DERRICK®
EQUIPMENT COMPANY

FLC 513 and 514
Component Shaker System

Part of the Flo-Line® Cleaner Series

Powered by SUPER G2®

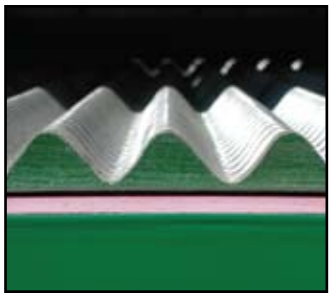
Derrick uses only the highest quality materials in the manufacturing of the Flo-Line® Cleaner 500 – one of the most powerful and versatile shale shakers in the world today. The single-side tensioning system shortens screen panel replacement time to less than one minute per panel and can be configured for operation on either the left or right side. All FLC 500 linear motion shale shakers are powered by two Super G²® vibrating motors which enable the FLC 514™ (4-panel) to operate at an unprecedented continuous 7.3 G's and the FLC 513™ (3-panel) at 7.0 G's. This increase in G's at the screen surface dramatically improves the conveyance rate of a shale shaker, enabling maximum cuttings removal efficiency.

SUPER G²® VIBRATING MOTOR

- Produces 7.0 to 7.3 G's of force.
- Continuous internal oil bath lubrication system reduces repair and maintenance costs.
- Sound output from the machines has been reduced to approximately 78 dBA.

PYRAMID™ SCREENS

- Offers 105% to 184% more screen area.
- Fluid handling capacity increases up to 125%.
- Enables the use of finer mesh sizes at higher capacities.

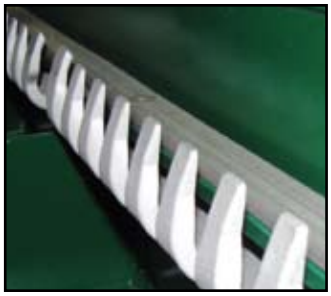


PYRAMID (PMD™)

PYRAMID PLUS (PMD+™)

SINGLE-SIDE TENSIONING SYSTEM

- Effectively shortens screen panel replacement time to less than one minute per panel.
- Can be installed on either left or right side of the shale shaker for increased installation versatility.
- Utilizes tensioning fingers and two Quick-Lok, 1/2 turn tensioning bolts per screen to facilitate faster, easier and more reliable panel tensioning.



