

KREBS®

PUMPS, CYCLONES AND VALVES

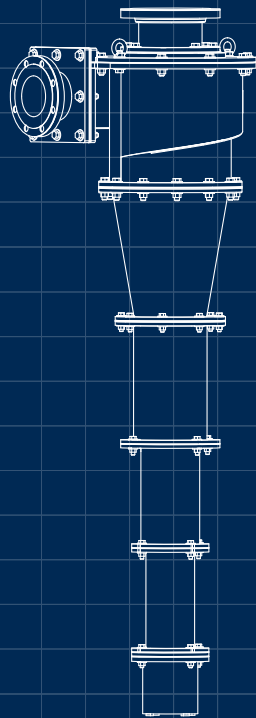
gMAX® Hydrocyclones

Finer particle separation
with patented technology



gMAX[®] hydrocyclones **performance**

We have dramatically enhanced hydrocyclone geometry and materials of construction to provide our customers with finer and sharper separations, as well as higher throughput, reliability, and product life. This improvement in performance and availability increases user's productivity.



Key benefits

■
Finer, sharper
particle separations
at high capacities

■
Fewer cyclones
needed for optimal
performance

■
Operates at higher
feed densities for same
separation results

■
Operates at
low cyclone
inlet pressure

■
Retrofitted into
existing installations
to boost throughput

KREBS® Hydrocyclone technology leads the way in separation mining and industrial applications

Optimum cyclone performance relies on minimizing turbulence while maximizing tangential velocity. The gMAX® cyclone focuses on these two important factors, significantly advancing cyclone performance.

To achieve these two design criteria, the gMAX incorporates performance-enhancing improvements to the inlet head, cylinder section, cones, and apex. In fact, the performance level reached by the gMAX was once only achievable using many small-diameter cyclones, at a much higher capital cost.

- Minerals processing
- Oil sands
- Power plants (FGD)
- Chemicals
- Automotive
- Industrial and manufacturing
- Water treatment

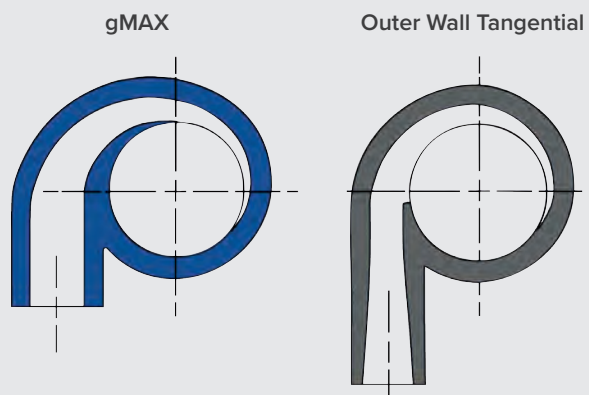




gMAX inlet head

- Contoured ramped inlet pre-classifies feed and reduces turbulence
- Reduced turbulence minimizes coarse solids bypass to overflow
- Less turbulence reduces wear

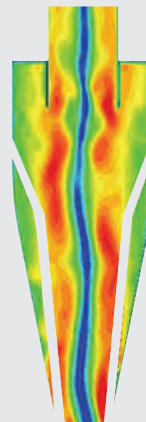
The innovative gMAX® inlet



Paint wear test: gMAX vs. outer wall tangential



The innovative gMAX cone



gMAX[®]

Innovative hydrocyclone design

Inlet head design

The innovative gMAX[®] inlet design provides finer and sharper particle separation at high capacities. Our commitment to continuous improvement in separation technology for our mining and industrial customers is why we are the world leader in cyclones.

The outer wall involute design entrance pre-classifies the feed solids prior to entering the main body of the cyclone. The inlet head of the gMAX also includes an improved vortex finder and top cover plate liner design.

These improvements result in reduced misplacement of material to the overflow and dramatically increased wear life. By using premium ceramics in the lower section of the cyclone, we've boosted overall wear life, greatly increasing the intervals between complete cyclone rebuilds.

