

ROTARY DRYER / COOLER SOLUTIONS

FEECO
INTERNATIONAL



ACROSS INDUSTRIES AND MATERIALS, AGGLOMERATION WORKS

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It's Not as Simple as It May Sound

Far from the basic definition found in Webster, the industrialized art and science of "collecting in a mass," has had extensive applications in many industries and for many materials throughout the world over many years. Today, stringent emphases on efficient use of raw materials and waste reduction, improved performance in product handling and manufacturing processes, and enhanced environmental protection all demand the latest in agglomeration technology and equipment. That's exactly what FEECO International delivers.

FEECO Agglomeration: A Family of Solutions

Since 1951 Feeco has been providing a family of solutions to meet agglomeration needs for companies all over the world. Whether the purpose is to eliminate dust and fines, convert a waste to a marketable product, or improve product characteristics, we can run lab tests, design, manufacture, and install agglomeration equipment and systems to create a highly efficient process.

Our field sales representatives are among the world's most knowledgeable and experienced professionals. And are backed by the finest chemical, mechanical, structural, and electrical engineers. Our sales team shares its extensive expertise and experience with customers, through seminars, professional associations and published papers.

This knowledge and expertise is combined with modern production methods and a highly-skilled workforce to produce reliable, technologically advanced agglomeration machinery and systems.

From beginning concept of how to solve your agglomeration problem, to the production of your machinery, FEECO International's technology-driven products offered organization uses its full range of expertise to meet your unique agglomeration needs.

FEECO Systems: Complete Solutions

At FEECO we have highly qualified staff of engineers, designers and skilled fabricators to custom design a system that exceeds your expectations. Whether it is a new or existing process, we can design, layout, supply, and commission your new plant or optimize your existing plant. With our state-of-the-art laboratory and pilot plant, we can emulate new processes, or further refine existing processes. Let show you how a technology driven, processes offered company can assist you with your design, processes, equipment or production needs.

Why Consider Agglomeration for Your Materials?

The continued gathering of agglomeration process knowledge has produced the means to change what were once financially draining problems into income producing solutions. It helps reduce environmental impact and applies to a wide range of industries throughout the world.

Products	Processes	Economics	Raw Materials	Environment
Improve physical appearance.	Eliminate dust and fines.	Convert waste to saleable product.	Simplify transport and shipment.	Can eliminate need for landfill. Improve characteristics for cost efficient recycling.
Simplify handling and application processes.	Increase flowability.	Reduce transportation cost.	Prevent dust loss.	Makes waste to fuel processes possible.
Prevent segregation.	Streamline process and post process material handling.	Reduce material handling cost	Increase porosity, density and meltability	Improve cost efficiency of waste disposal

WHAT KIND OF EQUIPMENT / PROCESSES ARE AVAILABLE

Five approaches are especially suited for the agglomeration processes of tumble growth and pelletizing.



DISC PELLETIZING

In this process, also called "pan granulation," raw material is continually fed into the rotating pan and is wetted by fine sprays of water and or binder. This tumbling action in the pan first forms nuclei, which grow into larger pellets by coalescence of fines. Spherical pellets are continuously discharged over the lip of the pan. Self classifying disc pelletizers are especially suitable when high product size uniformity is required.



PADDLE MIXER AGGLOMERATION

These mixers, also called "pug mills" consist of a series of paddles mounted on dual counter rotating shafts in a barrel shaped trough. With the addition of liquid binder, the material undergoes a tumbling kneading and medium shear action as it travels through the mixer. Paddle mixers are primarily used for wetting, mixing and granulation.



DRUM GRANULATION

Drum Granulators, also called "drum pelletizers," are open-ended rotating cylinders which impart a tumbling and growth action to form spherical pellets in the presence of liquid. Drums produce a wider size range of pellets and are often operated with screening and undersize recycle. Drums are the method of choice, when a chemical reaction is combined with agglomeration.



