

**KREBS®**

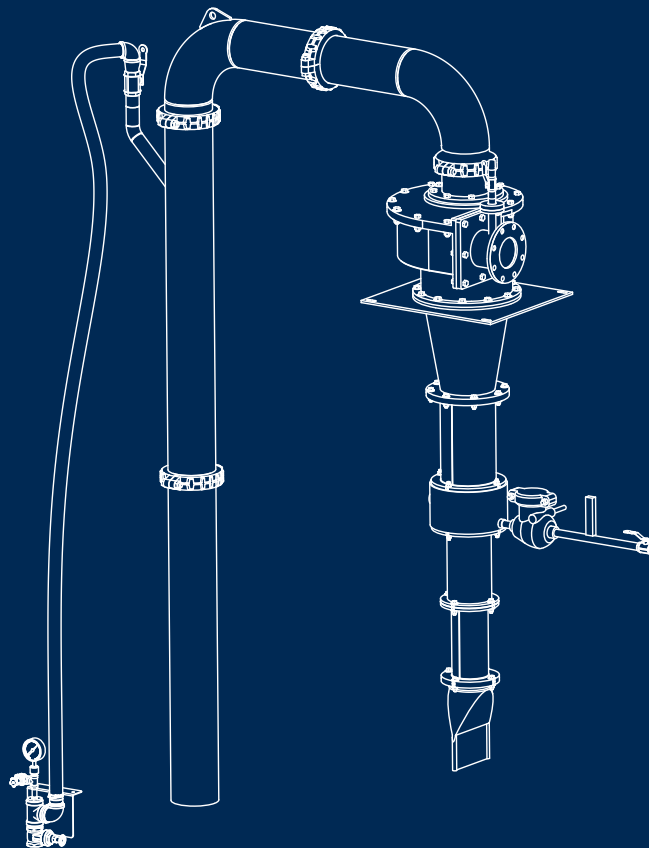
# **CycloStack™ and CycloWash™ Enhance your performance**



**FLS**

# Enhance separation

Boost your cyclones' dewatering performance with our CycloStack™, which attaches to the bottom of a standard cyclone to automatically control the moisture content and discharge concentration of the cyclone underflow. Enhance cyclones' separation and desliming capabilities with our patented, low-cost CycloWash™ device.



## Key benefits

- Improve efficiency and performance
- Reliable, automatic operation
- Reduces operating costs
- Low upfront costs
- Easy to install and maintain

# Enhance your dewatering and desliming cyclones

Improve your cyclones' performance with CycloStack™ and CycloWash™



KREBS® CycloStack™

## Improve efficiency and performance

The CycloStack™ minimises moisture content in the cyclone underflow, and constantly acts to "adjust" the apex diameter for better hydrocyclone efficiency. The CycloWash™ helps to improve cyclonic classification.

## Reliable, attention-free operation

The CycloStack™ and CycloWash™ devices dependably perform shift after shift, with virtually no operator attention.



KREBS® CycloWash™

## Reduce operating costs

Attention-free operation allows personnel to focus on other areas of the plant. Elimination of plugging reduces the risk of unplanned downtime. Better cyclone performance translates to reduced costs overall.

## Low upfront costs

CycloStack™ and CycloWash™ are relatively inexpensive items that attach to standard cyclones, improving their performance.

# CycloStack™ Dewater and desand performance

Our CycloStack™ attachment is designed for use in solids dewatering applications, and can be attached to the bottom of a standard cyclone to minimise the moisture content in the cyclone underflow. The attachment provides a low-cost method for automatically controlling the dewatering and discharge concentration of the cyclone underflow, allowing direct discharge of the underflow onto a conveyor belt or into a pile. This occurs even with fluctuating feed conditions.

The CycloStack™ consists of a urethane flap that opens when solids are present, allowing the solids to discharge while retaining water in the cyclone. With the help of the vacuum caused by the siphon created in the overflow pipe, the CycloStack™ closes if there are no solids present.

The device improves hydrocyclone efficiency by constantly “adjusting” its apex diameter, as it virtually eliminates plugging. It is a low-cost device that allows attention-free operation.

## KREBS® CycloStack™ features

The CycloStack™ attaches to the bottom of a standard cyclone and overflow pipe/siphon control assembly for use in solids dewatering applications. As it minimises the moisture content in the hydrocyclone underflow, it provides a low-cost way to automatically control its dewatering and discharge concentration. The CycloStack™ allows direct discharge of hydrocyclone underflow onto a conveyor belt or into a pile.

Cyclones with the CycloStack™ attachment can be used alone, on a manifold with multiple cyclones or in combination with screens, screw classifiers, hydro-separators/hydrosizers or gravity settlers to classify and separate a wide variety of sand and gravel products.

