

**CAVEX®**  
Hydrocyclones

Slurry  
Equipment  
Solutions



**CVX Laminar Spiral Hydrocyclones**



# **Weir Minerals are specialists in delivering and supporting Slurry Equipment Solutions including pumps, hydrocyclones, valves and wear resistant linings for global mining and mineral processing, the power sector, and general industry.**

**We use our specialist slurry knowledge and experience from around the world to deliver reliable product and service solutions.**

**Our global network ensures that we are close to our customer wherever they base their local operations.**

The strength of Weir Minerals products lies in the superiority of our hydraulic designs and wear and corrosion resistant materials.

For many years we have applied this experience of slurry handling technology in the design and manufacture of hydrocyclones.

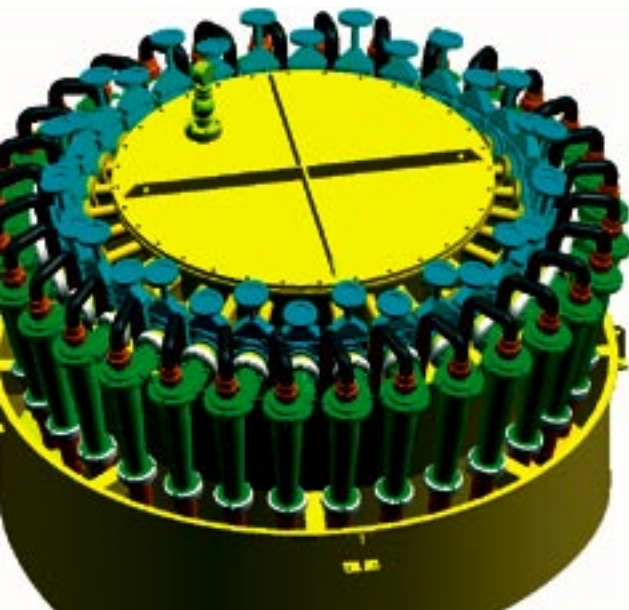
Cavex® Hydrocyclones feature a unique laminar spiral inlet geometry designed to deliver maximum efficiency, maximum capacity and longer wear life than conventional involute or tangential feed hydrocyclone designs.

Not just a cone modification, the Cavex® hydrocyclone has an entirely new feed geometry that substantially increases hydraulic capacity while minimising localised wear on the feed chamber and vortex finder. These design improvements result in lower operating costs and fewer hydrocyclones required for a given duty.

For grinding circuit applications, Cavex® hydrocyclones increase circuit capacity by minimising the quantity of fines bypassing to the underflow stream. Cavex® hydrocyclones achieve these results by maximising the air core diameter created within

the rotating mass of fluid in the hydrocyclone. These effects are proven in both laboratory testing and full scale plant operation.

- **Around 300% increase in feed chamber wear life.**
- **Superlative hydrocyclone process efficiency, with reduced grits in**



*Each cluster of Cavex® hydrocyclones is modelled using the latest 3D CAD technology.*



## Our customers range from the world's largest mining and minerals multinationals to single site operators.

**We don't just claim that a Cavex® hydrocyclone will lower your ownership costs. We have field tests to prove it.**

Look how the Cavex® hydrocyclones can lower your ownership costs, just as it did in the following case studies.

**Get the same grind at higher tonnage -**  
Osborne Mine, Australia

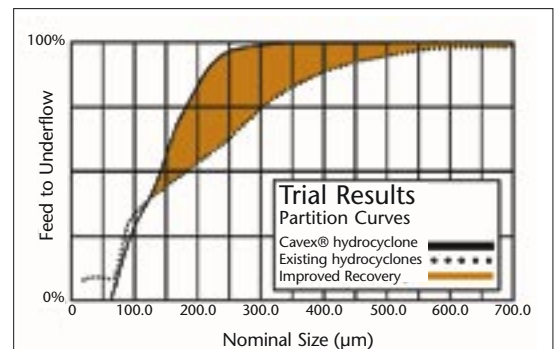
The efficient classification of Cavex® hydrocyclones produced a lower P80 and a lower circulating load. This allowed Osborne to increase tonnage at the original P80.