PIN MIXER AGGLOMERATION

In this process agglomeration occurs, when radially extended pins mounted on a high velocity central rotor shaft, in a stationary cylindrical shell impart agitation forces on the material and sprayed liquid binder. This causes a tumbling, turbulent movement resulting in densification. Pin mixers are used for solids mixing, densification and granulation. They are used primarily for dedusting and for spherical micropelletizing.



BRIQUETTING / COMPACTION

Particle size enlargement using a dry process in which dusts or powders are formed into shapes. The densification of the product is obtained by mechanical compression through a Sahut-Conreur double roll press.

PELLETIZING METHODS, EQUIPMENTS SELECTION CRITERIA

Your choice of the proper agglomeration method and equipment is primarily predicated upon:

- Raw material characteristics
- Equipment capabilities
- Desired agglomerate specifications
- Binder properties

Other sources of information valuable in the selection process include:

- Prior agglomeration applications for the same and or similar materials
- Technical information from trade groups, independent researchers and professional societies
- Industry standards



WHO USES AGGLOMERATION, AND WHAT MATERIALS ARE AGGLOMERATED?

A representative list of industries, and some of the materials they agglomerate, include:

Ag Chemicals: fertilizers, gypsum, pesticides, herbicides, insecticides, soil conditioners, aglime, dolomite

Cement / lime: raw meal, kiln dust

Ceramics: alumina, catalyst, tile mix, press feed, frits, color

Chemicals: soda ash, sodium sulfate, detergents, cleaners, zinc oxide, pigments, dyes, industrial carbons, carbon black, pharmaceutical compounds

Copper: concentrates, smelter dust, precipitates
Ferralloy: silicon, ferrosilicon, ferromanganese, ferrochrome
Glass: glass raw mix, glass powder

Gold/Silver recovery: mine tailings

Steel: EAF baghouse dust, coke fines, raw materials, iron ore pellets

Utilities: ash, coal, dust, FGD sludge

FEECO TECHNOLOGY CENTER

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LET US TEST YOUR MATERIAL

FEECO offers an initial feasibility test
FREE OF CHARGE

Will your material agglomerate, pelletize, or granulate? What is needed to get the job done? The answers to these two basic questions are readily available for you at FEECO International's Materials Testing Laboratory in Green Bay, WI. With more than 60 years of experience in agglomeration,

FEECO has a vast database on a wide variety of materials and test procedures. Among the tests routinely performed on customer samples are bulk density, flow rate, compression strength, moisture content, abrasion and hardness, and sieve analysis. In addition, a benefit analysis is done based on test results and customers' product needs.

Lab professionals team with FEECO design engineers to identify the best workable process and equipment. Using FEECO's own test equipment--in many cases, the same equipment that will be used in the final process--we simulate production conditions, scale the process up to pilot plant proportions, and produce end product anywhere from pounds to tons per hour.

For more information about how FEECO International can help solve your agglomeration challenges, contact us at **(800) 373-9347** or e-mail **sales@feeco.com**

Waste to Value Added Products

"What the world today calls waste — to FEECO International, they are really just raw materials for products that haven't been invented yet." – Dan Madigan [President]

We're more than an Equipment Company...We're a Complete Solutions Provider. FEECO International, Inc. was founded in 1951 developing solutions to companies worldwide in a variety of industries—helping to convert waste to usable products. We work hard to create usable solutions from wastes that would normally go into landfills.

Partial Materials Converted to Higher End Use Products

Beginning Material

Sulphur stack emissions
DDG
Ash [Wood, Fly]
Bentonite Clay
Calcium Chloride
Cell Phone Batteries
Electric Arc Furnace(EAF) Dusts
Egg Yokes Powder

Final End Product

Granulated fertilizers
Animal feed
Fertilizer pellets
at Litter granules
ce Melt pellets
Lithium, Zinc metal recovery
Metal Recovery
Powder Egg Pellets



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