ORGANIC & INORGANIC FERTILIZER GRANULATION SYSTEMS

FEECO was founded in 1951 as the Fertilizer Engineering & Equipment Company. Since our founding, we’ve developed a reputation as the premier name in custom equipment and complete process systems for the production of both organic and inorganic fertilizers.

You can rest assured when you purchase FEECO systems and equipment, you’re getting equipment that was engineered around the material to be processed, and built with longevity in mind. Our engineers work closely with our in-house fabricators to ensure everything is crafted just right. We use only the best materials to provide you with a dependable solution that will work reliably for years to come.

Whether you need replacement equipment, are looking to modify your current process, or you have an idea for a new product you’d like to test out, FEECO can help take you from idea to full-scale production.

WHO WE WORK WITH
FEECO’s expertise has been sought by nearly every big name in the fertilizer industry. Producers come to FEECO for the best in innovative solutions in process design, engineering, and manufacturing. Some of these companies include:

ORGANIC & INORGANIC MATERIALS
FEECO has experience processing a wide variety of fertilizers and soil amendments, including:

- Ammonium Sulfate
- Chicken Litter
- Chicken Manure
- Compost
- Dairy/Cattle Manure
- Gypsum
- Hog Slurry
- Limestone
- MAP, DAP
- Municipal Sewage Sludge/Biosolids
- NPK
- Pipe Reactor Grades
- Potash
- Separated Dairy Manure
- SSP, TSP
- Urea

FEECO CAN SUPPLY
- Acidulators
- Bucket Elevators
- Coating Drums
- Combustion Chambers
- Conveyor Systems
- Disc Pelletizers
- Granulation Drums
- Hammer Mills
- Pin Mixers
- Pipe Reactors
- Pug Mills (Paddle Mixers)
- Rotary Dryers & Coolers
- Tanks, Hoppers, and Chutes
We’ve been working in the fertilizer industry since 1951. People come to us for our expertise and reputation for equipment that performs reliably over the long haul.

- Shane Le Capitaine
FEECO Process Sales Engineer
EQUIPMENT

A FEECO rotary drum is prepared for shipment.
GRANULATION & COATING DRUMS

FEECO granulation drums are an ideal fit for high capacity processing settings, or when a chemical reaction must be combined with agglomeration, such as in the production of many traditional fertilizer blends. FEECO can also supply coating drums of a similar design.

FEATURES
- Efficient bed turning/flight designs
- Robust design and construction
- Various material options

SIZE | Drum diameters from 36" - 15' (1 - 4.6m)

CAPACITY | 500 lb/hr - 3500 TPH+

OPTIONAL COMPONENTS
- Spray Systems
- Various Liner Options
- Machined Bases
- Screw Conveyor Feeder
- Various Drive Assemblies
- Automatic Gear Lubrication System
- Variable Speed
- Variable Slope
- Variable Frequency Drive (VFD)
FEECO rotary dryers and coolers are the tools of choice when it comes to drying and cooling bulk solids such as fertilizers.

Engineered around the process at hand, these industrial work horses are known for their high throughput, uniform results, and reliability.

FEECO rotary dryers and coolers are highly customizable, with a variety of options and add-ons to increase efficiency and ensure an optimal drying or cooling solution. For more information, see our dryer and cooler brochure.

### ROTARY DRYERS & COOLERS

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<td>- Specially designed lifting flights</td>
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<td>- Heavy-duty design and construction</td>
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### CAPACITY

| 1 TPH - 200 TPH+ |
| (1 MTPH - 181 MTPH+) |

### DIAMETER

| 3’ - 15’ (1 - 4.6 m) |
PIN MIXERS

**SIZE:** 10” - 50” (254 - 1,270mm) | **CAPACITY:** 200 lb/hr - 70 TPH

Pin mixers are a diverse piece of agglomeration equipment that can be utilized as a stand-alone device, or as part of a larger disc pelletizer or granulation drum setup.

