



ROTARY DRYERS
& COOLERS



TOMORROW'S PROCESSES, **TODAY.**

FEECO.com

SINCE 1951

ABOUT

Since 1951, FEECO has been designing and supplying custom rotary dryers and coolers for industries around the world. Whether you're looking for a single piece of equipment, or a complete system including the necessary exhaust gas handling and material handling equipment, we can offer you a customized solution, tailored to your processing needs. Advantages of a FEECO system include:

BUILT FOR LONGEVITY

FEECO engineers work closely with in-house fabricators to ensure everything is crafted just right. The conservative, robust design of our dryers and coolers yields a lifetime of reliable performance.

CUSTOMIZED FOR PERFORMANCE

From facility layout, to material characteristics and process goals, FEECO dryers and coolers are customized for optimal performance and efficiency. Our familiarity with hundreds of materials allows us to provide the best solution possible.

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:

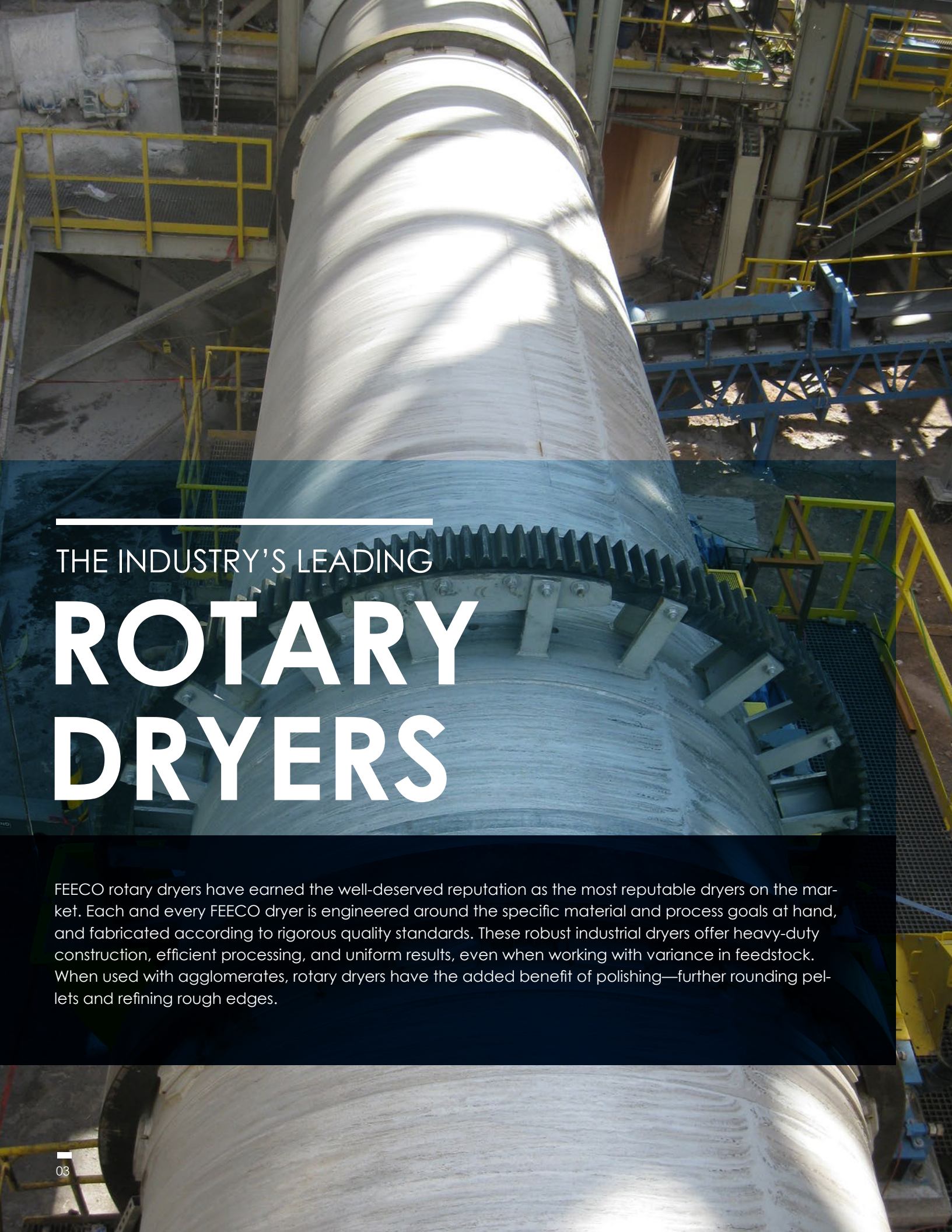


INDUSTRIES WE SERVE

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

COMMONLY PROCESSED MATERIALS

- Aggregates
- Agricultural Byproducts
- Animal Feeds
- Biosolids
- Fertilizers
- Gypsum
- Inorganic Chemicals
- Limestone
- Manure
- Metal Chips & Shavings
- Municipal Waste & Sludge
- Ores & Concentrates
- Organic Chemicals
- Paper Sludge
- Plastic Pellets & Grains
- Potash
- Reclaimed Dust
- Rubber Pellets
- Salts & Sugars
- Sand
- Steel Mill Waste Sludges
- Urea Prills & Crystals



THE INDUSTRY'S LEADING

ROTARY DRYERS

FEECO rotary dryers have earned the well-deserved reputation as the most reputable dryers on the market. Each and every FEECO dryer is engineered around the specific material and process goals at hand, and fabricated according to rigorous quality standards. These robust industrial dryers offer heavy-duty construction, efficient processing, and uniform results, even when working with variance in feedstock. When used with agglomerates, rotary dryers have the added benefit of polishing—further rounding pellets and refining rough edges.

