

Technical Article Series

Removing Fines from Animal Feed

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Removing Fines From Feed

Maple Leaf Mills faced several vexing problems. One of these involved the removal of fines in pellet and crumb animal feeds. The fines had to be sifted out carefully and recycled to avoid generating more fines. This is especially significant when large quantities are involved. Some 120 metric tons of chicken, turkey and hog feed pellets containing 1% to 3% fines are processed per 16-hour day at the Komoka, Ontario, mill.

The mill also needed to install a higher capacity separator but only an area 8 foot square was available for it. After checking with manufacturers of circular, rectangular, and centrifugal designs, the plant manager, Robert Douglas, chose a Kason 72 inch diameter circular vibratory separator and purchased it from Separator Engineering Ltd. , the Canadian affiliate of Kason Corporation.

Installed in May 1985, the Vibroscreen® unit separates fines from pellets in sizes ranging from 5/32 inch round to 3/4 inch x 1 inch oblong. Its construction incorporates a top Cascade Deck™ containing a screen with 0.141 inch openings and a bottom Cascade Deck containing a screen having mesh (0.074 inch) openings to separate crumbs (cracked pellets) into small particles for chicks and large particles for laying hens. Fines are recycled to the pelletizers, while pellets or crumbs drop into bins for bulk shipment.

Other than the weekly lubrication of the gyrator bearing, the separator has required no maintenance since its installation, said Douglas.

The pellets are fed to the center of the top deck, a stainless steel screen of woven 0.041 inch diameter wire with 0.141 inch diameter openings. Vibrating in horizontal and vertical planes, the screen quickly separates smaller sizes and fines which drop through. The pellets exit from a spout just above the screen.

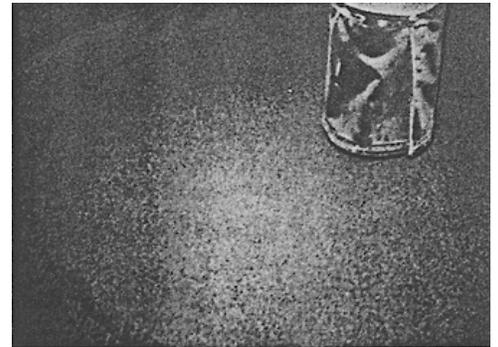
The Vibroscreen separates crumbs into two sizes. Those over 0.141 inch remain on the top screen and discharge from it; those under 0.141 inch and over 0.074 inch remain on the bottom screen and exit from it. The fines pass through both screens and flow to the pelletizer.

Because Cascade screen decks discharge pellets from their full 360° periphery, there is no "rope" or accumulation of solids moving around the periphery to a spout which would reduce effective screen area, explains MacKenzie Dickson of Separator Engineering. This prevention of rope eliminates a prime cause of wear on the screen, increases capacity and virtually eliminates overloading.

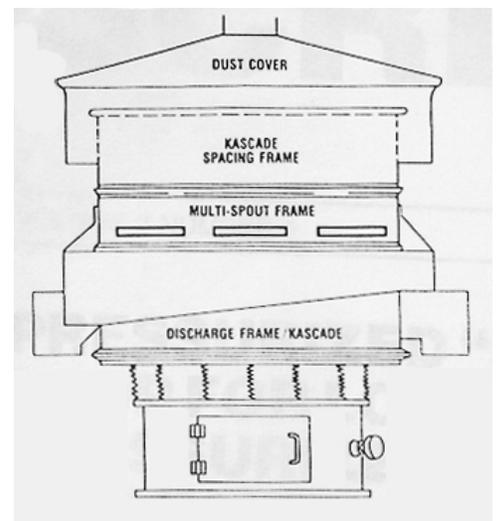
In operation, the screens are vibrated by a gyrator rotating adjustable unbalanced weights at either end of its shaft, says Dickson. The screens and gyrator are a single inertial vibration system, mounted on a circular base supported by springs.

These springs allow the unit to vibrate freely while preventing transmission of the vibrations to the floor. The top and bottom eccentric weights on the gyrator are independently variable as to mass and relative angle, giving great control over screen discharge flow patterns (from the central feed on the screen). These adjustments can be made by the operator quickly and easily.

Increasing the top weight increases the horizontal throw of the screens, speeding the radial movement of material on their surfaces. Increasing the bottom weight increases the vertical throw, which maximizes the passage of undersize material through the screen by inhibiting blinding of near-size particles, explained



Looking down on top Cascade Deck® of feather meal feed separator, showing the pellets cascading off the circumference.



Side view of Kason dual-Cascade unit separating fines from pellets at Maple Leaf Mills, Komoka, Ontario.

Dickson.

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