Series MPA Peristaltic Pumps

MPA-6 Pump

The patented Maguire peristaltic pumps are designed to accurately meter precise amounts of liquid color into the main flow of natural material directly above the throat of your process machine. Metering is accomplished by the compression and release of a flexible pumping tube by six hardened dowel pins that rotate within a Celcon® housing.

Positive Displacement Pump

Series MPA pumps are true positive displacement pumps, with no seals, check valves or clearances to allow even the slightest internal leakage. The units are self-priming and will pass any entrapped air bubbles in the liquid through the pump without loss of prime. They can pump liquid with viscosity as high as heavy syrup.

Automatic Speed Control

The MPA pumps use automatic speed control to assure self-adjusting accuracy. This pump can be used for both injection and extrusion. The electronic controls are explained on page 21 of this catalog.

Three Tubing Sizes Available

Various tubing diameters and assemblies are available to provide a wide range of outputs.

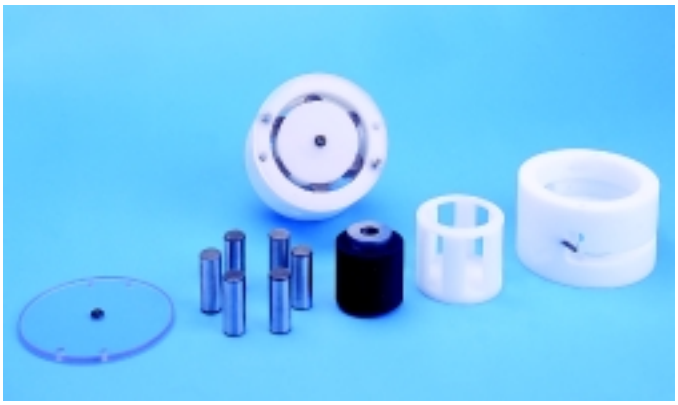
Ideal for Most Liquid Color Applications

Maguire MPA peristaltic pumps are best suited for accurate metering at the very low rates (up to 3 gallons) typical of liquid coloring applications.

High rate extruders requiring higher rates of liquid color may be better served by our Model MPA-3-HO (3 - 5 gallons/hour) or Model MDA Drum Pump (up to 45 gallons/hour).

6-Roller Pump Head

6-roller pumps utilize six hardened dowel pins retained by a plastic cage and held firmly against the inside surface of the pump head housing by a flexible elastomeric center drive roller. A tube compression groove, machined into the pump head housing, provides a path for the pump tube.



Because tube compression is determined by the depth of this groove, tolerances will not change over time, and priming and pumping accuracy is never lost. In this patented design there are no bearings. The rolling dowel pins do not wear out. A clear viewing window allows observation of the roller and tubing.

How MPA Pumps Work:

The Maguire standard Digital Controller provides the precise motor speed regulation and metering control necessary to assure absolute accuracy of color usage. Because metering rate is directly related to motor shaft rotation, accuracy is obtained by precisely controlling drive motor rotation.

The controller divides each full motor rotation into 106 increments, each increment representing a small fraction of a gram of color being carefuly measured. The controller contains a 1/27 HP DC Permanent magnet motor with variable speed control. In the standard configuration the motor is close-coupled to a heavy duty gearbox with a reduction ratio of 53:1.

As the motor turns, a "hall effect" pickup device on the motor sends 2 pulses per revolution to the microprocessor. The gearbox ratio of 53:1 means that 106 pulses (2 x 53) are received for every single revolution of the motor shaft.

Easy set-up

The digital counter located on the face of the controller provides the means for pre-determining the exact degree of pump head rotation and, therefore, the precise amount of color that will be added. To determine the proper setting for the counter, a simple formula is used based on percent of color required, a predetermined metering rate, and total shot weight in grams (or pounds per hour for extrusion applications).

Easy Maintenance and Cleaning

Maintenance

No part will wear out or need replacing. Occasional cleaning may be necessary. Pump tubes must be replaced periodically. Typical tube life is 1 to 6 months.

Cleaning

Cleaning is accomplished with soap and water. Disassembly is easy and parts are large. The unit must be free of liquid color contamination to operate properly.