For a labeled diagram of components, visit [FEECO.com/rotary-dryers/](https://www.feeco.com/rotary-dryers/)



Direct Rotary Dryer

DIRECT ROTARY DRYERS

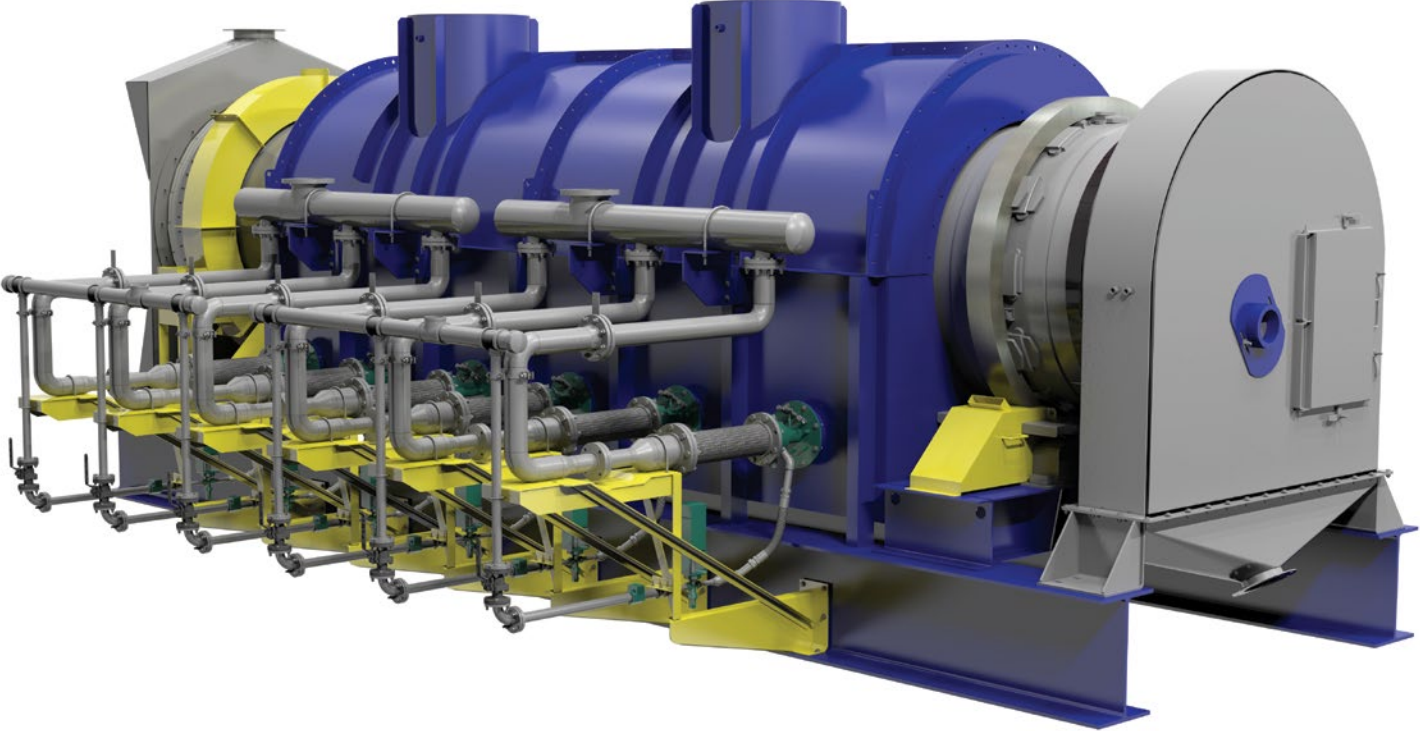


Direct [rotary dryers](#) rely on direct contact between the material and drying air. This direct contact, combined with the use of lifting flights, maximizes the heat transfer between the material and drying air, offering a highly efficient processing solution.

