Pelleting Equipment

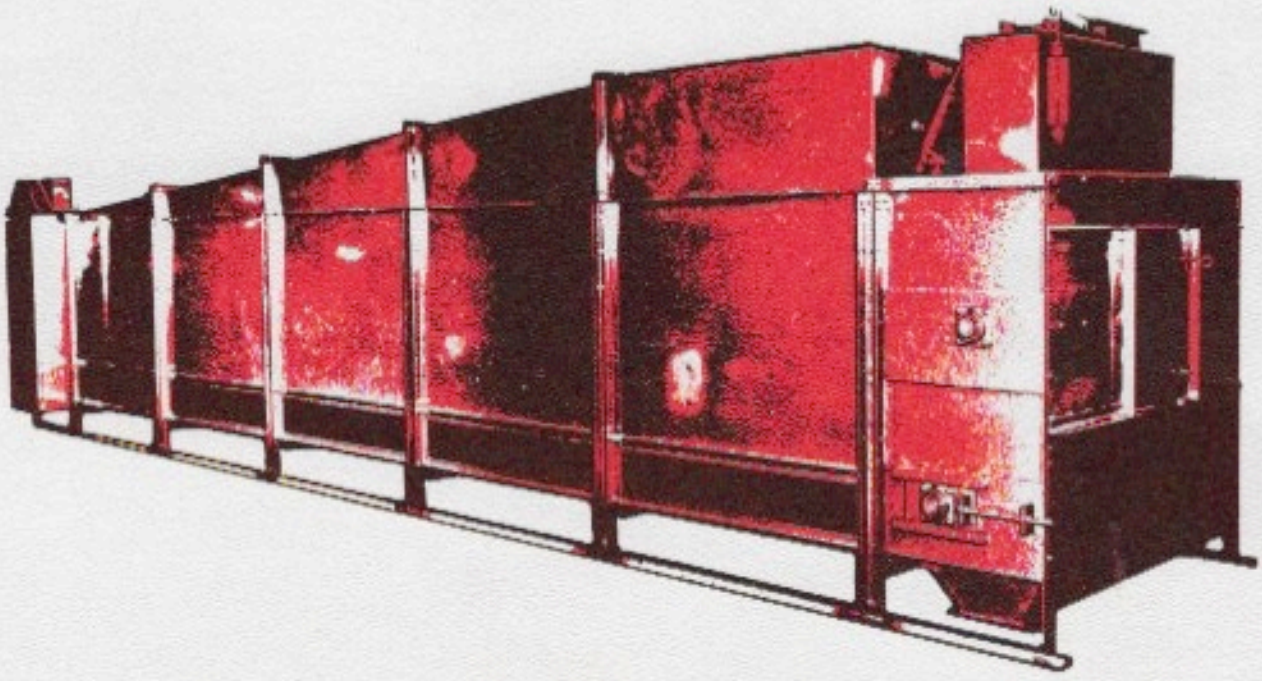
Bulletin 5150

Revised 1/82

Sprout-Waldron

Horizontal Pellet Cooler

KOPPERS
Engineered
Products



Sprout-Waldron Horizontal Pellet Cooler

. . . a truly dependable performer for high capacity production at low cost . . . with many design features that make it the ultimate in cooling and drying pellets of all types.

The Sprout-Waldron horizontal pellet cooler is one of the most efficient and effective cooling and drying components available to pelleting operations today.

It is a truly dependable, high capacity performer that adequately cools and dries large or small pellets . . . range cubes, too.

Here is a sturdy unit that incorporates many design features uncommon to most competitive models . . . features that provide a clean, contamination-free operation at low cost; maintain a constant bed depth independent of inlet feed rate; insure better removal of fines; permit simple, easy installation; and eliminate costly maintenance problems.