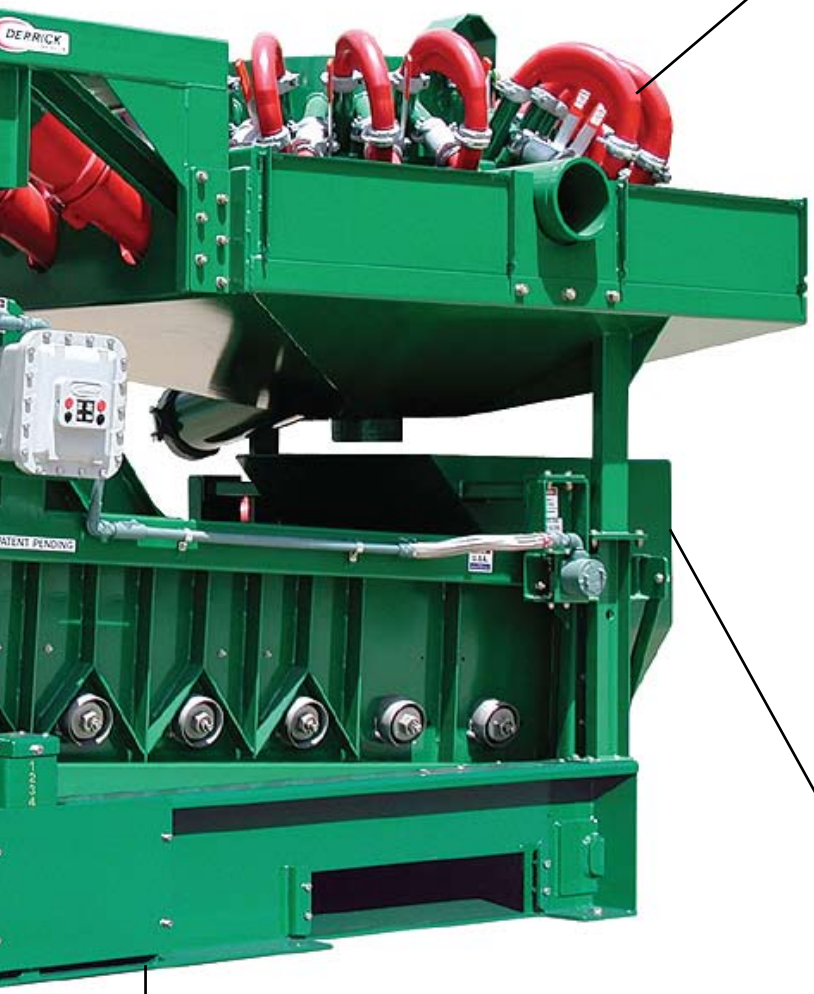
Under-Side Tensioning Fingers

DESANDERS

- Inline manifold holds between one and three 10” desander cones.
- Each cone can process 500 GPM.
- Makes a separation between 40 and 100 microns.

DESILTERS

- Round desilter manifold holds up to twenty cones and accepts 3” or 4” hydrocyclones.
- Each 4” cone can process 80 GPM.
- Makes a separation between 12 and 74 microns.
- The 4” hydrocyclone can be manufactured with a ceramic liner in the lower cone section for increased wear tolerance.
- Cones contain separate ball valves that can be individually shut off during operation to allow for increased control of flow capacities and ease of maintenance.



Derrick FLC 514™ with Optional Mud Cleaner Package

FEEDERS

- Traditional 40.9 gallon back tank with weir feed.
- Weir feed with bypass offers a valve that can be opened if the fluid needs to bypass the shakers.
- The top feeder evenly spreads the flow of mud across the shaker basket and eliminates excess mud volume.

Top Feed

Weir Feed

ADJUSTABLE WHILE DRILLING (AWD)

- Easily and quickly raise or lower the screen basket from -1° to +5° on the FLC 513™ (3-panel), and -1° to +7° on the FLC 514™ (4-panel).
- Offers the capability to optimize shaker performance without interrupting operation.

Flo-Line Cleaner 500

Component Shaker System

Super G²® Vibrating Motors

Derrick's patented Super G²® vibrating motors feature a continuous internal oil bath lubrication system provides longer life, reduced repair costs and robust maintenance-free operation. A unique hydrodynamic cushioning effect is created on the bearing surface which reduces friction, wear, heat and sound generation. The motor will run longer and at a reduced decibel level (78 dBA) which greatly extends the life of the motor. The higher G-force produced by the Super G² motors has proven to dramatically increase liquid/solids separation due to superior conveyance characteristics. Two Super G² motors are standard equipment for the FLC 500.

Pyramid™ and Pyramid Plus "Three-Dimensional" Screens

Derrick's patented Pyramid (PMD™) screen consists of a standard sandwich construction featuring two fine mesh cloths layered with a coarse backing cloth. The three layers are bonded together, corrugated, and then bonded to a metal perforated plate. The resulting corrugations are 0.8" high on the Pyramid screen and 1.5" high on the Pyramid Plus (PMD+™), adding 105% to 184% more usable screen area than a standard flat, perforated plate panel. The three-dimensional Pyramid screens exceeded all expectations when the fluid handling capacity was found to increase up to 125%. Installation of Pyramid screens permits the use of finer mesh sizes at higher capacities, further optimizing the performance of the Derrick shaker. As with the Derrick flat, PWP™ screen series, the Pyramid screens are capable of making separations as fine as 43 microns. When fitted with Derrick's Pyramid screens, the FLC 500 has the following area available for screening per API RP 13 C (ISO 13501): *FLC 514 (4-panel) has **33.2 sq. ft. with the Pyramid screen** and **46 sq. ft. with the Pyramid Plus**. The FLC 513 (3-panel) has **24.9 sq. ft. with the Pyramid screen** and **34.5 sq. ft. with the Pyramid Plus.***

Single-Side Tensioning System

The single-side tensioning system shortens screen panel replacement time to less than one minute per panel and can be configured for operation on either the left or right side. A typical screen panel change requires a one-half turn of two Quick-Lok nut assemblies to relax the tensioning fingers. This system provides reliable and consistent panel tensioning throughout the life of the machine.