CAPACITY 1 TPH - 200 TPH+ (1 MTPH - 181 MTPH+)	OPTIONAL COMPONENTS <ul style="list-style-type: none">- Various Seal Options- Knocking Systems- Trommel Screen- Liners- Machined Bases- Screw Conveyor Feeder- Automatic Gear Lubrication System- Exhaust Handling Equipment- Various Burner Configurations- Ductwork	MATERIAL OPTIONS <ul style="list-style-type: none">- Carbon Steel- Stainless Steel- Specialty Alloys- Explosion Bonded- AR Steel
DIAMETER 3' - 15' (1 - 4.6 m)		DRIVE OPTIONS <ul style="list-style-type: none">- Chain & Sprocket- Girth & Pinion Gear- Friction Drive- Direct Drive at discharge end
FEATURES <ul style="list-style-type: none">- Specially designed lifting flights- Heavy-duty design and construction- Process and mechanical warranties- Co-current or counter current design		

ACCEPTABLE FUEL TYPES | Fuel Oil | Natural Gas/Propane | Waste Heat | Biogas

For a labeled diagram of components, visit [FEECO.com/rotary-dryers/](https://www.feeeco.com/rotary-dryers/)



Indirect
Rotary Dryer

INDIRECT ROTARY DRYERS

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

DIAMETER | 3' - 15' (1 - 4.6 m)

FEATURES
- Heavy-duty design and construction
- Process and mechanical warranties

OPTIONAL COMPONENTS
- Various Seal Options
- Trommel Screen
- Liners
- Machined Bases
- Screw Conveyor Feeder
- Automatic Gear Lubrication System
- Exhaust Handling Equipment
- Various Burner Configurations
- Ductwork

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

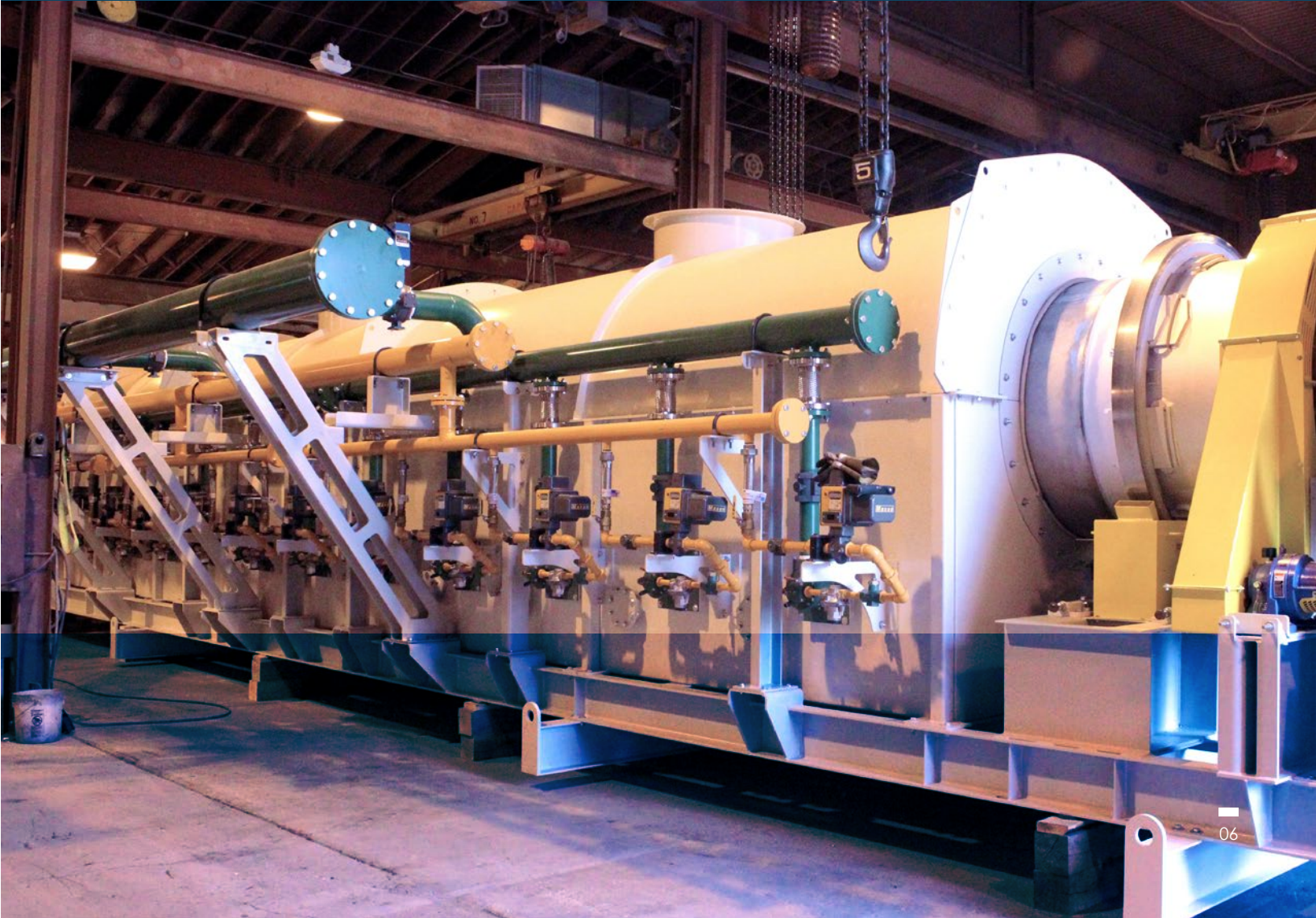
ACCEPTABLE FUEL TYPES | Fuel Oil | Natural Gas/Propane | Electricity | Waste Heat | Biogas

