

Metso Comminution Solutions

Maximizing
throughput and
energy efficiency



Predictable results in an unpredictable industry

As the world population grows to 11 billion or more by the year 2100 (according to UN estimates), the demand for metals and minerals will grow as well. At the same time, a reduction in ore grades means more rock needs to be processed for every bit of saleable metal. Mining and mineral processing industry must predict these challenges, to negate the effects on global environment. Growing urbanization and need for more minerals, also demands a more agile approach to develop new technology to process and recycle minerals efficiently and in an environmentally friendly way.





Mines are going deeper and ores are getting harder to find

Energy will continue to be a huge part of every mine's cost

Cost effective production of metals as the demand grows with Urbanization

Metso Comminution Solutions

The comminution process, which includes crushing, screening and grinding, is one of the world's most energy-intensive industrial processes. Comminution uses at least 3% of total global electricity production and, according to the Coalition for Energy Efficient Comminution, it accounts, on average, for more than 50% of a mine's energy consumption and 10% of total production costs. Energy-efficiency is one of the pillars of comminution circuit design and ignoring this can be the difference between a profitable operation and a money loser. Metso has been at the forefront with technology and solutions that answer your needs. Not just for a productive today, but a profitable tomorrow.

Metso is a
global leader in
comminution
technology

Superior performance from high throughput and energy efficient solutions

Ensuring the accuracy and consistency of product size directly affects the profitability of your operation. To make sure to achieve your operation's goals there must be the best choices in equipment and services for the job. Metso's crushing, screening and grinding solutions complete your comminution circuit, while ensuring an efficient operation that is your best defense against varying energy prices.

Energy efficient solutions provided to maximize throughput and productivity while maintaining profitability

Deliver predictable results with Metso Comminution solutions

Crushing

Metso's high capacity, reliable and energy efficient crushing equipment delivers superior performance and maximized throughput for the most demanding mining applications.

Screening

Metso's high efficiency screening solutions provides dependable screening performance for large material volumes with hard and abrasive ores.

Grinding

Metso's comprehensive line of grinding mills and systems provide the most effective and energy efficient technology across wet or dry, horizontal or vertical stirred milling operations.

Crushing

Experience what comes from years of crushing expertise in design and cost-efficient operations

Efficiently reducing ore size requires the optimum mix of world class equipment. As the world's leading supplier of crushing and screening equipment for the mining industry, Metso can ensure that you've selected the very best equipment, systems and solutions for your mining application.

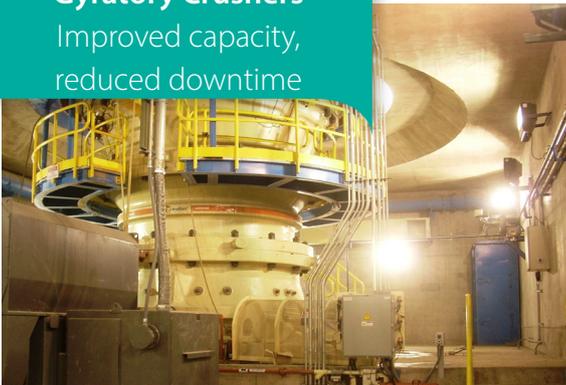
From large primary jaws and gyratories to cone crushers for tertiary and quaternary finishing, Metso equipment is engineered to meet your material reduction requirements.

High-capacity crushing solutions built with unique combinations of crusher cavity design, crushing forces, reliability and safety.

Industry leading solutions

Gyratory Crushers

Improved capacity, reduced downtime



Cone Crushers

High throughput, high crushing force



Engineered Systems

CAPEX efficiency, flexible complete offerings



Throughput focused Crushing solutions

Crushing provides a key part to the comminution circuit in your operation. Choosing crushers to perform at a high level with reliability for extensive periods of time for a variety of applications helps create more profitability.

Metso's crushing equipment provides all this, and more to make sure your entire mineral processing operation is as optimal as possible.



Reduce downtime by up to **70%**

Superior™ MKIII primary gyratory crusher



Up to **70% increase** in **required feed** for grinding

Metso crusher liners



Increase availability by up to **23%**

Crusher upgrades and automation



Crusher operating time reduced by up to **25%**

Nordberg® HP Series™ cone crushers



Screening

High level screening that fits all your needs based on screen type and application

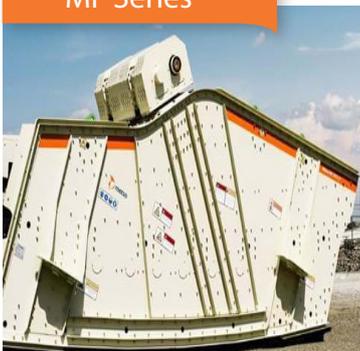
Performance of a comminution circuit greatly depends on the screening equipment. Mining screens have to have excellent screening efficiency to ensure that the material going through the process is the desired size. So choosing the right screen is very important.

