

HM Cyclones for Coal



The Leader in Heavy Media Cyclones

Did you know?

- The heavy media cyclone used in the coal industry is an extremely efficient cleaning device using finely ground (-325 mesh) magnetite and water as the “media”.
- The media density primarily determines separating gravity.
- A relatively wide range of coal sizes can be cleaned in a wide range of cyclone sizes.
- Ceramic lining is critical since high-ash “refuse” is very abrasive.
- Pressure should be kept relatively low to reduce classification of magnetite particles.
- Heavy Media Cyclones are usually operated in a near-horizontal orientation allowing for large apex sizes to be used for refuse removal.



FLSmidth Krebs supplies over 90% of all cyclones used in the U.S. coal industry, such as this 48-inch heavy media cyclone.



FLSmidth is a global leader in high-efficiency process systems for coal and mineral beneficiation.

For over a century, the company has helped advance the productivity of mineral processing operations with mechanical systems and process innovations of ever greater capacity, efficiency and reliability.

Today, FLSmidth continues to push the limits of mill performance, pioneering the integration of process hardware and intelligent control systems in self-optimizing plants of unprecedented profitability. FLSmidth's legacy started 127-years ago in Denmark, and now enjoys the financial stability and trusted brands of a worldwide technology organization.

Heavy Media Cyclones

Heavy media cyclones often appear as classifying cyclones, but they are instead used to clean coal. A gravimetric separation takes place because the buoyancy affect of the media forces the lighter coal solids to the center of the cyclone where they are transported upward and through the vortex finder. The dense mineral matter spirals toward the apex and exits through that orifice.

Optimum cyclone performance relies on minimizing turbulence while extending residence time. The Krebs® gMAX® Cyclone has the capability to produce finer and sharper particle separations using large high capacity hydrocyclones.

Krebs Large Diameter Heavy Media Cyclones

With FLSmidth Krebs new Large Diameter Heavy Media Cyclones, larger top size can be efficiently cleaned at higher feed rates within a coal preparation plant. Quite often cyclones can be used in lieu of maintenance-intensive heavy media vessels for cleaning coarse and fine coal. The high capacity design lends itself well to the now popular "parallel circuit" plant design where one feed pump is dedicated to one Large Diameter Heavy Media Cyclone along with a separate set of screens.

One of the most important features of a Heavy Media Cyclone is its coal cleaning efficiency. Krebs has taken several design features of the D26B, that has long been established as the industry's standard high capacity cyclone with "benchmark" efficiencies, and incorporated them into the new larger diameter designs.

The 30", 40", 48", and 55" diameter models utilize a patented ceramic "acceleration wedge". By inserting a smaller wedge, more capacity is immediately obtained. Alternately, a larger wedge can be installed where more G-forces are required to clean fine coal more efficiently.

To ensure your new cyclone operates for long periods of time with minimal maintenance requirements, 1" to 1.5" (25-36mm) thick ceramic lining is utilized throughout the designs with replaceable cone liners and apex inserts in the lower regions of the cyclone. Several ceramic lining options are available to meet each operation's needs.

Krebs Heavy Media Cyclones - Typical Operating Conditions

Krebs Model Designation	Recommended Top Size [in/mm]	Volumetric Feed Rate U.S. Gal/Min (m ³ /hr)	Pressure Equivalent Liquid Column Height [ft/m]	Capacity* STPH (MTPH) Raw Coal
D20B	.5" [12.5]	720 (164)	15 [4.6]	58 (53)
D20LSB	.75" [19.05]	1325 (301)	17 [5.2]	106 (96)
D26	1.5" [38.1]	1400 (318)	19.5 [5.9]	112 (102)
D26B	1.5" [38.1]	1900 (431)	19.5 [5.9]	152 (138)
D30B	2.0" [50.8]	2800 (636)	22.5 [6.9]	226 (205)
D33B	2.5" [63.5]	3900 (886)	24.8 [7.6]	314 (285)
D40B	3.0" [76.2]	5700 (1295)	30 [9.1]	460 (417)
D48	3.5" [88.9]	9100 (2067)	36 [11]	728 (660)
D55	3.5" [88.9]	12313 (2797)	41.3 [12.6]	985 (894)

*Based on a 4:1 media-to-coal ratio, v/v.

**These capacities represent maximums for units fitted with the largest vortex finder and inlet. Contact FLSmidth Krebs for all specific HMC applications.

Maintenance of Ceramic-Lined Cyclones

www.flsmidthkrebs.com



With several ceramic liner options, frequent maintenance is usually not a requirement. Preventative maintenance, as with other pieces of process equipment, is important, however.

For Classifying, Water-Only, and Heavy Media Cyclones, apex wear is probably the most important aspect and the easiest to monitor. With all pump motor electrical switches properly secured, a flashlight and measuring device are usually the only items required for this inspection.

To inspect the other liners, usually an apex assembly or overflow pipe and vortex finder can be removed. If this still doesn't allow adequate view of all liners, additional disassembly will be

required. Because the liners are somewhat brittle, all ceramic lined cyclones should be handled carefully; hammering on any surface of the cyclone is not recommended.

Because Krebs ceramic lined cyclones will last such a long period of time, some maintenance personnel may forget certain aspects of repairing them. In this case, please contact FLSmidth Krebs (www.flsmidthkrebs.com) or your local Representative for assistance; some of the representatives may also be able to provide you with a rebuild or exchange service if you're interested.



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