

KREBS®

PUMPS, CYCLONES AND VALVES

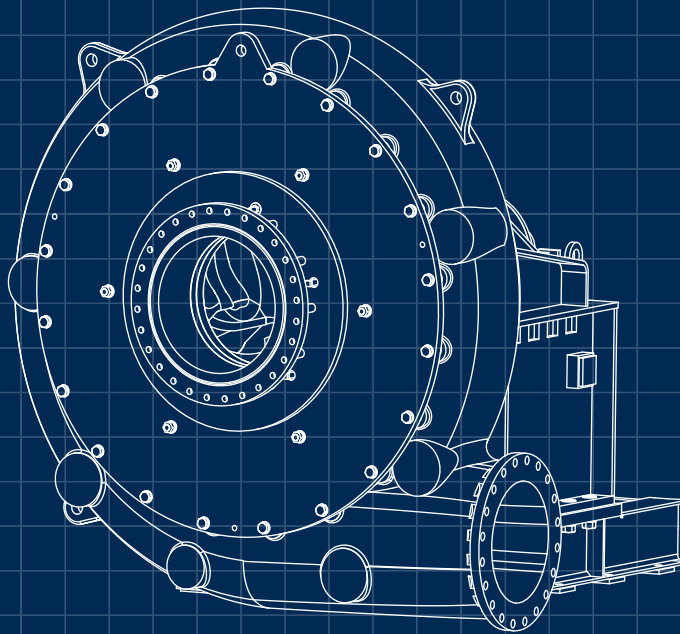
UMD™

Ultimate Mill Discharge pump



Heavy duty pump for tough abrasive slurries

Our KREBS UMD™ centrifugal slurry pump is designed to pump the discharge from hard rock grinding mills. The optimised, heavy duty design delivers the highest efficiency and even wear in the most abrasive applications.



Key benefits

■
Even and predictable
wear life for wet
end parts

■
Lowest
cost-per-ton
pumped

■
Multiple material
options for a wide
range of applications

■
5-10% decrease in
slurry power for the
same flow and head

■
Lower inventory
requirements

Grind in your mill, not in your pump

The UMD pump integrates a superior hydraulic design with our patented suction-side sealing system to reduce grinding and recirculation, while maximising wear life and efficiency.

Even and predictable wear life for wet end parts

The UMD pump features our wear ring suction-side sealing system that solves both the grinding and recirculation problems within the pump. To stop recirculation, pumps without a wear ring must close the suction-side clearance either with a full-face suction liner adjustment or by adjusting the impeller to the suction liner. This can be effective when pumping fluids without solids; with slurries, however, the solids that become caught between the rotating impeller and static suction liner are crushed, consuming power and causing wear.

Our wear ring solution stops recirculation, while still allowing for a large gap between the impeller and suction liner—eliminating the grinding of solids and increasing the wear life by more than 50% when compared with other pumps.

5-10% decrease in power consumption for the same head and flow

Because the UMD maintains a constant operating speed and does not grind particles, the pump lasts longer and consumes 5 to 10% less slurry power.

