polycom® high-pressure grinding roll

Designed to master future challenges in ore processing
Our solutions for the hardest jobs

When it comes to the crunch, grinding systems from thyssenkrupp Industrial Solutions offer the ultimate in performance, reliability and cost-effectiveness. With us as your partner, you can expect the best possible customized solution for even the most demanding of jobs.

Call on our services and you can count on a wealth of experience and ongoing innovative drive. As a leading manufacturer of machines and plants for the aggregates and mining industry, we supply well-engineered grinding systems that have stood the test of time in the toughest service conditions. At the same time, we invest in intensive research and development work to make proven solutions even better and adapt to changing demands.

polycom® – say hello to tomorrow’s world

Make sure you’re fit for the future.

Today’s reality is none too far from your dreams. Your real life polycom® is designed to meet the requirement of the fully digitized concentrator of the future and the standards of the industry 4.0. Besides of state of the art sensors, the ease of control, Local Analyze Interface, additional subsystems allow to integrate the polycom® easily into the needs of the future world of mining.

polycom® is designed to meet the future challenges in ore processing. Challenges such as increasing energy costs, lower ore grades and fine grained ores require an energy-efficient solution offering high capacity and an optimized comminution process for fine grind ores. thyssenkrupp grinding equipment has been developed to master all these challenges and offers the additional benefits of optimized wear lifetime, easy maintenance and ease of operation.

How you benefit

Reduced operating costs
• Energy-efficient operation
• No grinding media required
• Lower energy consumption in downstream process
• Reduced wear costs

Metallurgical benefits
• Higher recovery rates
• Faster recovery
• Micro cracks
• More fines in the product

Simple process control
• Only two parameters to adjust
  - Roll speed
  - Grinding force

thyssenkrupp’s global presence
• Maintenance teams around the world
• Service centers on each continent
• Market and innovation leader in HPGR technology
• More than 400 installations worldwide

Designed to master future challenges in ore processing
Following on from material analysis, ores are compared with the comprehensive thyssenkrupp Industrial Solutions material database to quickly and reliably obtain the data on their grindability, hardness, abrasiveness and agglomeration behavior, which are needed to design the plant configuration.

High-performance simulation programs support the selection of machines and systems and forecast the energy requirements, mill circuit material balances, wear rates, etc. This ensures future-oriented, customized plant solutions with the lowest possible operating expenses.

Whatever your needs – a new plant, upgrading of existing facilities or opening up of new fields of application for proven technologies and services – we can deliver.

**polycom® – your customized future-proof solution**

From small to large scale – always the right solution

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Profit from the experience of more than 400 polycom® installations.

Since the launch of polycom®, its wear protection concept has been constantly improved and adapted to the requirements of the different industries.

For abrasive materials such as those processed in the minerals and mining sector, roll bodies with surfaces protected against wear by hard metal studs are generally used. This polycom® model ensures a long service life, high plant availability and minimal maintenance requirements.

The design of the hard metal studs – their geometry, hardness and metallurgical composition – and their arrangement on the roll surface are specifically selected to suit the operating conditions and feed materials.

Nowadays, roll service lives of up to 60,000 hours have been achieved for iron ore concentrate applications, for example. And depending on the operating parameters, even higher figures are possible.

<table>
<thead>
<tr>
<th>Material</th>
<th>Operating hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron ore pellet feed</td>
<td>up to 60,000 h</td>
</tr>
<tr>
<td>Hard rock applications</td>
<td>up to 20,000 h</td>
</tr>
</tbody>
</table>

For abrasive materials such as those processed in the minerals and mining sector, roll bodies with surfaces protected against wear by hard metal studs are generally used.
Move up to the next level in automated data processing with our Local Analyze Interface (LAI), an edge device for data logging and pre-processing that will help to improve your plant performance and reduce downtime.

Ever since the launch of polycom® we have been working on solutions to make your life easier, reduce your plant downtime, and protect you and your employees. Now, we have employed our expertise to develop an all-inclusive smart data logging, storage and processing solution that is both safe and reliable.

The LAI edge device installable next to your polycom® delivers pre-processed information to a remote data storage unit as the basis for a range of smart services we can provide: expert reports, condition and process monitoring, machine protection, operation optimization, and lifecycle & performance management. This enables us to offer you practical assistance in the form of predictive maintenance, energy efficiency analyses, performance improvements, and reduced downtime.

**How you benefit**
- Safe and reliable data storage
- Internal cache to prevent data loss
- Secure operating system
- Multiple access to different control systems
- Easy configuration with web interface
- Internally developed core application
- Applications optionally expandable
- Use of different protocol possible
- Events’ generation with pre- and post-trigger
- Local data analyzer – different analysis methods possible

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**What is edge computing?**

Edge computing simply means that some of the computational requirements of modern-day applications are met in a decentralized manner from a cloud network. An edge device positioned close to where the data is collected or where a particular application is used thus provides an enhanced machine diagnostic interface for the user. With its DIN rail mounting, our LAI edge device is suitable for use in the control cabinet and industrial automation applications. Moreover, its flexible design enables functionalities to be expanded for a variety of additional applications.