The high-speed spinning action of pin mixers makes them especially well-suited to processing finely divided solids, and promoting a homogeneous mixture when feedstock consists of both solid and liquid feed components.

Various customizations are available for the pin mixer.

DISC PELLETIZERS

**SIZE:** 24” - 25’ (0.6 - 7.5m) | **CAPACITY:** 100 lb/hr - 100 TPH

Disc pelletizers, sometimes called pan pelletizers or pan granulators, are the equipment of choice when creating a highly refined product.

Several variables can be adjusted during processing in order to fine-tune pellet characteristics for the intended application.

Various customizations are available for the disc pelletizer.

For more information on our mixers and disc pelletizers, see our agglomeration brochure.
HAMMER MILLS

FEATUES
- Utilizes a cracking action instead of grinding or pulverizing
- Non-clogging design
- Designed for easy accessibility
- Durable construction
- Simplified maintenance
- High throughput
- Removable Screen

FEECO double rotor hammer mills are a heavy-duty crusher for use in size reduction efforts. Two sets of chain/bar links reduce dry and semi-moist materials with a minimum amount of fines and caking or plastering within the crusher.

Hammer mills are ideal for use in fertilizer production and can convert oversize agglomerates into the desired product range of minus 4 mesh to plus 20 mesh.

PIECE REACTORS

FEATURES
- A reaction between ammonia and sulfuric and/or phosphoric acid
- Effective use of the heat of reaction to evaporate water
- Utilization of the reaction temperature and pressure to create a molten product for controllable granulation in the drum
- Interchangeable sections to minimize downtime on replacement of wear sections
- Reactor designed to integrate effectively with granulation drum and supplemental ammonia and steam sparger equipment
- Available in various materials of construction

Pipe reactors can be a valuable addition to a granulation process, offering significant energy savings. Pipe reactors allow for a complete reaction between the ammonia and sulfuric and/or phosphoric acid. The hot melt created in the reaction is discharged into the bed of the granulator as a hot melt, allowing for controllable granulation in the drum. The heat of the reaction is captured and used to “flash off” the initial moisture, greatly reducing the amount of energy required to dry the final product.
ENGINEERED MATERIAL HANDLING

FEECO offers a variety of custom material handling equipment, including:
- Belt Conveyors & Conveyor Systems
- Bucket Elevators
- Steep Incline Conveyors
- Reversing Shuttle Conveyors
- Belt Trippers & Plows
- Belt Feeders

All FEECO material handling equipment and systems are designed around the unique material to be handled to ensure that the most efficient handling solution is reached.

For more information on our material handling equipment, see our bucket elevator and conveyor brochures.
A hog manure granulation plant engineered and built by FEECO
FEEO offers expertise in all approaches to fertilizer granulation, from traditional processes to the latest advancements, as well as novel processing techniques and custom formulations. We can provide everything from a single piece of equipment, to a complete granulation system.
FERTILIZER & SOIL AMENDMENTS: MATERIAL EXAMPLES

FEECO has developed an extensive material knowledgebase through our years of experience in the fertilizer and soil amendment industries. Some of the many materials we’ve helped our customers to develop and produce through our custom equipment and process solutions are shown below.
Potash before and after agglomeration in the FEEDCO Innovation Center
CUSTOMIZED TESTING SOLUTIONS

Testing in the FEECO Innovation Center offers a host of invaluable information, allowing you to gain critical data on your material, work out process variables, and develop a recipe for process scale-up.

The Innovation Center is well equipped to suit small batch tests on a single piece of equipment, as well as a continuous process loop with multiple pieces of equipment, including drying, particle sizing, and product recycle capabilities. We can record operating data to assist in process scale-up and design a full-scale production plant.