Multiple material options for a wide range of applications

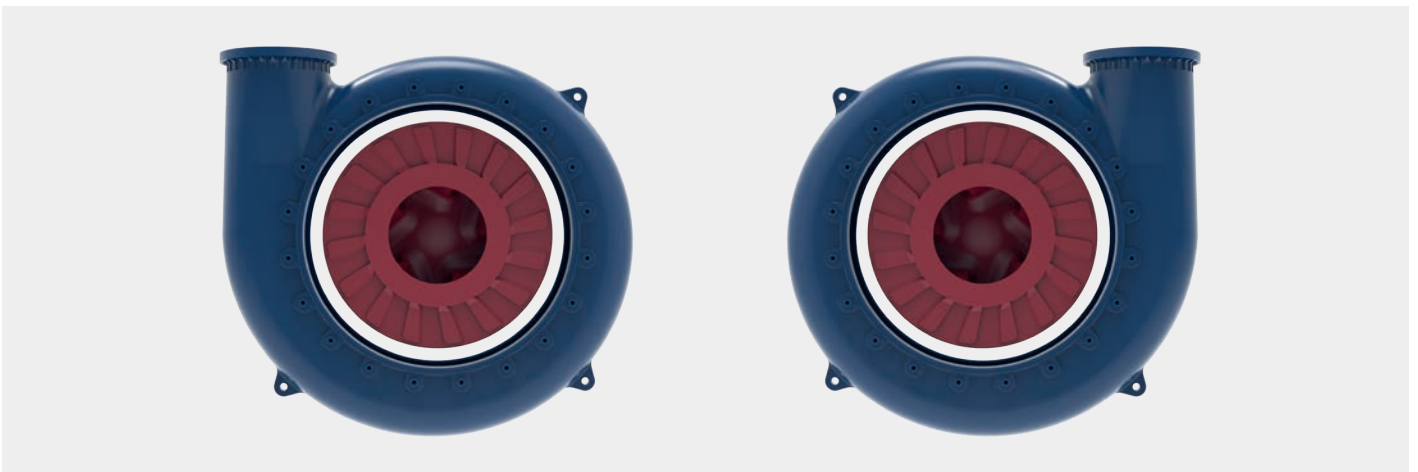
Our UMD is available in a variety of interchangeable elastomer, alloy and polyurethane liner materials. The UMD can handle a flow range from 200 to 90,000 GPM (50 to 20,000 m³/hr). High pressure and fully rubber lined split cased versions of the UMD pump are available for applications with wide flow ranges, corrosive agents and high discharge pressure requirements.

Lowest cost-per-ton pumped

Our UMD has been proven worldwide to reduce downtime, power and maintenance costs when compared to conventional pumps—in all, reducing your cost-per-ton pumped.

Lower inventory requirements

Many sites have pumps rotating in both left- and right-hand orientations. This requires keeping different casings, liners and impellers in stock. Our UMD has a symmetric casing, which means for either orientation, the same casing, suction liner, back liner and wear ring can be used (as shown below).



Lower your inventory requirements with our UMD symmetric casing design

Patented UMD designs

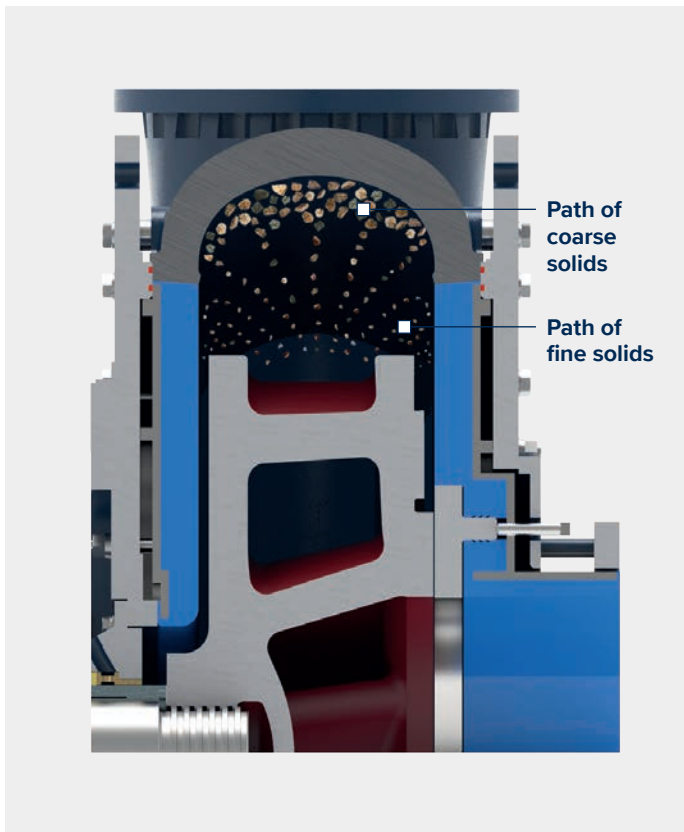
Longer wear life

Unique casing design

The UMD's large clearance between the casing and impeller creates a deep bed of slurry that acts as a buffer zone, shielding the casing from the direct impact of coarse solids. An enlarged cutwater clearance reduces turbulence to extend pump life.

