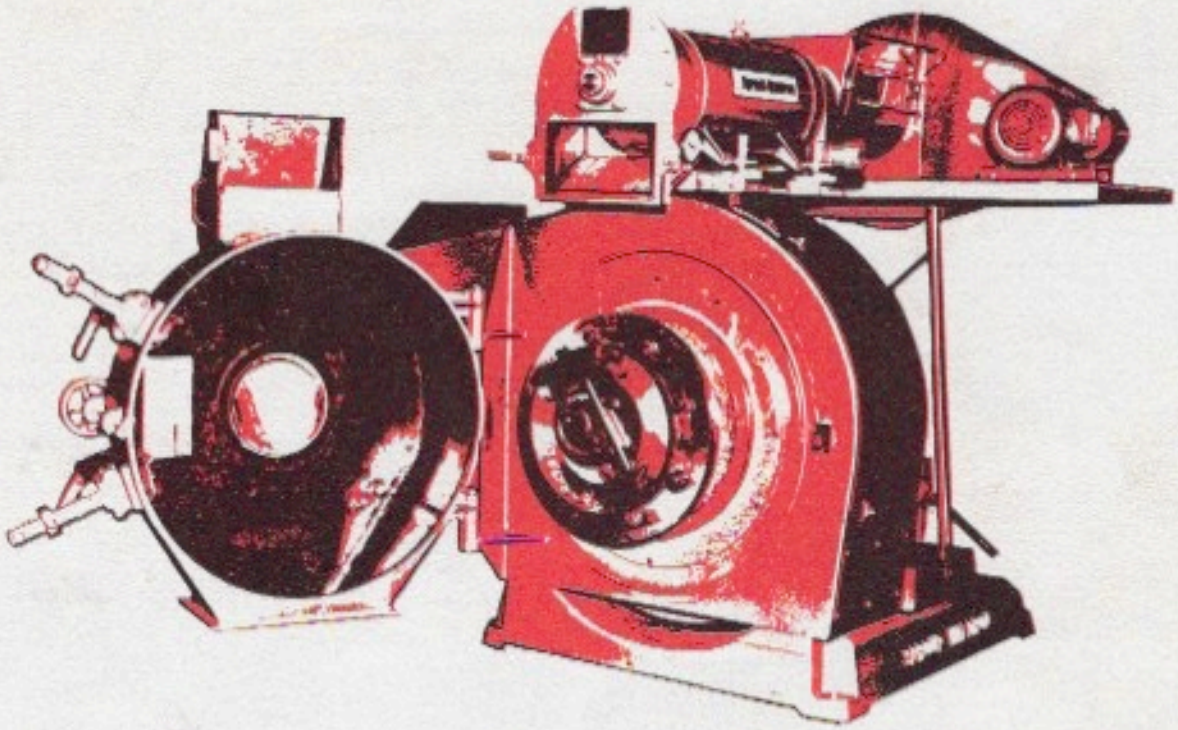


Sprout-Waldron Ace™ Pellet Mill

Pelleting

Bulletin 5061

Revised 9/79

KOPPERS
Engineered Products

Thoroughly Proven Ace™ Pellet Mill Is Design Simplicity at Its Best

No other pellet mill can match the Ace for uncomplicated, straightforward design simplicity. That simplicity, illustrated in the cutaway below, means fewer moving parts, easier lubrication and maintenance which results in the lowest operating cost of any pellet mill available. There is nearly 40 years of Ace operating experience to prove that statement!

One example of the Ace's simple design is the fact that two big heavy duty Timken bearings ring the massive 5" O.D. main shaft to provide full support of the die housing and all pelleting components mounted there.

