FEECO INTERNATIONAL

AGGLOMERATION EQUIPMENT



TOMORROW'S PROCESSES, **TODAY.**

FEECO.com

SINCE 1951

ABOUT

Since 1951, FEECO has been engineering and supplying custom agglomeration equipment and systems for industries around the world. From a single piece of equipment, to a complete system, we can offer you a customized solution, tailored to your processing needs. All FEECO equipment is engineered around the material to be processed and built with longevity in mind.

UNMATCHED EXPERTISE

FEECO has experience around hundreds of materials and derivatives, giving us a unique and high-level perspective on material processing for both novel and traditional applications.

COMPREHENSIVE SUPPORT

FEECO provides comprehensive support for every stage of the process lifecycle. This starts with options in batch and pilot testing in our Innovation Center and finishes with our extensive parts and service capabilities to assess, repair, and optimize equipment and existing production lines. We are also a Rockwell Automation partner, allowing us to outfit all equipment with control systems.

WHO WE WORK WITH

Many of the world's most notable companies, across nearly all industries, rely on FEECO for innovative solutions in process design, engineering, and manufacturing, including:

CALCIUM PRODUCTS

IOC

PotashCorp
Helping Nature Provide

IMERYS

Cargill

SAINT-GOBAIN

INDUSTRIES WE SERVE

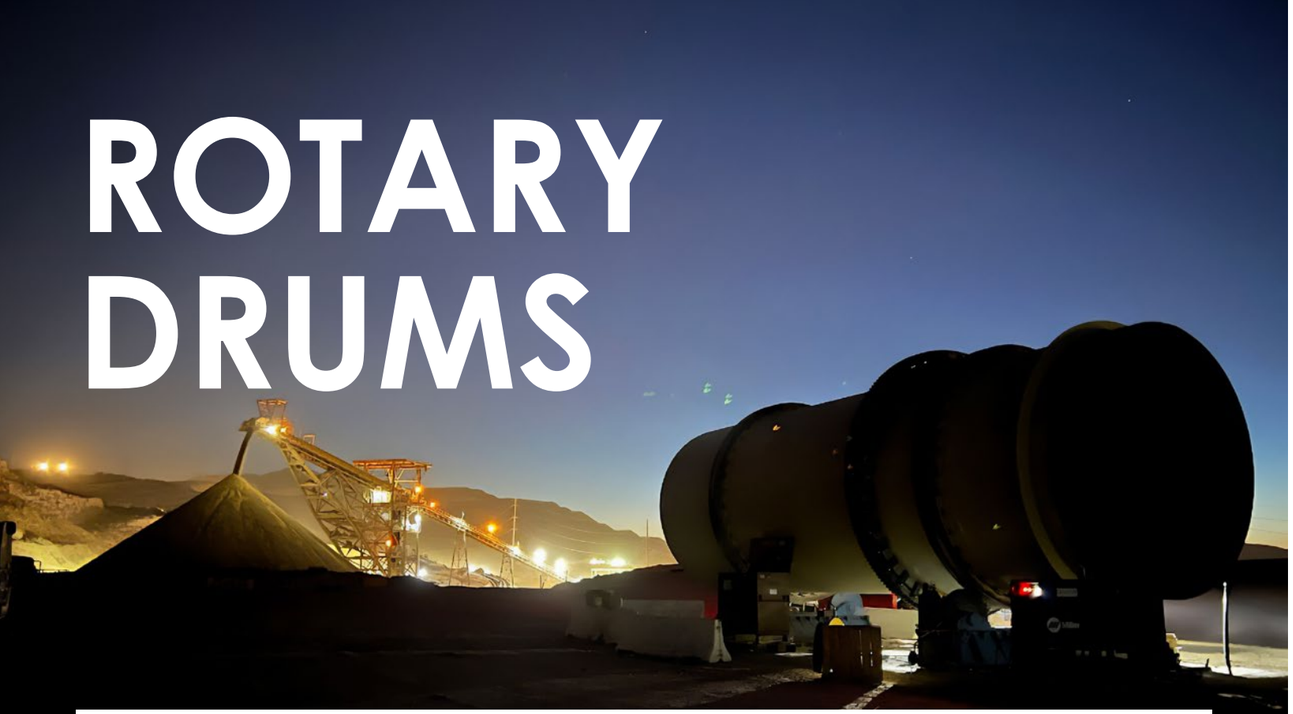
- Chemical
- Fertilizer & Granulation
- Mining & Minerals
- Power Generation
- Forest Products
- Waste Transformation