Optimised impeller design

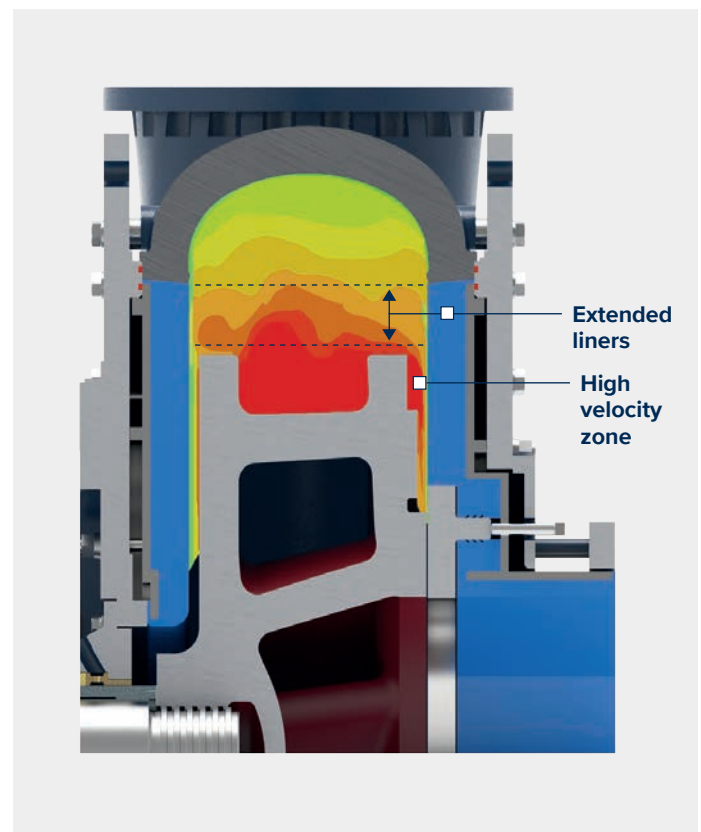
We have optimised the shape of the pumping vanes, increased the shroud diameter, and improved the shape of the expelling vanes to bring you the most hydraulically advanced impeller of its kind. The UMD impeller design reduces localised wear at the leading edges of the vanes to maintain efficiency and extend the wear life.



Wide clearances in the UMD create the deep bed of slurry that acts as a buffer zone to protect the casing

Oversized outer liners

Conventional pumps experience high wear rates around the outer diameter of the impeller due to the turbulent regime of fine solids. With this in mind, the UMD design incorporates oversized suction and back liners to contain the wear and protect the sides of the casing. Available in a variety of material options, the UMD puts the right liner material in the right place to provide 30-40% increased wear life over conventional pumps. Further, the design saves both money and maintenance time as the side liners are less expensive and easier to replace.