Inserting Tube

The tube is laid into the slot across the top of the pump head running from front to back in a straight path across the top of the dowel pin rollers. With rollers turning, the tube is drawn under the edge of the housing overhang. Unlike 3-roller pump designs the clear cover disk need not be removed.

The 6-roller pump head features straight-through tube path minimizing tube deflection resulting in longer tube life.

Model MPA–	Tubing I.D.	Maximum RPMs	Flow/hr @ 10 lb/gal		Minimum Dispense
			Min (g)	Max (lb)	(One Cycle)
18–G	1/8" (green)	30	36	2.9	.006 grams
34–G	1/8" (green)	56	36	5.4	.006 grams
34–R	3/16" (red)	56	81	11.6	.013 grams
51–G	1/8" (green)	90	36	8.6	.006 grams
51–R	3/16" (red)	90	81	18.0	.013 grams
51–C	1/4" (clear)	90	138	30.0	.022 grams

MDA Drum Pumps

Self-priming Positive Displacement

The Progressive Cavity Drum Pump meters liquid color by positive displacement. The pump consists of a single helix steel screw, called a rotor, rotating within a double helix hollow stator constructed of an elastomeric material.

The rotation of the rotor within the fixed stator causes empty pockets or voids to travel or progress upward, drawing liquid into one end and expelling it out the other end, producing a positive displacement pumping action. The double helix stator produces an overlapping of voids resulting in smooth non-pulsating pumping action. Pressures of 200 to 300 PSI are achievable.

Fits on 30 or 55 gallon drum

The pumping unit is mounted at the end of a stainless steel pipe which serves a double purpose. First, it positions the pumping unit at the bottom of the liquid drum totally immersed in the liquid while the controls and drive motor are positioned safely above the drum. Second, the pipe serves as a conduit in which the liquid flows up and out of the drum. A quick-release coupling joins the motor and shaft allowing for easy removal of the motor and controls from the pumping unit.

Automatic Speed Control

Because pumping rate is directly related to pump operation, accuracy is obtained by controlling the exact degree of rotation of the drive motor. The unique Maguire Digital Controller is designed to do this with precision.

A digital counter provides the means for predetermining the exact degree of rotation and, therefore, the precise amount of coloring that will occur during each cycle. When the preset count is reached, the motor automatically shuts off, ensuring that no excess colorant is metered.

Motor speed is automatically controlled by the internal microprocessor to allow color metering to occur uniformly over the entire screw return cycle. The operator need not concern himself with motor speed adjustment, voltage fluctuations or changing cycle times.

To determine the proper setting for the counter, a simple formula is used based on shot weight in grams, percent let-down desired and the liquid color weight in lb/gal or gm/l. Once production is started, the counter setting can be adjusted up or down as required to achieve the desired shade of coloring.

In addition to this precise control of the quantity of liquid being metered, the microprocessor ensures the motor speed is precisely held regardless of changing torque requirements.

Extrusion Following

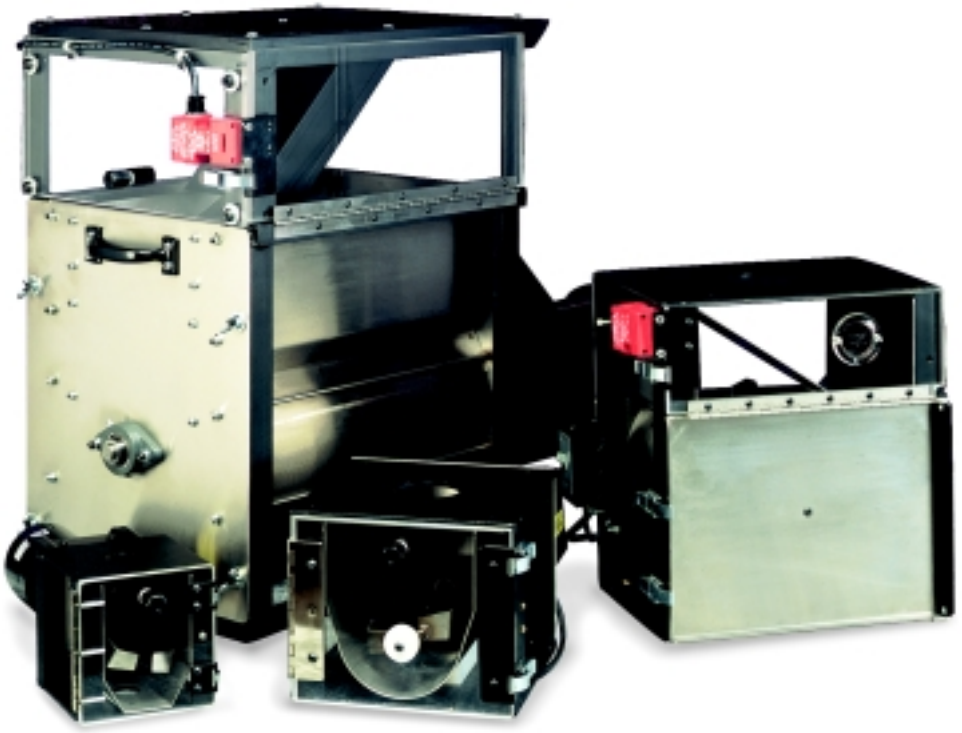
With this option the drum pump follows the speed of the extruder automatically. Any changes in extruder speed are followed exactly by the pump output.