COMMONLY PROCESSED MATERIALS

- Aggregates
- Animal Feeds
- Biomass Products
- Clay
- Clinker
- Coal
- Copper Ore
- Fertilizer Products
- Frac Sand
- Grain
- Gypsum
- Inorganic Chemicals
- Iron Ore
- Lignite
- Limestone
- Nickel
- Organic Chemicals
- Petroleum Coke
- Potash
- Pulp & Paper Products
- Sulfur

Iron ore pellets
produced in the
FEECO Innovation Center

CONTROL PARTICLE CHARACTERISTICS



ROTARY DRUMS

COAT | CONDITION | GRANULATE | AGGLOMERATE

Rotary drums serve as the basis for several different types of rotary equipment. These diverse machines offer uniform results and a reliable solution for high-capacity processing in a variety of settings. They are robust and ideal for demanding operating conditions, as well as when a long retention time is required, or agglomeration is carried out with a chemical reaction, such as in the production of granular fertilizers.

APPLICATIONS

HEAP LEACHING/ ORE BENEFICIATION

- Copper Ore
- Gold Ore
- Silver Ore
- Uranium Ore

BALLING

- Iron Ore

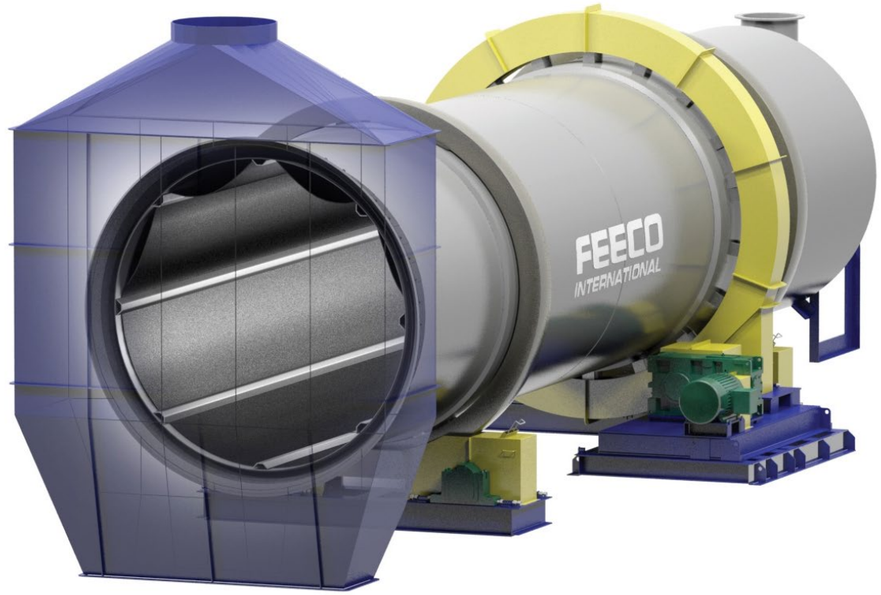
GRANULATION

- Inorganic Fertilizers
  - Ammonium Sulfate
  - NPK
  - MAP
  - DAP
  - TSP & SSP
  - Urea
  - Soil Conditioners & Micronutrients
  - Animal Feeds (DCP, MCP)

COATING/CONDITIONING

- Granular Fertilizers (NPK, MAP, DAP, Urea, Ammonium Sulfate, TSP, SSP)
- Animal Feed (DCP, MCP)
- Proppants
- Cat Litter
- Chemical Powders
- Iron Ore

For a labeled diagram of components, visit FEECO.com/agglomeration-drums/



Rotary Ore Agglomerator

Depending on the intended application, a rotary drum may be equipped with a variety of customizations such as tumbling flights, liners, integrated spray systems, and more. These drums are highly customizable to suit specific production goals, while offering a reliable, high-capacity processing solution. They are often operated with screening and recycle.