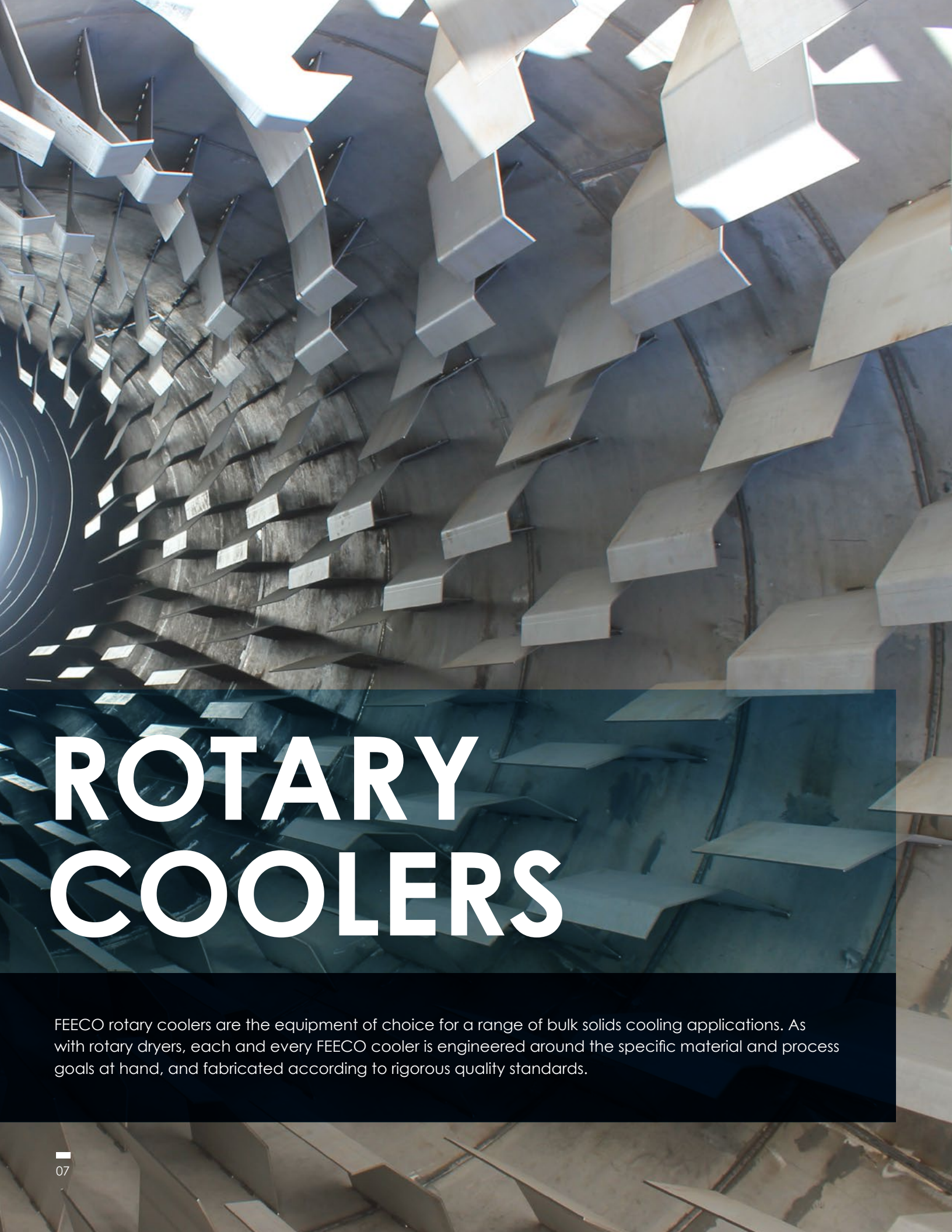
When direct drying is not an option, FEECO offers state-of-the-art indirect dryers to suit your drying needs. Indirect dryers are similar in design to direct dryers, but instead of using direct contact between the material and drying air to reduce moisture, the heating medium is kept separate from the material to avoid contact between the two.

The drum shell is heated externally and fitted within a heat shroud. The material is dried through contact with the shell of the drum.

Indirect dryers offer three major distinctions when compared to direct rotary dryers:

1. When processing fine materials, an indirect dryer avoids the risk of entrainment. When processing in a direct dryer, fine materials can become entrained in the drying air, and carried out to the baghouse. An indirect dryer avoids this issue because there is minimal drying air moving through the drum.
2. Less exhaust air treatment is required. Because no drying air is moving through the drum, and the furnace exhaust is kept separate, significantly less exhaust air treatment is required.
3. Processing in an indirect dryer allows temperatures to be adjusted along the length of the drum, providing precise process control.

