



Adding value  
in minerals



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# Adding true value

Metso Minerals is the global leader in solutions for rock and minerals processing and metal recycling – and combines a global presence with strong local support to provide customers with unique added value.

Our expertise is based on over a century of experience, driven by the contribution of pioneers such as Bruno Nordberg, Edward P. Allis, and Waldemar Lindemann. Today, Metso Minerals' industry-leading solutions embrace the latest technology and an extensive service and aftersales offering for a very wide range of industries, including:

- Quarrying and aggregates production
- Mining and industrial minerals production
- Construction and civil engineering, and
- Metals and demolition waste recycling.

Our solutions and know-how cover everything from individual machines – such as crushers, grinding mills, conveyors, and components – to complete systems and turnkey installations.

Our offering is rounded out by a comprehensive range of installation and commissioning services, operational support, and training, together with wear parts and maintenance. With by far the largest installed machine base of any supplier, our service and aftermarket operations account for around half of our business today.

## Higher performance

Metso Minerals is all about delivering high-value performance, and meeting customers' needs for:

- Better end-product quality
- Higher throughput
- Enhanced availability
- Lower operating costs, and
- High standards of safety and sustainability.



## Metso Minerals worldwide

Headquartered in Helsinki in Finland, Metso Minerals has annual net sales of some €2.2 billion (2006). We have some 35 manufacturing plants, as well as 135 sales and service units in 45 countries worldwide; and a local presence in over 100 countries. Personnel number over 9 000.

Metso Minerals forms part of Metso Corporation – a €5 billion-a-year group (2006) listed on the Helsinki and New York Stock Exchanges – that also includes Metso Paper and Metso Automation. Metso Minerals accounts for approximately 43% of Metso's consolidated net sales.

To achieve this, we invest not only in the best in quality control in our own manufacturing, but also in R&D to provide durable, wear-resistant equipment and components for today's and tomorrow's processes.

With major product development centers and testing facilities in Finland, Sweden, France, the United States, and Brazil, we are committed to understanding our customers' operations, and providing the latest and most sustainable technology.

Customers can rely on the same dedication from Metso Minerals people in areas such as maintenance, supervision, project management, process optimization, and testing and inspections.

We wear the Metso Minerals helmet with pride.

# An integral part of the chain

- >> Our customers are involved in every stage of the journey rock and minerals take on their way from the world's quarries and mines, through refining and manufacturing, into end-products and infrastructure projects – and on into recycling and reuse. Being part of every stage of this value chain is what makes Metso Minerals' range of products and services so unique.

## Rock processing



### Quarrying

Our work starts at the cutting edge – designing quarry systems and providing equipment such as crushers, screens, feeders, and conveyors, together with a wide range of wear protection solutions.



### Construction

Our highly efficient mobile and stationary crushing and screening solutions deliver the best-quality inputs for today's infrastructure and construction projects.



### Recycling

Metso Minerals' recycling systems for demolition waste help preserve valuable gravel resources, as well as save materials, money, and the environment.





## Minerals and metals processing



### **Recycling**

Our recycling systems for metal and waste recycling ensure that metal-based products and household waste can be processed very efficiently for reuse. Ferrous scrap produced by our equipment is vital to many steel mills.



### **Metals production**

Plants such as steel mills benefit from the Metso Minerals advantage in areas like materials handling, grinding, slag treatment, and pyro processing.



### **Materials handling**

Efficient materials handling, whether in loading and unloading, storage, or transportation, is critical – and we help you achieve the performance you expect here too, with the latest in wear, dust, and noise protection.



### **Ore processing**

Our process optimization expertise covers complete mines and process plants; and our equipment everything from size reduction and control to enrichment and upgrading.

# Adding value in quarrying & aggregates processing

- >> Today's infrastructure projects – whether tunnels, bridges, or roads – are being built to ever-tougher deadlines and specifications, and being expected to handle ever-greater volumes. This means that the equipment, systems, and wear materials used to produce the materials for building them must be the best. Which is where we come in – with the right solutions for the job, every time.



We pioneered track-mounted crushing plants some 20 years ago, and have supplied some 3,000 Lokotracks since then. If you need mobility and maneuverability, Metso Minerals has the answer.



We are equally at home with stationary systems, when they offer the most cost-efficient solution. Our plant engineering and process optimization services cover all types of operations, from green-field projects to system upgrades.