CFD analysis of velocity within an operating pump

KREBS® quick release

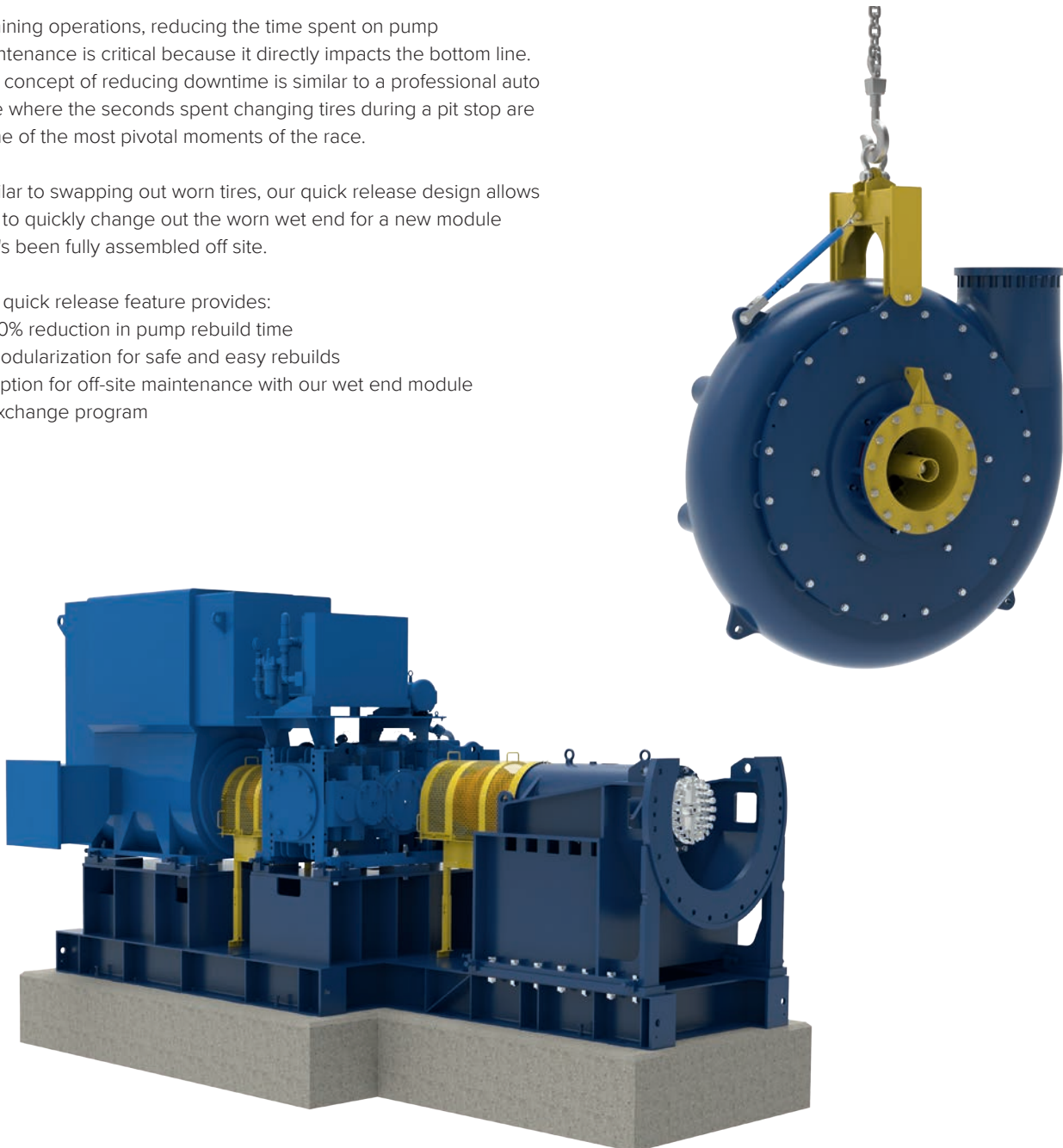
Feature for quick and safe rebuilds

In mining operations, reducing the time spent on pump maintenance is critical because it directly impacts the bottom line. The concept of reducing downtime is similar to a professional auto race where the seconds spent changing tires during a pit stop are some of the most pivotal moments of the race.

Similar to swapping out worn tires, our quick release design allows you to quickly change out the worn wet end for a new module that's been fully assembled off site.

Our quick release feature provides:

- 50% reduction in pump rebuild time
- Modularization for safe and easy rebuilds
- Option for off-site maintenance with our wet end module exchange program



UMD™ unlined pump

Design features

Advantages of an unlined pump

- At least 20% reduced maintenance time
- Compact, space saving design
- Fewer components required
- Symmetric casing design allows for use of same casing, suction liner, back liner and wear ring for both left- and right-hand orientations

