PerMix
Perfect Mixing Technologies




WE OFFER

# PERFECT MIXING TECHNOLOGIES

# PERMIX VACUUM MIXING & DRYING

www.permix-mixers.com

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# WHAT IS VACUUM MIXING & DRYING

When we talk about vacuum mixing and drying, we are talking about taking the mixer, and its contents, and removing not only air, but reducing the internal pressure below that of the atmosphere. When we talk about molecules, ingredients, and reactions, the molecular weight is determined in its natural state under our current atmosphere. By removing the atmospheric weight on the ingredients/molecules you change the way they react and allow for better evaporation of liquids/ solvents and mixing of powders as various densities of products are rendered mute.



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# THE ADVANTAGES OF VACUUM MIXING & DRYING

Mixing under vacuum offers numerous benefits which include the following:

- Decreased drying times
- Precision control of moisture content
- Recovery of evaporated contents, whether solvents or water
- Drying at lower temperatures which allows certain ingredient characteristics to stay intact and undisturbed.
- Quick agglomeration of products if agglomeration is desired
- Removal of air and unwanted gases, which extends shelf life and decreases oxidation of finished products
- Quick dispersion of ingredients and a more homogeneous blend.
- Vacuum Mixers & Dryers allow for a phase change of materials during the mixing & drying of pasty materials.



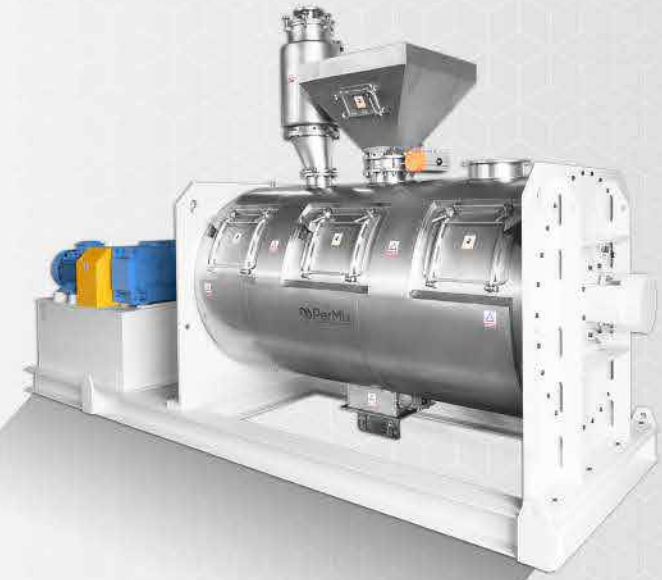
## High Temperature Mixing Capability

High temperatures, especially in the new nanotech areas is sometimes needed. Our vacuum mixers & dryers allows users to reach temperatures of 325•C while under vacuum or positive pressure. Special seals & gaskets are used and valves have an option for cooling media to be recirculated around them as to not effect the valve sealing or opening, controlling the expansion of the valve and protecting the seals if needed.



## ExP & ATEX Certifications For Hazardous Areas

As various industries use the vacuum mixers & dryers, and applications are diverse for these mixers, a need to extract solvents or to mix in explosive/hazardous atmospheres may be needed. As such, PerMix offers a wide range of ExP and ATEX certified mixers and dryers to accommodate these requirements



## Recovery Of Solvents & Evaporation

Often times the recovery of solvents as well as evaporated liquid is requested. For this reason, PerMix offers a complete line of recovery systems and condensing columns. These systems can be stand alone, skid mounted, or integrated.



## Horizontal Vacuum Mixers & Dryers:

Horizontal Mixers & Dryers are the most popular vacuum mixers & dryers offered on the market as they are available in the most configurations and types. With size ranges from 1 liter to 30,000 liters and higher, combined with agitation types that include:




| 01 | 02 | 03 |
|---|---|---|
| Paddle & Plow Mixers | Ribbon Mixers | Fluidized Zone Mixers |

These types of vacuum mixers & dryers allow the user to select a configuration that allows them to mix any type of product and achieve desired results needed whether they need a no/low shear effect or a very quick resizing of products leading them to choose a medium to high-shear type, and anything in between.

With the additions of choppers, these units are very versatile and allow users to meet the needs of today yet adapt to the demands of tomorrow easily and quickly.

## Vertical Vacuum Mixers & Dryers:

Vertical Vacuum Mixers & Dryers are rapidly becoming more popular than the horizontal versions. Although the operating theory is the same, the advantages of going vertical bring with it several advantages which include:

- Larger surface area contact in regards to heat transfer per volume versus horizontal mixers
- Less residue left in the mixer due to its vertical, center bottom discharge, which allows for an easy discharge of product with minimal to low/no residue left behind.
- Requires less product space/footprint, which lowers them amount of space needed for the production area. Ideal for small facilities with big production demands.
- When cleaning between batches, cleaning is quicker and, if using CIP, water is easily drained completely which lowers the amount of waiting between batches is needed.
- A larger flexibility of batch sizes is allowed as the vertical mixers allow for a lesser amount to be used for a minimal batch size.

With size ranges from 1 liter to 15,000 liters or more...our Vertical Vacuum Dryers allows users to select a configuration that still meet the needs of today while adapting to the demands of tomorrow quickly.







## TYPES OF VERTICAL VACUUM MIXERS OFFERED INCLUDE

| 01 | 02 | 03 | 04 |
|---|---|---|---|
| Vertical Paddle Mixers | Vertical Ribbon Mixers | Conical Type Mixers (Nauta Style) | Vertical Granulators |

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## Tumble Vacuum Mixers & Dryers



Tumble Vacuum Mixers & Dryers gained their popularity as they possess all the same characteristics of vacuum mixing & drying yet have fewer moving parts and are very easy to use as well as maintain. The tumbling action allows for an aggressive yet gentle mixing. Our tumble mixers may also include intensifier bars which add to mixing efficiency if mixing products/ingredients of various densities.



Our Vacuum Tumble Mixers & Dryers are available in size ranges from 1 liter to 10,000 liters and include:



01 V-Blenders

02 Double Cone Mixers


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