*The Fukaura-cho tunnel in Aomori Prefecture, Japan.*



Mobile crushing and screening solutions enable contractors to crush and recycle construction materials on-site, reducing the need for off-site waste disposal. Water sprays and sealed conveying systems minimize dust emissions.



Our lifecycle support and service philosophy ensures that your systems will continue operating reliably year in, year out.

>> **Success in today's quarrying and aggregates business calls for a partner that can give you not only the best equipment for the job, but help you achieve the best competitiveness in terms of end-product quality, throughput, machine availability, and operating costs. We can do that because we understand every aspect of the entire chain of your operations.**

You can rely on our engineers to balance the raw material characteristics of your site with the production rate and the size and shape of the end-product you are looking for. With our over four decades of experience in rubber, polyurethane, and composite wear materials, you benefit with the lowest possible operating cost per ton.

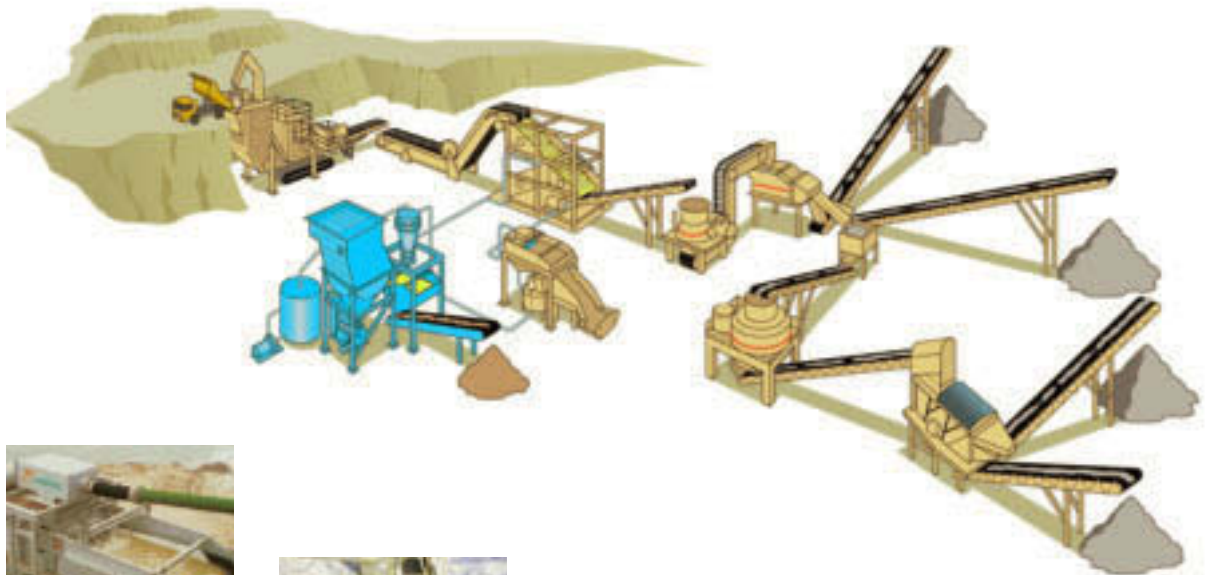
Our Bruno process calculation system, for example, has become the international benchmark in the crushing industry. And our research and test centers provide comprehensive test data on parameters such as capacity, product distribution, and the amount of power required to crush specific materials.

## The mobility you need

Metso Minerals solutions cover the entire aggregates production process, including crushing and screening, conveying, classifying, washing and pre-treatment, storage, loading and unloading, automation, and environmental protection. For both stationary and mobile facilities.

We have been a pioneer in fully mobile in-pit crushing operations. These systems typically integrate two or three mobile crushing plants, combined with a mobile screen and conveying system. A fleet of track-mounted crushing and screening units, capable of moving along the quarry face and handling your primary, secondary, and tertiary processes, can offer substantial savings compared to dump truck haulage. And can be easily relocated and started up elsewhere.

Equipped with intelligent controllers, our mobile crushing plants provide real-time operational data, and are the first that enable you to control the entire crushing process from a single point. Using Metso Minerals technology, one operator can run an entire, high-performance, multi-stage crushing and screening plant.