CAPACITY | 500 lb/hr - 3500+ TPH (225 kg/hr to 3,200 MTPH+)

DIAMETER | 36" - 15' (1 - 4.6m)

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

OPTIONAL COMPONENTS
- Spray Systems
- Various Liner Options
- Machined Bases
- Screw Conveyor Feeder
- Automatic Gear Lubrication System
- Variable Speed
- Variable Slope
- Variable Frequency Drive (VFD)

MATERIAL OPTIONS
- Carbon Steel
- Stainless Steel
- Specialty Alloys
- Explosion Bonded
- AR Steel

DRIVE OPTIONS
- Chain & Sprocket
- Girth & Pinion Gear
- Friction Drive
- Direct Drive at discharge end



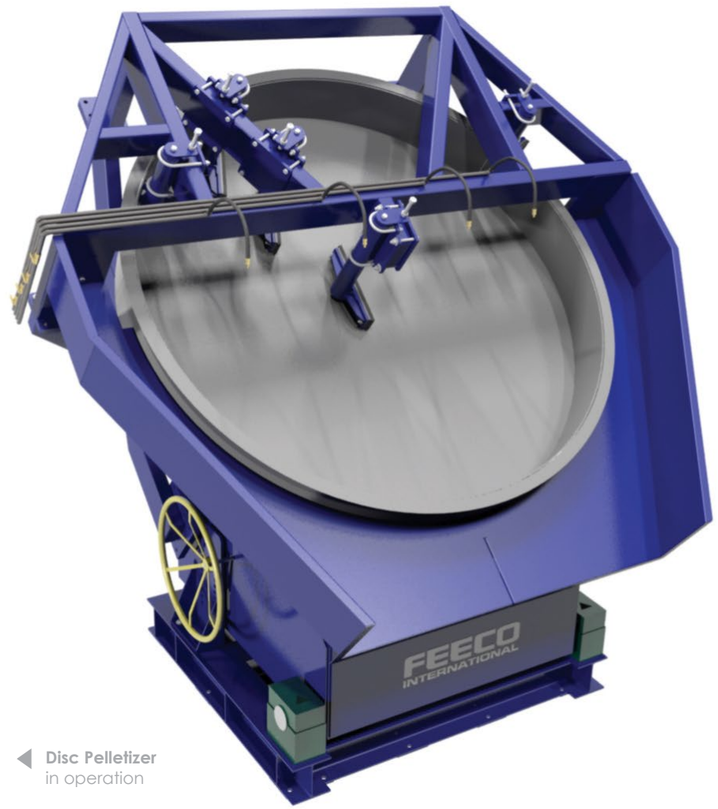
DISC PELLETIZERS

The disc pelletizer can be used for a variety of materials and is often chosen for its ability to fine-tune a pellet product; disc pelletizers create a refined, round pellet product ideal for use in many applications. They are especially popular in the soil amendment industry, because they create a premium product that can withstand handling and transportation, but still break down easily upon application.

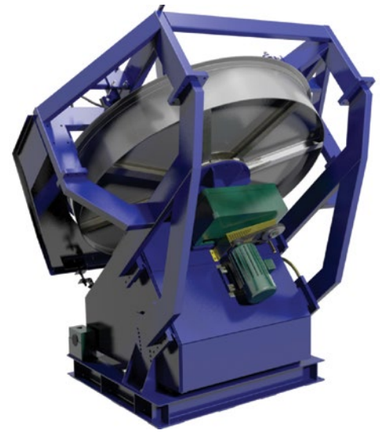
HOW DISC PELLETIZERS WORK

Material is fed onto the disc, where it is taken up by the rotation. Both material feedstock and a binder are continuously fed onto the pelletizer, making this a continuous process. The binder causes the fines to be tacky, which allows them to pick up more fines as they tumble on the disc. This results in an effect similar to rolling a snowball, referred to as coalescence. Several variables can be adjusted during operation to tweak end product characteristics in order to meet exact product specifications. A pug mill (paddle mixer) or pin mixer is often used as a primary feed conditioner and for binder pre-mixing before the pelletizer.