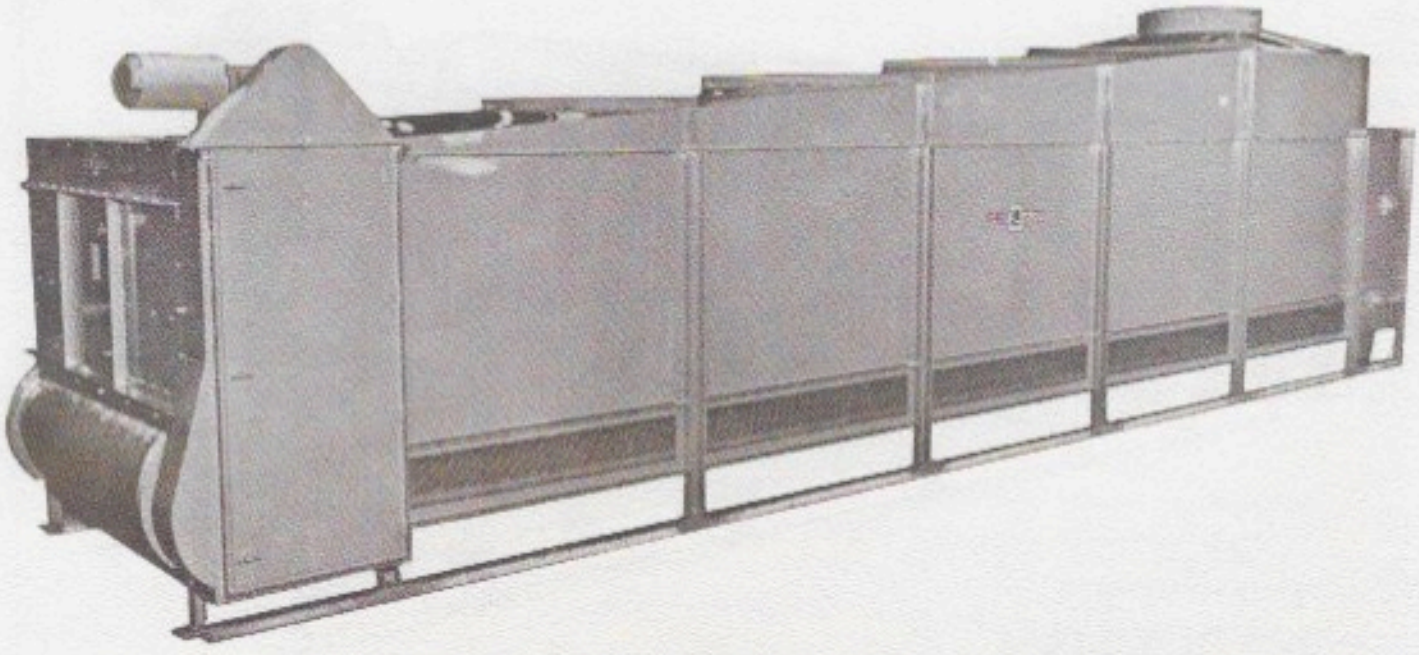
The Sprout-Waldron horizontal cooler is available in either single or double pass units, in 5' and 7' widths and available in 15', 20', 25', 30', 35' and 40' lengths.

The single pass cooler functions additionally as a conveyor since pellets are cooled/dried, conveyed and discharged at the end opposite the inlet. The inlet and discharge of the double pass cooler are at the same end.

Check These Features

Sprout-Waldron has incorporated these important features into this cooler, all engineered and constructed to eliminate the problems common to most horizontal coolers.

1. Perforated metal tray carriers provide a clean, low-cost operation.
2. Inlet hopper and main drive motor controls are designed to maintain a constant bed depth at all times, independent of production rate, thus eliminating air bypassing, hot spots, and potential pellet spoilage.
3. End-of-run discharge time (emptying cooler) cut to 5 minutes! With numerous short runs, this can significantly increase production capacity.
4. Fiberglass reinforced plastic fines return section is specifically contoured to eliminate areas for material to collect and to insure better removal of fines.
5. Exhaust hood is specially painted to resist corrosion, and tapered to maintain constant velocity along the length of the cooler.
6. Brass key in drive sprocket serves as overload protection.
7. Knocked down construction enables ease of installation in tight locations; reduces shipping costs.
8. Modular design concept permits cooler extension at minimum cost.



Operation

Basically, a Sprout-Waldron horizontal cooler consists of a slow-moving perforated metal carrier enclosed in an air-tight housing. Hot, moist pellets are distributed on the carrier and cooled and dried by air drawn through the perforated carrier.