Image on left shows the CycloStack™ installed on cyclone. Close-up on right of CycloStack™ and Siphon Control assembly.



CycloStack™ installed on our gMAX® Cyclone



Our CycloStack™ includes a Siphon Control assembly that attaches to the underflow launder of the manifold.

# CycloWash™

## Washing solids

Our CycloWash™ is used for desliming purposes, normal classification takes place in the upper portion of a cyclone; this can be thought of as the first stage of desliming. The CycloWash™, located in the lower/apex section of the hydrocyclone, injects water into the cyclone, and the injection water displaces the fines-laden water in the partially thickened underflow pulp. The result, essentially, is a second stage of classification taking place, where the displaced water with fines joins the normal cyclone overflow. The coarse solids are thickened, and they discharge through the apex orifice as a thoroughly deslimed underflow.

Because the device is inexpensive, easy to install and relatively little injection water is needed for effective slimes displacement, the CycloWash™ offers a low-cost means for improving cyclonic classification.

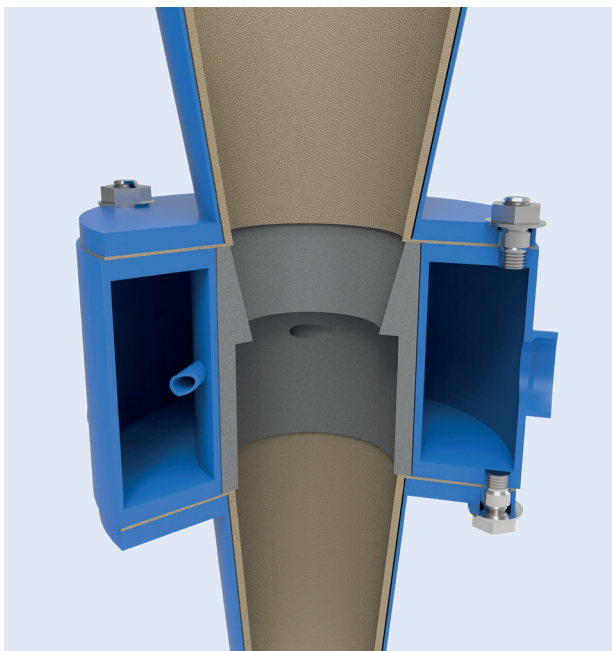
### KREBS® CycloWash™ features

CycloWash™ is used for washing of solids for separation of fine solids or soluble values or contaminants.

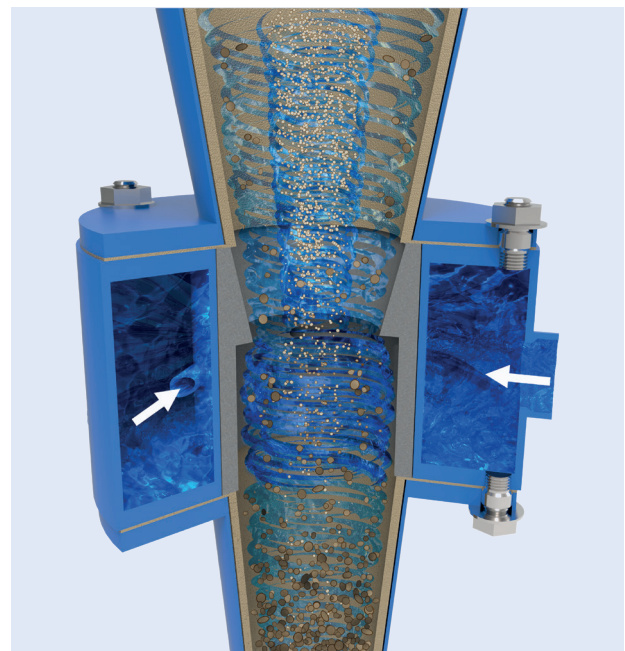
The CycloWash™ permits the injection of elutriation (cleaning) liquor or water into the lower section of the hydrocyclone, so that fine particles in the underflow or solubles in the liquid phase of the hydrocyclone feed stream can be displaced and discharged with the hydrocyclone overflow.

The injection liquid serves as the displacement agent of fine particles that are entrained in the underflow pulp. With creation of a “secondary classification” within the hydrocyclone, displaced fines rise within the centre of the hydrocyclone, joining the overflow pulp.

For separation of soluble values, or contaminants, fresh injection liquor can be used in the CycloWash™ as a washing agent to help displace liquid-containing solubles with the hydrocyclone overflow. Our CycloWash™ device can be installed on single cyclones or manifold systems



Section view of our CycloWash™ device



Injected water displaces the fines-laden water in the partially thickened underflow resulting in a second stage of classification.



