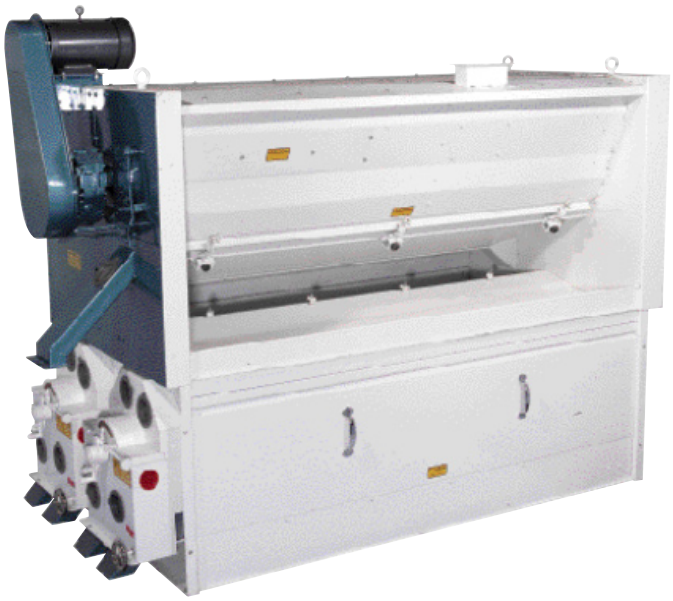
CARTER DAY

Sizing & Separating Equipment

JACOBSON

DISC SEPARATOR

DISC CYLINDER SEPARATOR



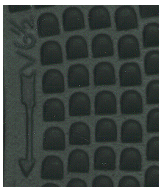
WORLDWIDE REPRESENTATION

CARTER DAY
DISC SEPARATION PRINCIPLES

The Disc Separator consist of a series of discs mounted on a horizontal shaft. The discs, each with hundreds of undercut pockets, revolve through the mass of material lifting the shorter material into a discharge trough at the front of the machine. While the disc blades convey the longer rejected material to the discharge at the end of the machine. This discharge has a retarder which controls the burden depth of product within the discs. Near the end of the machine a return conveyor carries liftings from the tail end discs back to the inlet by using raised trap doors in the front of the discs for further conditioning.

To handle the various shapes and sizes of materials, disc pockets are made in many styles and sizes. Machines vary in the number of discs, depending on the size of pockets being used and the capacity range required.

Disc pockets are made in three basic shapes;



V

The **"V" pockets** are derived from Vetch seed. It has a round "lifting edge" and a square horizontal "leading edge" and is designed to pick up and for discharge; small round shaped seeds or particles.

R 3 1/2

The **"R" pockets** are derived from the rice cleaning process. It is like a "V" pocket but the pockets have straight lifting edges and a curved top edge. This type of pocket is designed to lift small, irregular shaped material.

NOTE: Both the "V" and "R" pockets are made only in small sizes; from 2.5 millimeters (6.3/64") to 7 millimeters (17.5/64"). The letter on the "V" and "R" discs are always followed by a number; i.e. V4 1/2. The number indicates the pocket width in millimeters.

AC

Alphabetically designated pockets that do not have a number following; i.e. "A", "MM" or "J" are always square faced or rectangular. Generally these square faced pockets have two basic functions. One is to rapidly lift out the shorter particles to reduce the mass in the machine and to increase capacity. The second is to provide a dividing or splitting separation where each fraction produced is to be resized in separate operations.

DISC MACHINE APPLICATIONS EXAMPLES

STANDARD APPLICATION

1. The short product fits into the rotating disc pocket and is lifted out of the longer product. Just after top dead center of rotation, shorter product is centrifugally thrown out of the pocket – much like product is discharged out of bucket elevator cups.

2. Shorter product is always lifted by disc pockets and longer product is always rejected and over-tailed.

3. There must be at least 1/16" difference in length of products to perform good separations.

4. When the disc pocket liftings represent 25% (or less) of the input volume, eg. seeds out of wheat, the disc pockets are usually furnished in progressively larger size from the feed end to the discharge end. In this way, the smallest particles are lifted out of the mass first, with progressively larger liftings being removed as the product passes through the machine.