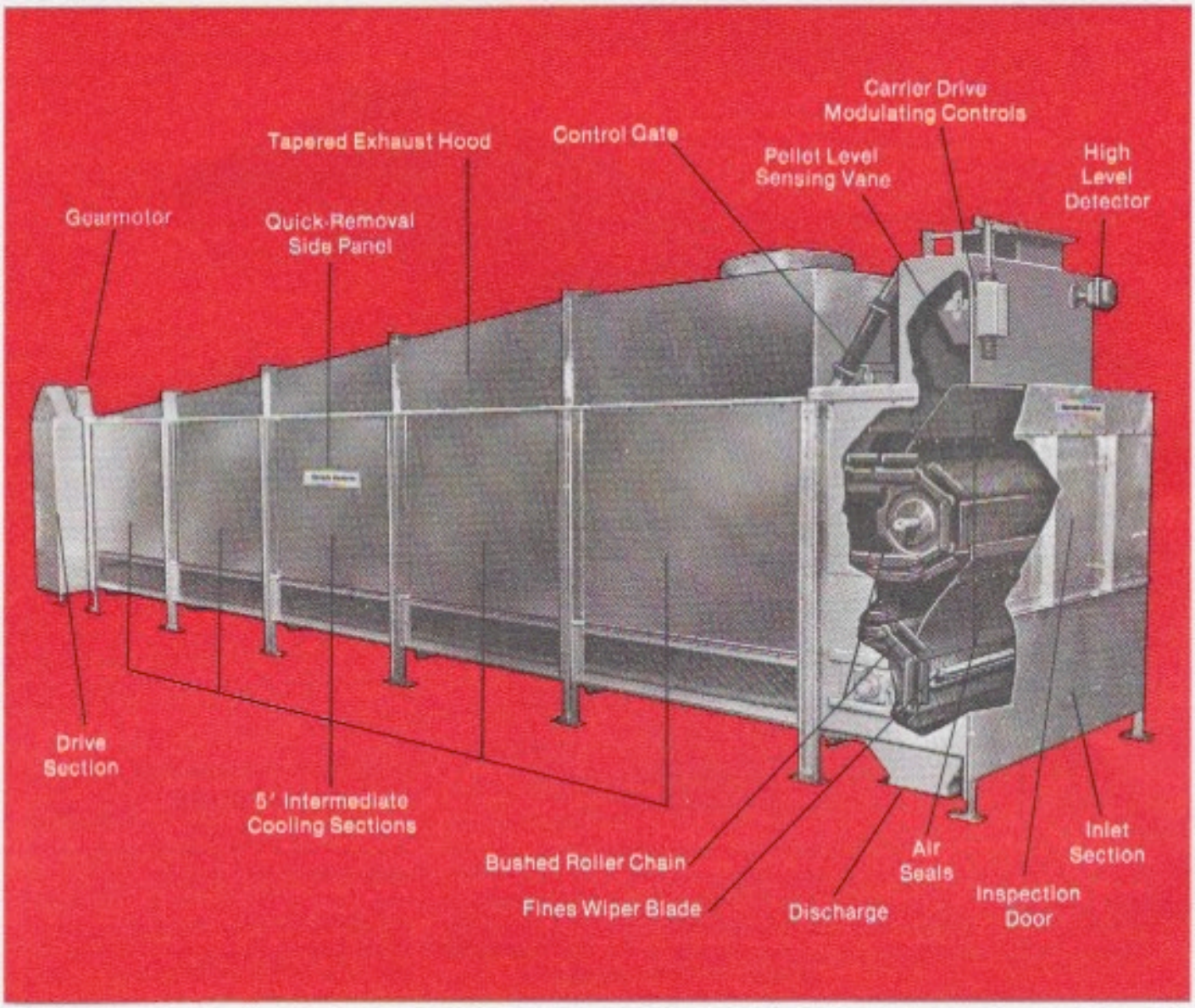
New modulating controls added to this unit in early 1978 provide automatic adjustment of carrier speed to match pellet input rate. This new solid state electronic modulating control system converts a standard A.C. gearmotor into a variable speed drive. Thus, the gearmotor—directed by a signal from a linear potentiometer that is connected to the pellet level sensing vane—drives the cooler at a speed proportional to the pellet bed depth in the inlet hopper. Controls are easy to set up and require minimal attention.

These features result in the most uniform distribution of pellets across the carrier surface of any cooler made.

Uniform bed depth is essential for proper cooling and drying. Any variations will "short circuit" the air flow, causing insufficient cooling or drying. Bed depth can be varied (for different formulations or pellet sizes) with a discharge gate in the inlet hopper (see cutaway below). After sufficient retention time, which is a function of carrier speed and length of cooler, the dried pellets are discharged.

At the end of a run, the operator can energize a control to empty the cooler at maximum speed. Complete clean-out is achieved in 5 minutes! This feature can provide an extra hour of pelleting production each day where a number of short runs is typical.

Cooler drive runs continuously on this new model, for smooth operation and reduced power consumption.



Construction

The unit is furnished with completely assembled inlet and drive sections; intermediate sections are loose for field assembly. All loose pieces are prepunched for bolted-type construction. Assembly time is primarily dependent on the type and length of the cooler.