For a labeled diagram of components, visit
FEECO.com/disc-pelletizers/



Disc Pelletizer
in operation



FEATURES

- 6' (1.8m) and larger discs are lined with expanded metal to reduce abrasive wear
- A hand-wheel operated jacking screw allows for easy adjustment of disc angle
- The base and plow support members provide maximum rigidity, while simultaneously allowing rapid disc angle adjustment, without the need for separate plow adjustment
- Individually mounted vane-type plows easily control and maintain the product layer over the disc's entire surface
- The pivot base is mounted on heavy-duty, anti-friction bearings

SIZE | 6' - 25' (1.8 - 7.5m)

CAPACITY | 1 TPH - 100 TPH

OPTIONAL COMPONENTS

- Reciprocating Scraper
- Partial Hood
- Full Hood
- Stainless Steel Construction
- Variable Frequency Drive (VFD)

*Testing and rental options available

COMMONLY PELLETIZED MATERIALS:

Ag Chemicals: Fertilizers, pesticides, herbicides, insecticides, soil conditioners, minerals

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

Chemicals: Soda ash, detergents, zinc, pigments, dyes, carbon black

Glass: Glass raw mix, glass powder

Nonmetallic minerals: Clay, talc, fluorspar, diatomaceous earth, gypsum, limestone, potash

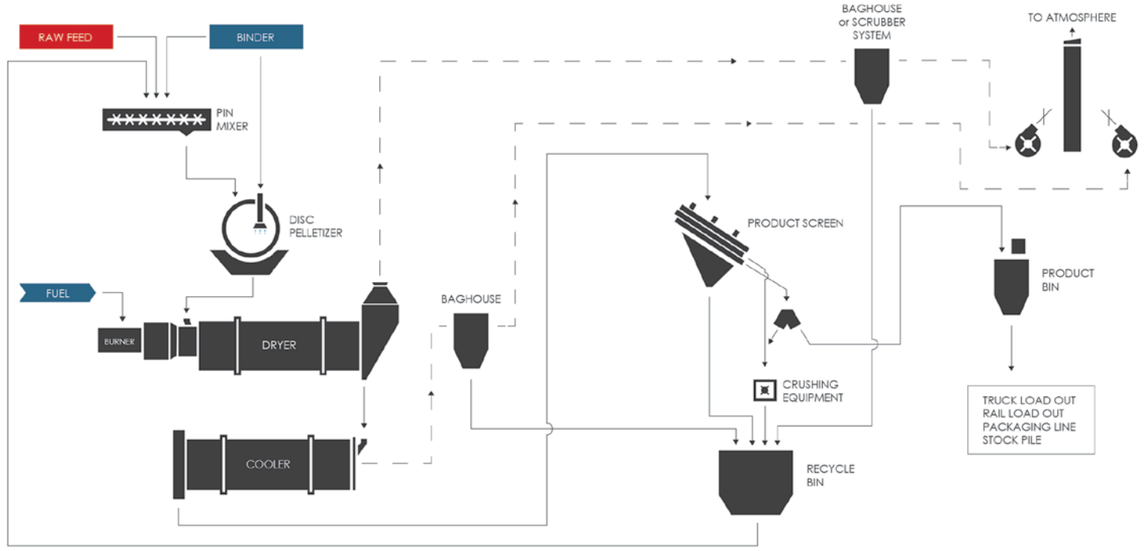
Steel: EAF Dust, coke fines, iron ore

Utilities: FGD Sludge, coal dust, fly ash



Synthetic Gypsum produced on a disc pelletizer

SIMPLIFIED PELLETIZING PROCESS FLOW DIAGRAM



The diagram above illustrates a typical disc pelletizing system with a preconditioning step. The preconditioning step in the mixer helps to make the process more efficient and more effective by pre-mixing the material and binder in a pin mixer or pugmill mixer.

