



PRO-BLEND[®]

CLOSED MIXING SYSTEM

FAQ's - Frequently Asked Questions

OVERVIEW & INTRODUCTORY INFORMATION

How does the Micro Matic Pro-Blend® work to mix containers?

The Micro Matic Pro-Blend® injects a timed, pressurized bubble of air through the Micro Matic container valve and down tube assembly. As the bubble is ejected from the down tube, it expands significantly and sends a shock wave through the liquid causing rapid motion of the liquid and subsequent mixing.

As the bubble continues to expand, it also rises to the top, causing the liquid to circulate and mix. The liquid at the top of the container flows outward toward the edges of the container and then circulates towards the bottom of the container. Thus, the entire contents of the container become part of a total circulation that is occurring inside the container.

Since compressed air is being injected into the container to mix the contents, does the container experience a 'ballooning' effect?

No, the air that is displaced in the container escapes via air vents that are integrated into the design of the Micro Matic container valve and coupler.

Is this type of mixing new? How long has Pro-Blend® been around?

Industrial mixing using compressed pulses of air has been in use globally in many different industries for over 20 years. In 2014, Micro Matic and Pulsair combined product technologies to bring Pro-Blend® mixing systems into use on closed containers in the Agriculture market.

What's inside the Pro-Blend® mixing unit?

Pneumatic circuits to time and discharge the pulses of air.

Are there any moving parts?

None that are user accessible. The moving parts are located inside the mixing unit.

What are those parts that are connected to the mixing unit? What does each one do?

The filter regulator controls the pressure and flow of compressed air that controls the system. The stainless steel coupler is a Micro Matic fill coupler that allows access to the container in a manner consistent with EPA regulations.

How many different Pro-Blend® Mixing Systems are there?

There are two. One for use on drums and one for use on IBC's.

OVERVIEW & INTRODUCTORY INFORMATION cont'd

What is the difference in air displacement between the two systems?

The Pro-Blend® IBC Mixer displaces twice as much per stroke as the Pro-Blend® Drum Mixer.

Where is the product made?

In the United States.

Is this system regulated by any group such as the EPA?

No, but Micro Matic Closed Systems are compliant with the EPA's FIFRA regulations. Since the Pro-Blend® Mixing System uses Micro Matic's Closed System as an interface to the Drums and IBC's, it is FIFRA-compliant.

Is there scientifically generated data that demonstrates Pro-Blend® system performance versus other mixing systems?

Data to be generated during summer 2015 trials.

DIFFERENTIATION VERSUS EXISTING METHODS OF MIXING

Compare Pro-Blend® to systems that physically agitate the product.

The Pro-Blend® system mixes product in a closed environment inside of the container from top to bottom and in all the challenging areas where product can collect. The mixing blades of an agitator do not mix all the way to the bottom of the container once the level of the liquid is below the mixing blades.

The Pro-Blend® works well on both drums and IBC's since the mixing action through a Micro Matic Container Valve and Down Tube takes place from a full container all the way until it is empty. The Pro-Blend® mixer will mix most Suspension Concentrates and Seed Treatments thoroughly throughout the container in a gentle non-shearing manner.

There is no mess or clean up as it works with a Micro Matic closed system container valve and down tube. There is no rinsing off or generation of rinsate with the Pro-Blend® mixing system as the product never leaves the container during mixing. Risks of environmental and worker exposure are reduced because the mixing takes place in a closed container.

Will the mixing action of the Pro-Blend® degrade or shear the product?

No, the unit does not add any shear to the liquid like traditional mixers or pumps as the product is moved by the pressure and velocity of the air bubble.

Does it work like an Air Sparging Device?

No, the bubble produced by the Pro-Blend® stays relatively complete as it does its work. Air sparging adds a lot of energy and velocity and it breaks in to micro bubbles and loses its ability to mix in many cases.

How does the Pro-Blend® system differ from how Recirculating Pumps will remix product in drums and IBC's?

The Pro-Blend® rapidly mixes and creates a homogeneous product while a recirculation pump gently pulls liquid from the bottom of the container and then adds it back in to the container with very little mixing of solids experienced on the bottom of the container or on the outer areas of the containers.

When the cost of different mixing systems are considered, how does Pro-Blend® compare?

Since a single Pro-Blend® can be used on literally hundreds of containers, the cost-benefit calculation quickly turns in favor of Pro-Blend® after only a few containers. When the cost

DIFFERENTIATION VERSUS EXISTING METHODS OF MIXING cont'd

of the contents are considered and the superior homogeneity delivered by the Pro-Blend® system, it becomes an investment in quality and helps to ensure product performance and customer satisfaction.

Is this technology available for my storage tanks or my mix tanks?