With the exception of the inlet hopper and fines return section, all other components of the cooler are fabricated from carbon steel.

Inlet Hopper

Because of the hot, moist atmosphere in which it operates, the inlet hopper is fabricated from stainless steel to resist the effects of corrosion.

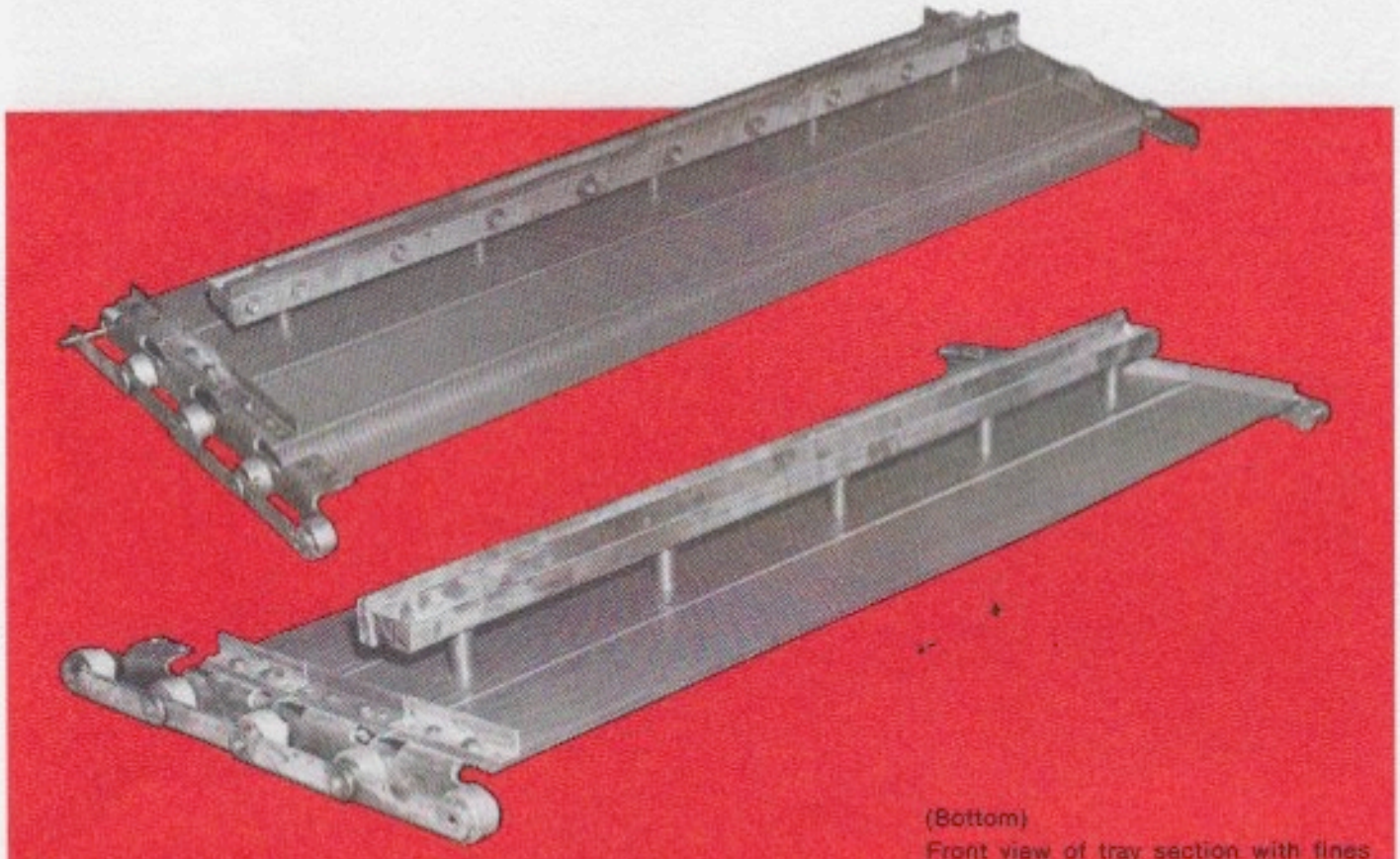
Perforated Trays

The pellet carrying trays for both the 5' and 7' wide coolers are of 14 ga. perforated carbon steel. The unique design of these trays makes them self-supporting for added strength.

The trays are carried by a precision roller chain at each end of the tray. The hardened pins, bushings and rollers of the chain provide superior alignment and wear characteristics.