Adjustable wear ring

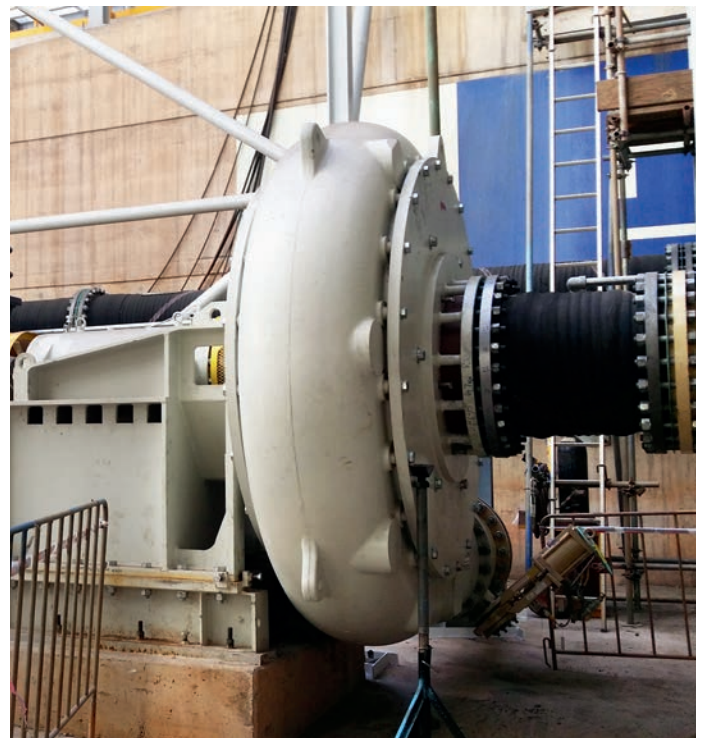
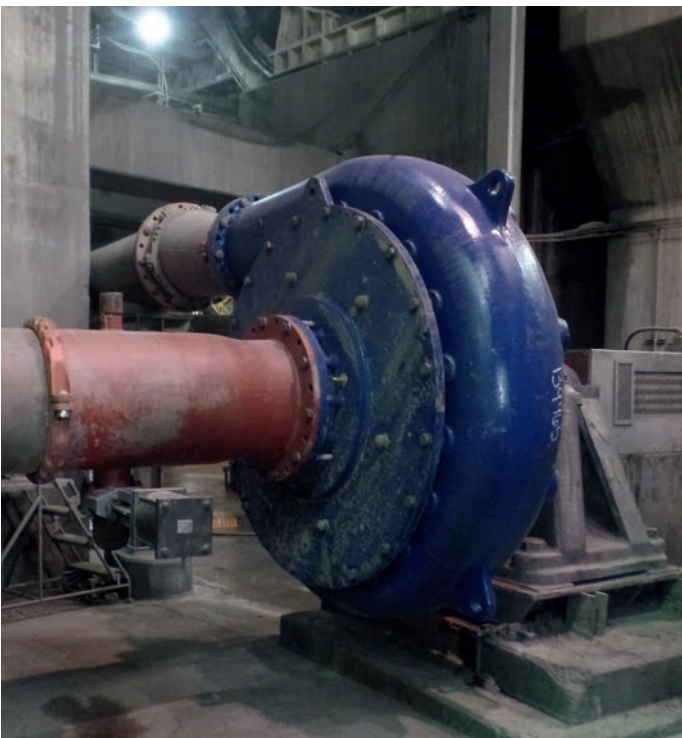
- Reduces suction-side recirculation
- Adjustable during operation
- Closes clearance at the impeller
- Maintains hydraulic performance
- Bearing assembly movement not required to adjust impeller clearances within the pump