**Increase metal recovery -**  
Zinkgruven Mine, Sweden

At the Zinkgruven Mine in Sweden, eight Cavex® hydrocyclones replaced eight conventional style hydrocyclones. Less coarse particles in the flotation feed gave an additional increase of 0.5% metal recovery. Payback on the Cavex® installation was achieved within 28 days.

**Increase wear life by 300% -**  
Bronzewing Gold Mine, Western Australia

A Cavex® hydrocyclone was placed in a cluster of 14 conventional style hydrocyclones at the Bronzewing Gold Mine in Western Australia. Conventional style feed chamber liners, 25mm thick, averaged 1200 hours when worn through. The Cavex® hydrocyclone rubber feed chamber liners, 25mm thick, averaged 3750 hours - a 300% increase in wear life. All hydrocyclones are now Cavex® hydrocyclones.



### Improve leach kinetics

The graph above shows the hydrocyclone efficiency curves prepared by operations staff. The inclusion of the Cavex® hydrocyclones, along with other plant modifications, increased gold recovery at Bronzewing.

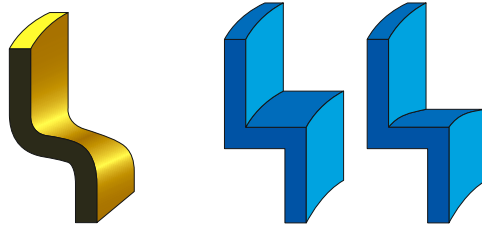
Results of head-to-head trials in a gold mining operation closed circuit grinding with a feed slurry of 65% w/w. Major reduction of the >300 micron particles from the overflow increased gold recovery. Wear life of the Cavex® hydrocyclone liners was three times longer.

# The Cavex Laminar Spiral Hydrocyclone

## - Maximum Life

### How do Cavex hydrocyclones reduce turbulence?

The design of Cavex hydrocyclone's laminar spiral inlet geometry provides a natural flow path into the hydrocyclone. This unique shape has no sharp edges and no square corners and allows the feed stream to blend smoothly with the rotating slurry inside the chamber.



**Cavex Design**

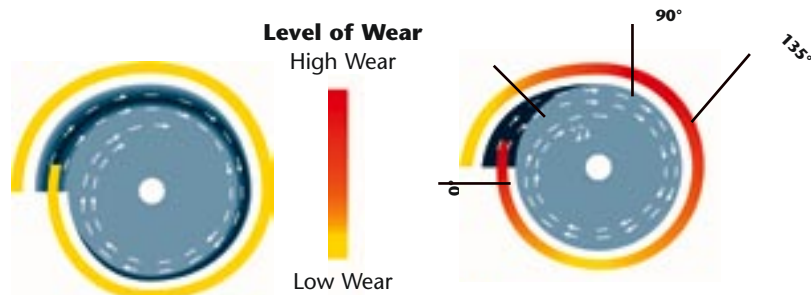
**Conventional Designs**

### Improved flow means you can do more with less – less power consumption and fewer hydrocyclones.

By minimising resistance of flow through the feed chamber, Cavex hydrocyclones process substantially higher slurry volumes than conventional hydrocyclones with equivalent fittings. This increased productivity effectively reduces the quantity of hydrocyclones required and/or reduces the energy required to perform a given duty.

The result is greatly reduced turbulence throughout the whole hydrocyclone, creating more even wear, longer life and a more efficient classification.

In conventional hydrocyclones, slurry bursts into the cylinder with no flow control and the resulting turbulence is responsible for gouging the liner walls.