Adjustable While Drilling (AWD)

Derrick's local/remote actuated AWD enables one person to quickly and easily raise or lower the screen basket from -1° to +5° on the FLC 513, and -1° to +7° on the FLC 514. As drilling rates and formation or mud properties change, the angle of the screen deck can be adjusted to achieve the proper solids conveyance and fluid end point. Increased capacity, longer screen life, and optimal solids removal efficiency are the results.

Hydrocyclones

Derrick offers a round desilter manifold mounted over the vibrating deck with the ability to hold up to twenty 3" or 4" hydrocyclones. This allows the FLC 500 to be used as either a high performance mud cleaner or as a means to reclaim the liquid discharged in the cone underflow. Each 4" hydrocyclone processes 80 GPM at 75 feet of head allowing for a maximum capacity of 1,600 GPM. The cone underflow is caught in the pan mounted over the vibrating basket and can be directed to the vibrating basket or discarded. Derrick's uni-body 4" hydrocyclone can be manufactured with an optional ceramic liner in the lower cone section for increased wear tolerance.

Derrick desanders offer the flexibility of mounting either one, two, or three 10" desander cones over a cone underflow pan. Each 10" hydrocyclone processes 500 GPM at 75 feet of head, allowing for a maximum capacity of 1,500 GPM. The underflow can either be discarded or directed onto the vibrating bed for further processing.

Feeders

Derrick's feeder designs offer the choice of a traditional weir feed, a weir feed with bypass, or a top feed. The weir feed consists of a 40.9 gallon tank where the mud flows over a weir and onto the shaker basket. The weir feed with bypass offers a quick opening gate that can be opened if the fluid needs to bypass the shakers. The top feed eliminates the settling of solids while minimizing foot print area. The top feed is designed to spread the flow of mud across the shaker basket while eliminating the excess mud volume that is normally held in traditional back tanks. Any of the feed systems can be used in conjunction with the Derrick Flo-Divider, a flow distribution device used with the FLC 500 series at the flow line.

Uses of the Flo-Line Cleaner 500

The FLC 500 can be configured for use as a main shaker, high performance (1,600 GPM) mud cleaner, or as a secondary drilled cuttings dryer. The FLC 500 allows the user to configure the shaker and its interchangeable components to fit specific needs for application, size, and capacity. The FLC 500 can be used in the following instances:

- ***As a main shaker.*** *Two FLC 500's with Super G² motors can be used in place of three or four standard shale shakers due to their exceptional fluid handling capability and superior solids conveyance. When coupled with Derrick's Flo-Line Primer, two FLC 500's can replace three or four stacked or cascade shakers.*
- ***As a mud cleaner to dry the underflow from desanders and desilters.*** *The FLC 500 is a useful tool in reducing the amount of liquid being discharged from desanders and desilters. This technique is effective when using an expensive drilling fluid. It also allows hydrocyclones to be a useful part of a "closed-loop" system.*
- ***As a cuttings dryer to recover oil base mud from drilled cuttings****. When utilized for secondary drilled cuttings drying, the FLC 500 can reduce the oil on cuttings to below 10% by weight.*

The Results

The Derrick Flo-Line Cleaner 500 is powered by two Super G² vibrating motors for superior performance. While conventional shakers operate in the 3 to 5 G force range, the Derrick Super G² motors produce 7.3 G's on the FLC 514 (4-panel) and 7.0 G's on the FLC 513 (3-panel).

