

Metso:Outotec

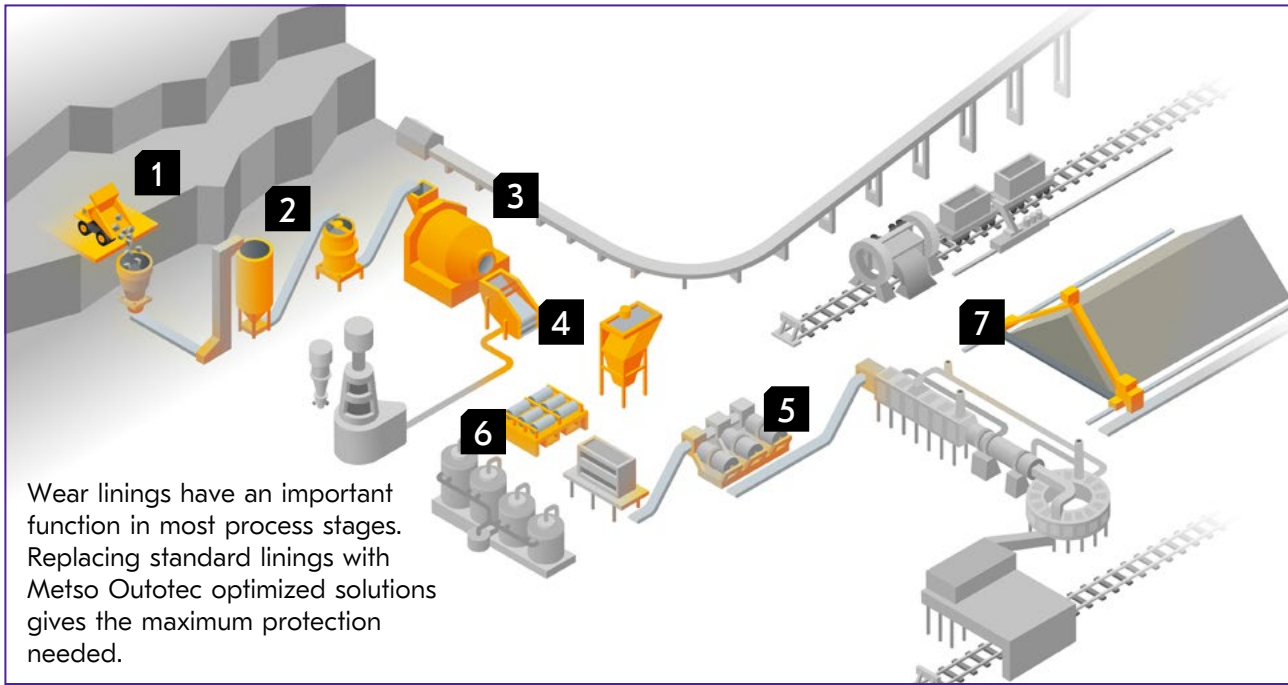
# Wear lining solutions for any need

Keep material flow up  
and maintenance down



# Wear linings protect your assets

Installed in chutes, spouts, hoppers, transfer points and other applications subjected to wear, wear linings protect the assets and provide sufficient wear and chemical resistance to keep maintenance down and material flow up. When used in the correct application, long-lasting and robust wear linings make a substantial difference in improving process flow, machine uptime and safety.



Mining and aggregates sites process rocks and other abrasive ore that wear out equipment and parts.

Wear linings are protective materials installed in areas subjected to wear.

Wear linings have an important function in most process stages. Replacing standard linings with Metso Outotec optimized solutions gives the maximum protection needed.

## 1 | Loading and hauling

- Truck body
- Truck bed lining

## 2 | Crushing

- Feed chute liners
- Mainframe liners
- Vault liners

## 3 | Grinding

- Mill feed chute liners
- Rubber backing
- Discharge chute liners

## 4 | Classification

- Screen feed box liners
- Screen feed chute liners
- Undersize chute liners
- Oversize chute liners

## 5 | Conveying

- Transfer chutes and liners
- Skirting

## 6 | Flotation

- Magnetic separator liners
- Flotation tank liners

## 7 | Bulk material handling

- Feeder chutes and liners
- Stacker and reclaimer chutes and liners
- Transfer chutes and liners
- Bins and liners
- Tubs and liners

## 8 | Other

- Mobile equipment liners
- Concrete mixer liners
- Debarking drum liners
- Scrubber/washing drum liners
- Balling drum/pelletizing drum liners



# Increased uptime



# Maximized throughput



# Improved health and safety



## Reaching your targets

Our customers strive to increase uptime, maximize throughput, reduce costs and improve safety while also managing sustainable business operations.