*Metso Minerals has supplied HP cone crushers and screens to quarries operated by Pedreiras Basalto, one of South America's fastest-growing aggregates producers.*

## The solutions you need

### Crushing

We offer everything from large primary gyratory and jaw crushers to cone crushers, impact crushers, and vertical shaft impactors to give you the product shape and size distribution you expect. As well as the best in track- and wheel-mounted mobile crushing plants.

### Feeding

Our heavy-duty feeders are designed to absorb impact and meter material on its way to the crusher, storage bins, or load-out stations – and can scalp out process fines as well, if needed.

### Screening

Whether you operate a wet or a dry process, or use stationary or mobile units, our screening solutions incorporate state-of-the-art equipment and an unrivalled range of rubber, polyurethane, and steel screening media.

### Washing

Efficient sand and gravel washing is essential for producing the premium-quality materials needed for demanding construction projects, such as tunnels and bridges.

### Conveying and materials handling

Whatever your material, and whether you want to transport it horizontally or vertically, our conveyor solutions are guaranteed to deliver uniform flows of all sizes of rock and mineral fractions. Our comprehensive range of wear protection solutions ensure maximum reliability.

### Original wear and spare parts

Original Metso Minerals wear and OEM spare parts provide the right tolerances, functionality, and durability to guarantee you the best results for your process and a long service life for your machinery.

## The long-term performance you need

We build in the best in terms of long-term performance – not only through industry-leading equipment and processes, but also through the best in inspections, wear part replacement, maintenance and repair, and training.

Fewer failures and production delays, and less downtime mean better life-cycle productivity and more profitable business for our customers.

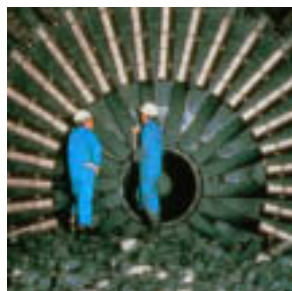


# Adding value in mining & industrial minerals

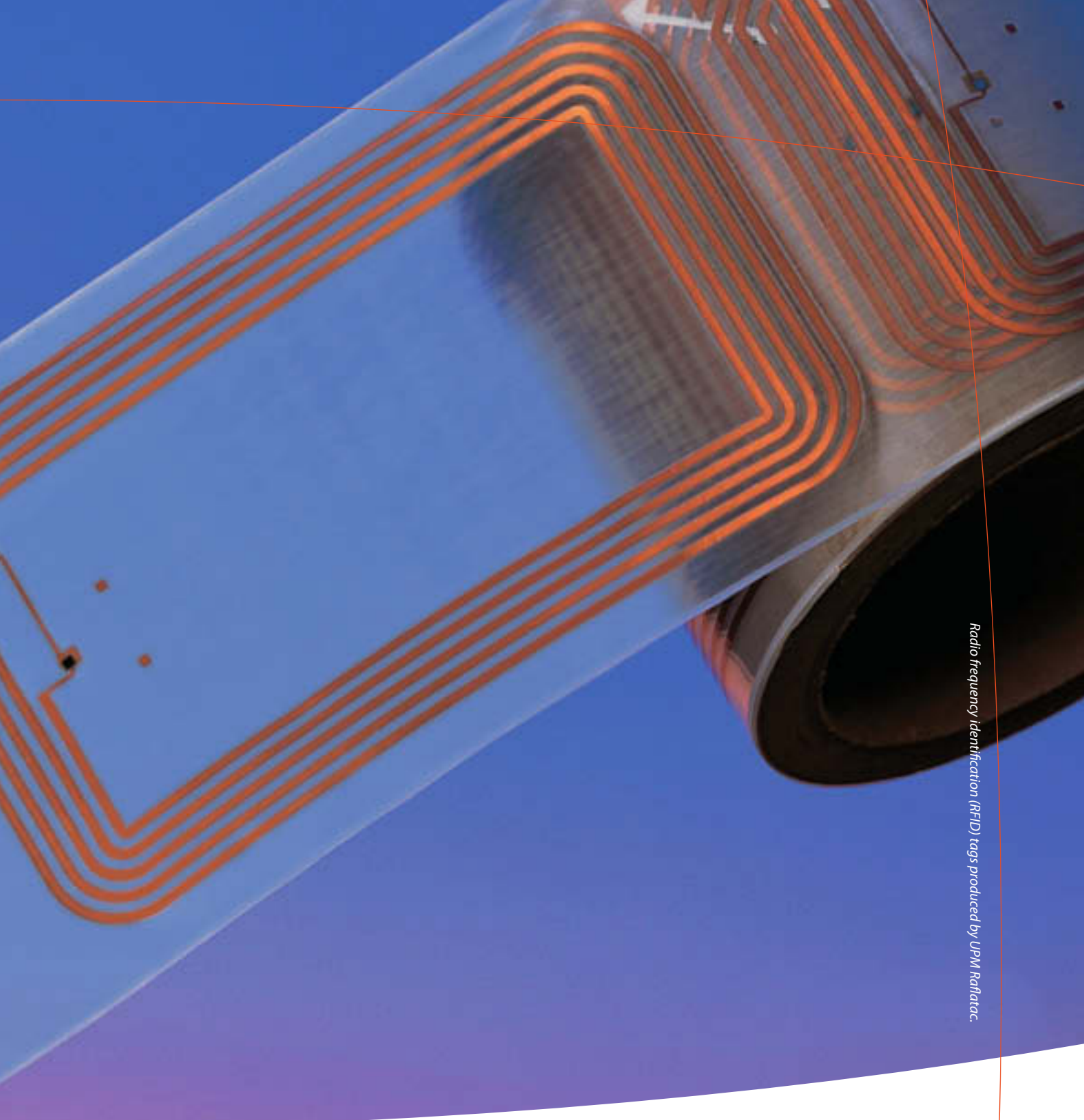
- >> The journey from the ore face to a refined metal or mineral – and to the end-product – can be a long one. All of which calls not only for the best in products such as crushing, grinding, separation, and filtration equipment, but also the best in entire systems and subsystems, such as mineral concentrate processes.