WHEAT APPLICATION

Wheat containing on average 2-4% weed seeds which are shorter than the wheat and 2-4% oats which are longer than the wheat are fed into the machine. As the weed seeds, oats and wheat are conveyed through the machine the weed seeds are lifted by a series of pockets found on the first 10 discs. In this case we use a V type disc ranging in depth and size of pocket responsive to the weed seeds. The lifted weed seeds are discharged into a liftings trough at the right front of the machine. The remaining 15 discs are arranged to lift the remaining wheat from the oats using a MM. The wheat is discharged at the left front of the machine while the oats are discharged at the outlet of the machine. Near the end of the machine trap doors in the lifting trough can be opened or closed to allow the reprocessing of wheat if needed. The trap doors cover a return conveyor which allows reprocessing of the small wheat if the disc begin to lift too aggressively near the discharge of the machine.

The main wheat flow is generated by conveyor blades mounted on the discs and regulated by individual retarders between the discs. The overall flow of wheat is controlled by a main adjustable retarder at the discharge of the machine.

CARTER DAY ADVANTAGE
DISC SEPARATOR

STANDARD OF THE WORLD FOR MULTIPLE LENGTH SEPARATION BY SIZE

PRODUCT FLOW FEATURES

Inlet Feeder spreads the product evenly to allow proportional burden depth and lifting edge contact.

Adjustable retarder panels controls the product flow from the inlet to the discharge of the machine.

Reclaim doors allow the capture of lifted grains for reprocessing if needed. These grains are sent to the front of the machine via a conveyor.

Lifting Inspection doors allow an operator to inspect machine performance of the length grading.

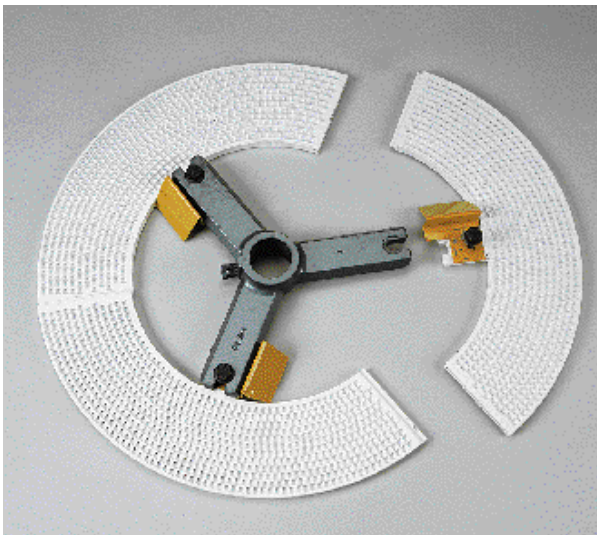
Main Product Retarder retards the product at the outlet to allow for the correct burden depth within the cylinder and when product capacities are low.

Drop Down Door cleanout feature to allow complete cleanout of the machine.

SPLIT & SOLID DISCS

Carter Day has been manufacturing the original cast disc since 1881. The disc offers extremely long life and wear resistance (approximately 4 million bushels of wheat).

We offer both a solid and split disc. The split disc dramatically reduces disc replacement downtime.

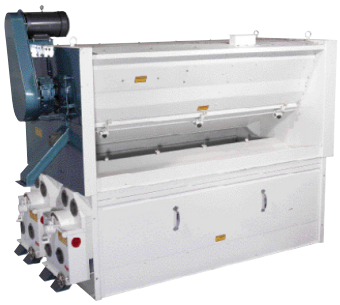


HIGH PERFORMANCE DRIVE

The drive package is comprised of a shaft mounted gear reducer drive run by twin belts.