In Sprout-Waldron's design, jointures of trays slide over each other to keep joints clean. Competitive trays overlap and tend to catch and tear out when material builds up at the discharge.

Adjustable neoprene wiper blades located every 5-ft. along carrier length sweep fines from the bottom of the cooler. These wipers are elevated above the tray surface to minimize surging at the discharge. Wiper blades are securely bolted to tray and chains on both sides for extra rigidity.



(Top)
Rear view of perforated metal tray with adjustable neoprene fines wiper blade. Wipers are placed every 5' and bolted to the tray and roller chain for extra rigidity. Bushed roller chains are constructed for heavy duty service.

(Bottom)
Front view of tray section with fines wiper blade. Note fines tray extending full width of blade. Fines, swept from bottom of cooler at fines return section, fall into cup at top of cooler and are carried to unit's discharge section. Fines fall by gravity to discharge as tray begins downward pass.

Fines Return Section

The fines return section is a transition molded of fiberglass to guarantee the special contour required for clean operation. This special contour guarantees contact with the moving fines wiper 100% of the time as the wiper lifts the fines from the bottom of the cooler. Each wiper is fitted with a fines tray across its full width which collects fines as they reach the top level of the cooler. The fines are discharged at the cooler/dryer outlet as the wiper begins another pass around the cooler. This fines return method eliminates the unsanitary build-up of fines that is common on most existing coolers.

Side Panels

Side panels are designed for quick, easy removal to permit full access to the interior of the cooler. All maintenance work can be done from the outside of the cooler with this arrangement; the need for inspection doors is eliminated. The panels are secured to the cooler frame by a few bolts, all accessible from the outside.

Tapered Exhaust Hood

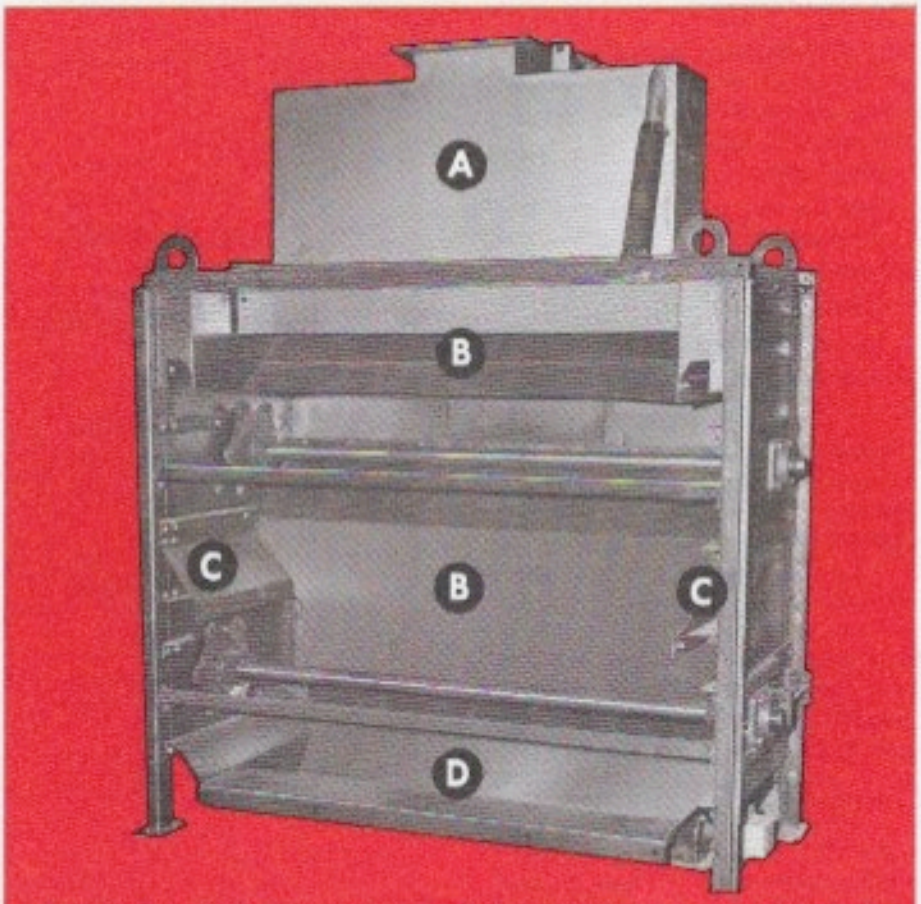
A tapered exhaust hood provides a constant air velocity along the entire length of the hood, thus eliminating any area of stagnant air and assuring uniform air distribution through the material.