**Plan View - Cavex Design**

**Plan View - Conventional Design**

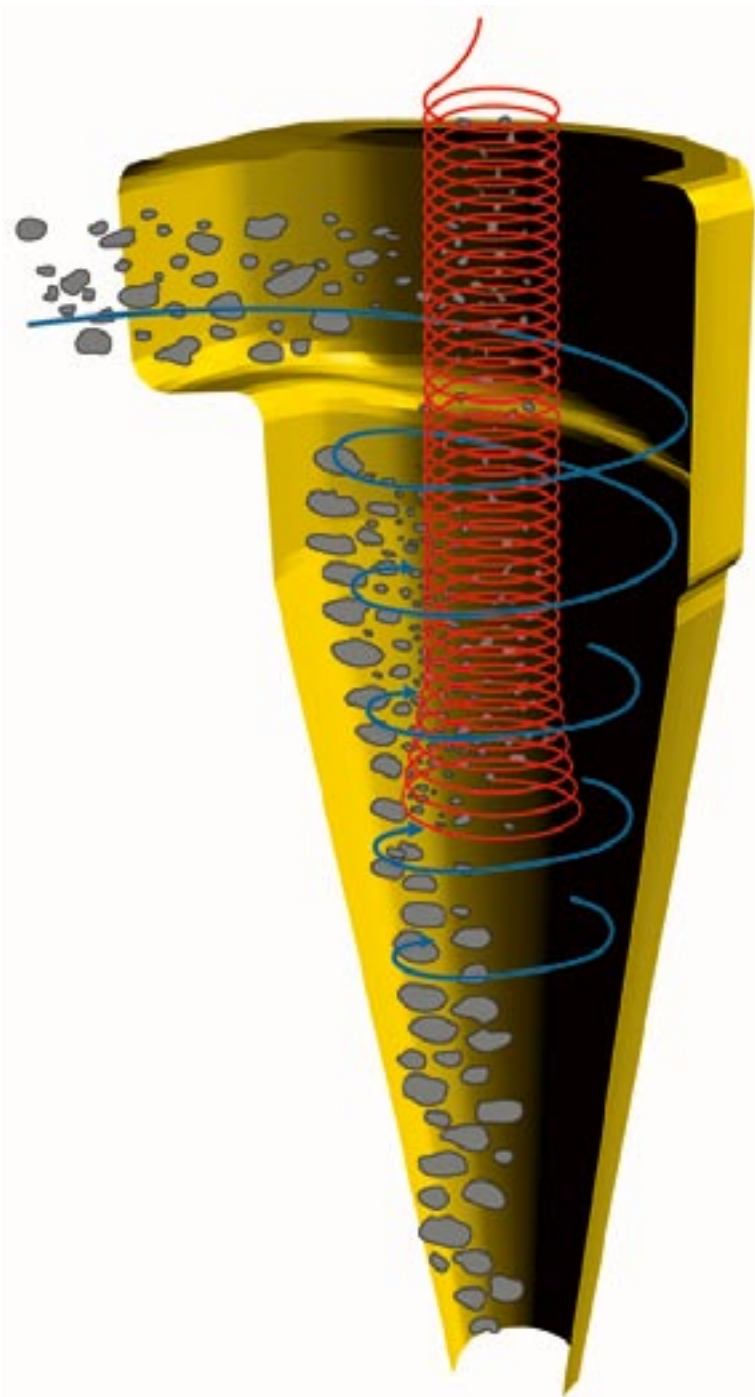
**Cavex Design =**

**High efficiency + low even wear**

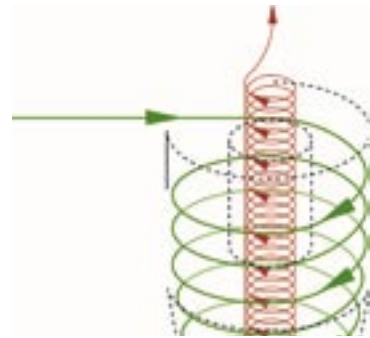
**Turbulence =**

**Loss of efficiency + localised wear**

## The Cavex Laminar Spiral Hydrocyclone - Maximum Efficiency



Reduced turbulence means improved efficiency and classification



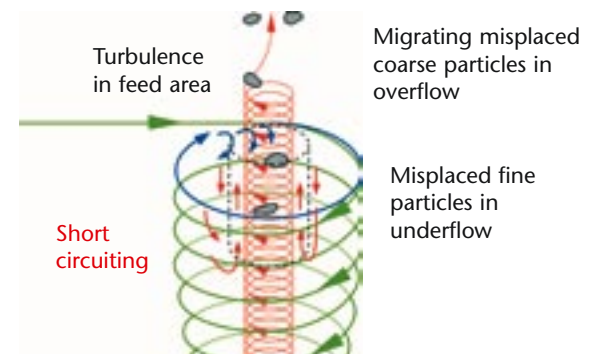
**Cavex Design =**

**High recovery + higher grade**

Cavex "Laminar Spiral" hydrocyclone geometry dramatically reduces misplaced coarse carry-over resulting in significant financial gains.