CARTER DAY ADVANTAGE
DISC CYLINDER SEPARATOR

TWO WORLD CLASS LENGTH SEPARATORS TO MAXIMIZE SEPARATIONS IN 1 PASS



DISC CYLINDER SEPARATOR COMBINATION

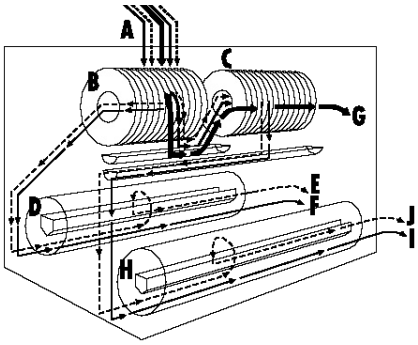
The Disc Cylinder Separator combines the high performance capability of the Disc Separators with the precision separating capability of the indented Uniflow cylinder. The combination of the No. 3SI high separating capacity and efficiency obtained from the 17" diameter, 90" long cylinder and the Disc Machine makes for high performance.

The Disc Cylinder Separator separates and sizes product by length into five different separations, all in a single continuous process. The Disc Cylinder Separator can be coupled with two additional No.3SI to offer higher capacity. The additional unit is run in series or parallel to the top unit.

FIVE SEPARATIONS IN ONLY ONE PASS

PRODUCT STREAM DESCRIPTION

Product intake begins at (A) where the grain enters the disc portion of the machine which is divided into the Splitter Section (B) and the Grader Section(C). Liftings of the Splitter Section are delivered to the Grader Section. The tailings of the Splitter Section goes to the Oat Cylinder (D) where the grain is divided into Large Clean (E) and Oats (F). The tailings of the Grader Section is Medium Clean Grain (G) and constitutes the heavy stream from the machine. The lifted portion removed from the Grader Section is conveyed to the Seed Cylinder (H) where the product stream is divided into Small Clean (I),Seeds and Broken Kernels (J).



DISC CYLINDER SEPARATOR MACHINE APPLICATION EXAMPLES

WHEAT APPLICATION

Incoming product comprised of wheat, oats and weed seeds are fed into the"splitter section" of discs found in the center of the machine. The "splitter section" having large square pockets typically 10A's and 5MM's, pocket size responsive to the type of wheat being processed, to lift 40-60% of the product flow consisting of medium wheat, small wheat and weed seeds. This lifted material is dropped into a conveyor. The "splitter discs" are fitted with left hand conveyor blades which convey the large wheat with 5% oats to a spouted No.22 Indent cylinder which length grades the wheat from the oats. The lifted medium wheat, small wheat and weed seeds of the "splitter section" are screw conveyed to the center of the machine and discharged into the "grader section" containing 8V's an 10R's, pocket size responsive to the type of weed seeds and small wheat to be removed. The medium wheat is right conveyed to the end of the machine and discharged while the lifted weed seeds (5%) and small wheat are screw conveyed to a No. 8.5 Indent cylinder to length grade the weed seeds from the small wheat.