Our process experts can work with you to develop a customized testing program around the answers you’re looking for, whether you’re looking to test a new process, modify an existing product for a new market, or otherwise. Depending on your needs, we offer comprehensive testing services in four categories:

| 1. Feasibility/Proof of Concept | An initial, non-witnessed batch testing phase in which the possibility of creating a product is explored. |
| 2. Proof of Product | A more in-depth batch testing phase in which more time is spent determining whether a product can be made to desired specifications. |
| 3. Proof of Process | A continuous testing phase that aims to establish the equipment setup and parameters required for continuous production of your specific material. |
| 4. Process/Product Optimization | An in-depth study to optimize your specific material’s characteristics and/or production parameters in an industrial setting. |

PARTICLE CHARACTERISTICS

There are a variety of particle characteristics that can be measured and adjusted during processing to produce a product with ideal characteristics. The following properties can be measured and fine-tuned:

- Attrition
- Bulk Density
- Compression
- Crush Strength
- Flowability
- Green/Wet Strength
- Moisture Content
- Particle Size Analysis
- Physical Characteristics
- Solubility
- Temperature

AGGLOMERATION

- Coating
- Compaction Granulation
- Conditioning
- Micro-Pelletizing
- Mixing
- Pelletizing (Disc or Drum)
- Pipe Reactor Granulation

THERMAL

- Drying
- Kiln Applications

The Innovation Center can also accommodate phosphoric and sulfuric acid, allowing a variety of fertilizer blends and formulations to be tested.
AUTOMATION AT ITS BEST

FEECO is a Rockwell Automation partner, providing integrated process control solutions, both as a service in the Innovation Center, and as part of a system purchase. FEECO and Rockwell Automation process control solutions are provided with current technology, motor control centers, programmable logic controllers, and data collection systems with advanced technologies for reporting. The FEECO Innovation Center features a Rockwell Automation PLC/MCC system, which utilizes current technologies for optimizing testing operations.

DATA IN REAL-TIME
Our system allows you to monitor, trend, and adjust various data points in real-time, all from a single interface or mobile device. This includes:
- Current (Amps)
- Fan Speed
- Feed Rate
- Flow Rates/Product Flow
- Fuel Usage
- Gas Sampling & Analysis
- Horsepower
- Speed
- System Pressure
- Temperature

UNPARALLELED REPORTING CAPABILITIES
A control system from Rockwell Automation provides state-of-the-art data collection and reporting capabilities. Our system allows you to select only the variables you want to report on, from the exact time frame you’re looking for. This is especially beneficial in the Innovation Center, allowing returning customers to pick up exactly where they left off.

FEECO can integrate third party equipment into your control system, giving you complete process tracking and visualization.

Secure remote access to the system provides unparalleled troubleshooting capabilities.

Additional capability to customize data reporting features the ability to accommodate a broad range of operational variables.

AFTERMARKET
We are an extension of your maintenance department. From start-up and installation support, to emergency services and preventative maintenance, FEECO offers a variety of services to help keep your equipment running at its best for years to come, whether your equipment is FEECO brand or otherwise. We offer the following services:

- Installation & Start-up Support
- Spare Parts
- Field Services
  - Tire & Trunnion Wheel Grinding
  - Drum Trunnion Training
  - Alignments
  - Gear Replacement
  - Spare Parts Installation
  - Laser Alignment
  - Inspections
  - Equipment Audits
- Training Programs
- Process Optimization Engineering
- 24-Hour Emergency Service
THE FEECO COMMITMENT TO QUALITY

FEECO International, Inc. was founded in 1951 as an engineering and equipment manufacturer. FEECO is recognized globally as an expert in providing industry-leading process design, a range of engineering capabilities, including everything from process development and sample generation, feasibility studies, to detailed plant engineering, as well as manufacturing to a variety of industries, including: fertilizer and agriculture, mining and minerals, power/utility, paper, chemical processing, forest products and more. As the leading manufacturer of processing and handling equipment in North America, no company in the world can move or enhance a concept from process development to production like FEECO International, Inc.

The choice to work with FEECO means a well-rounded commitment to quality. From initial feasibility testing, to engineering, manufacturing, and aftermarket services, we bring our passion for quality into everything we do. FEECO International follows ISO 9001:2015 standards and procedures.

Ammonium Sulfate created in the FEECO Innovation Center