This can be challenging since mining and aggregate production is tough on equipment — and that can make it even tougher on budgets. Plenty of maintenance is often required and working conditions can sometimes be risky.

Protecting the equipment from wear is essential to avoid machine failure and expensive stops.

# The right solution for you

Working with us means you get access to the market's widest range of optimized wear protection solutions, tools and services to minimize wear and improve safety while also maximizing productivity and profit.

		Rubber	Metallic	Ceramic	Polyurethane	Polyethylene	
#1	Wear linings	Trellex® wear plates	x			x	x
		Microledge	x				
		Trellex® SQ300	x		x	x	
		Trellex® Poly-Cer			x		
		Xalloy™		x			
		Gridlock™		x			
		Xlok™	x	x	x		
		Rockbox		x			
		Xledge™		x			
	Sheetings and coatings	Sheeting	x			x	
Xresist™ epoxy system				x			
Attachment systems	EzyLock™, Taper-T™, D-Lock™ and RemLock™		x	x			
#2	Complete solutions	Chutes					
		Bins					
		Tubs					
		Conveyor skirting system					
		Cyclone underflow boxes					
		Impact plates					
#3	Services and tools	Lifting and cutting tools					
		Value-added services					



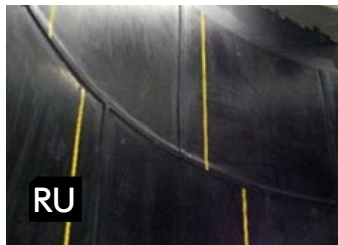


# Optimized wear linings of all types and materials

Rubber, metallic, ceramic, polyurethane and polyethylene all have their strengths. In an optimal operation, each material is used where it performs the best.

By having all options available to choose from, we can select the ideal material for your operating conditions. Sometimes the best results can be achieved by combining several materials in the same application.

## Materials



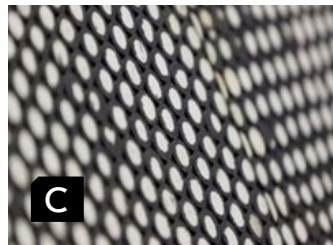
**Rubber**

Light-weight with unique wear, noise and vibration properties.



**Metallic**

Excellent wear protection, wide range of alloy options.



**Ceramic**

Extremely tough with outstanding wear life properties.



**Polyurethane**

Abrasion- and impact-resistant material.



**Polyethylene**

Minimizes surface friction and prevents material sticking.

Up to

70%

less labor hours

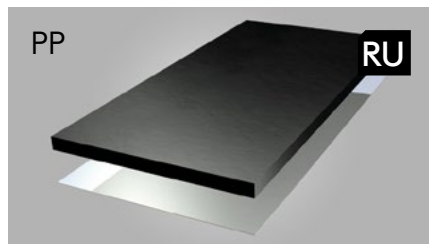


# Wear linings

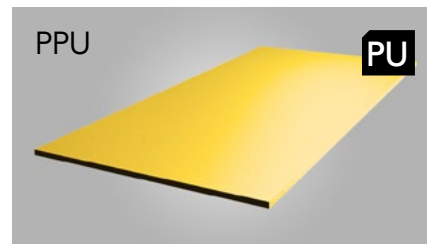
Our comprehensive portfolio in combination with deep technical knowledge means we can offer exactly the right solution to help you reach your targets.

## Trellex® wear plates

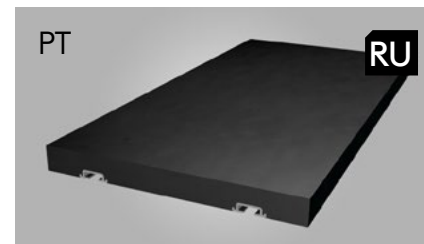
Our wear plates minimize wear and reduce noise while increasing service life. The offering includes a wide range of products designed to best support customers' needs in keeping the total cost per ton down.