Yes, the technology is used in varied industries worldwide in tanks ranging from several thousand gallons past one million gallons. Its simplicity and low capital cost offer a means to properly mix and maintain multiple tanks for near the price of one traditional electric mixer. For larger requirements and multiple tanks, a PLC can be utilized to sequence the system. The benefits of reduced labor, low energy use and low capital requirements offer superior results and decreased costs to the customer.

After the air bubble ejects through the down tube, can any liquid go back into the down tube or the mixer?

No.

Is the Pro-Blend® system patented?

Patent applications are pending.

Will I still need a dispensing pump to remove the contents of the container? Does the Pro-Blend® also dispense the product?

A dispense pump will still be required as Pro-Blend® is not a pump.

For those who mix a limited number of containers each season and their current system works OK, why would they want to spend money on a Pro-Blend® system?

Pumps wear out over several seasons and must be replaced at several hundred dollars each. Pro-Blend® has no moving parts and so there is a much longer, even indefinite replacement cycle. Also, the thoroughness of mixing is superior to what a recirculation pump can provide. When you consider the value of what is in the container, it becomes an investment in quality control.

USE OF THE SYSTEM

Are any special tools or operator training needed?

The containers need to be equipped with a Micro Matic (or similar) three key container valve and down tube. Operator training can be accomplished by reviewing Pro-Blend® Operating instructions and on-line videos. Micro Matic company personnel are also available for consultation and on-site instruction is offered upon request.

Does a container have to be equipped with a Micro Matic container valve and down tube in order for the Pro-Blend® system to work?

Yes, containers require a Micro Matic three key container valve and down tube or equivalent. Micro Matic has also developed down tubes that will optimize system performance. These are low cost options that are designed for best results over time.

What equipment is needed in a facility in order to use the system?

A reliable source of clean air at no more than 125 PSI with 4-5 CFM. The ¼" air connection is an industry standard OSHA-approved quick connect.

How important is the down tube length, foot design and material of construction for system performance?

To optimize system performance, the length of the down tube is very important. The bottom of the down tube should be within ¼" of the bottom of the container. The design of the down tube foot and the materials of construction also enhance system performance. To calculate the optimal length of the down tube, contact Micro Matic for instructions to calculate the down tube's H3 dimension. An optional mixing plate is available to enhance the mixing in IBC's.

What is the viscosity range of the products that Pro-Blend® will mix?

The Pro-Blend® works on a wide range of products. The normal range is up to 2000 Centipoise or cP. The best means to determine its effectiveness is to conduct trials to determine mixing efficiency as well as the time required to gain proper homogeneity. A larger unit may provide the best mixing when the viscosity is higher.

USE OF THE SYSTEM cont'd

Will the Pro-Blend® work on other gases than clean dry compressed air?

The Pro-Blend® works well on both DRY lubricated and oil-free compressed air. Water in the air can shorten the life as corrosion and gumming up of the unit can occur. Water or oil in the compressed air may also be incompatible with the product being mixed. Pro-Blend® can also run on room temperature Nitrogen when product purity is a requirement or the product is flammable. When using Nitrogen, the same operating instructions for the system apply since warm nitrogen works to create a pulse and bubble in the same manner as compressed air.

How much compressed air is consumed with the Pro-Blend®?

The drum unit requires 1-2 CFM of 45-75 PSI for proper operation. The IBC unit requires 3-4 CFM at 45-90 PSI for proper operation.

Is it expensive to run?

No, it is less costly to operate than other means of mixing.

Is there a minimum pressure and a maximum pressure for the system to run properly?

45 PSI is recommended as a starting pressure. It can be gradually increased until proper mixing is observed. Most products will mix properly in a range of 45 to 75 PSI for Drums and 45 to 90 PSI for IBC's.

What products will not work with a Pro-Blend®? What are the limitations of the system?

The Pro-Blend® mixer was designed to restore homogeneity to Suspended Concentrates or Emulsions and solutions that have settled out in drums and IBC or similar containers. Product that is extremely sticky or gummy at the bottom of a container may not be completely remixed by this system. For more demanding applications, additional options can be developed by contacting Micro Matic.

Pro-Blend® is not designed to mix the initial product. For original mixing, the action of a traditional shear type mixer or homogenizer is required. Pro-Blend® is ideal for the mixing and remixing of different liquids or powders that will mix with liquids easily.

Does the Pro-Blend® work totally on compressed air?

Yes. Pro-Blend® is totally pneumatic with no batteries or electricity.

USE OF THE SYSTEM cont'd

Will the system operate in cold/hot conditions?

It is not affected by temperature. The liquid viscosity of the product will be different and the mix time will change.

Does a damp climate effect how the system works?

Environmental conditions such as a humid day should not affect the mixing process. Dry compressed air is always preferable.