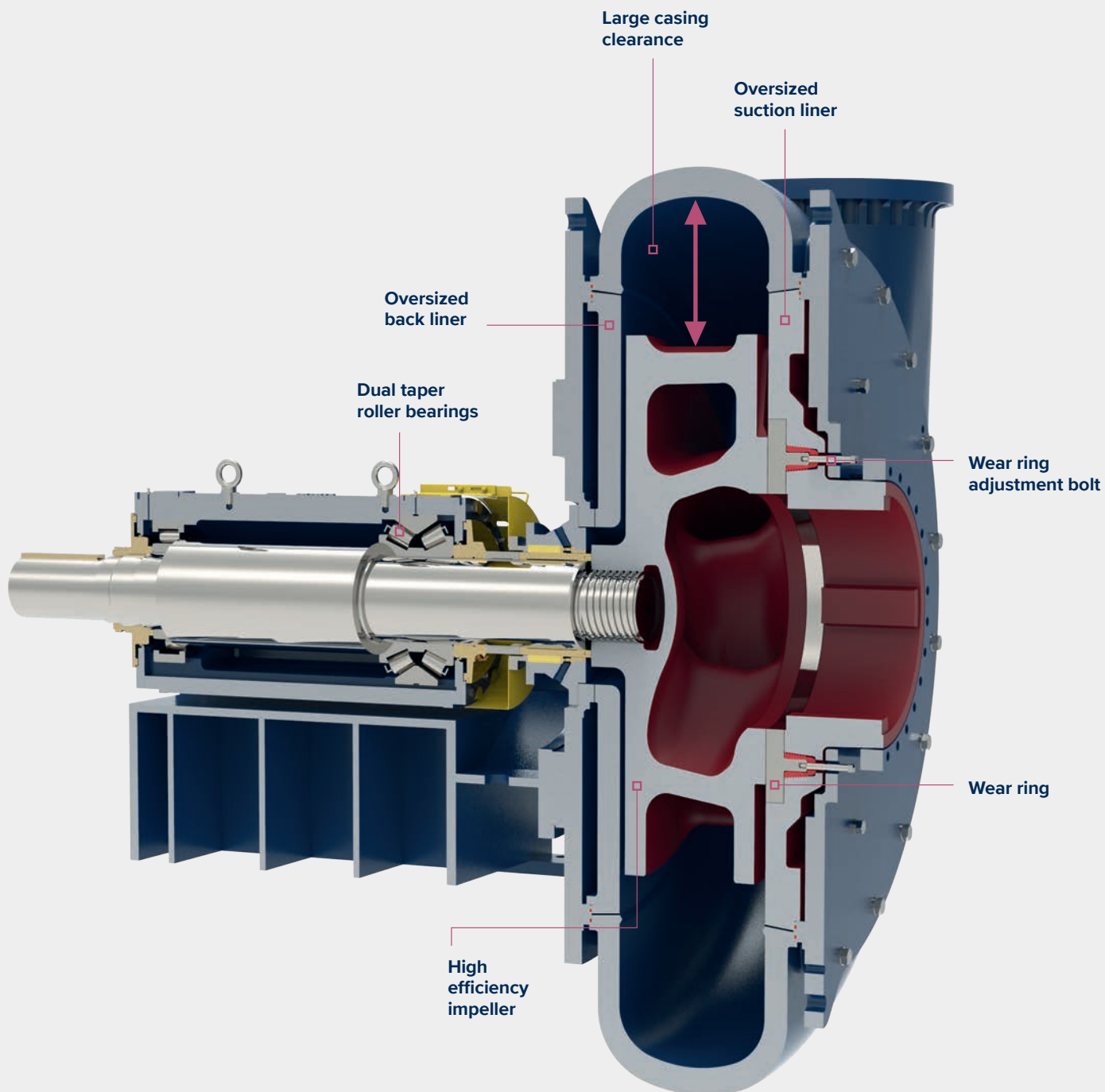
Bearings that cannot be over-greased

- Pumping action of taper rollers discharges grease to the outside, preventing ingress of slurry and eliminating the possibility of failure due to over-greasing
- Increase the effective load span to improve life
- Heavy-duty shaft and taper roller bearings rated at 100,000 hours minimum of B10 life
- Larger pump sizes utilise dual taper roller bearings

Multiple material options

- Heavy-duty thick outer casing designed to handle impacts of large and abrasive solids
- Interchangeable elastomer, alloy and polyurethane liner material options available