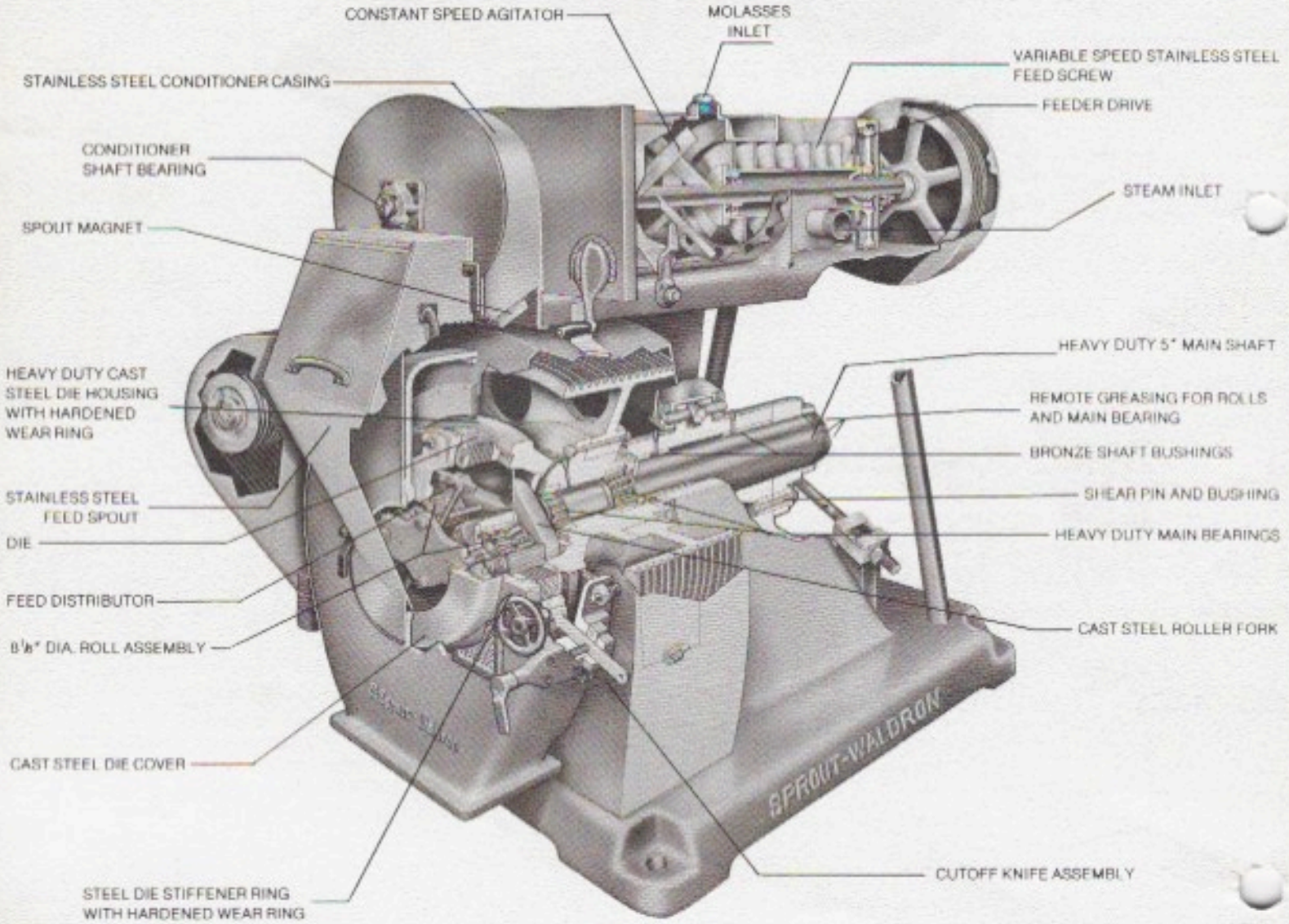
Evidence of the V-belt drive design superiority is the fact that efficiency of a V-belt drive runs to 98%—permitting as much as 12 to 15 tons per hour pelleting capacity with a 150 hp motor.

Additionally, the massive drive sheave acts as a flywheel to smooth out shocks of unexpected wet, dense or fibrous feed surges.

Only Two Main Bearings

The extreme simplicity of the Ace design requires only two main bearings as compared with the six or eight on some competitive machines. Capacity of our main bearings is nearly double that of comparable size mills. To the mill owner this means longer trouble-free life and fewer parts to wear and replace.

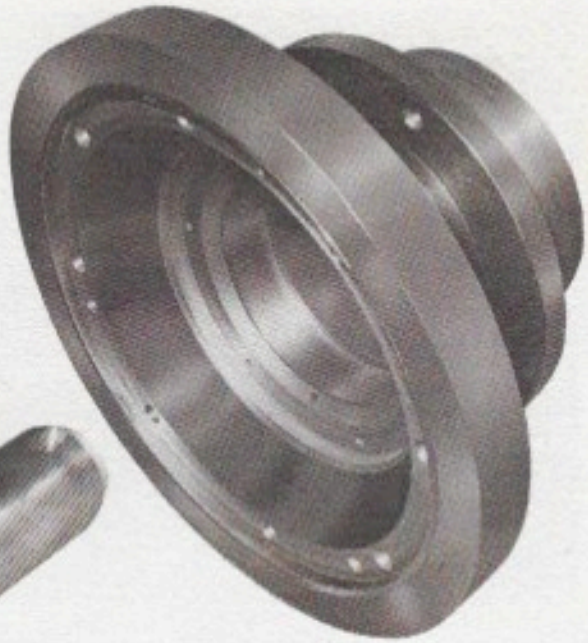
The grease seals of the Ace mills are so arranged that over-greasing is impossible. Remote greasing, which saves time because lubrication can be performed while the pellet mill is operating, is available for manual or automatic systems.



