

VACUCAM[®]

EJM 2000



Semi-Bulk Systems, Inc.

We'll make a believer out of you

Advantages of the **VACUCAM®** EJM 2000 System



It's time to
STOP...

- Bringing bags and pallets into the wet process area and dumping powders into an old-fashioned funnel
- Putting up with snail-paced mixing processes
- Letting dry ingredient incorporation hold up your entire operation
- Living with ingredient dust polluting the air you breathe
- Tolerating power-guzzling mixing systems that require frequent maintenance
- Accepting inconsistent finished mixes
- Treating dry ingredient handling and dry-liquid mixing like a stepchild of the manufacturing process



And it's time to
START...

profiting from the advantages
of the **VACUCAM® EJM 2000**

Higher Quality

- **Optimal accuracy and product consistency** — Powders and liquids are combined continuously and uniformly, producing higher slurry quality.
- **High product integrity** — Dry handling and wet processing are totally separated.
- **Industry standard hydraulic pumping** — Centrifugal or positive displacement pumps featuring Fristam quality.

Lower Cost

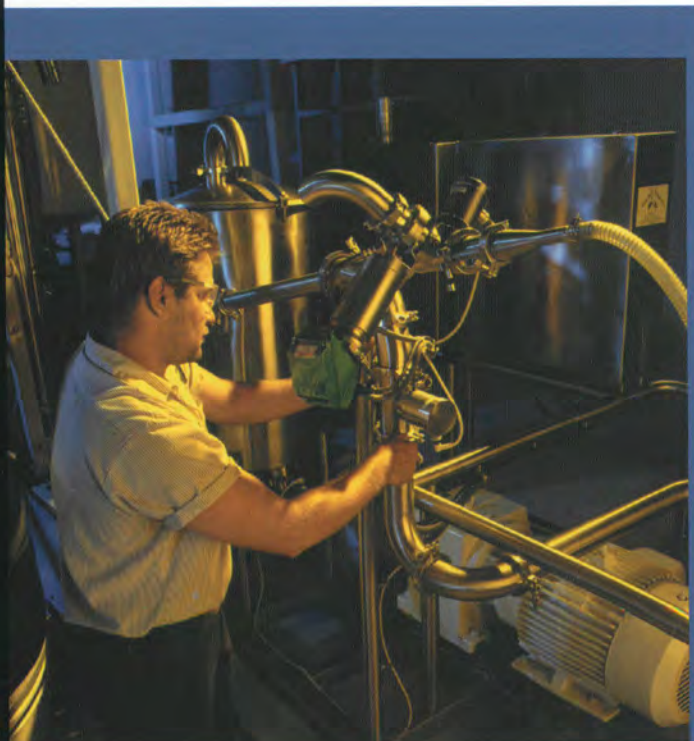
- **Power consumption reduced** by 50% to 75% compared to alternative processes.
- **Minimal downtime and maintenance costs** — The VACUCAM® EJM 2000 has no moving parts. High quality, low maintenance Fristam pumps supply the hydraulic energy.
- **Greater speed and efficiency** — The EJM 2000 process can be automated and operated from a central control. Process time is greatly reduced with increased capacity. The process offers faster hydration and faster functioning of thickeners or reactive products.
- **Reduced housekeeping effort** — Dry handling and mixing are totally enclosed and vacuum conveyed, providing a dust-free environment:
 - For hygienic processes, powder is kept out of wet process area, minimizing potential for bacteria growth.
 - For industrial processes, powder is kept out of process areas, eliminating dust.

Flexibility and Convenience

- **Available with optional** centrifugal or positive displacement pumps to meet process requirements.
- **Configured for either** single pass or batch recycle processing.

Safety and Health

- **Less slipping and fewer accidents** — Dust does not accumulate on wet walking surfaces.
- **Fewer respiratory issues** — No more dust-filled air contaminating the work environment.



A complete pre-packaged slurry system.

Comes ready to install & operate.

Designed for both smaller & larger processors.

Optimal performance at an economical price.

Semi-Bulk Systems has more than 25 years of experience in perfecting patented systems for powder/liquid mixing processes. The VACUCAM® EJM 2000 provides a complete slurry process with the most advanced technology in the industry for the dual functions of handling powders and mixing powders with liquids.