At Metso, we make the decision as easy as possible and ensure that you have the right screen for the job. Metso uses our expertise to help search by either what type of screen you are looking for, and also what application your screen will be used for. The application covers all the main industry focuses: Ferrous, non ferrous, industrial minerals and coal. Making sure that when a screen has been chosen it will produce the best results possible.

Versatile screening performance for large material volumes even with hard and abrasive ores.

Industry leading solutions

Banana Screens
MF Series™



Inclined Screens
RF Series™



Horizontal Screens
LH Series™



Elliptical Screens
EF Series™



UltraFine Screens
UFS Series



Performance focused Screening solutions

Screens play a huge role in the comminution circuit, and is one of the most CAPEX efficient pieces of equipment for the operation if done correctly. Metso is known as a screening technology specialists in the world and has provided solutions globally.

Metso's screening solutions provides a wide range of models, sizes and screening types to make sure that there is an option for every application.



Increase screening efficiency by up to **16%**

Screening media replacement



Increase by up to **20%** in **screen availability**

Life Cycle Services



Screening media lifetime increased by up to **100%**

Life Cycle Services



Wide range of 120+ model and size combinations

Metso Mining Screens

Grinding

Energy efficient solutions to maximize grinding productivity and profitability in the mining industry

At Metso, we have over a century of experience in designing and manufacturing the most comprehensive line of grinding mills and entire grinding systems for the global mining industry. Wet or dry, horizontal grinding or vertical stirred milling, we make sure you'll get precisely the equipment that is most effective and most energy efficient – and that your operations are backed up with all needed services over the long haul.

The offering from Metso Grinding solutions gives many options for your grinding circuit. Whether you are in search of a horizontal mills, stirred mills or a high pressure grinding roll combined with comprehensive upgrade of optimizing services, Metso's trusted and proven solutions are here to help.

Leading energy efficient grinding solutions across wet, dry, horizontal and vertical grinding

Industry leading solutions

Horizontal mills

Low OPEX
low maintenance costs



High pressure grinding rolls

Low OPEX,
energy efficiency



Stirred mills

Energy efficiency,
effective production



Efficiency focused Grinding solutions

What do you look for in grinding solutions? Energy efficiency? High capacity? There are many factors that go into finding the right fit.

Metso Grinding solutions are designed and improved based on challenges that YOU are facing in the industry. Discovering ways to overcome those challenges to meet your needs, and to produce consistent results for various applications.



Up to **50%** higher **energy savings**

Vertimill®



Up to **20% increase** in **throughput**

HRC™3000 HPGR



Up to **200%** longer **mill liner lifetime**

Megaliner™



Increase wear life by up to **36%**

Mill lining optimization



Promising Results

A switch from ball mills to Vertimill® boosts Miaogou Iron Mine's transformation

Miaogou Iron Mine launched a technological transformation project, which included replacing the original tertiary ball mills with Metso's Vertimill® VTM1500. The result? A decrease in both power and grinding media consumption.



Challenge

Find a solution to solve the problem that the concentration costs were exceeding the price of iron concentrate.

Solution

Replace all the current ball mills in operation with a Vertimill®.

Result

Increased grinding fineness from 71-73% to 88-90%, iron concentrate grade from 65% to 66%, and lowered energy and grinding media consumption rate, while taking up less space.

➔ www.metso.com/showroom/mining/a-switch-from-ball-mills-to-vertimill-boosts-miaogou-iron-mines-transformation/

Increased grinding
fineness by
17%

Los Bronces reduces downtime in primary crushing plant by 69%

When in 2010, Los Bronces faced the challenge of optimizing its operations in order to achieve greater levels of efficiency, safety, and maintenance performance, one of the focal points was the primary crushing plant.

That was when the objective of reaching 93% equipment availability for its crushers was set. The challenge was to achieve the goal while maintaining a safe and positive work environment, in addition to high client satisfaction levels.



Challenge

Optimize operations in order to achieve greater levels of efficiency, safety and maintenance performed in the primary crushing plant.