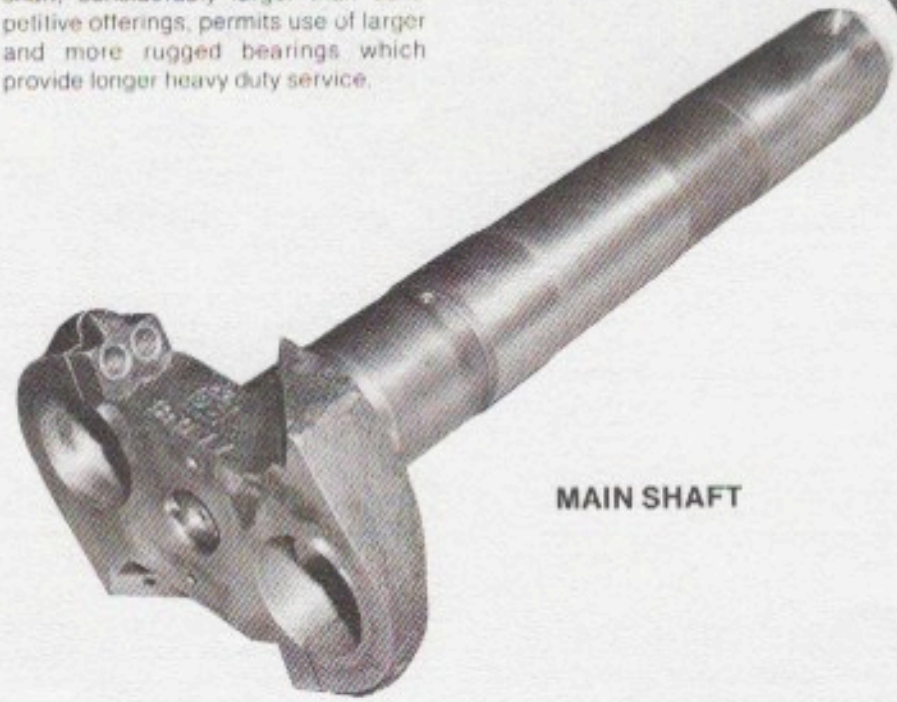
Construction Features

Heavy Duty Main Shaft

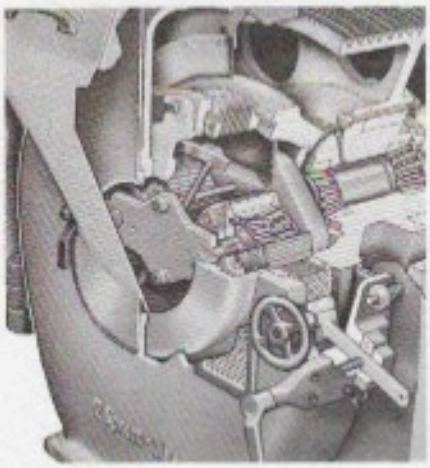
A big 5" diameter main shaft forms an integral die and roller support. It is machined to exacting tolerances and heat treated for superior wear resistance and strength. This maintains long term accuracy of bearing fits and results in extended bearing life. The shaft, considerably larger than competitive offerings, permits use of larger and more rugged bearings which provide longer heavy duty service.



DIE HOUSING



MAIN SHAFT



Roll Assembly

Next to die cost, roll maintenance is the most important item in pelleting cost. The Ace roll design contributes substantially to keeping roll cost at a minimum . . . a fact borne out by the experience of our customers.

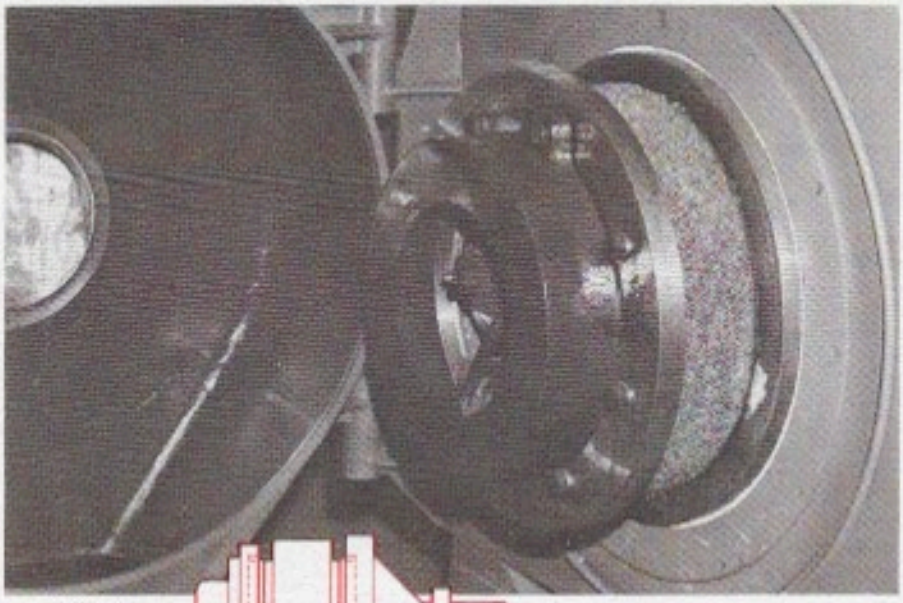
To conform to many varied pelleting applications, Sprout-Waldron offers two main types of roll shells: Ruftex™ (tungsten carbide inlay) and indented (heat treated steel with a very high hardness factor). Other special rolls and materials are furnished for special applications. All rolls are ruggedly built and have non-slip surfaces which can withstand the high mechanical pressures developed in pelleting. Ace rolls are the largest diameter rolls offered on any comparable size pellet mill. With an 8⅛" diameter shell, these rolls offer 21% more circumferential wear surface than available on any other pellet mills, and will accomodate substantially larger roll bearings and roll pins. Ace roll bearings are rated at 11,000 lbs., approximately 40% more than many other makes. The Ace 3⅜" diameter roll pins are heat treated to increase the wearing quality of the pin itself. Keeping the pin within tolerance over many hours of production maintains the bearing fit which in turn will further extend bearing life.