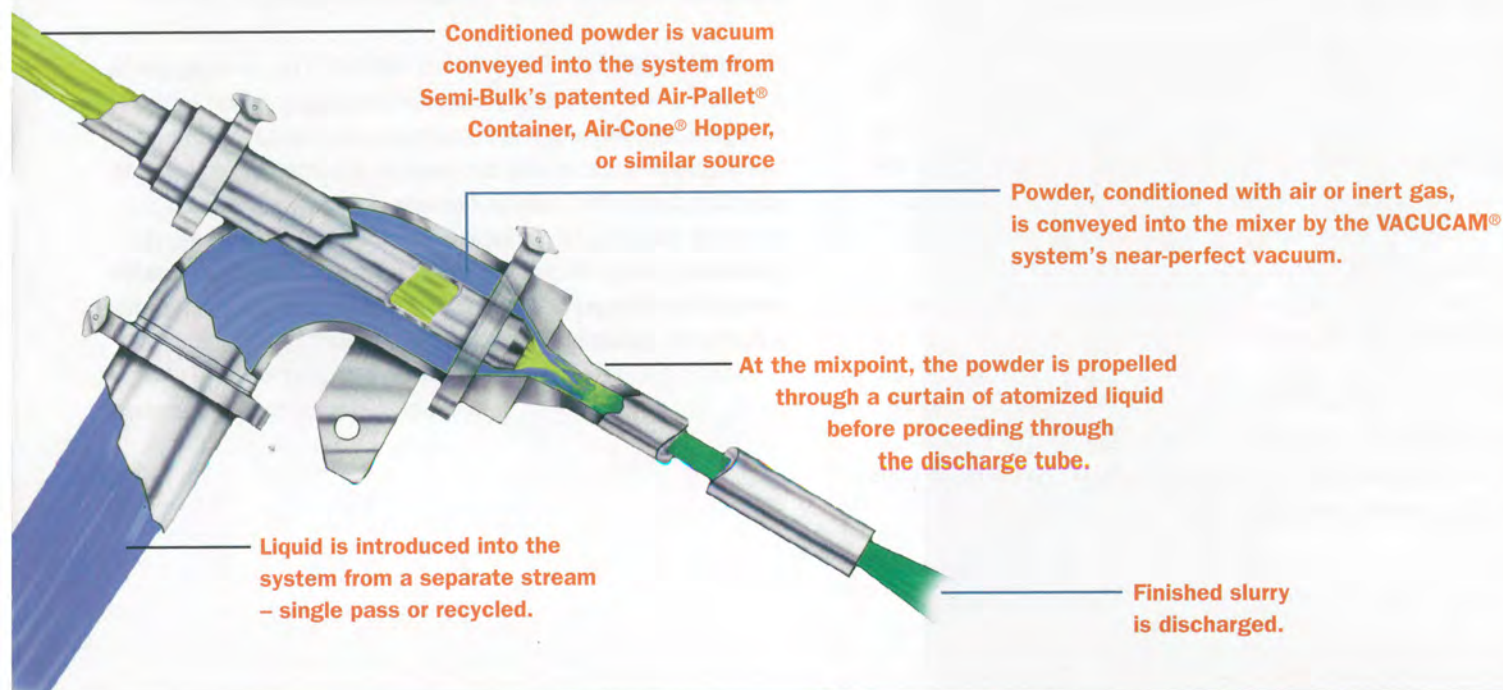
The Heart of the System

The VACUCAM® Ejector Mixer is the most effective system available for conveying, wetting and dispersing powders into liquids. Here's how it works.

CONDITIONED POWDER IS CONVEYED INTO THE MIXER BY A NEAR-PERFECT VACUUM, WHICH IS CREATED when pressurized fluid is forced through the Ejector Mixer's unique, patented annular nozzle. The fluid is discharged as a high-velocity, hollow jet into which the powder is drawn.