We have the know-how to engineer an entire mine and provide complete mine-to-mill optimization, drawing on our extensive experience with the latest technology, pilot-scale trials, and the specific needs of your operation.



Variables such as ore properties, product requirements, site conditions, and environmental issues need to be balanced against projected maintenance and wear costs, energy costs, and manpower and other expenses.



*Radio frequency identification (RFID) tags produced by UPM Raflatac.*



Size reduction is easily the largest single process operation in minerals processing in terms of volume, and needs to be as optimized and efficient as possible to ensure a smooth enrichment and upgrading path.



Metso Minerals systems enable you to upgrade the value of your product using techniques such as sedimentation, dewatering, and thermal processing – and protect the environment by treating process water and effluent effectively.

>> **No two ores, no two mines, and no two minerals processing plants are identical. Which is why our extensive experience and industry-wide know-how are so valuable to our customers – to ensure that they get the recovery rates and concentrate quality they expect, the throughput and the availability they want, as well as lower operational risks and lower operating costs.**

Our customers in the minerals processing industry range from coal mines, precious and non-precious metals mines, to ore processing and smelting and refining facilities, and units producing industrial and agricultural minerals.

And we are the only company anywhere capable of meeting the full range of all their needs. From simple circuits to complete, complex systems. From the sharp end of crushing and separation all the way to mineral concentrate production.

Metso Minerals has an unequalled track record in both greenfield and retrofit projects. The latter have become an important Metso Minerals strength, and give customers a range of benefits, including improved control, stability, and system management – incorporating the latest in operability and maintainability.