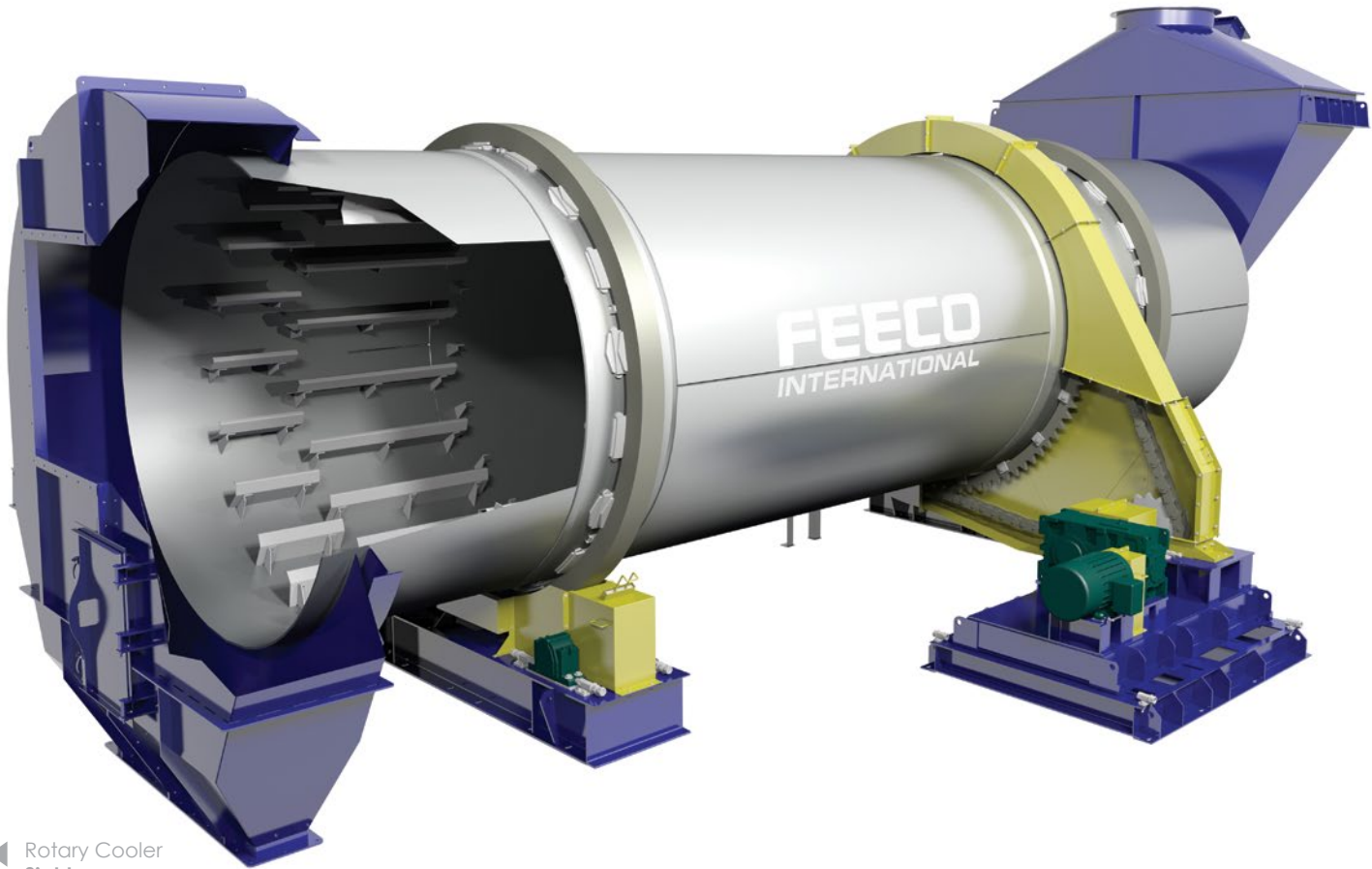




ROTARY COOLERS

FEECO rotary coolers are the equipment of choice for a range of bulk solids cooling applications. As with rotary dryers, each and every FEECO cooler is engineered around the specific material and process goals at hand, and fabricated according to rigorous quality standards.

For a labeled diagram of components, visit [FEECO.com/rotary-coolers/](https://www.feeeco.com/rotary-coolers/)