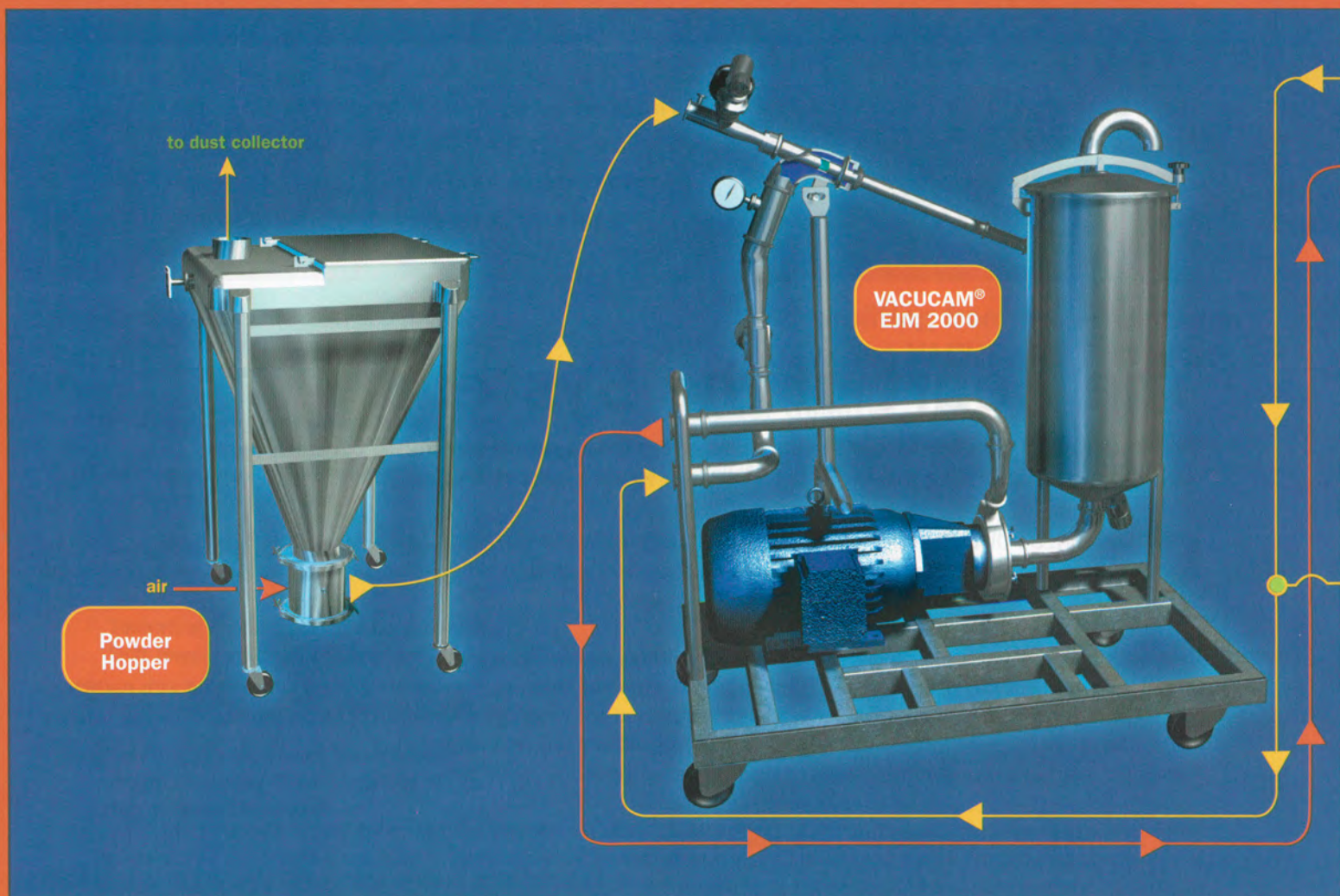
The VACUCAM® system achieves high-speed, instantaneous and complete wetting by bringing together conditioned powder and highly atomized liquid from two separate streams, incorporating particles of liquid with particles of powder. The reactive surface areas of both the powder and the liquid are maximized before intimate contact is actually made. The result is consistently uniform, superior wetting without the agglomeration or "clumping" usually associated with conventional mixing methods.

Semi-Bulk Systems has packaged the VACUCAM® EJM 2000 to incorporate our patented Ejector Mixer on an in-line skidded slurry unit with a bag-dump supply hopper and manual controls. The finished slurry can be delivered to multiple nearby or remote process vessels or mix tanks. The dry/liquid mixing process can be physically separated from wet areas without sacrificing quality or throughput.



The VACUCAM® EJM 2000

Total Package



Dry Feed

The VACUCAM® EJM 2000 process includes a 5 or 14 cubic foot (0.14 or 0.39 cubic meter) bag-dump hopper with lid, 70 degree cone angle bottom, vibrating screen and clamp on Air-Cone® Pickup transition. The vibrating screen is built into the top of the hopper to prevent clumps and paper bag scraps from entering the system. The Air-Cone® Pickup transition conditions the powder to provide uniform feed to the VACUCAM® Ejector Mixer. A pneumatic panel includes the necessary components to operate the system.

Standard hopper construction is 304 Stainless Steel with polished interior and bead blast smooth exterior finishes. Available options include casters for portability and load cells for loss-in-weight feed systems.

Slurry Process

The VACUCAM® EJM 2000 in-line module offers a state-of-the-art hydro-pneumatic slurry process that is packaged to provide outstanding economy and superior performance compared to typical mechanical mixing processes. It comes complete with operator panel and manual controls, local vacuum and pressure gauges, AC Variable Frequency Drive controller (for take-away pump) and step-down transformer. Integration with existing distributed control system is easily accomplished for automated operation.