Shear Pin Protection

Shear pin protection is provided to prevent damage to rolls and die due to metal and other foreign materials not caught by the spout magnet. This shear pin arrangement, coupled with a limit switch, automatically stops the main drive motor and feeder-conditioner when pin shears.

Positive Lubrication

Standard remote greasing is made possible on the Ace pellet mill by the special drilling of the main shaft and roll fork to provide grease access to main bearings and roll bearings. Either manual or automatic greasing arrangement is available.



Industry's Most Superior Die Support Method

Die Housing

The Sprout-Waldron die mounting method provides maximum support with minimum wear between die and housing. This drastically reduces excess clearances that permit die movement with consequent fatigue loading and ultimate die breakage long before the die has worn out.

The Ace die housing is constructed of heat treated alloy steel . . . into which a replaceable hardened wear ring is installed. The die is press fit inside the die housing, and is bolted securely in place. This attachment is much more positive than other pellet mills and is much less subject to wear than tapered clamping mechanisms.

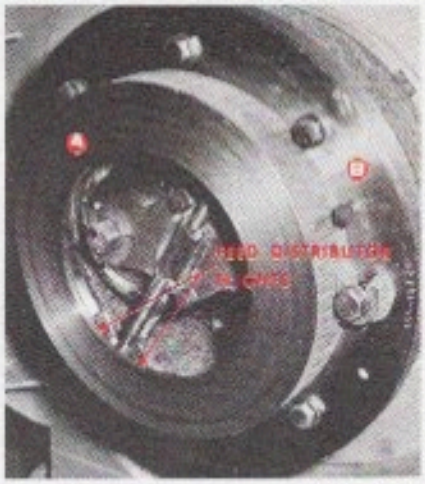
Should the die become loose in the Ace, it is normally only necessary to replace the low cost wear ring, not the entire housing.

Stiffener Ring

A thick stiffener ring is mounted on the outside of the die using twelve high tensile bolts. Now you have support at both front and rear of the die . . . to reduce die stress as much as 75% that of dies supported at the back only! This reduces die flexure and appreciably prolongs die life. No other pellet mill offers this important feature.

The stiffener ring keeps the die from distorting, thus the die remains parallel to the roll face at all times so that all rows of die holes pellet evenly.

Adequate die support is very important because of extreme pressures which act on the die during pelleting. The portion of the stiffener ring which fits into the die contains a hardened wear ring similar in arrangement to that on the die housing.



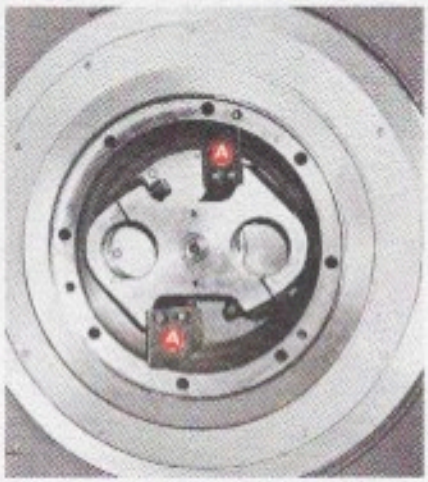
Die cover (A) mounted on stiffener ring (B)

Uniform Feed Distribution

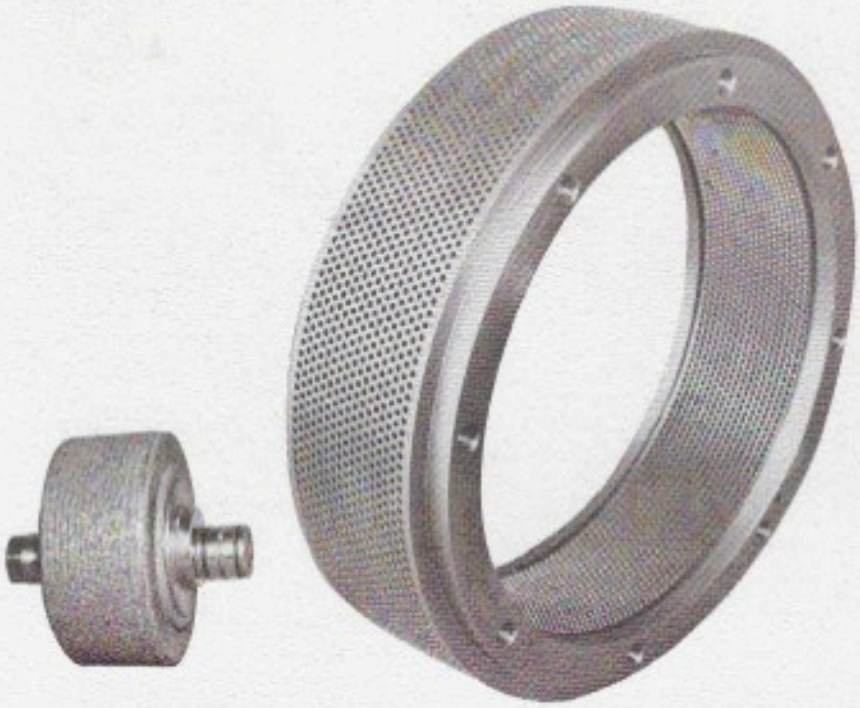
The die cover contains inter-elevator flights which assure a smooth, continuous flow of mash to both rolls. These flights carry feed to the right hand roll and accelerate the material across the die face. The cover is clamped to the stiffener ring. This method of attachment permits rapid removal of the cover for roll adjustment and die change.