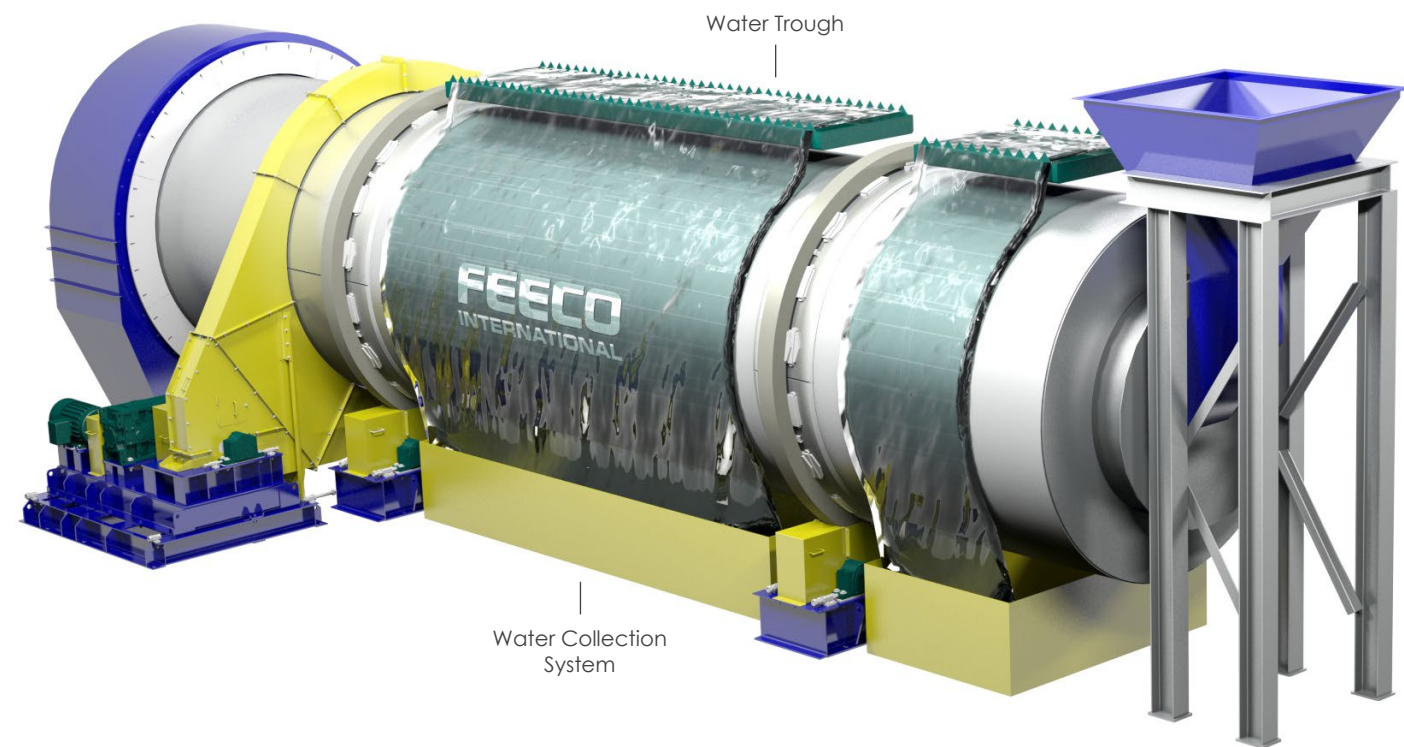


◀ Rotary Cooler flights

DIRECT ROTARY COOLERS

Direct [rotary coolers](#) rely on direct contact between the material and cooling air. This contact, combined with the use of lifting flights, maximizes the heat transfer between the material and processing medium, offering a highly efficient cooling solution. The feed end can be lined in order to protect from incoming hot materials.

CAPACITY 1 TPH - 200 TPH+ (1 MTPH - 181 MTPH+)	OPTIONAL COMPONENTS <ul style="list-style-type: none">- Trommel Screen- Liners- Machined Bases- Screw Conveyor Feeder- Automatic Gear Lubrication System- Exhaust Handling Equipment- Ductwork	MATERIAL OPTIONS <ul style="list-style-type: none">- Carbon Steel- Stainless Steel- Specialty Alloys- Explosion Bonded- AR Steel
DIAMETER 3' - 15' (1 - 4.6 m)		
FEATURES <ul style="list-style-type: none">- Specially designed lifting flights- Heavy-duty design and construction- Process and mechanical warranties- Counter-current design		DRIVE OPTIONS <ul style="list-style-type: none">- Chain & Sprocket- Girth & Pinion Gear- Friction Drive- Direct Drive at discharge end



Rotary Dryer
with knockers and
chamber and controls

INDIRECT ROTARY COOLERS

Indirect coolers, or indirect water deluge coolers, are a specialized type of industrial cooler used in applications where the processing environment must be tightly controlled, or when the material to be processed risks entrainment in a direct processing configuration.

Unlike their direct counterparts, indirect water deluge coolers avoid contact between the cooling medium and the material being processed. Instead, material is tumbled through a sealed rotating drum, which is externally bathed in cool water. The water cools the exterior of the drum, which in turn cools the material within. A water collection system collects the used water and passes it through a heat exchanger to re-cool it if needed. It is then recirculated to the trough above the drum for reuse in the bathing process.

Indirect water deluge coolers are typically constructed of stainless steel in order to protect the drum from the constant exposure to water, which can result in corrosion. Specialty alloys can be employed at the inlet of the drum to accommodate materials that are coming in at especially high temperatures.

TYPICAL ROTARY DRYER & COOLER DATA

The chart below illustrates common rotary dryer and cooler data points. Please note that all FEECO equipment is custom engineered around the project at hand, and this data is only a general representation.