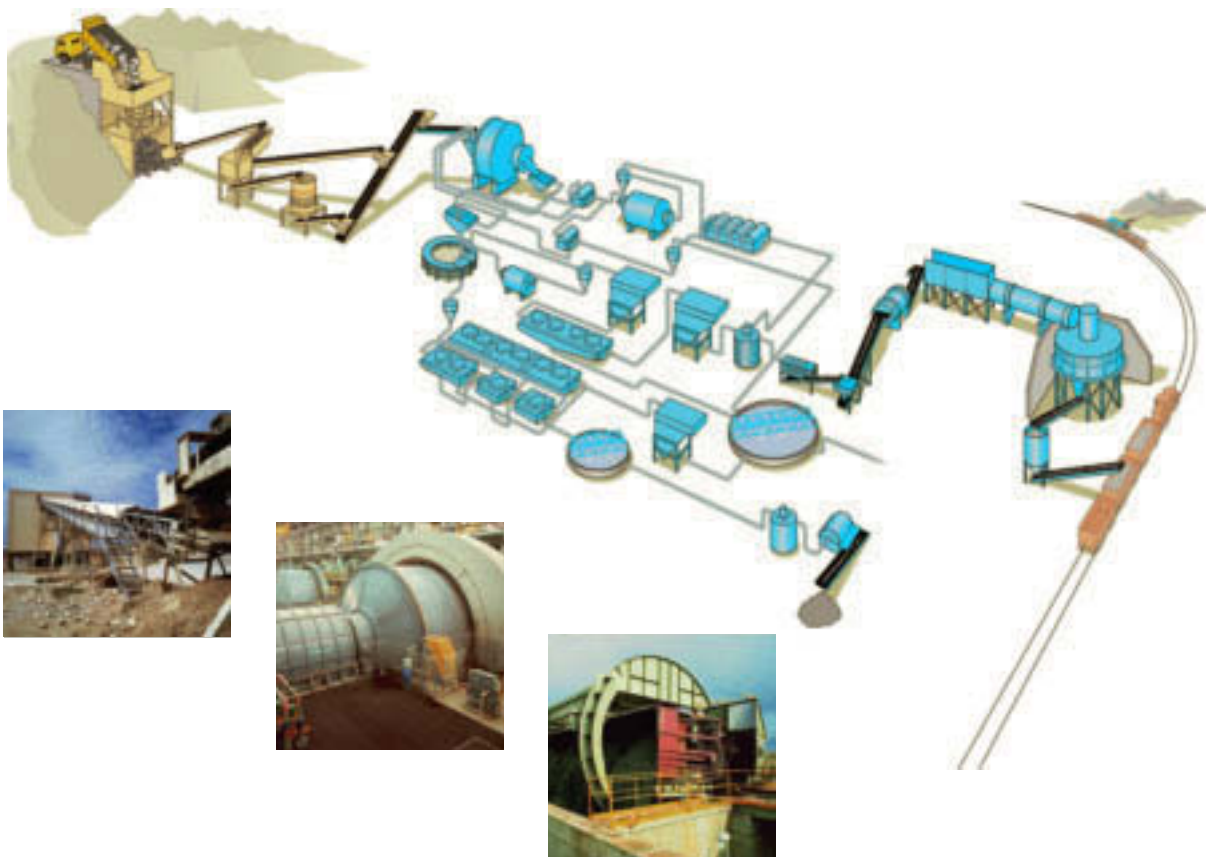
We draw on a comprehensive portfolio of structural, mechanical, chemical, and electrical engineering expertise, together with the latest developments in FEA, CFD/SPH, CAD, and DEM technology, to design and optimize the performance and reliability of every aspect of our solutions. Our test laboratories dedicated to crushing, grinding, pyro processing, and slurry pumping are a particularly valuable asset for our mining customers.

### **The solutions you need**

Size reduction, enrichment, upgrading, and materials handling are all central to the needs of producers of everything from coal to gold.

### **Crushing, grinding, and screening**

Maximizing the added value of size reduction calls for the optimum mix of crushing and grinding equipment. With over 30,000 crushers and more than 8,000 grinding mills installed worldwide, we offer superior designs and quality for long life, minimum maintenance, and unmatched value.



*Metso Minerals supplied the primary crushing circuit, >  
SAG mills, and ball mills for Newcrest Mining Limited's  
Telfer gold mine in Western Australia.*

### **Enrichment**

Metso Minerals is at the forefront of developing separation technology offering high efficiency and low operating costs. Our separation systems are based on a variety of gravity, magnetic, flotation, and leaching techniques. We are also one of the largest manufacturers of heavy-duty centrifugal slurry pumps and our units have been renowned across the mining world for more than a century.

### **Upgrading**

We design, engineer, and supply equipment and systems for upgrading the value of concentrates or handling tailings based on drying, calcinating, pyrolysis, and thermal processing.

### **Materials handling**

Metso Minerals supplies a wide range of equipment for loading, unloading, storing, and handling everything from coal, iron ore, and bauxite to copper ore and potash. From in-plant conveyors and long-distance pipe and cable belt conveyors to rotary railcar dumpers, apron feeders, and ash handling systems.

### **Wear protection**

The best in operational performance and equipment availability calls for the best in wear protection. We pioneered rubber mill lining systems and have led the way in developing composite lining solutions to improve grinding efficiency and reduce costs in a wide range of applications for both wet and dry processes. And our full range of manganese wear parts ensure long life and reduced wear for crushers.