Feed distributor plows attached to the tie bar direct the feed uniformly across the die face ahead of each roll. Various feed plow designs are used, depending on the type of feed being pelleted. With this feeding arrangement, the distribution to each roll is proportional and constant, resulting in smooth operation, even die wear and uniform power consumption.

Die housing scrapers mounted on the roller fork keep the housing free of build-up and assist the distributor plows in feeding the material to the pelleting area of the die.



Die housing and roller assembly with housing scrapers (A)



Rolls and Dies—*Sprout-Waldron rolls and dies are the best available from the standpoint of metallurgy, heat treatment and quality control. Sprout-Waldron customers experience lowest die/roll cost per ton.*

Lowest Die and Roll Costs

Undoubtedly the most important factor in per ton pelleting cost is die life. Sprout-Waldron offers a standard alloy die, which is a heat treatable grade of high carbon steel. Additionally, Sprout-Waldron offers a variety of stainless steel dies to match the customer's specific production needs. These dies have helped many of our customers reduce their die costs substantially. Die life of 10,000 to 20,000 tons has been realized at many locations.

Both 5" and 6" wide dies are available for the Ace mill. Die holes from ⅜" to ½" are bored in the die by high-speed gun drills producing a mirror-smooth finish. This is a boring operation and is far superior to conventional twist drills used by some die manufacturers. Dies with ⅜" to 1¼" square or round holes are first drilled, then broached with a series of graduated broaching tools.

The 6" wide dies are *reversible* should uneven wear occur.

Dies are heat treated, checked for surface hardness, core structure and composition in our metallurgical laboratory. Dies are then ground to close tolerance to assure proper fit in the pellet mill.

All Sprout-Waldron dies are broken in with an abrasive mixture which gives the holes their final polish. Before boxing, a mixture of oil and oats is put into all holes for protection of the finish. These dies are then ready for immediate high production use . . . an important advantage over some dies which must be broken in before full production can be realized.

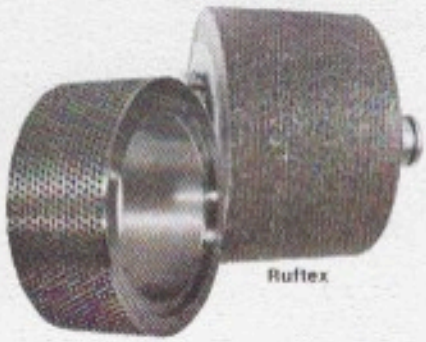
¼" Square Range Cube Die | 5/32" Poultry Die

Ruftex™ Shells

The Ruftex shell is produced by fusing a layer of tungsten carbide on the surface of a forging in a high temperature process. The result is the longest wearing roll shell in the industry today!

The shell is subsequently ground on the outside diameter to eliminate high spots and assure concentricity of the shell for a perfect roll-to-die fit. The Ruftex surface provides the traction to keep the rolls turning smoothly for maximum stability and production.

The Ruftex shells wear evenly across the roll width, free of shoulder erosion common with ordinary roll shells; the result is often up to three times the life of ordinary indented or corrugated shells. The wear and traction characteristics of these shells greatly improve die life—a most significant factor. The Sprout-Waldron Ruftex shell frequently outlasts two dies.



Ruftex

Indented Shells

The indented shells are produced by drilling holes in a patented arrangement in alloy steel heat treated forgings. The special arrangement of these holes or indents eliminates side slippage of the feed which is common with corrugated shells.