BARLEY APPLICATION

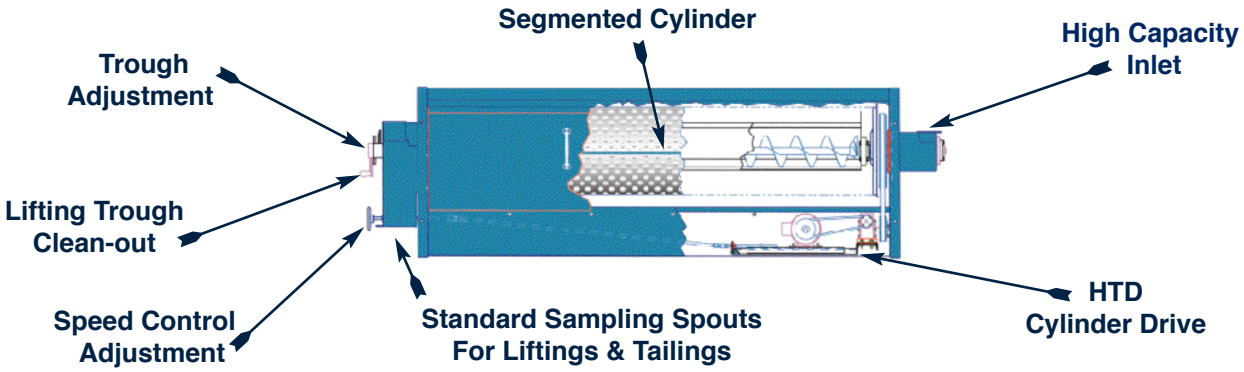
Incoming product comprised of barley, oats and weed seeds are fed into the"splitter section" of discs found in the center of the machine. The "splitter section" having large square pockets typically 5B's and 10MM's, pocket size responsive to the type of barley being processed, to lift 40-60% of the product flow consisting of medium barley, small barley and weed seeds. This lifted material is dropped into a conveyor. The "splitter discs" are fitted with left hand conveyor blades which convey the large barley with 5% oats to a spouted No.24 Indent cylinder which length grades the barley from the oats. The lifted medium barley, small barley and weed seeds of the "splitter section" are screw conveyed to the center of the machine and discharged into the "grader section" containing 10V's an 5R's, pocket size responsive to the type of weed seeds and small barley to be removed. The medium barley is right conveyed to the end of the machine and discharged while the lifted weed seeds (5%) and small barley are screw conveyed to a No.13 Indent cylinder to length grade the weed seeds from the small barley.

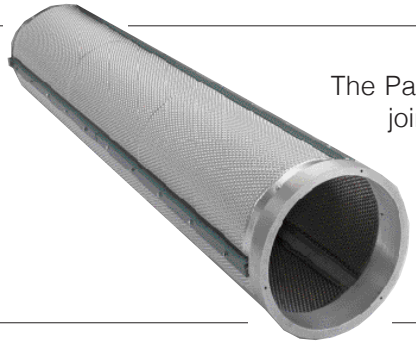
CARTER DAY
NO. 3 SI UNI-FLOW

THE STANDARD OF THE WORLD FOR THE SINGLE PASS LENGTH SEPARATION

NO. 3 SI PRINCIPLES OF OPERATION

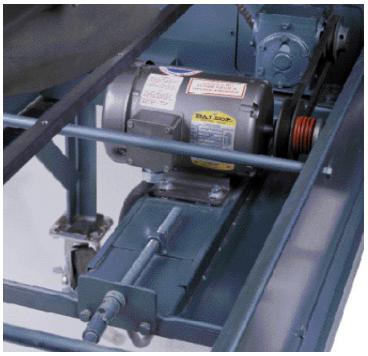
The indented cylinder separator relies upon centrifugal force. The speed of the cylinder holds the particle in the indent, lifting it out of the mass until the indent is inverted to the point where gravity causes the particle to fall out of the indent. The particle dropping from the indent falls into the auger conveying trough. The angle or tilt of the catch trough can be adjusted to obtain the desired "cut point" there by catching the small particles as they drop out of the indents but not permitting the longer particles to ride up the rising side of the cylinder and fall into the trough. To make adjustment on the "cut point" of the separation, a trough tilt adjustment is used which enables you to define the degree of separation that is required. A screw conveyor then discharges the short lifted material separate from the tailed long material. The amount of product which can be length separated depends on the number of pockets coming in contact with the product.





The Patented Segmented Cylinder consist of three equal segments. These segments are joined together by three solid bars which are attached to the ends of the cylinder assembly. The folded edges of the shell segments nest over these bars and are clamped in place with a clamping channel which provides a secure leakproof joint. The segmented cylinder design increases clean-out capabilities and minimizes cylinder removal downtime and maintenance.

The No. 3SI variable speed HTD drive system consist of a spring loaded V belt sheave on the motor. The rotation speed of the cylinder may be changed by the external cylinder speed adjustment wheel which slides the motor base changing the input speed to the worm gear reducer which changes the speed of cylinder.