### **The long-term performance you need**

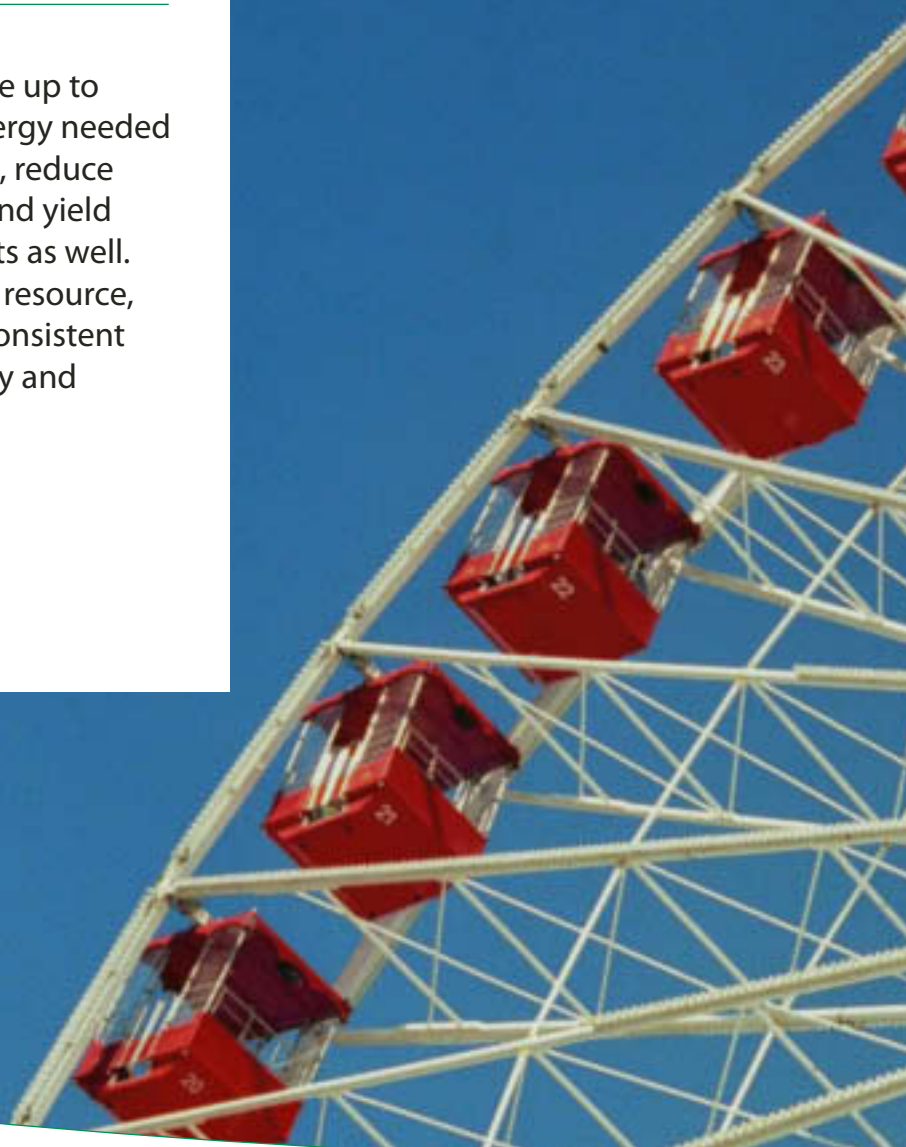
The right replacement parts, and the right maintenance and upgrades paths, are essential to guaranteeing that equipment has a long service life, and to ensuring that processes remain optimized and costs are kept in check.

We help you achieve better life-cycle productivity and profitability, thanks to fewer failures and production delays, and less downtime.



# Adding value in recycling

- >> Using steel scrap can save up to three-quarters of the energy needed to process virgin iron ore, reduce emissions significantly, and yield valuable financial benefits as well. To make the most of this resource, steel producers need a consistent product delivered reliably and cost-effectively.



Metso Minerals is the global market leader in metal recycling, and offers an extensive range of systems for fragmentizing, compacting, and separating virtually every type of scrap metal.



We have supplied hundreds of car body shredder plants and scrap balers, and close to 2,000 scrap shears.



A Ferris wheel at Navy Pier in Chicago, IL.



We provide assembly and commissioning supervision, operator training, OEM parts, inspections, maintenance, and comprehensive repair, overhaul, and modernization services – as well as rapid troubleshooting assistance.