A tachometer that currently exists on your extruder provides either an AC or DC voltage output. When this “tachometer feedback” signal is fed into the Maguire Drum Pump controller, the pump output is then able to match the extruder speed up or down.

MODEL MDA/MDA-H	lbs/hr @ 10lb/gal	kg/hr @ 1200g/litre	CCs/Min	Gal/hr	Litre/hr	Max	CCs/rev.	HP
6-18	4.5	2.0	28	.45	1.7	30	.9437	1/27
8-50	27.0	12.2	170	2.7	10.2	88	1.8874	1/8
10-50	54.0	24.5	340	5.4	20.4	88	3.7748	1/8
15-50	200.0	90.7	1262	20.0	75.7	88	14.344	1/8
20-50	450.0	204.1	2790	45.0	170.3	88	31.708	1/8
3-22	600.0	272.2	3800	60.0	227.1	36	105.69	1/8

Model MPM Pre-Mixers

Series MPM Pre-Mixers automatically and continuously provide thorough mixing of resin, regrind and additives as they enter the throat of the process machine. These mixers are designed to mount directly to the feed throat of the process machine with hopper and hopper loader mounted directly above. When adding liquid color, color concentrate or other additives, the Maguire Pre-Mixer ensures a homogenous blend, and coloring is more efficient, more thorough and more uniform. Color consistency of the finished product is improved, and problems such as streaking are virtually eliminated.



Visible Color Flow. No Clogging.

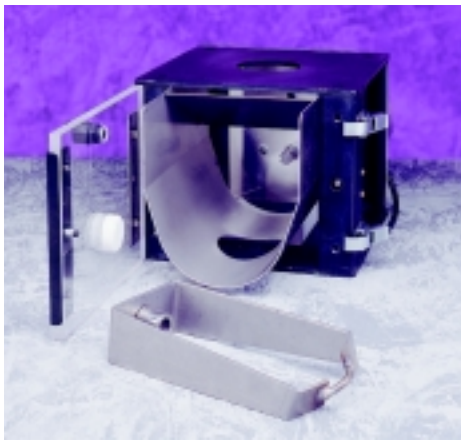
Color or additive is introduced into an air pocket just above the mixing blades. Material dispense is visible through the clear window. The non-clogging design provides consistent flow of blended material.

Easy Cleaning

The wrap-around mix chamber insert is easily removed, allowing clear access to all material contact surfaces. Stainless steel internal parts facilitate cleaning and will not corrode or discolor.

Baffle Plate Prevents Packing and Improves Mixing

As material flows into the Pre-Mixer chamber, it must first cascade over a sloped baffle plate. This prevents packing and eliminates downward pressure on the process screw. The drive motor runs cooler, higher mixing speeds can be used, and overall mixing is improved.



MPM-9 disassembled

Safety Interlock (Models MPM-50 & MPM-18)

The clear hinged door is equipped with an electrical interlock for operator safety.

Reduce Color Consumption

In many cases thorough mixing will actually reduce the amount of color required to produce the depth of desired coloring.