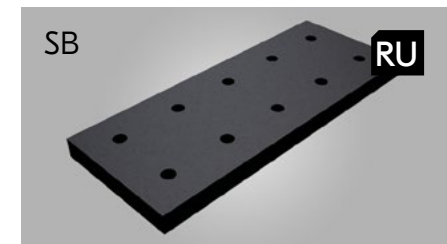
With hot-vulcanized steel reinforcement



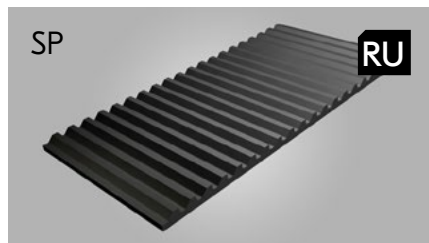
Cast-in steel reinforcement



With hot-vulcanized aluminum fixing profiles



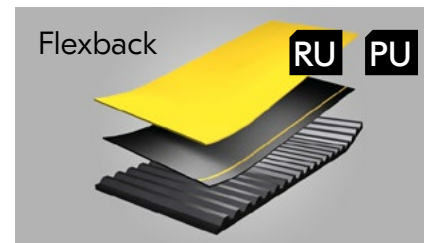
With molded holes for fixing



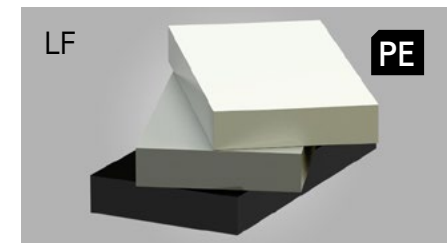
Serrated wear rubber



With hot-vulcanized aluminum fixing profile



With an embedded steel reinforcement



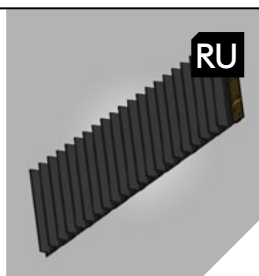
Ultra-high-molecular-weight polyethylene

# Wear linings

The ideal lining for your operating conditions means less maintenance and safer operations.

## Microledge

Rubber curtains designed to fit all types of chutes and hoppers processing wet fines. Self-cleaning properties significantly reduce the build-up of fines and sticky materials that cause blockages.



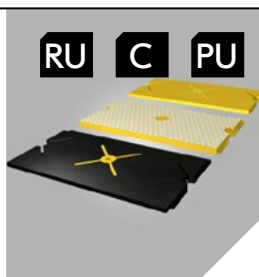
## Xalloy™

A range of abrasion and impact resistant metallic alloy wear lining plates.



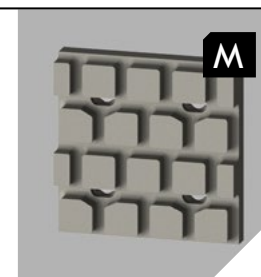
## Trellex® SQ300

Fully recyclable and light weight, the SQ300 modular system provides excellent protection and fast change-outs in many applications, keeping material flow up and maintenance down.



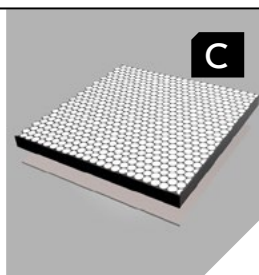
## Rockbox

Liner design effectively captures fine material that acts as a protective layer. Rock-on-rock wear results in very little wear on the lining itself.



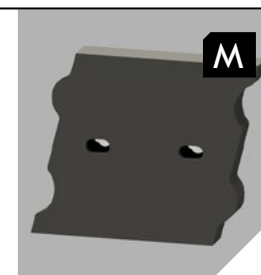
## Trellex® Poly-Cer

Hard ceramic surfaces provide unsurpassable wear resistance while the elasticity of the rubber absorbs the impact of blows. Excellent wear resistance in applications with sliding wear and high material speeds.



## Gridlock™

Anti-wash liner system designed to eliminate joint wash generated by using square liners. Available in horizontal, vertical and double-sided designs in a wide range of sizes and materials.