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**Polycom® high-pressure grinding roll**

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**Innovative polprotect®:**
- Continuously scans the roller surface by laser
- Detects wear protection failures due to tramp metal
- Communicates the wear status of the studs
- Evaluates any service demand
- Allows the operator to clearly define the best timed stop for maintenance work

**How you benefit:**
- No wear inspection losses
- No manual inspection needed
- Maintenance stops scheduled in advance
- Wear report delivered every two hours

Wear is the main opponent in the grinding process. polprotect® guards you against the risk of production downtimes, reduced profits and high costs.

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**Raise your plant availability even higher.**

For decades polycom® has been the number one in the grinding circuit with up to 95% availability. With the polprotect® system we have raised availability to an even higher level – and it will facilitate your daily business.
Mega concentrator plants in Chile and Peru have made use of the benefits polycom® technology brings in their grinding process. Case studies produced by the customer give a clear picture of the advantages they have gained. Besides massive energy savings through reduced grindability index and a better recovery rate through the generation of micro cracks, the high level of availability and ease of maintenance convinced these customers to go for polycom®.
polycom® in heap leach plants

In greenfield or brownfield plants polycom® is always the best solution for your heap leach process. polycom® crushed ore has two important characteristics that result in much better recovery rates than conventional crushed ores.

More fines + micro cracks = better recovery
Declining ore grades, fine grade ores and the environmentally sustainable use of water are major challenges facing not just the iron ore industry but, increasingly, the entire mining industry as well. It needs energy-efficient grinding circuits to offset increasing costs. The polycom® dry finish grinding concept in combination with the ultra-energy-efficient velix® stirred media mill will lower your operating costs.

New mines are increasingly being located or existing ones extended in areas of the world where water is in short supply. Our response to this has been to develop innovative water-saving technology. The polycom® HPGR finish grinding concept with our velix® stirred media mill saves thousands of cubic meters of process water per day compared to conventional grinding circuits.

The iron ore revolution
Thanks to a global network of subsidiaries and service centers we can refurbish polycom® roll bodies quickly and without complications – worldwide. Additionally we offer a technical update for extended operation time at the same time.

Safety by choice – not by chance

polycom® – maintenance in a safe environment

We know you have a tough job. So we want to do all we can to make it easier – through the design and simplicity of our intelligent maintenance procedures.

polycom® procedure entirely different

All you need to do is pull out the used roll units 1 into the area provided behind the machine 2 and bring them to your service workshop for maintenance. In the meantime you simply have to push the new roll units into the machine and then restart your process plant 3.

polycom® refurbishment – multiple roller uses

Profit from polycom® service teams worldwide.

Our service scope is so broad that customers all around the world can be sure of comprehensive support in achieving profitable plant operations. We regard this level of support as the basis for maintaining and strengthening our customers’ trust and loyalty.
An essential element of our global service philosophy is being close to our customers. To achieve this objective, thyssenkrupp has set up service centers all over the world.

thyssenkrupp Industrial Solutions is one of the world’s leading manufacturers of machines and plants for the processing industry. Based on decades of experience, our engineers are engaged in research and development, and the results of their work have become an integral part of processing technology. As a result, customers worldwide benefit from our innovations. Whether standard or customized designs, at thyssenkrupp Industrial Solutions we always offer complete solutions in close cooperation with the customer. Solutions that are reliable, safe, innovative – and profitable for you.

Our service center in Chile

For you as a customer the benefits are clear. It is much easier to work with just one partner during the different phases of your project. With a partner who overviews the entire grinding process, the different flowsheet options can be optimally matched to your requirements. Yet this is only possible if you know all the different product characteristics and the requirements of each and every process step within the grinding circuit.

At thyssenkrupp Industrial Solutions we are convinced that we can understand the needs of each and every customer better than any other company – simply because of our vast experience in mineral processing.

Complementary mill types

<table>
<thead>
<tr>
<th>Mill types</th>
<th>Main application</th>
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</thead>
<tbody>
<tr>
<td>AG / SAG mill</td>
<td>Soft and medium hard ore</td>
</tr>
<tr>
<td></td>
<td>Sticky material</td>
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<tr>
<td>Ball mill</td>
<td>Wet and dry grinding</td>
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<tr>
<td>velix®</td>
<td>Wet grinding</td>
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<td></td>
<td>Generation of ultra-fines</td>
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<tr>
<td>Vertical roller mill</td>
<td>Grinding of coal</td>
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<tr>
<td></td>
<td>Grinding of additives</td>
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<tr>
<td></td>
<td>Grinding of burned lime</td>
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<tr>
<td>Rod mill</td>
<td>Replacement of quaternary crushers</td>
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<tr>
<td></td>
<td>Splay product particle size distribution</td>
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</tbody>
</table>

Highest quality standards, high-end technology and security from our one-stop shop – that’s our 360° Service.