The increased classification efficiency means that overgrinding and circulating load are reduced.

**but with conventional designs**



**Turbulence =**

**Misplaced particles + overgrinding**

Conventional geometry causes migration of unclassified coarse solids to the overflow.

The effects of this can result in valuable mineral losses.



### Models 100, 150, 250, and 400 Design Features

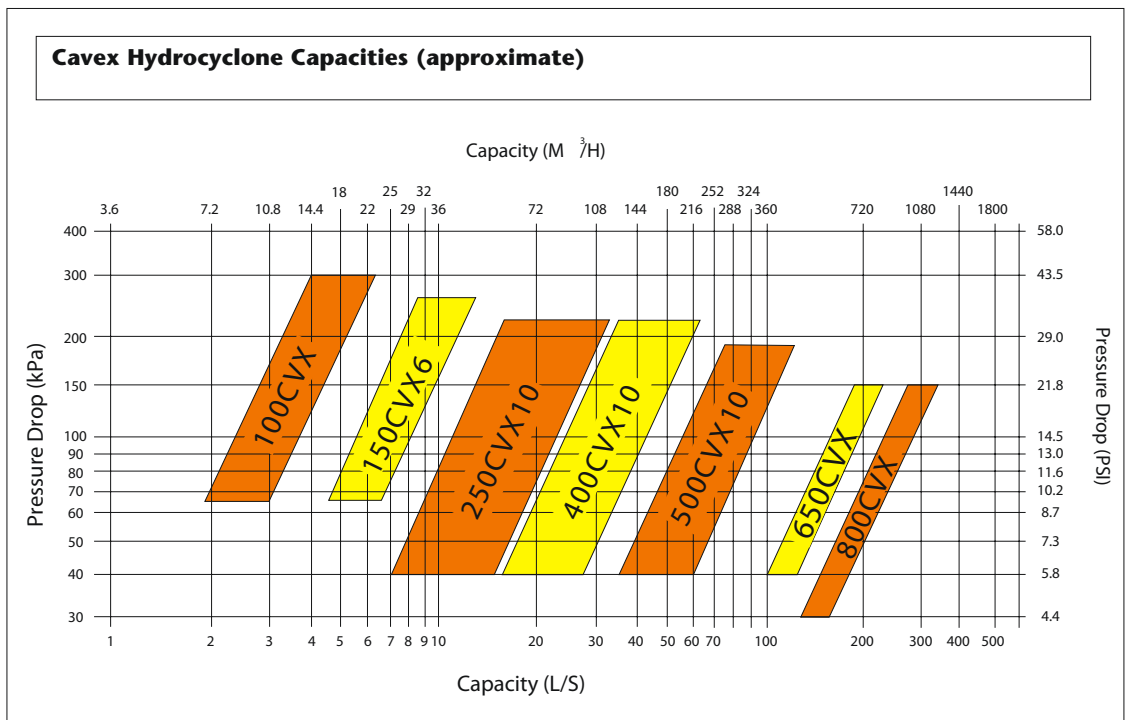
- Laminar Spiral Inlet Geometry
- Reinforced polyester resin casing
- Snap fit, replaceable, elastomer liners
- 316L ss Quick Release clamp fasteners
- Polyurethane or Hyperchrome vortex finders
- Rubber, urethane, or ceramic spigots
- Moulded HDPE overflow pipe