The screw trough adjustment provides extremely close settings of the separation edge. The liftings trough can be released from the settings to allow for quick clean-out without disturbing the settings. The adjustable retarder system improves separation results by controlling the amount of product maintained in the cylinder. The adjustable retarder can be positioned out of the product flow when it is not required.

CARTER DAY
PRODUCT FLOW CONFIGURATION

25" DISC SEPARATOR
TYPICAL DISC CYLINDER CAPACITIES

DISC MACHINE PRODUCT	SHORT REMOVAL bu/hr - mt/hr Disc Reference	LONG REMOVAL bu/hr - mt/hr Disc Reference	SHORT & LONG REMOVAL bu/hr - mt/hr Disc Reference
Sunflower (2520)		400/5.8 20-SS	
Wheat (Small)	275/7.4 2V5-8K-7V5.5	350/9.5 27A	100/2.8 6V5-4K-3V5.5-14A
Wheat (Medium)	210/5.7 8V5-6K-7V5.5-6V5.75 22A-5MM	300/8.2	85/2.3 4V5-3K-3V5.5-3V5.75-11A-3 mm
Wheat (Large)	150/4 10V5.5-10K-7V6	225/6.1 19A-8 mm	70/1.9 5V5.5-5K-3V6-10A-4 mm
Barley	220/4.8 6V5.5-10AC-8EE-3J. 27B	280/6.0	90/2.0 4V6-5AC-4EE-14B
Oats	200/2.9 8R5-R5.5-9AC-2EE 20SS	400/5.8	
White Rice	100/2.7 34-R5.5		
Grass Seed	2,200 lbs/1.0 5V4.5-6V5-6R5-7V5.5-3V6	3,500 lbs/1.5 27 mm	900 lbs/.4 4R5.5-4AC-5EE-14 mm

DISC CYLINDER SEPARATOR
TYPICAL DISC CYLINDER CAPACITIES

DISC MACHINE	SHORT & LONG REMOVAL Bu/HR - MT/HR, Disc/Cyl Reference
PRODUCT	
WHEAT (Small) 2533 2533 HC	350/9.5, 15A / 6V5.5-6K-6M / 19, 8.5 440/12, 15A / 6V5.5-6K-6M / 19, 11, 22, 8.5
WHEAT (Medium) 2533 2533 HC	315 / 8.5, 5MM-10A / 6V5.5-6K-6M / 22, 8.5 400 / 10.9, 5MM-10A / 6V5.5-6K-6M / 19, 11, 22, 8.5
WHEAT (Large) 2533 2533 HC	245 / 6.7, 8MM-7A / 6V5.5-5K-5M-2V6.5 / 22.8.5 245/6.7, 8MM-7A/ 6V5.5K-5M-2V6.5 / 22, 11, 24, 8.5
Barley 2533 2533 HC	280 / 6.0, 15B / 4V5.5-6AC-6EE-4J / 24, 13 350 / 7.6, 15B / 4V5.5-6AC-6EE-4J / 24, 13
Oats 2533 2533 HC	200 / 2.9, 10MM-5A / 6AC-6EE-6J / 28, 16 250 / 3.6, 10MM-5A / 6AC-6EE-6J / 25, 19, 28, 16
Paddy Rice 2533 2533 HC	250 / 5.0, 10MM-5A / 5R5.5-833-5J 28, 16 300 / 6.1, 10MM-5A / 5R5.5-833-5J 26, 19, 28, 16
Grass Seed 2533 2533 HC	4500 LBS / 2.0, 15MM / 4V4.5 4V5 5R5 5V5.5 / 22, 6.5 5000 LBS / 2.2, 15MM / 4V4.5 4V5 5R5 5V5.5 / 22, 6.5

Complete laboratory service is at your disposal. CARTER DAY'S facility enables us to test your unique product sample in laboratory or full size equipment to aid in determining the right machine for your application. We invite you to participate in tests conducted at our facility in Minneapolis, Minnesota, USA.

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