TABLE: FEECO DISC PELLETIZER SIZES

DIAMETER		DEPTH		HP		TPH* *Approximate
Std (ft-in)	Metric (m)	Std (in)	Metric (mm)	Std (HP)	Metric (kW)	
6'-0"	1.8	11"	280	5	3.7	2
8'-0"	2.4	13"	330	15	11.0	4.5
10'-0"	3.0	15 1/2"	395	25	18.5	7
12'-0"	3.6	17 1/2"	445	40	30	12
14'-0"	4.2	19 1/2"	495	60	45	17
16'-0"	4.8	22"	560	75	55	26
18'-0"	5.5	24"	610	100	75	35
20'-0"	6.0	26"	660	125	90	44
23'-0"	7.0	30"	760	150	110	58
25'-0"	7.5	30"	760	200	150	69

**Approximate capacities listed are based on processing 60 PCF (960 kg/m³) material and creating nominal 5x10 mesh (2-4 mm) pellets.*



MIXERS

MIX | CONDITION | DE-DUST

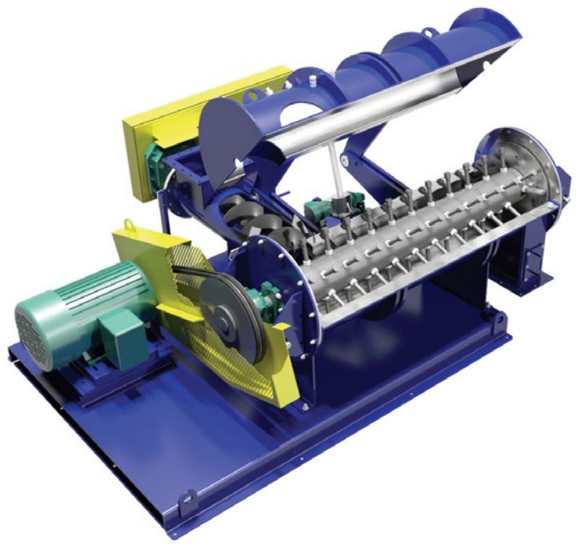
PIN MIXERS

Pin mixers are industrial mixers that are ideal for micro pelletizing and de-dusting applications. Pin mixers are particularly adept at processing ultra-fine materials in the presence of a binder, and can be used as a stand-alone agglomeration unit, or combined with a disc pelletizer or agglomeration drum to produce a premium pelletized product. Pin mixers use a high-speed spinning action to both mix and agglomerate materials in the presence of a binder. A single shaft affixed with rods (pins) rotates at a constant speed, creating a densified product through the use of motion.