The recommended location of the air discharge is at the inlet end, so the hottest and wettest air is directly removed without having to travel the length of the cooler. However, the air hood can be reversed so the air discharges at the tail end of the cooler—if the physical installation demands this change.

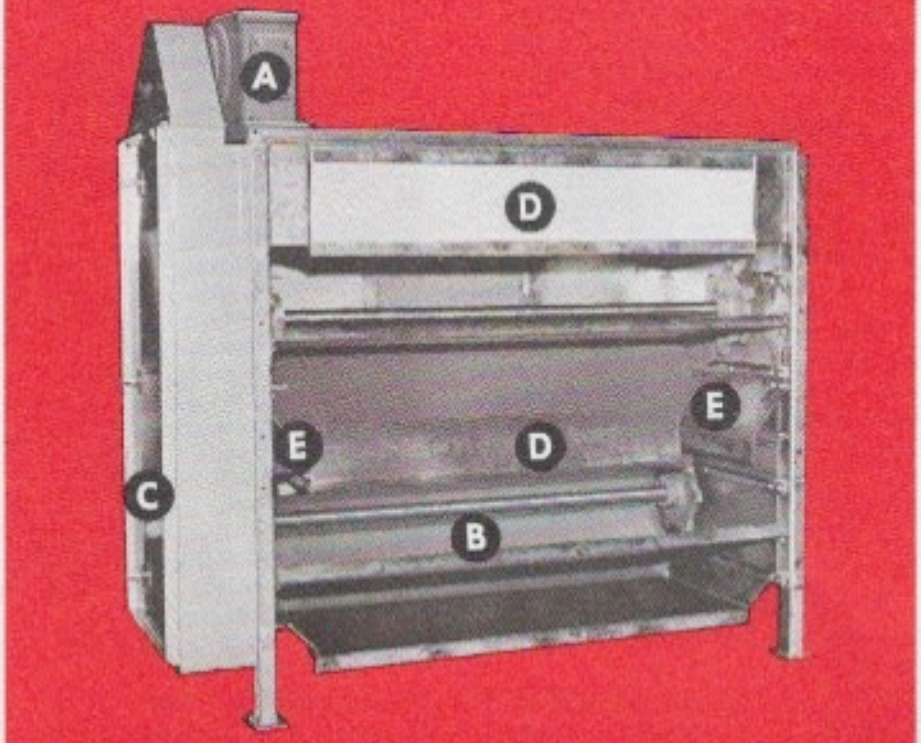
The interior of the hood is primed with zinc chromate and coated with an epoxy paint which, our experience shows, is most effective in avoiding costly rusting of the hood. Need for expensive stainless construction is eliminated.

Modular Design

With the modular design concept, common end sections are utilized and 5' intermediate cooling sections with either 5' or 10' air hood sections, are added as needed to create the desired cooler length. Sprout-Waldron's evaluation and recommendations are suggested when considering an increase in cooler length to gain additional capacity or retention time.



Inlet section of double pass cooler. Components of this section include stainless steel inlet hopper (A); two air seals (B) which prevent air from by-passing pellets; horizontal shields (C) which prevent pellets from falling off tray and onto roller chains; and bottom discharge (D).



Drive section of double pass cooler. Note gearmotor (A); contoured fiberglass fines return section (B); completely enclosed drive with wide door for easy access (C); air seals (D); and horizontal shields (E).

Selection

Sprout-Waldron is prepared to specify and supply the most economical cooler and properly-sized fan and cyclone for your particular application.

All we need to know is:

1. Tons per hour of all types of pellets to be cooled.
2. Size(s) of the pellets to be cooled.
3. General type of feed.
4. Discharge location relative to inlet.
5. Height and space limitations.

Sizing Your Cooler

While Sprout-Waldron should be contacted for exact specifications, the following data will help you quickly establish the *approximate size* cooler for your job. First you must establish *retention time* — time required for moisture to move from center to surface of pellet and be evaporated. This time depends primarily on material pelleted and size of pellet. A rough guide is provided below:

MINIMUM RETENTION TIME FOR MOST FORMULA FEEDS

Pellet Size	Retention time
10/64 to 12/64"	5 to 6 Minutes
¼"	6 to 8 Minutes
3/8"	7 to 8 Minutes
½"	8 to 10 Minutes
¾"	12 Minutes
7/8"	15 Minutes
¼" Alfalfa Pellets	8 Minutes

Some materials may require longer retention. Feeds containing more than 10 percent molasses require 20 percent more time than shown above.