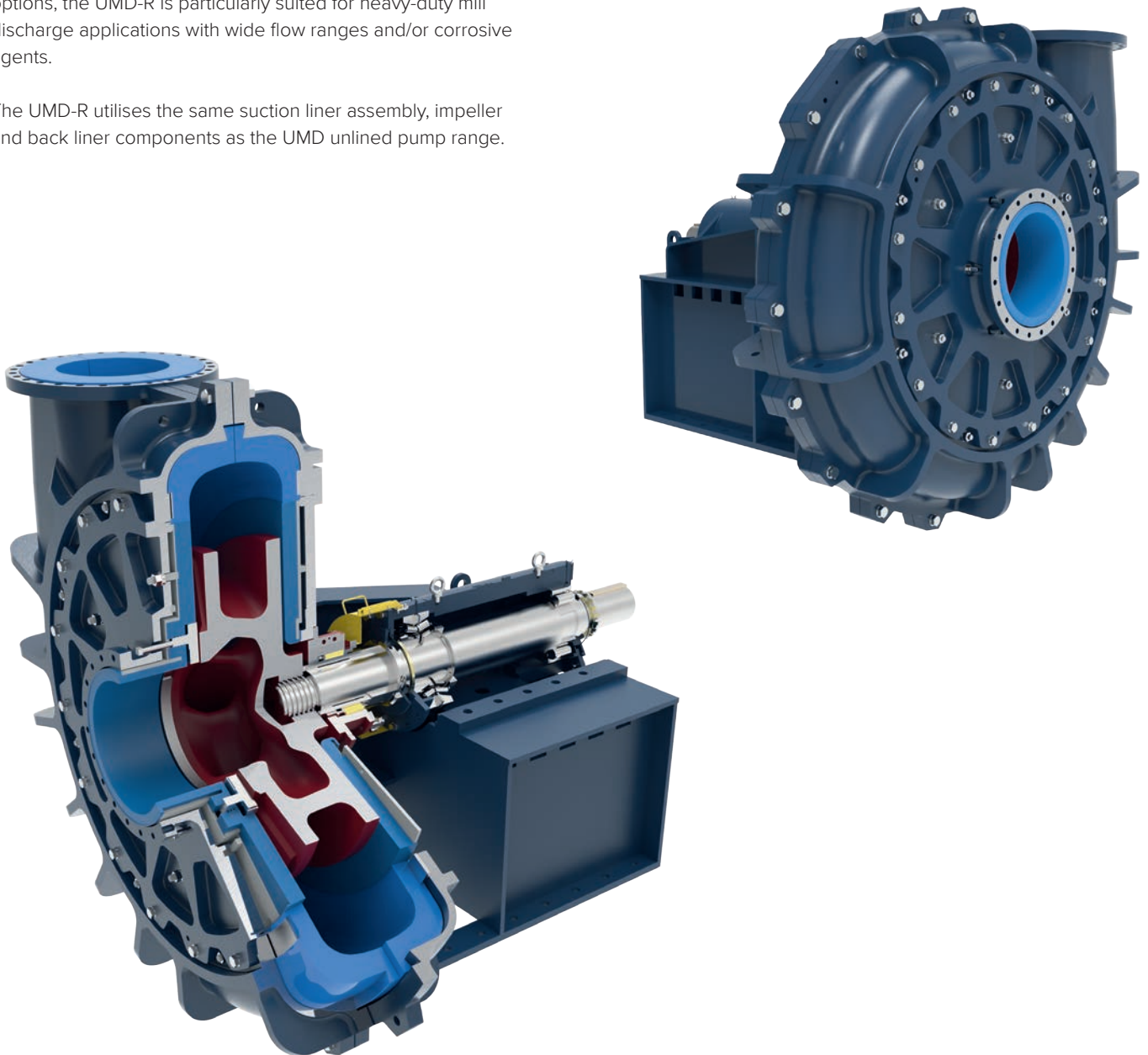
UMD™-R

Split case rubber lined pump

Ideal for wide-ranging flows and corrosive duties

The UMD-R is a fully rubber lined, split case version of the UMD. With thick rubber liners available in a range of elastomer material options, the UMD-R is particularly suited for heavy-duty mill discharge applications with wide flow ranges and/or corrosive agents.

The UMD-R utilises the same suction liner assembly, impeller and back liner components as the UMD unlined pump range.