Paint wear test: gMAX vs. outer wall tangential

To validate the reduced turbulence and wear characteristics predicted using computational fluid dynamics (CFD) on the gMAX

inlet head design, layers of paint in different colors were applied to the gMAX inlet head liner (left insert) and to a competitor's outer wall tangential inlet head liner (right insert). The components were assembled onto cyclones and slurry was pumped through them in FLSmidth Krebs' cyclone laboratory.

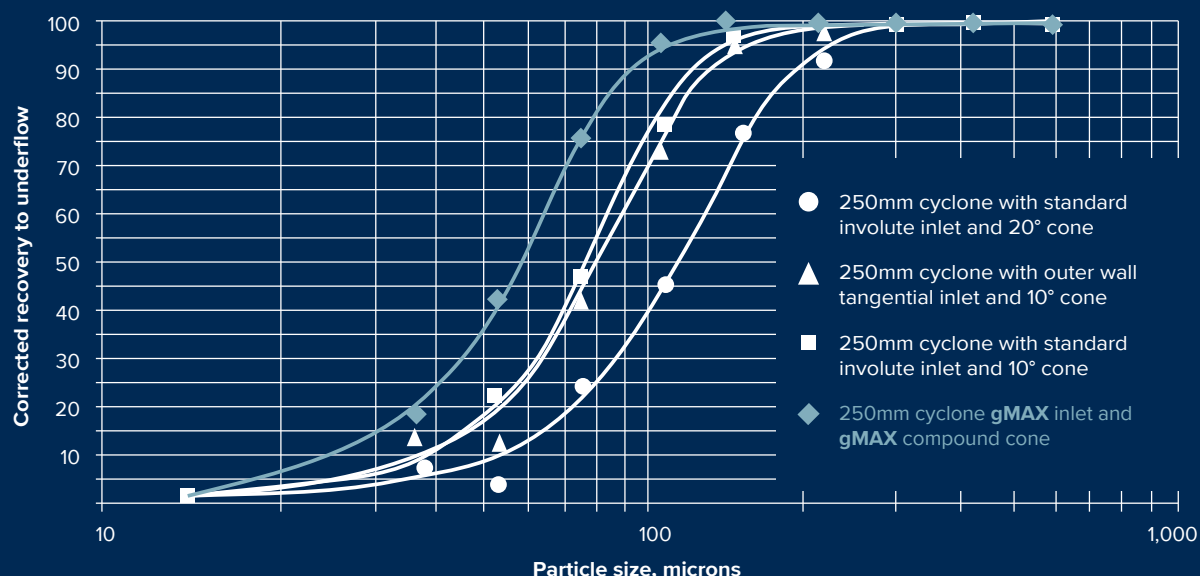
The resulting wear patterns show a dramatic reduction and wear as a result of the improved gMAX geometry.

Cone design

Through the use of computational fluid dynamics (CFD) analysis, our gMAX cyclone design features more sharply angled upper cones, followed by longer, angled lower cones.

This combination maximizes tangential velocity in the upper part of the cyclone. It also provides a long residence time in the critical separation zones in the lower part of the cyclone. The result is a substantially finer separation, with fewer fines in the underflow and less coarse material bypass to overflow.

gMAX[®] cyclone compared to other cyclones



World-class service and hydrocyclone test facilities

Our unparalleled technical staff of experienced engineers will quickly and thoroughly evaluate your potential applications and provide detailed recommendations and performance estimates. If your application requires validation testing, our hydrocyclone test lab can provide prompt testing at low cost. We also can arrange to run test cyclones at your site.