Process Options

The EJM 2000 can be designed for either
Single Pass or Batch Recycle mixing processes:

- **Single Pass** systems are designed for processes with low solids levels, less than 30% by weight. It is the preferred method for thickeners, filter aids, silicas, and other shear-sensitive mixtures. Single pass is also ideal for reconstitution of milk powders into water or fluid milk.

With the EJM 2000, a measured amount of liquid is pumped through the VACUCAM® Ejector Mixer conveying a desired amount of powder and discharging the slurry into a mix tank. The system is capable of dry product rates to 300 pounds per minute with an accuracy level of $\pm 0.5\%$ solids by weight.

- **Batch Recycle** systems are designed for processes with higher levels of solids, from 30% to 60% by weight. The mixture is subjected to intense shear upon recycling through a narrow gap in the mixer housing. Suitable for any non-shear sensitive mixture with elevated solids level.

With the EJM 2000, a measured amount of liquid in the mix tank is recirculated through the VACUCAM® Ejector Mixer until the desired amount of powder is conveyed into the batch. Dry convey rates to 300 pounds per minutes are possible from conditioned feed sources.

Depending upon requirements, the in-line module is available with either a centrifugal or positive displacement pump manufactured by FRISTAM. The compact unit can be operated in either single-pass or batch-recycle process.

A liquid supply pump can be included in the system scope. If recirculation is required from multiple process vessels, additional supply pumps may be required.

Standard construction is 304 Stainless Steel for deaeration tank, piping and process skid. Finishes are polished on tank and piping, bead blast on skid. Available options include casters for portability, vacuum and pressure transmitters, explosion-proof motors and panels.





VACUCAM® EJM 2000 Options

Mixer Options

LIQUID CAPACITY:

- The 75 gallons per minute (GPM) [283 liters per minute (LPM)] system is recommended for smaller capacity processes using single pass mode or for extended processing time (to add additional shear) in batch recycle mode.
- The 100 GPM (378 LPM) system is recommended for higher powder capacity and solids levels, cutting cycle time to provide optimum process throughput.

Either flow capacity VACUCAM® Ejector Mixer is available in the following models:

Model B3 — Designed to meet the stringent standards of FDA, USDA and 3A for cleanability. Has high polish interior and exterior, 316 Stainless Steel construction.

Model B4 — Designed for industrial processes or hygienic processes not requiring the 3A standards. Has a bead blasted exterior finish, 304 Stainless Steel construction.

Model B5 — Designed for industrial processes that circulate abrasive slurries. The powder tube tip and orifice are replaceable stellite. Balance of Mixer is 304 Stainless Steel, and exterior has glass bead finish.

Dry Side Expandable Options

The dry side feed of the EJM 2000 offers the versatility to accommodate a variety of different powder sources based on the specific customer requirements. Options include:

Bulk Bag Unload Station



Bulk Bag Unloader with Surge Hopper



Air-Pallet® Container



Filter/Receivers for receipt of pneumatically conveyed powder from silos, bulk trailers and rail cars



The **VACUCAM® EJM 2000** in-line module
offers a **state-of-the-art** hydro-pneumatic slurry process
packaged to provide **outstanding economy & superior performance**
compared to typical mechanical mixing processes.

System Comparisons

	VACUCAM® EJM 2000 (Hydro-Pneumatic Process)	Eductors, Funnel-Fed Devices, Rotor/Stator Devices, Agitated Vessels (Mechanical Processes)
System allows for a separation of dry ingredients from "wet" area without adding mechanical equipment such as conveyors, vacuum receivers, vacuum pumps, etc.	YES	NO
System has no moving parts other than liquid pumps	YES	NO
Process can be employed when there is a need for high shear or if shear is to be avoided altogether	YES	NO
Source company possesses both dry ingredient and liquid handling expertise	YES	NO
Mixing design disperses particles of dry ingredients into atomized particles of liquids to produce complete incorporation of any dry material into any liquid every time regardless of operator technique	YES	NO
Process can be fully automated, including dust control and interface with semi bulk packages (bulk bags) or bulk silos, and can be supplied by one company	YES	NO

Custom Engineered Alternatives

If our pre-packaged EJM 2000 doesn't meet your specific needs, Semi-Bulk can work with you to develop a custom-engineered VACUCAM® system designed to your exact specifications.