The accompanying graphs will indicate the size of single or double pass cooler for your job at point on curve where Capacity and Retention Time grids meet.

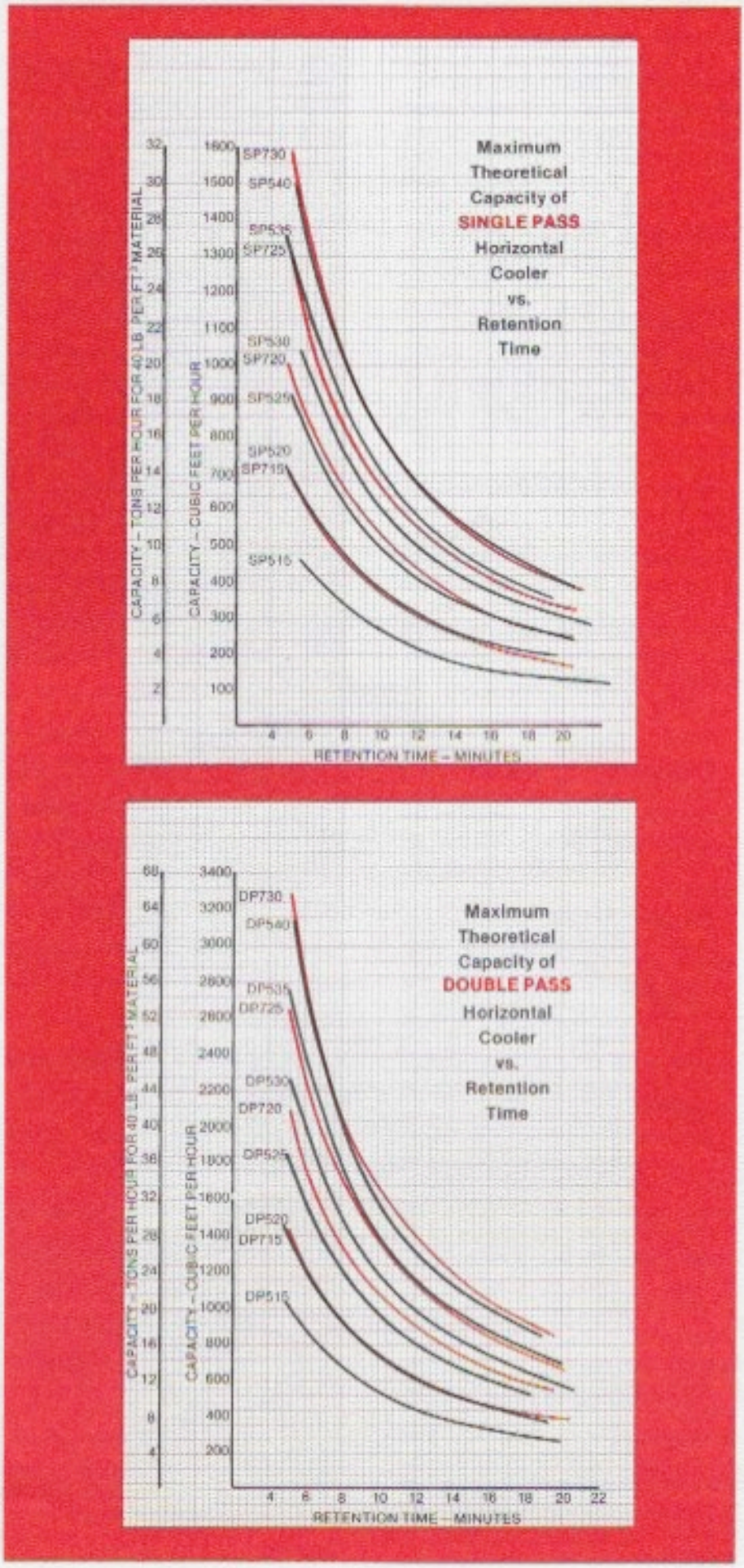
Fans and Cyclones

When sizing a cooler for a particular application, selection of sufficient air volume and static to satisfactorily carry away the heat and moisture from the surface of the pellets is very important. The required air volume should be determined from the production rate and type of pellets, not the size of the cooler.

Fan system specifications must be separately established. The table below again provides a rough guide.