STANDARD				METRIC				HEAT SOURCE (Dryer only)	DRIVE SPROCKET OR GEAR
DIAMETER (FT.)	LENGTH (FT.)	CAPACITY (STPH)*	HP	DIAMETER (M)	LENGTH (M)	CAPACITY (MTPH)*	KW		
3'	20-30	8	7 1/2	.9	6-9	7	5.5	Gas or Oil	Sprocket
4'	20-30	20	10-15	1.2	6-9	18	7.5-11	Gas or Oil	Sprocket
5'	20-40	30	15-25	1.5	6-12	27	11.0-18.5	Gas or Oil	Sprocket
6'	30-50	45	25-40	1.8	9-15	41	18.5-30	Gas or Oil	Sprocket
7'	40-60	60	50-60	2.1	12-18	55	37-45	Gas or Oil	Sprocket
8'	50-70	80	75-125	2.4	15-21	73	55-90	Gas or Oil	Sprocket
9'	50-80	100	100-125	2.7	15-24	91	75-90	Gas or Oil	Sprocket
10'	50-80	125	100-200	3.0	15-24	114	75-150	Gas or Oil	Gear
11'	60-90	150	150-250	3.4	18-27	136	110-150	Gas or Oil	Gear
12'	60-90	180	200-300	3.6	18-27	164	150-220	Gas or Oil	Gear
13'	70-100	210	250-350	4.0	21-31	191	185-260	Gas or Oil	Gear
14'	70-100	250	300-400	4.3	21-31	227	225-300	Gas or Oil	Gear

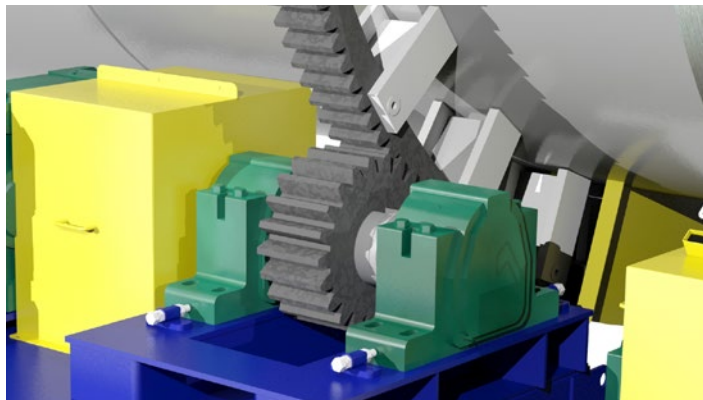
*Varies with materials to be dried. Capacity based on 60#/Cu. Ft. granular fertilizer materials having up to 10% moisture removal.



OPTIONAL COMPONENTS & SUPPORT EQUIPMENT

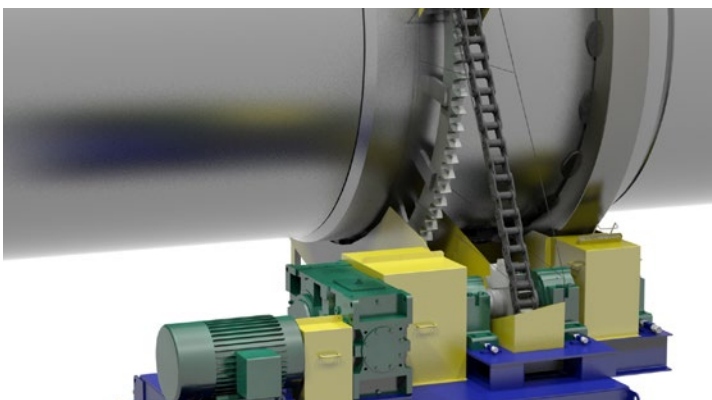
DRIVE ASSEMBLY OPTIONS

A variety of [drive assembly](#) options exist for dryers and coolers, with the choice between them depending on the amount of horsepower, and the overall size of the drum. Direct drive assemblies are also available.



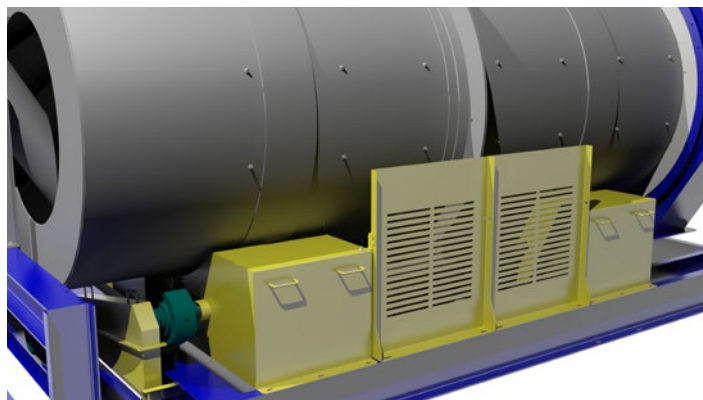
GEAR & PINION DRIVE

The gear and pinion drive assembly is best for heavy-duty applications running above 75 horsepower (55kW). While this type is more costly, it operates and wears better in demanding applications.



CHAIN & SPROCKET DRIVE

Chain and sprocket drive assemblies are reserved for smaller drums, running up to 75 horsepower (55kW). This type of arrangement is not suitable for larger drums running above 75 horsepower, but is ideal for smaller jobs, as it is cost-effective, and easy to run.



FRICTION DRIVE

Trunnion wheels are driven utilizing friction with the tires to cause drum rotation.



DIRECT DRIVE

Trunnion wheels are driven utilizing friction with the tires to cause drum rotation.