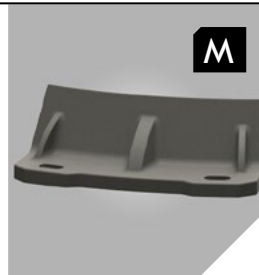


# Sheetings and coatings

Protect your assets and reduce the risk of breakdowns.

## Xledge™

Specialized range of ledge liners used on Wearback™ chutes to protect the parent metal. Consists of few parts and easy-to-handle small liners. The low weight lining provides excellent abrasion and impact resistance.



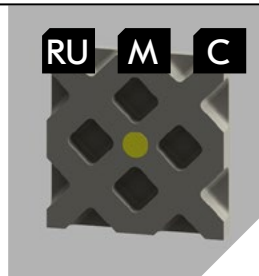
## Trellex® sheeting

Good operating economy and reduced risk of breakdowns. Long wear life means more uptime and safer operations. Available in different hardnesses.



## Xlok™

Liner with a backing plate made of mild steel. The steel is welded onto the application and liners are changed from the inside through a mechanical bolt lock. For areas difficult to access. No gap needed to place the liner.



## Xresist™

Ceramic wear-resistant coating made from premium components to protect your machinery against friction caused in surfaces subject to high abrasion.



## A lot to choose from?

No worries, we can suggest the ideal solution for your ore and process.

Some products are only available in selected markets.









## Attachment systems

Our unique fasteners eliminate the need for traditional studs and nuts and dramatically improve safety and uptime.



	Type and application	Description	Benefits
	<p><b>EzyLock™</b> Single-sided fastener (wear side). Perfect for areas difficult to access. For metallic liners.</p>	<ul style="list-style-type: none"> <li>• High strength, tapered bolt head, plate hole, flush wear surface</li> <li>• Unique locking mechanism</li> <li>• Can be installed through existing round holes in the wall</li> </ul>	<ul style="list-style-type: none"> <li>• No nuts, fewer bolts</li> <li>• No hot works</li> <li>• No external scaffold</li> <li>• Can use larger/fewer plates</li> <li>• Maintains clamping force throughout liner wear cycle</li> <li>• Safer/faster</li> </ul>
	<p><b>Taper-T™</b> Single-sided fastener (wear side). Perfect for areas difficult to access. For metallic and ceramic liners.</p>	<ul style="list-style-type: none"> <li>• High strength, tapered bolt head, plate hole, flush wear surface</li> <li>• Unique locking mechanism</li> <li>• Installed with conventional tooling</li> <li>• Enables the use of Taper-T™ sensors</li> </ul>	<ul style="list-style-type: none"> <li>• No nuts, fewer bolts</li> <li>• No hot works</li> <li>• No external scaffold</li> <li>• Can use larger/fewer plates</li> <li>• Maintains clamping force throughout liner wear cycle</li> <li>• Safer, further reduces downtime</li> </ul>
	<p><b>D-Lock™</b> Double-sided fastener. For up to 50-mm-thick metallic plate liners and 100-mm-thick cast liners.</p>	<ul style="list-style-type: none"> <li>• Direct replacement for studs, kidney bolts or conventional bolting system</li> <li>• Enables the use of SafeFit™ handling system</li> <li>• Does not require a tool to be used on the wear side when tightening the nut</li> </ul>	<ul style="list-style-type: none"> <li>• Fewer bolts, no over-torqued studs</li> <li>• No hot works (with RemLock™)</li> <li>• Can use harder/thicker materials</li> <li>• Maintains clamping force throughout liner wear cycle</li> <li>• Safer/faster (with RemLock™)</li> </ul>
	<p><b>RemLock™</b> A unique nut that replaces traditional nuts. Fits all existing studs and bolting systems.</p>	<ul style="list-style-type: none"> <li>• Separately removable nylon locking feature allows thread locking and easy nut removal</li> <li>• Nylon cap ensures thread corrosion protection</li> <li>• Installed with standard tools in the same way as traditional nuts</li> </ul>	<ul style="list-style-type: none"> <li>• No hot works/oxy cutting of corroded bolts/nuts</li> <li>• Safer/faster</li> </ul>