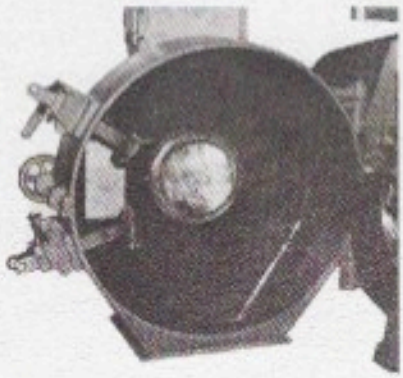
Positive Pellet Cut-Off

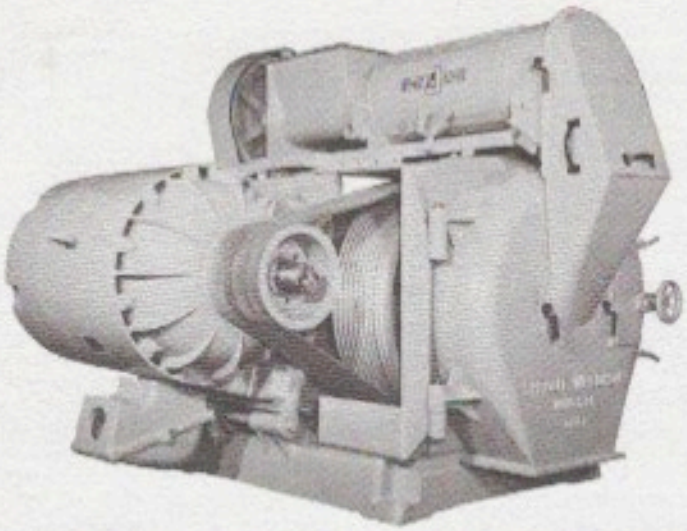
Each cut-off knife is mounted on a single sliding bar to facilitate quick and accurate setting for desired pellet length.

Once the desired knife-to-die setting is attained, it is firmly locked into place by a simple clamping arrangement. The use of a stop collar permits a constant knife setting to be retained, regardless how often the knife has to be pulled back from the die face.

The knife holding assembly is attached securely to the cast swing cover. Knives are of cast Ni-hard.

A shear bolt is provided to protect the knives if they are accidentally set against the die.





The two speed motor used is available with either constant horsepower or constant torque characteristics. Full power is available at both 1800 and 900 rpm speeds with the constant hp design. Belt guard removed for illustrative purposes.

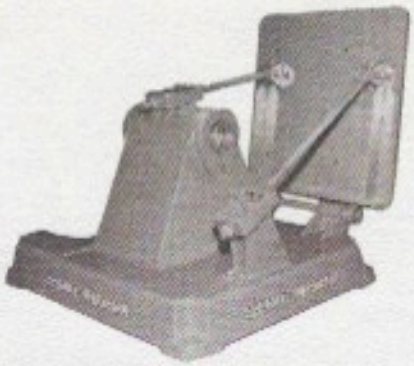
Simple, Efficient Drive

The Ace V-belt drive is superior to other drive arrangements for several reasons:

1. Basic simplicity of V-belt design eliminates need for a gear box—which means much less maintenance and repair than a gear driven pellet mill. No messy and expensive oil changes.
2. Modern high tensile V-belts offer as much as 98% efficiency, far better than gears where frictional losses are often high. Belt flexibility reduces shock loads from tramp metal, etc.
3. Big 42" diameter 670 pound cast iron drive sheave acts as a flywheel to even out surges and level power requirements; results in quiet, vibration-free drive.
4. Simple motor sheave change achieves new mill operating speed.
5. Readily accessible drive enables simple inspection.
6. Normal belt life is six to eight years and replacement is easy and inexpensive. In contrast to gear drive, V-belt efficiency does not decrease with wear.
7. A V-belt drive is silent.

Dual Speed Operation

Two-speed or dual-speed operation is simple on the Ace. At times widely contrasting pellet sizes or other reasons make it desirable to change die speed quickly. To accomplish dual-speed operation, a two-speed motor can be furnished, e.g., 1800/900 rpm. With this arrangment, it is possible to achieve, for example, a quick change from 400 to 200 rpm die speeds by simply switching an electrical control. Other speed combinations are possible by merely changing the motor sheave.



