123
Dryer #2	3.9	0.099	0.093	0.0015
Dryer #3	8.4	0.093	0.069	0.0240
<b>Total</b>	<b>16.2</b>	<b>0.147</b>	<b>0.069</b>	<b>0.0048</b>
<b>Acrylic Part #2</b>				
One Maguire® LPD™ Vacuum Dryer (Drying Takes Place in Two Cycles)				
Cycle #1	0.83	0.169	0.039	0.1560
Cycle #2	1.33	0.039	0.000	0.0293
<b>Total</b>	<b>2.16</b>	<b>0.169</b>	<b>0.000</b>	<b>0.0782</b>

\* Two acrylic parts injection molded by the same customer (which asked not to be identified) in different production lines. In both cases, readiness for molding required moisture content of 0.02 to 0.04%. While the parts differed in weight and in molding throughput, the two drying arrangements can be compared in terms of: 1) total moisture removal rate; and 2) moisture removal rate after moisture level in resin has been substantially lowered in the first drying stage so that it is closer to the moisture content of ambient air.

## SALES TALK

**NEW MAGUIRE ASIA: UP AND RUNNING.** Maguire Asia has been reorganized and established as a Maguire subsidiary providing sales service, technical support, and warehousing for customers throughout the region. Besides its new 500 m<sup>2</sup> (5,000 sq.ft.) headquarters in Singapore, Maguire has opened a second facility in Shanghai that will focus on China. Drawing on long experience representing Maguire in Asia, Hubert Nerlich is now managing director of the new subsidiary. "We will triple our sales force in China alone," Nerlich says, "and dramatically cut lead times for customers by maintaining extensive inventories of machinery and parts in both Singapore and Shanghai. In addition, each location will include facilities for demonstrations of equipment, trial runs of customers' materials, and training of customer personnel."

**NETWORK OF FIVE AGENTS IN ITALY.** Maguire Europe now has a network of agents in five regions of Italy to provide fast, localized support for a rapidly growing customer base. Though Maguire has been well established in Italy, much of its business there has been with large multinational firms and processing equipment OEMs, says Milan-based Robert Tesar, manager of the Maguire Italy operation. "Now even smaller processors are discovering that Maguire® blenders provide performance superior to other dosing equipment yet are priced competitively. In addition, the LPD™ dryer is now beginning to show rapid growth here."

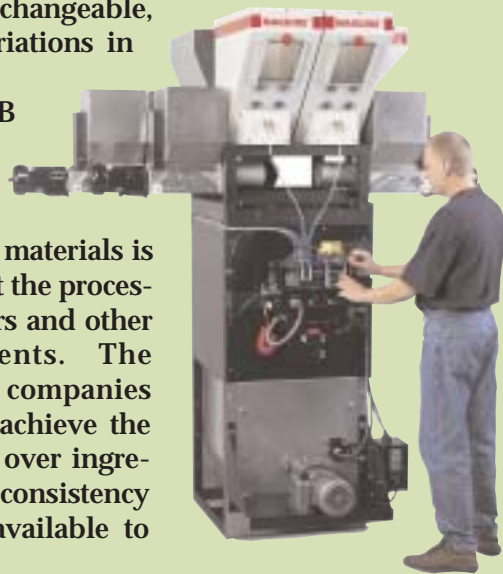
## Super-Sized MaxiBatch™ Blender Handles 'Difficult' Bulk Materials

by Peter Skulski, Sales Manager

The economic and product-quality advantages of Maguire® Weigh Scale Blenders are now readily accessible for compounders, high-throughput extrusion processors, and specialists in such hard-to-handle materials as plastics/wood composites. The new MaxiBatch™ WSB is rated for processing throughputs of up to 8,000 lb. (3,625 kg) per hour and has a batch size of 66 lb. (30 kg)—60% and 67% greater, respectively, than the largest Maguire blender models until now, in the 1800 Series.

This is not to say that we have simply scaled up the WSB. The MaxiBatch WSB accommodates nine removable hoppers for as many ingredients, each hopper incorporating its own dispensing device designed for precise metering in large quantities. As in other WSBs, ingredients are dispensed sequentially into a weigh chamber; the batch then falls into a mixing chamber. In the MaxiBatch, dispensing devices include vertical valves (for resin pellets and regrind) and auger feeders (for powders, granules, and pulverized materials). Because the hoppers are interchangeable, it is easy to accommodate variations in batch recipe.

If anything, the need for WSB precision increases with production volumes, simply because the share of operating costs accounted for by raw materials is greater, as is the likelihood that the processor will be using bulk powders and other difficult-to-meter ingredients. The MaxiBatch system enables companies with the greatest volumes to achieve the same exceedingly fine control over ingredient consumption and batch consistency that WSBs have long made available to other processors.



*Super-sized but sensitive as ever: Like every other Maguire WSB, the new MaxiBatch™ blender automatically makes small corrections from batch to batch, maintaining overall batch accuracy to within + / - 0.1%.*

### MAGUIRE ON THE MOVE Maguire or (where noted) its representative will exhibit at each of these trade shows in 2005:



PLASTEC<sup>a</sup>  
Anaheim, Calif.,  
Jan 10-12



ASEANPLAS  
Singapore,  
Apr 26-29



EXPO PLASTICOS<sup>b</sup>  
Monterrey,  
Jun 8-11



IPF<sup>c</sup>  
Tokyo,  
Sep 24-28



INTERPLAS<sup>e</sup>  
Birmingham,  
Oct 4-6



FAKUMA  
Friedrichshafen,  
Oct 18-22



MASS PLASTICS  
Leominster, Mass.,  
Mar 30-31



PLASTICS  
ENCOUNTER  
Indianapolis,  
May 24-26



CHINAPLAS  
Guangzhou,  
Jun 21-24



DRINKTEC  
Munich,  
Sep 12-17



AUSPLAS<sup>d</sup>  
Melbourne,  
Sep 26-29



EUROPLAST<sup>f</sup>  
Paris,  
Nov 15-18

a: Hansen Machinery. b: Plastec USA. c: Itochu Sanki. d: Fleming Plastics Equipment. e: Summit Systems. f: Martiplast.

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