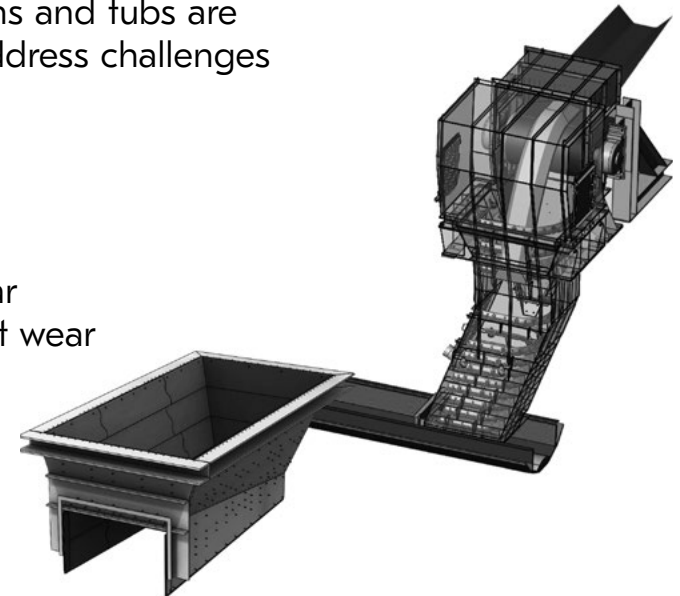
## A complete chute, bin or transfer point solution

Sometimes choosing an improved wear lining option is not enough. To get the maximum benefit for your process, a complete chute, bin or tub replacement could be required.

Metso Outotec designs, manufactures and installs not only wear linings but also a wide range of chutes, bins, tubs and other bulk material handling structures. The solution comes with optimized wear linings.

Our chutes, bins and tubs are designed to address challenges such as:

- Safety issues
- Material flow
- Spillage
- Excessive wear
- Conveyor belt wear





# Structures

The structures and the wear lining are designed together in a seamless process. Our long experience combined with Discrete Element Method (DEM) simulations makes it possible for us to compare and validate different options. You can be confident that the selected solution is the right one.

## Equipment and assets



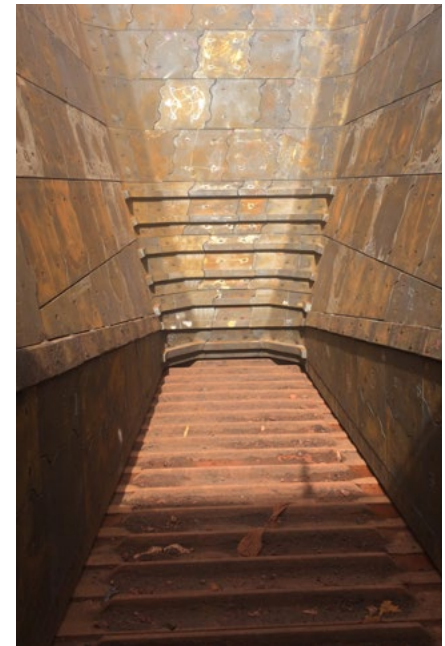
Transfer chutes



Bins



Chutes



Tubs



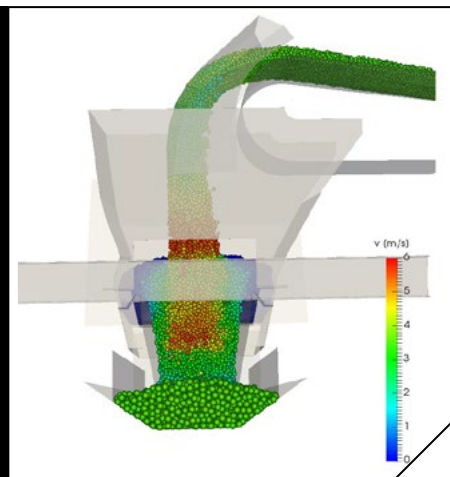
## Value-added services and tools












By choosing Metso Outotec wear lining solutions, you get much more than parts.

Combining the right parts with optimized installation methods, tools and services makes all the difference in your results and the safety of your people.

### DEM simulations

Our simulation software allows us to predict the performance of the customized solution extremely accurately, which ensures that we deliver the gains we promise.