Model	Description	Throughput
MPM-2	2 lb Pre-Mixer	up to 100 lb/hr (45 kg/hr)
MPM-9	9 lb Pre-Mixer	up to 500 lb/hr (227 kg/hr)
MPM-9C	9 lb Pre-Mixer w/removable blades and hi speed motor	up to 500 lb/hr (227 kg/hr)
MPM-18	18 lb Pre-Mixer	up to 1,500 lb/hr (680 kg/hr)
MPM-50	50 lb Pre-Mixer	up to 5,000 lb/hr (2,270 kg/hr)

PUMP TUBING
The pump tube that is continually compressed by the rotating rollers in a peristaltic pump is the heart of the pump. Pump tube will normally last one to six months. Smaller diameter tubing lasts longer than larger diameter tubing.

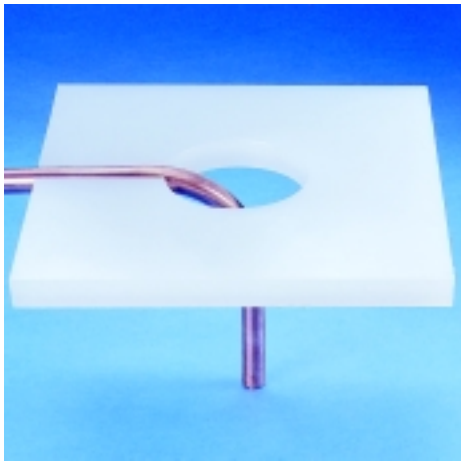
Generally, presses with less than a 500-ton capacity use 1/8" I.D. green tube. Nearly all larger presses use 3/16""I.D. red tube. Only large extrusion applications use 1/4" I.D. clear tube. Specific recommendations for your application are available.

TUR24	1/8" green pump tube
TUR35	3/16" red pump tube
TUR46	1/4" clear pump tube
AT07	1/8" green pump tube with end fittings
AT08	3/16" red pump tube with end fittings
AT09	1/4" clear pump tube with end fittings
AT04	1/8" green pump tube assembly
AT05	3/16" red pump tube assembly
AT06	1/4" clear pump tube assembly

SPARE DIRECT-ENTRY CONTROLLER
The Direct-Entry Controller is a controller upgrade that simplifies the operation of liquid color pumps or feeders. The unit, available as an option, eliminates the need for calculation and monitoring by the operator. First, the operator enters the desired colorant or additive level by using a simple thumbwheel. Then, the controller automatically calculates the metering rate, compensates for color already present in regrind and adjusts to variations in the molding or extrusion process. Expanded electronic recording functions are also provided. Hard-copy output can be generated directly through a printer port that is standard on the controller.

Prevent Off-Spec Production
Before color runs out, an alarm output turns on a strobe light and horn alerting the operator to replenish color supply.

Cycle, continuous and extrusion following modes available on all models.



LIQUID COLOR ADAPTOR PLATE - MODEL MLAP
This adaptor plate allows for easy insertion and removal of the color delivery tube.

The adaptor plate is sandwiched between the existing natural material hopper and the feed throat of your process machine.

The adaptor plate is 10" square and 3/4" thick with a 3" diameter hole in the center. Holes are easily drilled through the plate to match your existing hopper bolt pattern.

Custom drilling is available from supplied templates.

MODEL MPT5 LIQUID COLOR TUMBLER
Our Model MPT5 tumbler for 5-gallon containers allows you to gently tumble liquid color containers prior to putting them into service. Much like paint, most liquid colors are pigments in suspension. Over time the heavier pigments settle to the bottom, leaving a layer of thin liquid on top. Time required for adequate mixing will vary widely from 10 to 20 minutes to several hours, depending on the severity of separation. Maguire tumblers are safe, compact and use standard 110 volt power. Low speed tumbling (10 RPM) allows mixing to occur without foaming.

LWA LOW WEIGHT ALARM
The Maguire Low Weight Alarm is an inexpensive alarm system designed to notify the operator when liquid color supply is low.

LWA Basic Operation
A suitable container is placed on the center of the aluminum top surface. As the material is depleted from the vessel the aluminum top plate rises and at a set calibration point the indicator light will glow and the duplex receptacle at the rear of the unit will become energized. At this location a 115 volt AC alarm or other device may be activated.