KNOCKING SYSTEMS

[Knocking systems](#), or knockers, are used to control buildup in rotary dryers and coolers (among other drums). FEECO offers knockers in two primary designs: Ball-and-Tube Knockers and Pneumatic Hammer Knockers.



BALL-AND-TUBE KNOCKERS

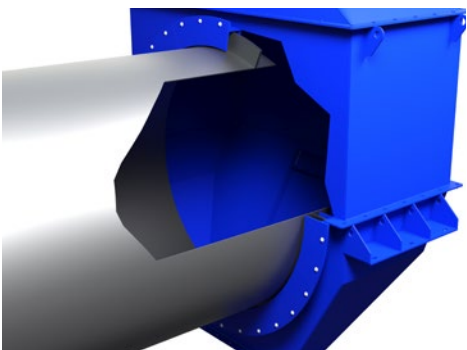
Ball-and-tube knockers consist of chambers mounted on reinforced bands. Inside each chamber is a ball, which, upon rotation of the drum, move down the chamber, delivering a heavy-impact force to dislodge buildup. Impact plates protect the drum.



PNEUMATIC HAMMER KNOCKER

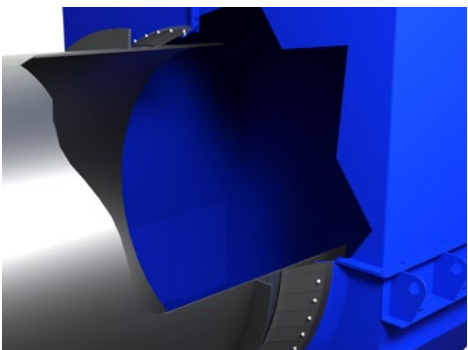
A pneumatic hammer knocker consists of a sole-noid-activated hammer mounted above a strike plate on the drum. Force, frequency, and strike interval can all be adjusted for a tailored solution. The knocker can be turned off for noise reduction when not in use.

SEALS



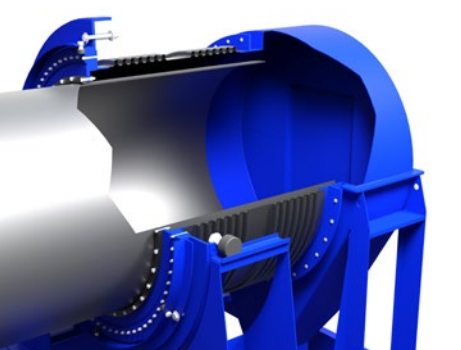
LABYRINTH SEAL

With a relative leakage of $\gg 5.0\%$, the labyrinth seal is a cost-effective seal when some air leakage is tolerable. This seal employs a tortuous path for ambient air via a close clearance between the rotating seal ring and the stationary housing.



LEAF SEAL

Leaf seals employ overlapping spring steel plate mounted on the housing and riding on the wear ring to create an effective seal. Both single- and double-leaf seals are available, with a relative leakage of around $1.0\% - 5.0\%$ depending on whether the seal consists of single or double leaves.

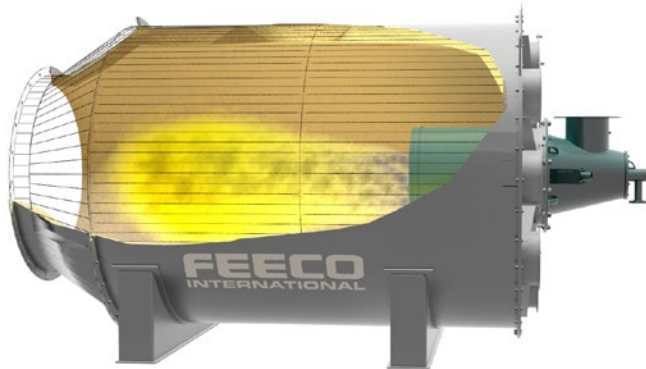


BELLOWS SEAL

The bellows seal offers a relative leakage of $\ll 1.0\%$, utilizing a wear material (such as graphite) to act as a face material when compressed against a flat, rotating surface. The corrugated bellows this seal uses allows for significant longitudinal expansion.

COMBUSTION CHAMBERS

FEECO [Combustion Chambers](#) are frequently incorporated into rotary dryers for the many benefits they can offer. Used to house the combustion reaction, the combustion chamber prevents direct contact between the material being dried and the flame. This provides a number of benefits, including reduced drying cost, more uniform drying, maintained product integrity, and a reduction in the cooling capacity required.



TROMMEL SCREENS (GRIZZLY)

A trommel screen often referred to as a grizzly, is a wire mesh extension of a rotary dryer or cooler shell.

Trommel screens are often employed when the potential for clumps to form is present; the rotating screen breaks up clumps and helps to screen material according to particle size.

FEECO can construct trommel screens according to various requirements, with a range of lengths, materials, and cutout opening sizes available.



FLIGHTS (MATERIAL LIFTERS)

Flights, or material lifters, are standard in all rotary dryers and coolers. However, their contribution to efficiency is significantly increased with a custom design and placement pattern. Various flight options are available, including advancing flights, as well as single-, double-, and custom flights.

Flights may be welded into place, or bolted in for easy changeout.





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/