

Pneumatic Injection RotoFeed and RotoScrew



Pneumatic Injection of Granular, Pulverized & Powdered Materials

MAC Equipment offers total pneumatic injection capability.

Wherever there is a need to inject powdered or granular materials, into a process environment, there is a potential application for MAC's injection technology. Products can be continuously injected into process environments at smooth, easily controlled rates, with accuracies $\pm 0.5\%$ and against back pressures of 300 psig or more.

RotoFeed and RotoScrew Provide:

- ▶ Controllable Feed - Provides a steady, controlled feed of material into a process.
- ▶ Adjustable Injection Rate - The injection rate is adjustable and can be controlled to meet the needs of the process, 5:1 turndown is standard.
- ▶ Accurate Feed - The injection rate is accurately controlled, by the RotoFeed/RotoScrew to $\pm 2\%$ by volume or $\pm 0.5\%$ by weight.
Injection against pressure - The material can be injected into a pressurised environments.
Integrated into Process - Injection systems normally form an integrated part of a larger process plant.
- ▶ Wide range of materials - RotoFeeds are used for fine fluidizable materials through granulars to 3/8". RotoScrew can feed cohesive or irregular and large materials as well as highly abrasive materials.

Pneumatic Injection Applications Include:

- ▶ Coal or alternative fuels injection to rotary kilns in cement and other industries.
- ▶ Bio-mass injection to process reactors for fuel or for conversion to liquid fuels and chemicals.
- ▶ Fuel injection to air/fuel and oxy/fuel burners.
- ▶ Pulverized or granular coal injection to blast furnaces.
- ▶ Carbon, lime or dolomite injection to Electric Arc and Ladle Met. Furnaces.
- ▶ Flux or catalyst feed to ladles for desulfurization etc.
- ▶ Non-ferrous concentrate feed to smelters and converters.
- ▶ E-scrap injection for fuel and metals recycling.



MAC Equipment and Clyde Materials Handling has provided pneumatic injection solutions across many industries and has consistently improved productivity rates, system reliability, availability and performance for organizations who operate within such markets such as iron & steel and non-ferrous metals.

RotoFeed - Continuous Injection

The RotoFeed range is designed to reliably and accurately inject dry solids into processes. Different configurations are available to suit batch or continuous processes with one or multiple injection points.

The RotoFeeder is a volumetric device driven by an electric motor and gearbox. Using a variable frequency drive, the RotoFeeder speed can be varied to provide the required injection feed rate, with predictability and accuracy. The feeder has a 5:1 turndown capability. Different models are available for feed rate ranges as low as 2-10 lbs/min and as high as 400-2,000 lbs/min (at 50 lbs/ft³ bulk density). The gas flow through the RotoFeed is fixed at the level needed to support reliable material transport at the max injection rate.

- ▶ RotoFeed accuracy is unaffected by reducing material level in the inject vessel or by variations in material size.
- ▶ Feeder components are also available with a variety of coatings to enhance product release as well as further enhance wear life.
- ▶ RotoFeeds are shop built to the greatest extent possible for transport to site, for faster and easier installation.



How the RotoFeed Works

The continuous RotoFeed assembly includes lock and inject vessels each with Spheri Valves to control vessel filling, a RotoFeeder at the discharge of the injection vessel to control injection rate, and valves/instruments to control gas flow and pressure.

The lock vessel receives the material from ambient pressure storage and balances pressure with the inject vessel in order to refill it. Meanwhile, the RotoFeeder continues to deliver material at the required rate to the injection pipeline. The gas flow through the RotoFeed is fixed, at the level needed to support reliable material transport at the maximum injection rate. Continuous RotoFeed injectors can be used in a wide variety of applications. Virtually any dry bulk material from fine powders to granular (3/8" max.) can be injected.

Material delivery is smooth enough to support a burner flame when delivering fuels. The rate does not change as the inject vessel fill level drops or when the vessel is re-filled.



RotoScrew

As well as developing the RotoFeed solution, MAC has also developed an injection solution which can be used to transport very abrasive, coarse granular and lump materials. This solution is called the RotoScrew.

The RotoScrew is based on the premise of the RotoFeed but it makes use of a feeder screw, which drives material through a pipeline and into process. The RotoScrew has been used to inject materials such as granular limestone, iron ore, mill scale, electronic scrap and lump coal. Same benefits achieved with RotoFeed can also be generated with the RotoScrew for more abrasive materials.

State-of-the-Art Testing Facilities

Our test labs enable us to analyze the properties of materials and to compile valuable performance data on our conveying, filtration and process control systems to ensure optimum equipment performance. Material testing lets us determine the most efficient conveying or filtration technique and equipment configuration for each specific application.



Kansas City, Missouri Pneumatic Test Lab

Our Pneumatic Test Lab in Houston has been built around the petrochemical industry and is often used for long-term testing situations. The Houston Test Lab includes 3, 4, 5, 6, and 12 inch lines plus several stepped configurations, which simulate actual plant conditions. MAC Equipment operates a second Pneumatic Test Lab in Kansas City, Missouri.



Sabetha, Kansas Filtration Test Lab

Our Sabetha, Kansas Filtration Test Lab (pictured above) features a Particle Emissions Test (PET) machine, which is unequaled in the filtration industry. The machine allows MAC to design and specify the best system for your specific application. The Particle Emissions Test equipment records and graphs air flow and velocity, air-to-cloth ratios, pressure differentials, inlet loading and outlet mass emissions.

We encourage customers to be present while their tests are run so they can see firsthand how their equipment and product perform. Come visit us today and let us prove our solution!

Contact Us

To learn more about our range of pneumatic conveying and air filtration solutions, please contact us at:

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