We are able to integrate components from various manufacturers in customized configurations so the system fits your specific product and process requirements, as well as your physical plant accommodations and other relevant factors. We also provide options such as mounting the Ejector Mixer on other tanks or integrating our system with your existing process vessels.

As part of the customization, we offer complete design engineering plus initial ingredient evaluation and characterization. We also offer consulting services for all phases of projects involving dry-ingredient handling. All fabrication and assembly are done in our manufacturing facility, and the system is tested in our production-scale pilot plant using your product before it is placed into your operations. Then we supervise your installation and start-up, and we provide ongoing training and service.

Semi-Bulk also provides contract engineering and consulting services. For more complete information on our custom-engineered systems – including our revolutionary continuous steady state process – contact us by phone, mail, or website.

We'll make a believer out of you

Industrial Applications

- **Chemical Processing** — Automated reaction catalyst addition, waste stream pH adjustment, filter aid incorporation
- **Paint & Coatings Processing** — Silica incorporation, thickener additions, pigment slurries (e.g. TiO_2 , calcium carbonate, talc, oxides)
- **Aluminum Heat Exchanger Manufacturing** — Brazing flux slurry preparation and distribution
- **Power Generation** — Limestone/fly ash slurries, waste stream pH adjustment
- **Paper Manufacturing** — Starch slurry, waste water pH treatment, specialized coating slurry preparation and distribution (e.g. calcium carbonate, clay, TiO_2)

Sanitary Applications

- **Pharmaceutical** — Sodium bicarbonate slurries, salts dissolution
- **Dairy** — NFDM reconstitution, sugar liquification (*Batch Processes or Single Pass*), ice cream mixes
- **Brewing** — Filter aids, silica and activated carbon slurries
- **Processed Cheese** — Wet mix (*high protein*) slurries
- **Margarine** — Whey slurries
- **Dressings** — Spiced ingredients, starch slurries, egg mixes
- **Confectionery** — Dry ingredient recovery/reintroduction
- **Health/Personal Care Products** — Carbopol slurries (*thickeners*), compound dispersions



The products and services described in this brochure are available for purchase from Semi-Bulk Systems, Inc. All such sales shall be subject to the terms and conditions contained in the proposal forms, invoices, shipping tickets and other sales forms and documents of Semi-Bulk Systems, Inc. pertaining to the products and services. These items include various limited warranties and other disclaimers concerning the products and services available for purchase from Semi-Bulk Systems, Inc. Such documents will supersede and replace any and all statements made in this brochure with respect to the products and services.

Specifications

Utilities

Electrical Power: 440V, 3Ph., 60Hz.
400V, 3Ph., 50Hz.

Controls: 120 or 220V A.C.
Transformed to 24V D.C.

Amperage required

**15 horsepower
(11kW):** 19 amps full load
(125% service recommended)

**20 horsepower
(14kW):** 26 amps full load
(125% service recommended)

Compressed air: 35 CFM (991 cubic liters/min.)

Capacities

**Liquid
throughput:** Rated 75 or 100 GPM
(283 or 378 LPM)

**Powder rate,
maximum:** 300 pounds per minute
(136 kg/minute) subject
to solubility limits

Dimensions

VACUCAM® Slurry Module:

	w/Centrifugal Pump	w/P.D. Pump
Overall Width:	36" (914 mm)	60" (1524 mm)
Overall Length:	60" (1524 mm)	72" (1829 mm)
Overall Height:	74" (1880 mm)	74" (1880 mm)
Approx. Dry Wt.:	1050# (477 kg)	1300# (590 kg)

Powder Hopper:

	5 Cu. Ft. (0.14 Cu. meter)	14 Cu. Ft. (0.39 Cu. meter)
Overall Width:	24" (610 mm)	38" (965 mm)
Overall Depth:	24" (610 mm)	38" (965 mm)
Working Height:	44" (1118 mm)	64" (1626 mm)
Approx. Dry Wt.:	250# (114 kg)	400# (181 kg)

Powder Convey Hoses/Fittings

Appropriate diameter and length for your application.
Included with packaged unit.



We'll make a believer out of you



**Manufacturing custom-designed
systems for dry and liquid mixing
processes and dry ingredient handling**

Headquarters

159 Cassens Court
Fenton, MO 63026-2543
P: (800) 732-8769
(636) 343-4500
F: (636) 343-2822
sales@semi-bulk.com
www.semi-bulk.com

Subsidiary

Semi-Bulk Systems, International Ltd.
Unit 232 K2 House Heathfield Way
Dallington, Northampton
United Kingdom, NN5 7QP
P: 44(0) 1604 754971



25 Years

Semi-Bulk Systems
incorporated