The higher G force generated by the Super G² motors combined with Derrick's patented Pyramid screen technology have proven to be very effective in liquid/solids separation due to superior conveyance characteristics and maximized available screening area. The FLC 513 shakers have processed in excess of 560 GPM with a 17.8 PPG mud over Pyramid DX-A140* screens. The FLC 514 shakers have processed upwards of 900 GPM with 9.1 PPG mud over Pyramid DX-A140* screens.

**DX-A140 replaces DX175 and DX210*

The High G shaker system consisting of FLC 500 series shakers enables a drilling rig to use fewer shakers, or to screen finer with the same number of shakers, producing significant savings in drilling fluid and disposal costs. Its proven performance and durability are an asset for any drilling program.

Derrick FLC 513

FLC 513 and 514 Dimensions

FLC 500 with standard sump & weir feeder

OPTIONS	MODEL	DIMENSIONS (IN / MM)				(LBS / KG)
		Width	Length	Height	Weir Height	Weight
WEIR FEEDER (BACK TANK)	513	72 3/8 / 1838	119 / 3023	67 13/16 / 1722	39 11/16 / 1008	4500 / 2041
	514	72 3/8 / 1838	144 7/8 / 3680	73 3/16 / 1859	41 / 1041	5250 / 2384
BOX FEEDER	513	72 3/8 / 1838	103 / 2616	67 13/16 / 1722	41 7/16 / 1053	4300 / 1950
	514	72 3/8 / 1838	128 7/8 / 3273	73 3/16 / 1859	42 3/4 / 1086	5050 / 2291

FLC 500 with standard sump, weir feeder, & pan with hydrocyclone package

OPTIONS	MODEL	DIMENSIONS (IN / MM)				(LBS / KG)
		Width	Length	Height	Weir Height	Weight
(20) 4" DESILTER CONES	513	80 / 2032	119 / 3023	103 1/2 / 2629	39 11/16 / 1008	7450 / 3379
	514	80 / 2032	144 7/8 / 3680	104 13/16 / 2662	41 / 1041	8150 / 3697
(3) 10" DESANDER CONES & (20) 4" DESILTER CONES	513	80 / 2032	125 15/16 / 3199	109 / 2769	39 11/16 / 1008	8400 / 3810
	514	80 / 2032	144 7/8 / 3680	110 3/8 / 2804	41 / 1041	9100 / 4128

FLC 513 and 514 VE with box feeder

OPTIONS	MODEL	DIMENSIONS (IN / MM)				(LBS / KG)
		Width	Length	Height	Weir Height	Weight
BOX FEEDER	513	72 3/8 / 1838	103 / 2616	67 11/16 / 1719	41 7/16 / 1053	5120 / 2324
	514	72 3/8 / 1838	128 7/8 / 3273	73 3/16 / 1859	42 3/4 / 1086	5450 / 2472
(20) 4" DESILTER CONES	513	80 / 2032	118 / 2997	112 1/2 / 2858	41 7/16 / 1053	8320 / 3774
	514	80 / 2032	143 7/8 / 3654	113 13/16 / 2891	42 3/4 / 1086	8900/ 4037
(3) 10" DESANDER CONES & (20) 4" DESILTER CONES	513	80 / 2032	124 15/16 / 3173	112 1/2 / 2858	41 7/16 / 1053	9270 / 4205
	514	80 / 2032	143 7/8 / 3654	113 13/16 / 2891	42 3/4 / 1086	9850 / 4468

***All weights and dimensions are approximate.**

Derrick FLC 500 VE™ (Vapor Extraction)

To avoid exposing personnel and surrounding equipment to vapors, the screening surface is covered with self-locking hood. An exhaust fan connected to the feeder creates a vacuum, which removes unwanted process vapors and creates a continuous flow of fresh (ambient) air into the machine. Screening surface inspection, panel change and maintenance are easily accomplished by lifting the hood doors up thus permitting full access to the screen bed. The FLC 513 VE is a 3-panel shaker (adjustable from -1˚ to +5˚) while the FLC 514 VE is a 4-panel shaker (adjustable from -1˚ to +7˚).

Derrick FLC 514 VE

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