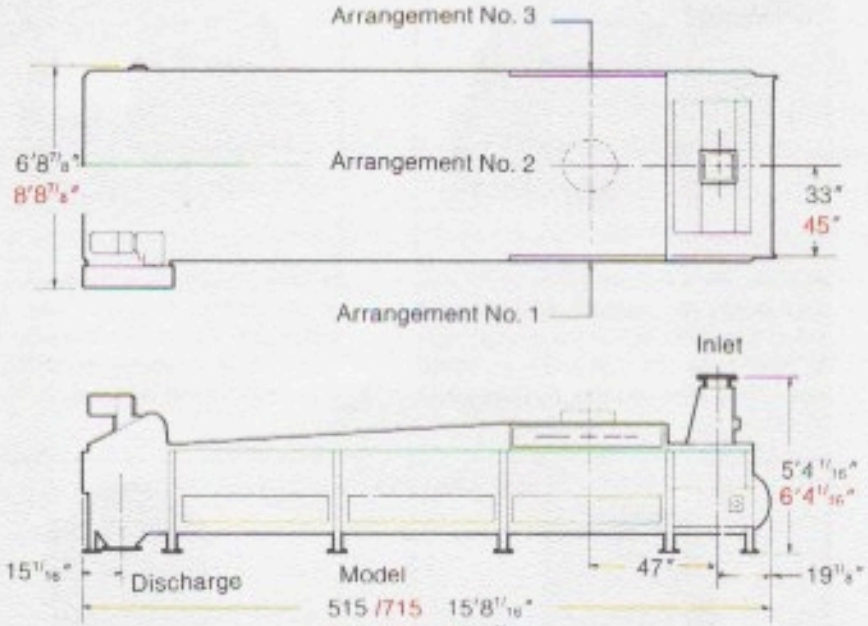
MINIMUM COOLING AIR REQUIREMENTS

Pellet Size	CFM of Air/Ton/Hour
10/64 to 12/64"	800 CFM
¼"	900 CFM
3/8"	1000 CFM
½ to ¾"	1100 CFM
7/8"	1200 CFM



DIMENSIONS

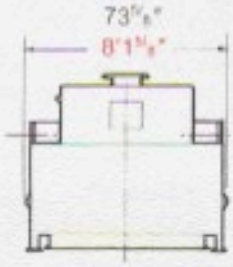
Dimensions Approximate. For Installation, request certified drawing.

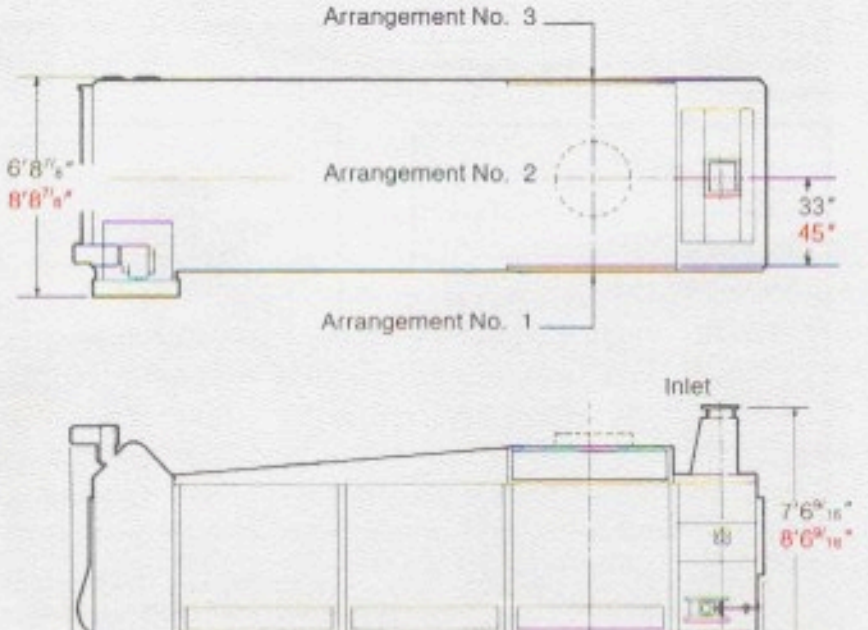


Model	
515 /715	15'8¹/₁₆"
520 /720	20'8¹/₁₆"
525 /725	25'8¹/₁₆"
530 /730	30'8¹/₁₆"
535 -	35'8¹/₁₆"
540 -	40'8¹/₁₆"

SINGLE PASS
HORIZONTAL COOLER

Black figures—5 ft. wide models.
Red figures—7 ft. units.





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DOUBLE PASS
HORIZONTAL COOLER

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Red figures—7 ft. units.