Service/tool	Status	Description
Pre-study/audit*		Our thorough pre-study sets the groundwork for optimization and ensures that the proposed solution is the best match for your ore and process.
Customized design/ selection*		Our wide portfolio, long experience and unique simulation software allow us to select the ideal solution for you.
Installation supervision and complete installations*		Our experienced engineers oversee and guide you on how to safely and quickly install parts – or can do the full installation for you using efficient installation methods and following the most stringent safety standards.
Wear and performance monitoring*		One of the surest ways to ensure you have exactly the right parts when you need them is to closely follow the wear rate. This can be done manually, with the more advanced 3D scanning or by using our real-time monitoring system.
Design and material optimization*		The more we learn about your process and closely follow the wear rates, the better we can support you. We constantly do material and design improvements to optimize your solution.
Technical support*		Buying from us gives you access to the unmatched experience and knowledge of our local teams as well as our global experts.
Development meetings and collaborative R&D		Regular meetings with Metso Outotec's experts ensure that development stays on track. We review the results and findings together, identify issues, as well as set new development and performance targets. We also do joint R&D projects with our customers.
Customer training		To stay ahead of the game, it is important to keep up to date on the latest technologies and understand how to best utilize your equipment. We offer customer training.
Lifting tools		Working with Metso Outotec, you get access to lifting tools that ensure safe and fast installations as well as tools to safely cut rubber sheeting.
Financing solutions		We have a wide range of financing solutions available for you, including consignment stock, leasing and other payment options.
Environmental initiatives**		Sustainable operations, suppliers and solutions, recycling take-back programs.

 Always included

 Optional

(\*) part of Metso Outotec's process of optimization, the complete life cycle from site audit to monitor and improvement.

(\*\*) only available in selected markets



# Wear monitoring system

WearSense™ monitors wear in real-time and tells you when to change the liners. It can be fitted to any metallic or ceramic liners independent of attachment systems.

Up to

50%

less maintenance  
downtime



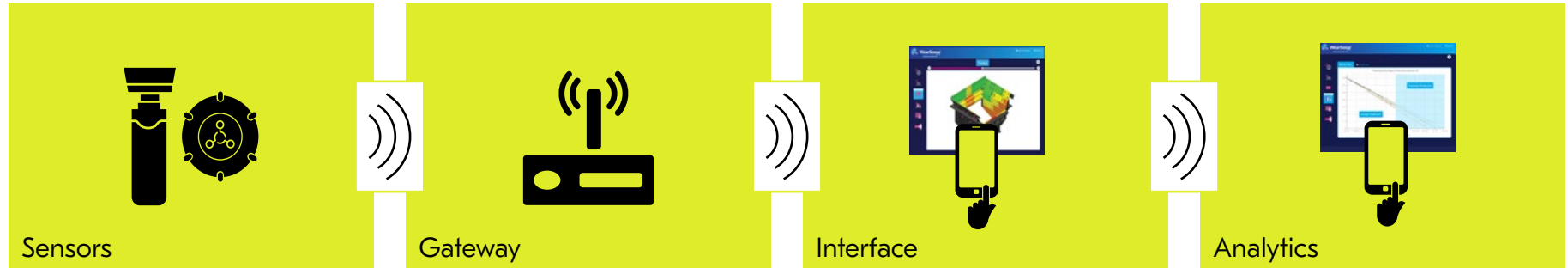
**1** Hugger™ sensor is designed to fit on any wear liner type independent of attachment system

**2** Hugger™ sensor suitable for fixed and mobile plant wear applications

**3** Taper-T™ sensor integrated into wear side only attachment

**4** Battery-powered sensor and communications

## System operation



### **Reduces maintenance downtime**

Provides real-time forecast of wear and expected liner change-out timing. Gives detailed information on problem areas that could cause shutdown delays or breakdowns. Enables accurate planning of shutdowns for wear liner maintenance.

### **Reduces inventory costs**

Enables accurate ordering of wear liners required for each liner maintenance shutdowns.