UMD™-HP

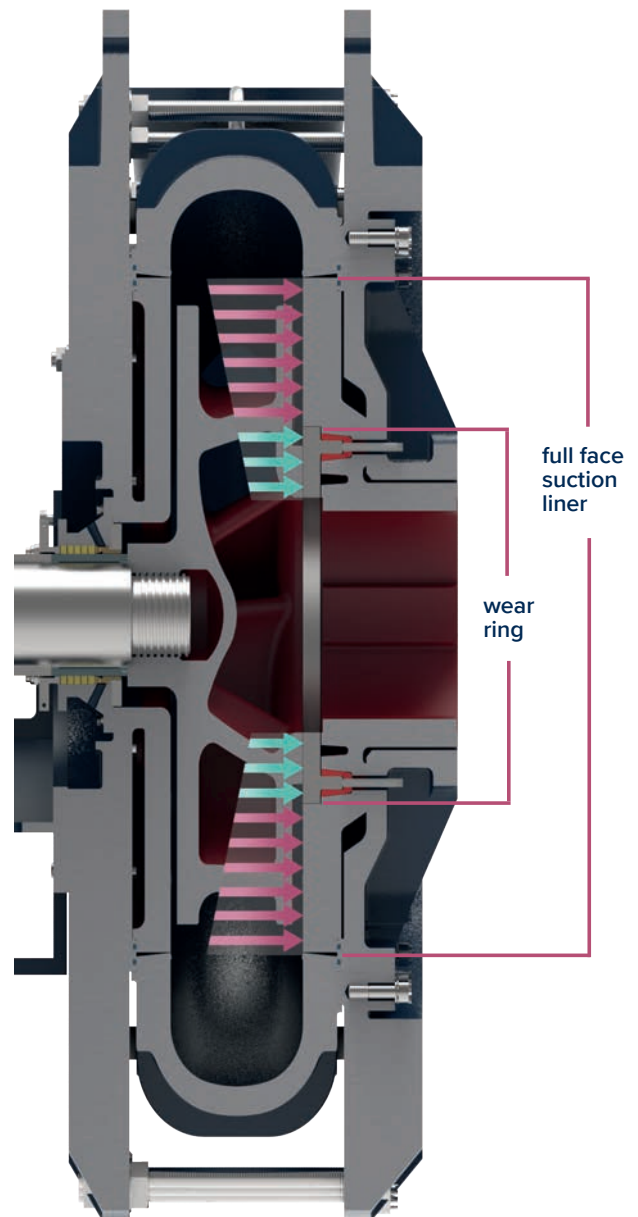
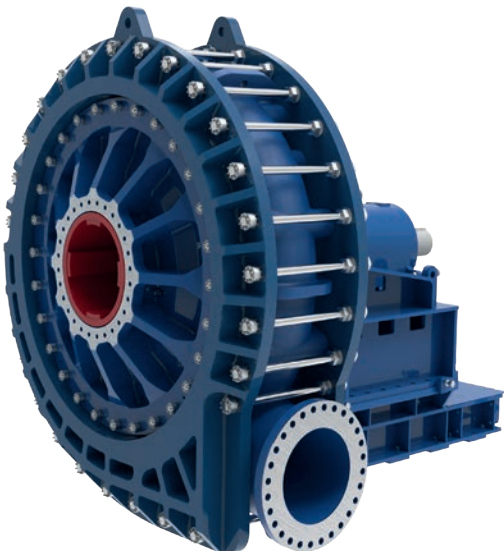
High pressure pump

Ideal for multistage applications

The high-pressure version of the UMD is designed specifically for multistage, high-pressure coarse tailings and hydrotransport applications. Within the tie-bolt design outer casing halves, sits a large diameter impeller and a thick chrome iron casing with added rib reinforcement. Back and suction liners, available in a range of ultra-wear resistant materials, significantly extend the wear life in the most abrasive applications.

Safe and easy adjustment at high pressures

Conventional designs, which rely on full face suction liner adjustments, require special tools and extreme force to attempt to reduce recirculation. By contrast, our wear ring makes up a small cross-sectional area of the suction liner minimising the force required to adjust the wear ring when the pump is operating. In fact, these adjustments can be performed by one person with a standard wrench. While competitors risk catastrophic failure from full face suction liner adjustments contacting the high velocity periphery of the impeller, wear ring adjustments occur close to the centre of the impeller where the velocity is low. As a result, wear ring adjustments on KREBS pumps provides the safest and easiest suction side sealing system, even at high pressures.



Force required to adjust a full face suction liner is exponentially greater than the force required to adjust our wear ring

low  high

Product range and applications

UMD™ size range

| Imperial units (in) | Metric units (mm) |
|---------------------|-------------------|
| 6 x 5 | 150 x 125 |
| 8 x 6 | 200 x 150 |
| 10 x 8 | 250 x 200 |
| 12 x 10 | 300 x 250 |
| 14 x 12 | 350 x 300 |
| 16 x 14 | 400 x 350 |
| 18 x 16 | 450 x 400 |
| 20 x 18 | 500 x 450 |
| 22 x 20 | 550 x 500 |
| 26 x 22 | 650 x 550 |
| 28 x 26 | 700 x 650 |
| 32 x 28 | 800 x 700 |
| 34 x 32 | 850 x 800 |
| 38 x 34 | 950 x 850 |

Mining Applications include:

- Mill discharge/primary cyclone feed applications
- Oil sands hydrotransport
- Hard rock tailings
- Coarse tailings
- Regrind cyclone feed
- Multistage applications
- High-flow applications
- Wide-flow applications
- Corrosive duties
- Other highly abrasive applications



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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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