Is the system affected by dirt or dusty operating environments?

Since Pro-Blend® operates as part of a closed system, it is not really effected by dirt or dusty operating environments. However, as with any piece of machinery, proper care, handling and storage is recommended.

How will we know when the system is running as it should?

With a closed system, a thumping sound will be heard about one time per second. The material inside the container will gradually take on the appearance of a homogeneous blend. In the case of translucent IBC's, the product movement will appear to be rolling and churning inside the container.

Do any harmful vapors come out of the container?

If the product has odors or volatiles that are objectionable, Micro Matic offers a Carbon Vapor Canister as a system accessory.

How long will it take to mix a drum? An IBC?

10 to 15 minutes for a drum and 15 to 20 minutes for an IBC is typical for an emulsion or suspended concentrate like a seed coating material. For many liquid solutions with solids that have settled out, the mixing time will be less.

How will I know when the product has been mixing long enough?

During initial validations, follow the timing guidelines above. When the mixing time has elapsed, open the container and visually inspect the product for desired consistency. Then draw samples from several locations throughout the container and perform chemical analysis to validate whether a homogeneous mixture has been achieved.

For field use, follow the product manufacturer's mixing guidelines for the amount of time needed to mix drums and IBC's.

USE OF THE SYSTEM cont'd

What size of containers will it work on?

Pro-Blend® has been shown to work with a wide variety of crop protection products in 15 gallon to 330 gallon containers. For containers larger than 330 gallons, additional mixing systems are available from Micro Matic.

Will it mix the contents thoroughly; even in the corners of an IBC?

Pro-Blend® has consistently mixed a wide range of products in IBCs. Even in the corners and the hard to reach areas.

What will happen if the Pro-Blend® mixer is installed in a three key container valve that is located in a top corner of the container instead of in the more typical center location?

On a drum this will not be a concern. The recommended location for the mixer on an IBC is in the center top. From this center location, the mixing action can radiate in all directions.

May the Pro-Blend® be used for constant duty?

The unit is designed to operate consistently and constantly.

When the system is mixing, will it leak? If so, where?

No. The only time any product will appear is if the drum is too full and/or the system is worked at a higher pressure or pulse rate than recommended. The leaking would occur at the outlet of the coupler vent.

Will product leak from the coupler vent?

It is important to look at the container the product is in. The container must have adequate headspace to allow the pulse of air to expand and rise to the top. Without proper headspace, product may find its way through the vent system of the coupler. Headspace of 1" or more is recommended.

When the unit is first set up and turned on, it is important that the speed of the pulse and the pressure of the air is at a minimum level. This is 40 PSI in most cases. Start slowly and add pressure as required. A pulse rate of one time per second is optimal.

What clean-up has to be done as the mixing system is moved from one container to another?

Usually, clean-up is not required when the system is moved from container to container. This saves time and reduces the risk of employee and environmental exposure. There is no generation of rinsate. Sometimes, the bottom of the coupler probe may have to be wiped with a clean cloth. If the container was too full and product entered the vent pathway of the coupler, then the coupler should be

USE OF THE SYSTEM cont'd

rinsed out.

Do I need a separate mixing system for each different product to avoid cross contamination?

Yes, this is recommended as a precaution against cross contamination.

Where is this system being used in Agriculture?

Pro-Blend® in use with a wide variety of Seed Treatment companies as well as Agricultural wholesale and retail sites. The mixing system fits wherever there is filling, storage or preparation for use of Crop Protection or Seed Treatment products.

What is the process a new user of the Pro-Blend® system will go through to evaluate it?

The best means is to test the Pro-Blend® on the user's own material in his own operating environment. The results normally become evident quickly. A very effective test is to run the Pro-Blend® system and then empty the container to inspect if any residue is left on the bottom.

Can we conduct our own tests? If so, what materials will be needed? What preparations do I have to make?

Yes, tests can be conducted independent of involvement from Micro Matic. A check list of equipment and preparations is available from Micro Matic.

How does the mixer and the coupler remain connected?

A tamper-evident connection mechanism keeps the two components connected.

MAINTENANCE & WARRANTY

How long will the system last?

Many years with the use of clean air.

How long is the warranty?

One year.

When a Pro-Blend® fails, what is the most likely cause?

Dirty air.

What will happen if the system is dropped?

It may be damaged and require repair. The coupler seal gasket and probe may require repair or replacement. Micro Matic can inspect damaged systems and provide repair service, where applicable.

What maintenance is required on the Pro-Blend® system?

If clean, dry air is used, no maintenance is necessary.

Do you have a storage system so that it can be safely stored when not in use?

Utilizing the Micro Matic Part Number 5223 Mounting Bracket will protect the coupler as well as keep the unit properly stored between uses.