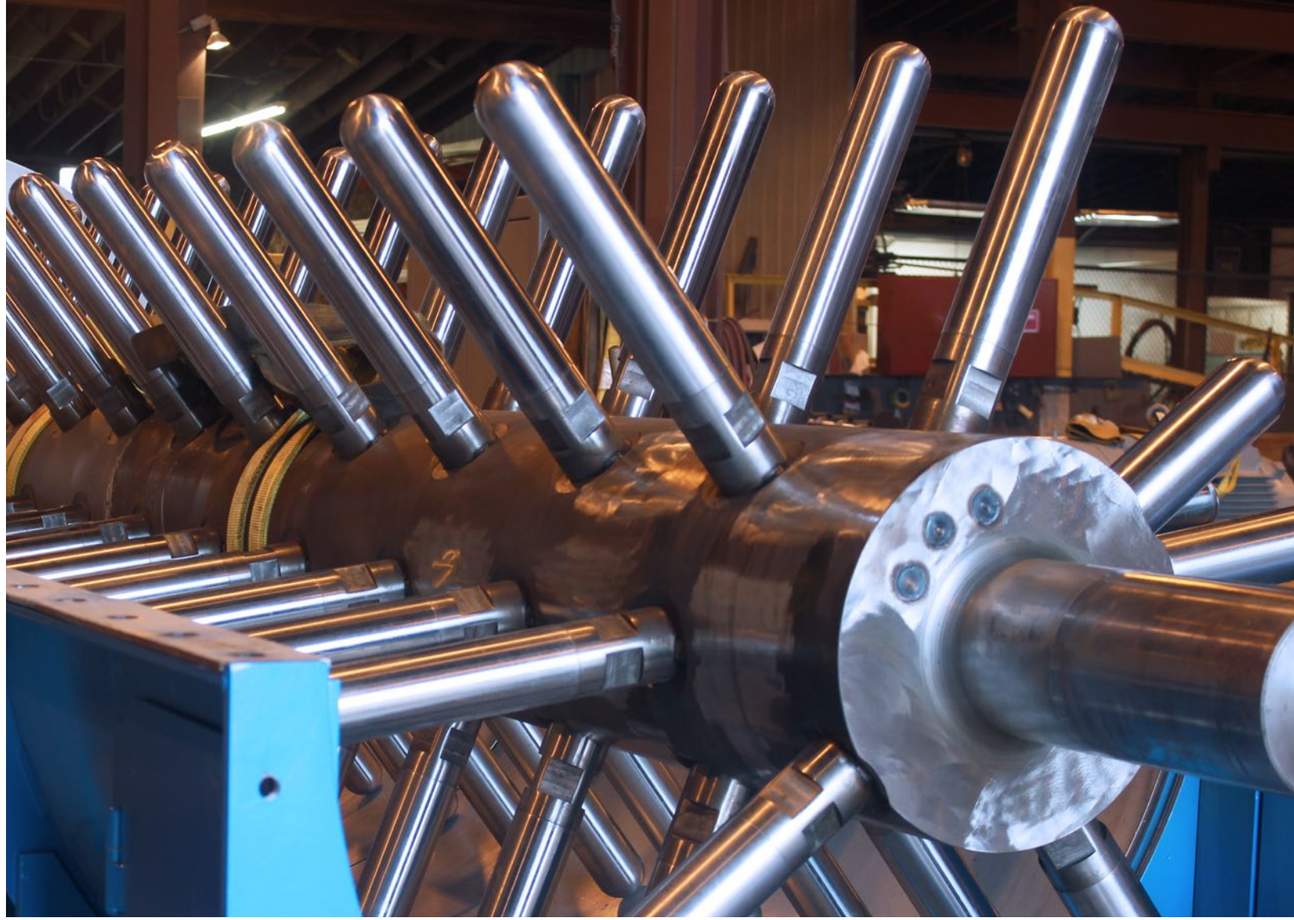
HOW PIN MIXERS WORK

Pin mixers use a high-speed spinning action to both mix and agglomerate materials in the presence of a binder. A single shaft affixed with rods (pins) rotates at a constant speed, creating a densified product through the use of motion. FEECO pin mixers can be **custom configured** to suit your processing needs, and offer a variety of optional components.

For a labeled diagram of components, visit FEECO.com/pin-mixers/



Pin Mixer shaft with pins



FEATURES

- Full sweep pin design
- Polished stainless steel liner to improve machine operation
- Available custom configuration
- Accurate feed ratios of powder to liquid for precise quality control
- Accurate production rates

SIZE | 15" - 50" (380 - 1,270mm)

CAPACITY | 500 lb/hr - 70 TPH

OPTIONAL COMPONENTS

- Zero-Speed Switches
- Raising Cover Assembly
- Abrasion-Resistant Pin Coatings
- Two Screw Feeders
- Various Pin Arrangements