Efficient size reduction is critical in recycling. Thanks to our extensive range of size reduction machinery, we can offer fragmentizing equipment for a wide variety of recycling processes.

>> **Long-term durability, high throughput capacity, excellent availability, ease of maintenance, and low energy use are the cornerstones of Metso Minerals' innovations.**

We offer probably the broadest range of state-of-the-art machinery and equipment for recycling metals and residual materials anywhere. The materials generated by these processes represent a valuable input for manufacturing processes and make a substantial contribution to reducing the global consumption of raw materials – cutting emissions and protecting the environment.

This is perhaps most highlighted in scrap processing, where Metso Minerals' fragmentation, compaction, and separation systems have become benchmark products for their innovation, quality, efficiency, and durability. Today's steel mills use scrap for almost every other ton of steel they produce, and expect the best in terms of reliability and economy.

Advanced simulation techniques guarantee the optimum design of hydraulic components for high availability and cost-efficient operations. We also prioritize issues such as dedusting systems for shredder plants to ensure that systems not only meet statutory requirements in terms of environmental emissions, but also often easily exceed them.

## The solutions you need for metal recycling

Making the most of scrap calls for the right equipment capable of handling the very wide range of different sizes, thicknesses, and compositions typical of the materials contained in recycling flows.

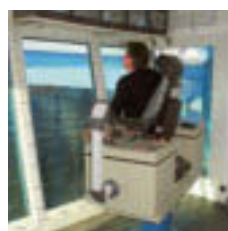
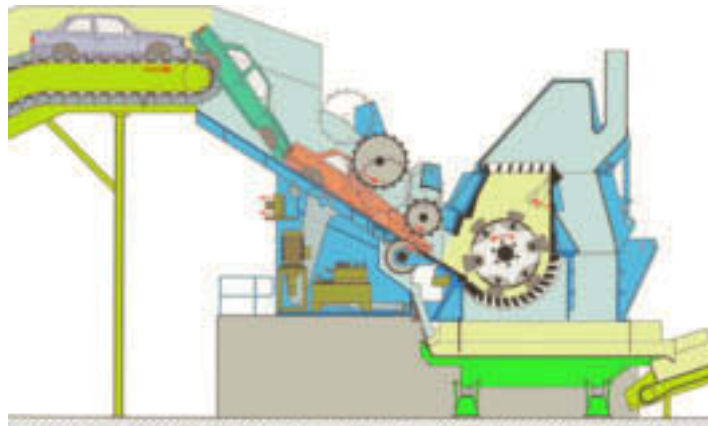
### Fragmentation

Our shredder technology is the right solution when you need to process large quantities of scrap vehicles and mixed scrap cost-effectively.

Auto Pilot is an automatic system for controlling the traditional operator functions of our car body shredding plants. By monitoring relevant variables, Auto Pilot is able to maximize drive motor performance and control the infeed rate. Metso Minerals also offers a production monitoring management software.

### Size reduction

Our high-performance scrap shears can handle anything – from mixed, heavy, and light scrap and bodies to cast iron and rails – with ease. We delivered our first scrap shears in 1956, and are now supplying fifth-generation products.



*Metso Minerals has supplied various leading companies with a variety of systems for metal fragmentation, size reduction, compaction, and separation.*

### **Compaction**

Whatever has to be pressed, from aluminum foil to car bodies, we have the solution for your needs. Our presses have set the standard for processing flexibility, operational reliability, and productivity when baling steel and non-ferrous scrap in the recycling, automotive, and non-ferrous metal industries.

### **Separation**

Our non-ferrous metal separators are ideal for use as stand-alone solutions or in combination with shredder and classifying systems in a variety of recycling plants.

## **The solutions you need for waste recycling**

### **Fragmentation**

Metso Minerals supplies a wide range of crushers, shears, and hammer mills for fragmenting waste. Thanks to our new technology, even small crushers offer low specific energy consumption, high throughput capacity, and excellent fragmentation performance.

### **Compaction**

Our double screw presses are perfect for efficient briquetting, pelletization, and homogenization when processing light shredder fraction. Output is ideal for energy use, as briquetting enhances calorific value and combustion performance.

### **Separation**

Our trommel screens offer a simple way to reduce investment and operating costs when processing secondary raw materials.