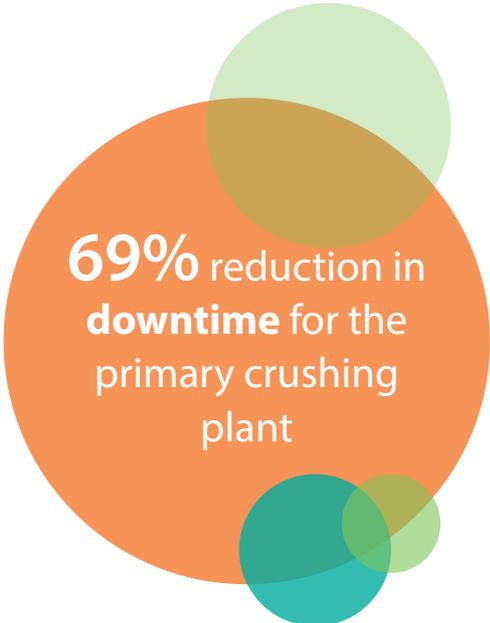
Solution

Metso provided a Life Cycle Service (LCS) maintenance contract for the primary crushing plant. This included maintenance on a Metso Superior™ MKII primary gyratory crusher and four Symons crushers.

Result

Equipment availability increases that is equal to 22% decrease in corrective maintenance time, and 69% reduction in downtime.

 www.metso.com/showroom/mining/los-bronces/



69% reduction in
downtime for the
primary crushing
plant

Hunchun Zijin improves efficiency by 18% with Metso screen media and Life Cycle Services

Hunchun Zijin Mining Co., Ltd. has made great strides in improving their process equipment as well as the skill level of their personnel, and in the process have achieved an 18% production efficiency improvement by using Metso's crushers, screen media and an LCS contract. In the past 10 years, they have transformed from a local state-owned enterprise to an international mining group.



Challenge

Existing crushers and screen media were not able to deliver on the mines high copper production goals.

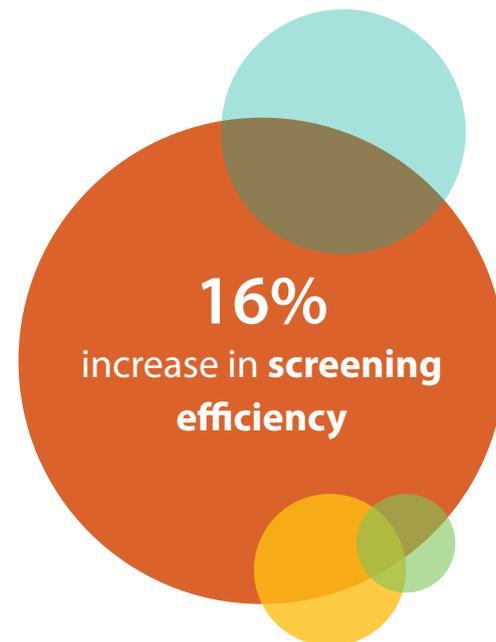
Solution

New HP6 crushers, Metso rubber screen media solution and a Life Cycle Services contract for process optimization and maintenance support were provided.

Result

An 18% improvement in efficiency from the new screen media and higher crusher performance Hunchun Zijin was able to hit their challenging targets.

➔ www.metso.com/showroom/mining/hunchun-zijin-improves-efficiency-with-metso-lcs-contract-and-screening-media/



Services built for performance

Maximize efficiency, availability and longevity

Spare and wear parts

Crafted to the same strict specifications and standards as our equipment, our genuine parts ensure complete compatibility for seamless operation. Our global distribution logistics network ensure that Metso OEM spare and wear parts are available when you need them.

Equipment upgrades and retrofits

Improve your equipment's productivity without the large capital investment. Our upgrades are offered as easy-to-implement packages or custom-engineered for your specific requirements, with the aim of enhancing safety, operating and maintenance features.

Maintenance and repairs

Proper maintenance is key to running your equipment effectively. Metso offers end-to-end service ranging from inspection and diagnostics, equipment and part repairs, shutdown solutions and planning, as well as emergency services.

Process optimization and controls

Metso process experts help in solving complex operational issues using analytical techniques, laboratory testing, and advanced control systems. Whether you need to optimize a piece of equipment, a circuit, or your entire plant, we have the tools and technology to help you make it happen.

Life Cycle Services

Metso's pre-packaged solutions are designed to assist you in meeting your business goals, from start-up to shutdown to end-of-life. We can support you on a specific activity or over a larger scope, combining elements from our large portfolio of services with unique commercial models.

Read more from the following links:

 metso.com/mining/services

The Metso Way -

Making the big difference to our customers

Everything we do is based on deep industry knowledge and expertise that makes the big difference to our customers. Decades of close customer collaboration and adaption to our customers' ever-changing needs have transformed us into a knowledge company.

Through our knowledge and experience, we work with our customers to create solutions that enable them to attain their objectives. We call this **The Metso Way**, which focuses on creating value to our customers. The Metso Way is built upon knowledge, people and solutions.

Knowledge -



We have deep knowledge about our customers' business environment, processes and challenges

People -



Our committed and highly competent people make the difference to our customers

Solutions -



We create the technology and services required to meet our customer needs