Optional liner materials available

- BPC rubber
- Neoprene
- Nitrile
- Chlorobutyl
- Alumina
- Nitride bonded silicon carbide ceramic
- Reaction bonded silicon carbide ceramic
- Sintered alpha silicon carbide ceramic

Fabricated/cast/molded unlined cyclone materials

- 304L/316L SS
- Duplex 2205
- CD4MCU
- Monel
- Inconel
- Nickel
- Hastelloy
- Other metal alloys
- Polyurethane*

* see brochure #9-201 molded polyurethane cyclones



GLOBAL SALES LOCATIONS

FLSmidth - Australia

Pinkenba, QLD, Australia
Tel: +61 7 5519 5700
Email: krebsaustralia@flsmidth.com

FLSmidth - Brasil

Sao Paulo, Brasil
Tel: +55 15 3416 7400
Email: krebsbrasil@flsmidth.com

FLSmidth - Chile

Santiago, Chile
Tel: +56 2 2463 8350
Email: krebschile@flsmidth.com

FLSmidth - Austria

Neusiedl am See, Austria
Tel: +43 2167 3345
Email: krebseurope@flsmidth.com

FLSmidth - Philippines

Ortigas Center, Pasig City, Philippines
Tel: +63 2 687 9251
Email: krebs-philippines@flsmidth.com

FLSmidth Private Limited

Chennai, India
Tel: +91 44 4748 1000
Email: krebsindia@flsmidth.com

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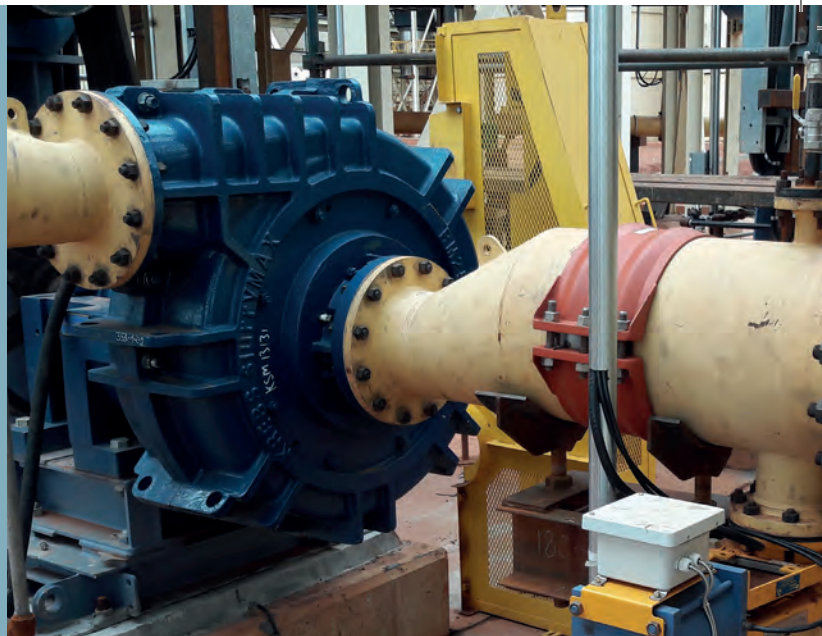
Beijing P.R. China
Tel: +86 10 8468 9100
Email: krebschina@flsmidth.com

FLSmidth - South Africa

Johannesburg, South Africa
Tel: +27 0 10 210 4000
Email: krebsafrica@flsmidth.com

**We offer a complete system
of knife gate valves and pumps
to feed your cyclone separation
solutions.**

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**Our slurry pumps with
wear ring technology delivers
constant cyclone feed pressure
through the life of the system.**

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Bringing better solutions to light

in the cement and mining industries

The future is full of possibilities and you are leading the way. But it's never a straight journey and it's easy to lose sight of true potential. With an ally by your side, who shares your ambitions and who sees your world from different angles, we will find the right way together.

For more than 135 years, we have challenged conventions and explored opportunities. Across more than 50 countries, we are 13,000 employees who combine our unique process-knowledge on projects, products and services to drive success. We develop the most advanced technology in our industries and offer market-leading product and service ranges.

Rooted in Danish values, we activate our knowledge and experience to navigate your complexity and bring better solutions to light. So no matter where in the world you are, we are here to help you discover new ground and achieve sustainable productivity enhancement.

We are the market-leading supplier of engineering, equipment and service solutions to customers in the global mining and cement industries.

We discover potential.



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FLSmidth

5505 W. Gillette Road
Tucson, AZ
USA

Tel +1 520 744 8200
Fax +1 520 744 8300

krebs@flsmidth.com