### **Wear parts**

Metso Minerals offers the largest supply of shredder castings in the world. Metallurgists at our laboratories analyze material properties constantly, and work with our foundries and manufacturing facilities to produce the best high-quality wear parts, offering the longest possible service life.

## **The long-term performance you need**

As with our other product segments, Metso Minerals' recycling systems are based on lifecycle thinking that extends from design, manufacturing, project specification, and installation to operator training, maintenance and parts, overhauls, and modernization. Qualified service teams are always on-call to deal with day-to-day issues, while aftersales service personnel focus on optimizing areas such as production flows and ensuring that OEM parts are always available.





## It's all about value



Drawing on a heritage going back over 120 years, Metso Minerals combines an extensive portfolio of brands, including such renowned names as Nordberg, Lokotrack, Barmac, Trellex, Skega, Lindemann, Texas Shredder, Flexowell, and Svedala.

The success of all of these products relies on our industry-leading core technological strengths in areas such as crushing and screening, minerals processing, wear protection and conveying, and recycling – know-how that is unmatched anywhere.

In addition, we offer spare parts and service for a vast range of other brands as well, including:

*Allis Chalmers, Allis Mineral Systems, Altairac, Bergaud, Big Bite, Cable Belt, Citycrusher, Conrad Scholtz, Denver, Dominion, Dragon, Dravo Wellman, Ellivar, Faço, Gardner Denver, GfA, Goodwin Barsby, Grizzly King, Gyra-disc, Hewitt-Robins, Hummer, Krupp/ORT, Kue-Ken, KVS, Laser, Lokolink, Lokomo, Loro & Parisini, Ludlow Saylor, Marcy, Masterscreen, McNally, McNally Wellmann, MPSI, Nokia, Nordpactor, Nordwheeler, Omnibelt, Omnimatic, Omnicone, Reed Screen-All, Sala, Seco, Stansteel, Stephens-Adamson, Superior, Supersteel, Supralok, Svedala Demag, Symons, Pyrotherm, Tidco, Waterflush, W.S. Tyler, C Jaws, G-Cone, CV, ST & SW mobile screens, MP, HP & GP cone crushers, and VI & NP impact crushers.*



### **Committed to technology**

By incorporating true lifecycle thinking into everything we do – all the way from product design to process optimization, training, and maintenance – we offer our customers the best performance.

In terms of longer service lifetimes, less downtime, better response times, and more cost-effective operating and maintenance costs.

High Fidelity Simulation (HFS) technology, for example, helps us improve the performance of rock size reduction processes and the design of wear parts, and reduce the specific energy consumption of our crushing and grinding systems.

Our innovative elastomer and composite wear protection materials reduce not only wear, but also dust emissions and noise as well. And our Optimizing Control System (OCS) improves the recovery of valuable minerals and reduces the volume of process tailings and waste per ton of product.



## Working together



### Working sustainably

Our global and partnership-driven philosophy underpins our commitment to the environment. We see a proactive approach to environmental challenges as central to our own long-term competitiveness and that of our customers as well.

Exploring for minerals and extracting and processing them – while yielding valuable raw materials for our general wellbeing – have an inevitable impact on our environment.

Which is why we focus on minimizing energy consumption, dust and noise emissions, and soil and water contamination in all our solutions. And why we also offer a full range of systems for recycling metals and other materials such as construction materials.

Working sustainably like this, at every stage of the value chain, reflects our dedication to delivering real-life value to all our partners and stakeholders.

Whatever the project, we're proud to wear the Metso Minerals helmet.

Metso Minerals forms part of Metso Corporation, a global engineering and technology company that serves the pulp and paper industry, the energy sector, and other industries – in addition to rock and minerals processing.

Based around three core businesses – Metso Minerals, Metso Paper and Metso Automation – Metso employs around 25,500 people in more than 50 countries worldwide.

Metso Paper, for example, is the global leader in pulp and papermaking equipment and processes. Metso Automation is the global leader in specialty analyzers, consistency transmitters, and control and automated valves for the pulp and paper industry; and the number-three supplier globally of automation solutions for pulp and paper producers.

Industry-leading process expertise underpins all of Metso's businesses. As does prioritizing customer satisfaction and operational excellence every stage of the way.

By innovating together like this, Metso Minerals and Metso's other businesses create new value-added solutions capable of benefiting all of our customers and everybody's competitiveness.

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