### Models 500, 650, and 800 Design Features

- Laminar Spiral Inlet Geometry
- Fabricated steel or cast ductile iron casings\*
- Replaceable, elastomer liners, up to 45mm thick. Ceramic lower cone available
- Rubber vortex finders
- Rubber or ceramic spigots
- Rubber lined steel overflow pipe or "Air Core Booster" cap available

\* cone casings on Model 500CVX10 are polyester fibreglass and fabricated steel



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Top: Warman AH Ultra Heavy Duty Slurry Pumps in Finland  
 Below: The Isogate WS heavy duty slurry valve ready for shipping to a customer in South America  
 Below: A cluster of Cavex hydrocyclones used in an Australian gold mine  
 Bottom: Vulco Trommel for a customer in Chile

Weir Minerals has an advanced product range incorporating market leading brands covering virtually any application, in any environment.

Our global leadership in slurry pumps is combined with innovative designs in complimentary products such as slurry valves, hydrocyclones and wear resistant linings.

**The Weir Minerals Brands :**

**WARMAN®**  
 Centrifugal Slurry Pumps

**GEHO®**  
 PD Slurry Pumps

**Cavex®**  
 Hydrocyclones

**ISOGATE®**  
 Slurry Valves

**VULCO®**  
 Wear Resistant Linings

**Geographical Footprint**

Weir Minerals has the geographical presence to service all the major minerals markets around the world. This global supply capability provides a competitive advantage in this relatively fragmented market.

**Customer Profile**

Our customers range from the world's largest minerals and mining multinationals to single site coal producers.

Weir Minerals capability supports an array of customer specifications with products easily adaptable to meet specific process requirements.

We build close, long term partnerships through which we are able to help customers achieve process efficiencies.

Weir Minerals customers include:

- Alcoa
- Barrick
- Codelco
- De Beers
- Newmont
- WMC
- Anglo-American
- BHP-Billiton
- CVRD
- Grupo Mexico
- RTZ

We support customer operations worldwide with consistent products and local engineering expertise. As part of the Weir Group, we have the reach and resource to build close, long term relationships with all our customers, helping them to achieve ...

**The Lowest Cost of Ownership**



**WARMAN**® Centrifugal Slurry Pumps  
**GEHO**® Positive Displacement Slurry Pumps  
**CAVEX**® Hydrocyclones  
**ISOGATE**® Slurry Valves  
**VULCO**® Wear Resistant Linings

For further information on any of these products or  
Total Care product support services contact your  
nearest sales office or via:

**[www.weirminerals.com](http://www.weirminerals.com)**

*European Sales Offices :*

<i>Belgium (BeNeLux)</i>	<i>014 47 09 60</i>
<i>Czech Republic</i>	<i>05 435 18300</i>
<i>Dubai</i>	<i>04 883 8581</i>
<i>Finland</i>	<i>03 877 350</i>
<i>France</i>	<i>04 72 81 72 72</i>
<i>Germany</i>	<i>07062 95290</i>
<i>Hungary</i>	<i>034 314 794</i>
<i>Netherlands (GEHO)</i>	<i>077 3895200</i>
<i>Italy</i>	<i>02 92 44 32.1</i>
<i>Poland</i>	<i>012 632 8469</i>
<i>Romania</i>	<i>0259 465 344</i>
<i>Russia</i>	<i>095 775 0867</i>
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Slurry  
Equipment  
Solutions