# Boost cyclone output



gMAX® radial manifold system with CycloWash™ installed

## Without CycloWash™

Mesh	Feed	O/Flow	U/Flow
STPH Solids	45.7	33.2	12.5
% Solids	39.3	34.2	65.2
US GPM Pulp	343.0	300.0	43.0

Mesh	Feed CUM. %+	O/Flow CUM. %+	U/Flow CUM. %+
35	2.4	0.1	8.7
48	8.7	0.7	30.0
65	17.3	3.4	54.5
100	27.2	12.3	67.0
150	36.4	22.2	74.2
200	44.2	31.3	78.6
270	49.8	38.0	81.2
325	54.2	43.8	82.6
-325	100.0	100.0	100.0

\*Injection water rate: 17 GPM

## With CycloWash™

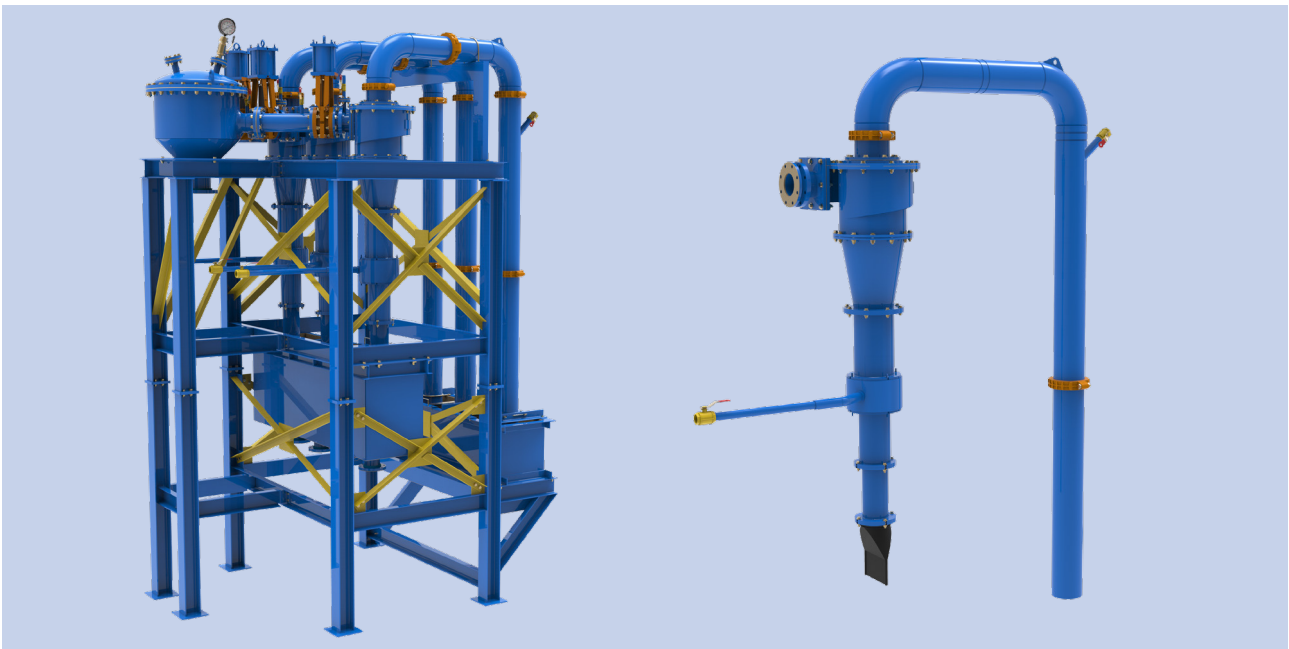
Mesh	Feed	O/Flow	U/Flow
STPH Solids	44.0	31.5	12.5
% Solids	37.9	32.8	61.9
US GPM Pulp	348.0	300.0	48.0

Mesh	Feed CUM. %+	O/Flow CUM. %+	U/Flow CUM. %+
35	2.9	0.0	10.2
48	9.9	0.4	33.9
65	19.1	2.2	61.4
100	27.7	8.4	76.2
150	35.5	16.8	82.6
200	42.8	25.2	86.9
270	47.9	31.6	88.8
325	52.0	36.8	90.1
-325	100.0	100.0	100.0

\*Injection water rate: 17 GPM

# Improve performance at low cost

The CycloWash™ and CycloStack™ can be used in combination to provide both maximal desliming and dewatering of cyclone underflow product. The CycloWash™/CycloStack™ combination also can be used to wash and thicken both end products and tailings.



Our CycloWash™ and CycloStack™ used together to maximize desliming and dewatering of cyclone underflow product. Image on left shows a three place radial inline manifold system. Image on right shows a single cyclone unit with custom designed overflow piping.

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