Rugged Cast Base

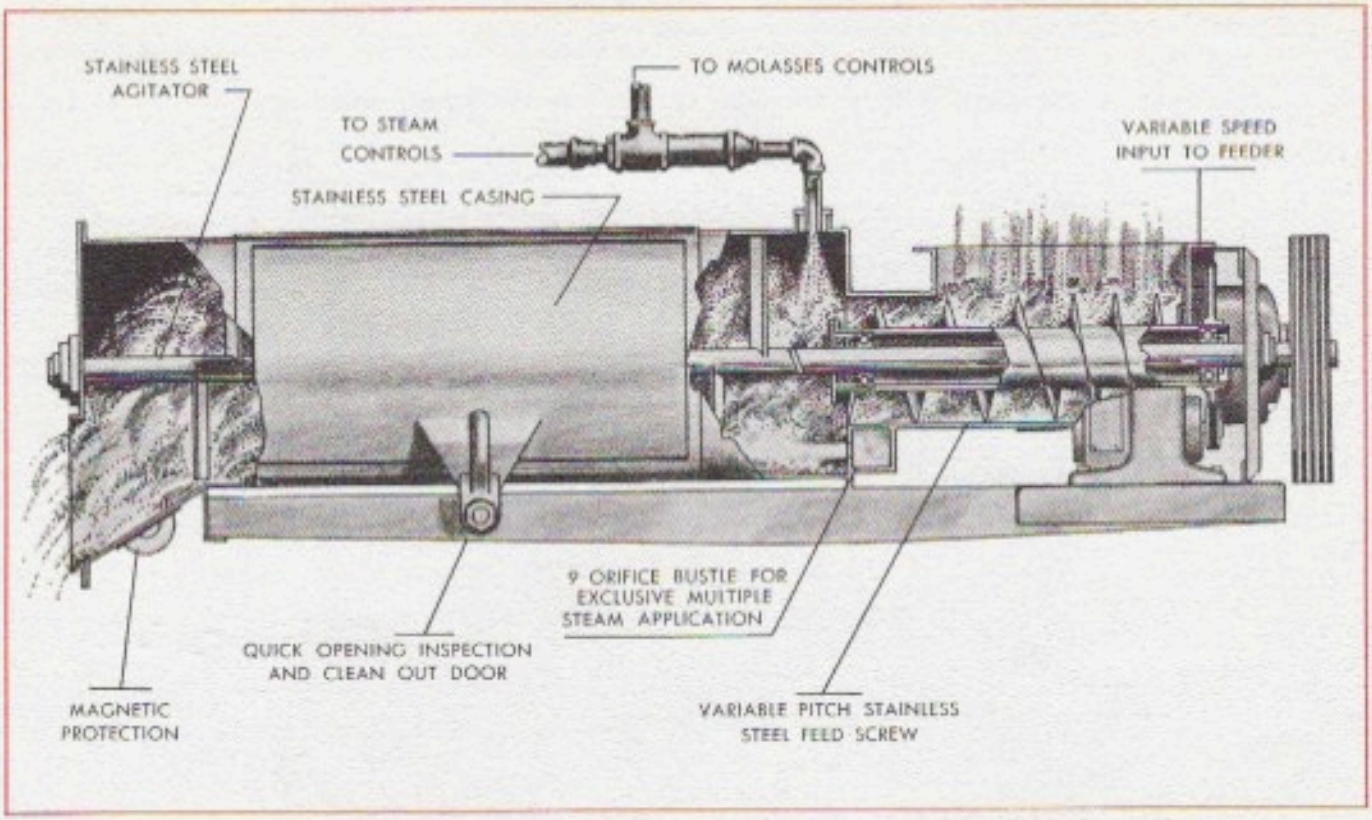
The integral cast base is made of high grade iron in our own foundry. This rugged base is the main support for all the operating parts. Its one-piece construction makes possible machining of all mounting surfaces, thus providing perfect alignment. The massive casting dampens vibrations, resulting in quiet operation.

In the event of a shock load in the pellet mill, the main shaft will fracture the shear pin allowing the shaft to rotate. Bronze bushing inserts on the main shaft prevent seizing when a shear pin fails.

The motor plate is securely hinged to the main base and is equipped with two adjusting rods for accurate and easy belt adjustment.

Stocking Program

An extensive stocking program of the more popular styles and sizes of pelleting dies are maintained not only at the factory in Muncy, but also at St Joseph, Missouri; Oakland, California; and Waterloo, Ontario, Canada, to permit fast response to your needs.



Complete Conditioning

The "in-line" feeder-conditioner used on the Ace provides optimum conditioning and has a much lower profile than the over/under design. All parts contacting feed are stainless steel.

The variable speed feeder delivers feed directly to the in-line conditioning chamber. Steam is injected through a 9-orifice steam bustle at low velocity to prevent blow back and to provide maximum condensation and high conditioning efficiency. With the in-line design, feed entering the feeder section forms a plug as it moves toward the conditioner section, thus preventing the escape of steam and consequent condensation of steam and build up of feed in the spouts and supply bins.

A paddle-type agitator, available in fixed or replaceable paddle design, blends in the steam and keeps the stock moving through the conditioner.

A dial thermometer is provided at the discharge end of the conditioner so the operator can monitor the temperature of the mash for consistent pelleting results.

For protection from tramp metal, a magnet is installed at the end of the conditioner where it is readily accessible for frequent inspection and cleaning.

Each conditioner is provided with a quick opening clean-out door that exposes the entire conditioner interior for rapid accessibility.

The standard "in-line" feeder-conditioner is available in two sizes: 18x54 and 12x32. The conditioner of the former size is 18" diameter x 54" long. Its feeder section contains a 9" diameter x 23" long screw. The 12 × 32 conditioner is 12" diameter x 32" long. Its feeder is the same as the 18 × 54.

The 18 × 54 and 12 × 32 units are available with two different drive arrangements, dual drive and single drive. In the dual drive arrangement, the feeder screw is built on a hollow shaft through which the bearing mounted conditioner agitator is assembled. This arrangement permits the use of a separate variable speed drive for the feeder and a separate constant speed drive for the conditioner, thus providing constant agitation for proper conditioning under varying feed rates.

In the single drive arrangement, a feeder screw and agitator are mounted on a common shaft. With this design a variable speed motor is used to vary the speed of the feeder and the conditioner. When the feeder-conditioner unit is control-fed from another feeder, a constant speed motor may be used to drive the single speed feeder-conditioner.