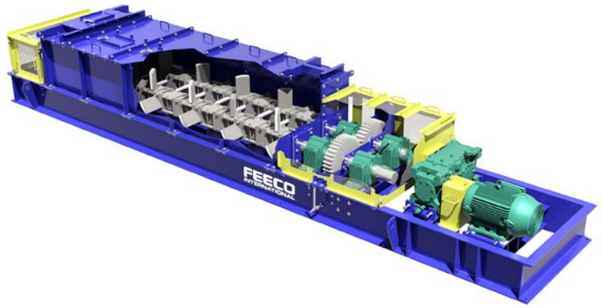
*Testing and rental options available

TABLE: PIN MIXER SIZING

MODEL	DIAMETER		DRIVE HP		CAPACITY	
	Std (in)	Metric (mm)	Std (HP)	Metric (kW)	cu. ft./hr	cu. m./hr
22"	22"	560	40	30	250-550	7-16
30"	30"	760	100	75	500-900	14-25
40"	40"	1,015	150	110	800-1,200	23-34
50"	50"	1,270	200	150	1,000-1,600	28-45

For a labeled diagram of components, visit
FEECO.com/pugmill-mixers/

PUGMILL MIXERS



Pugmill mixers, also known as pug mills or paddle mixers, are industrial mixers reserved for especially heavy-duty processing applications, such as those found in the mining industry. These industrial mixers are highly adept at processing materials in the presence of a binder to provide thorough mixing of both liquid and solid feed. Pugmill mixers can be used as a stand-alone agglomeration device, or as a precursor to a disc pelletizing or agglomeration drum setup. A liquid spray system for dispersing a binder may also be added for conditioning and agglomerating applications.

HOW PUG MILLS WORK

Pug mills utilize dual shafts with pitched paddles to create a kneading and folding over motion inside the horizontal, U-shaped trough. The action of the pitched paddles moves the material from the bottom of the trough up the middle, and forces the material back down the sides, resulting in an intimate mixture of materials.

FEECO pug mills can be **custom configured** to suit your processing needs, and offer a variety of optional components. Paddles can also be reversed to affect the mixing pattern. FEECO pug mills are **heavy duty** and built to withstand tough processing conditions.

FEATURES
- Double shaft design for thorough mixing of materials
- Heavy-duty construction for years of reliable operation
- Binder spray system to accommodate a liquid feed
- Options in paddle facings to help prevent wear
- Reversible paddles for modifying mixing pattern

*Testing and rental options available

SIZE | 22" - 78" (560 - 1,981mm)

CAPACITY | 2 TPH - 250 TPH

OPTIONAL COMPONENTS
- Zero-Speed Switches
- Mid-Height Cover w/ Spray Assembly
- High Cover w/ Spray Assembly
- Electronic Shock Relay
- Stainless Steel Wetted Parts
- Bottom Doors Open for Cleanout
- Direct Drive
- Variable Frequency Drive (VFD)



Pugmill Mixer with access doors

TABLE: PUGMILL MIXER SIZING

TROUGH WIDTH		TROUGH LENGTH		POWER		APPROX. TPH*
Std (in)	Metric (mm)	Std (ft-in)	Metric (mm)	Std (HP)	Metric (kw)	
22	560	8'-0"	2440	15	11	10
33	835	12'-0"	3655	40	30	20
42	1065	12'-0"	3655	50	37	60
48	1220	12'-0"	3655	100	75	85
60	1525	12'-0"	3655	125/150	90/110	125
66	1675	12'-0"	3655	150	110	160
72	1830	12'-0"	3655	200/250	150/185	190
78	1980	16'-0"	4875	200/250	150/185	240

**Capabilities are based upon dry, fluidized material weighing 60 lbs./ft.³ (960 kg/m³)*



ABOUT FEECO

FEECO International, Inc. was founded in 1951 as an engineering and equipment manufacturer. We are recognized globally as an expert in industry-leading process design, engineering capabilities (including everything from process development and sample generation, to feasibility studies and detailed plant engineering), custom equipment manufacturing, and parts and service. We serve a range 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 parts and service, we bring our passion for quality into everything we do.

FOR DETAILED PRODUCT INFORMATION & CAPABILITIES, **DOWNLOAD THE FEECO HANDBOOK** AT: **FEECO.com/FEECO-handbook/**

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