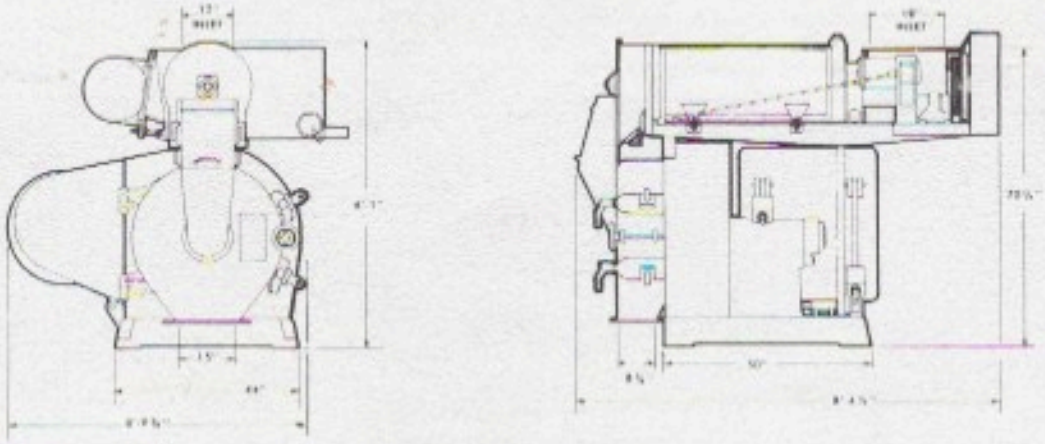
Feeder-Conditioner Options

Sprout-Waldron has developed superior steam control system for use on the Ace pellet mill. High pressure (15-100 psi) steam controls are generally offered with this unit. The use of properly controlled, dry, saturated steam is important for the optimum conditioning of materials for maximum production and pellet quality.

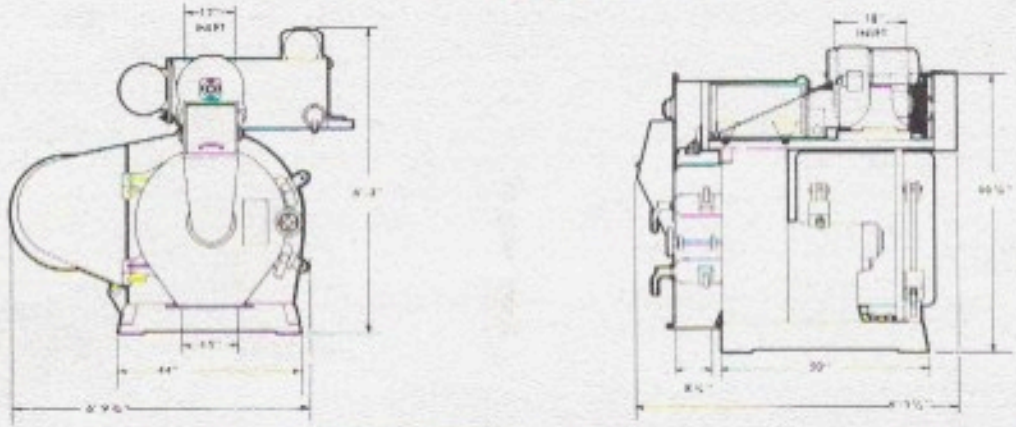
Also available is a Sprout-Waldron hot molasses injection control system to mix steam and molasses together. This injection method of introducing molasses into the feed assures maximum absorption of the liquid into the feed.

Dimensions: Approximate. For Installation Request Certified Print.

Model 501 Pellet Mill with 18 × 54 Feeder-Conditioner



Model 501 Pellet Mill with 12 × 32 Feeder-Conditioner



Specifications

Pellet Mill Model	HP	Feeder-Conditioner	Conditioner HP	Feeder HP	Approximate Pellet Mill Weights			Approximate Shipping Specs. Less Motor	
					Mill	Feeder-Conditioner	Main Motor (Typical Frame)	Export Boxed Wt.	Total Vol. (cu. ft.)
501-D	75	12 x 32	3, 5	½	4,260	500	1355(FR444U)	6,000	145
501-D	100	12 x 32	3, 5	½	4,260	500	1565(FR445U)	6,000	145
501-D	125	12 x 32	3, 5	½	4,260	500	2420(FR1504)	6,000	145
501-H	100	18 x 54	5, 7½, 10	1	4,560	800	1565(FR445U)	6,300	260
501-H	125	18 x 54	5, 7½, 10	1	4,560	800	2420(FR1504)	6,300	260
501-H	150	18 x 54	5, 7½, 10	1	4,560	800	2420(FR1504)	6,300	260

1. 1800 or 1200 rpm motors, depending on die speed.
2. Dimensions shown are for dual speed feeder-conditioners; single drive conditioners are the same except for motor arrangement.
3. For dual drive feeder-conditioners.
4. For dual drive feeder-conditioners.
5. With feeder-conditioner.
6. Includes mill, 3/16" die, rolls, drive, feeder-conditioner, motors, and steam controls, less main motor.
7. Pellet mills with 12 × 32 conditioners require one box. Mills with 18 × 54 conditioners require two boxes.

Production Rates

Capacities are determined by such variables as formulas, conditioning, operator efficiency, maintenance, etc. However, typical capacities—depending upon the material—range from 75 to 300 lbs. per hour per horsepower applied.

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