### **Reduces labor costs**

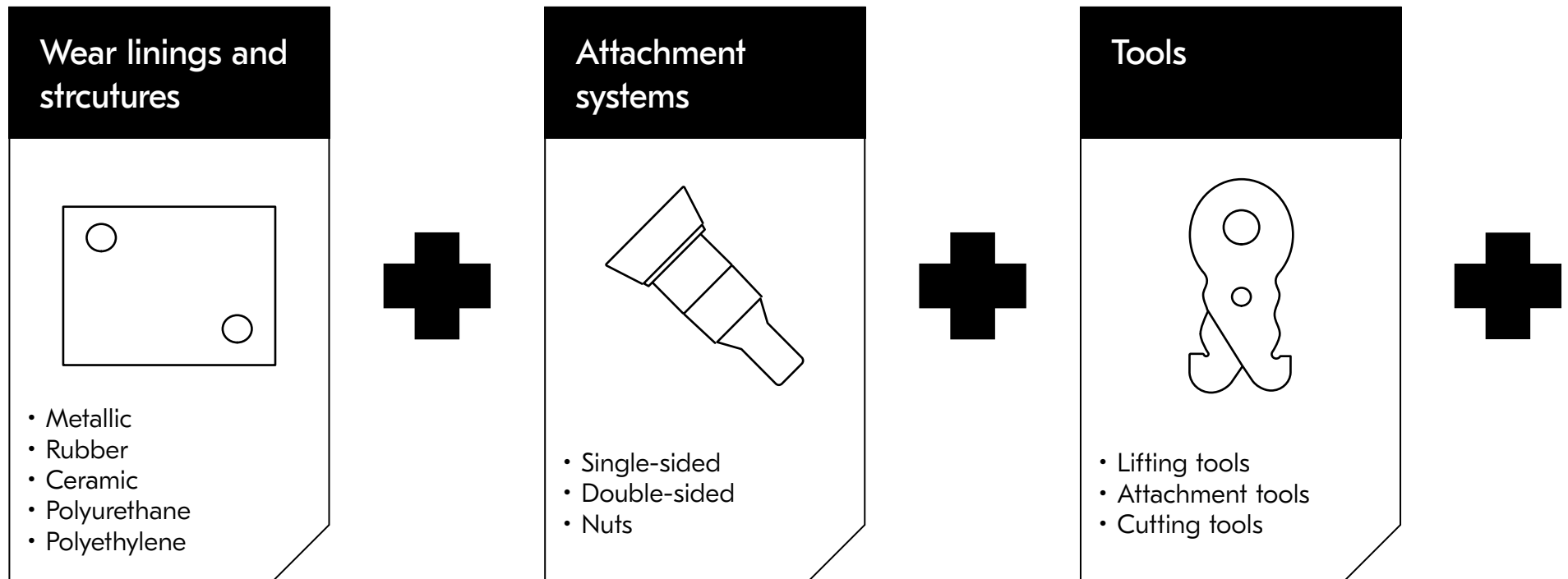
Enables more accurate planning of wear liner maintenance shutdown labor. Reduces labor costs for interim shutdowns to perform wear plate inspections.

### **Improves safety**

Reduces time exposure in confined space, hot works or working at heights.

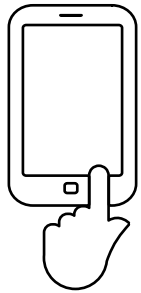
# The next level of performance

By working closely together and by combining the knowledge you have of your process with our optimized wear liners and unique services and tools, we can take your wear protection to the next level.

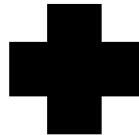




## Wear monitoring



- Traditional
- 3D scanning
- Real-time monitoring



## Other value added services



- Design optimization
- Installations
- Technical support
- Other



# Better results

- Improved health and safety
- Increased uptime
- Maximized throughput
- Lower costs

## Improve

Our solution is further improved based on the findings of performance monitoring.

## Audit

A thorough audit is conducted to understand your targets, process and issues to determine the right solution.

## Monitor

Performance is monitored through site visits, on-line condition monitoring and frequent consultation with site staff to ensure the results are achieved.

## Review

Pre-study findings are evaluated and discussed based on the current conditions of your asset as well as the desired outcome.

## Implement

Parts are manufactured by Metso Outotec and then installed on site.

## Develop

Simulations are executed to compare different options to maximize uptime, improve safety and deliver cost savings.

**Process of optimization**  
The way we work with you

Metso Outotec's process of optimization

# Your process changes and we change along with it

Change is the only constant. For us, continuous optimization means working closely with you, truly understanding your process and making improvements accordingly.

The process of optimization is at the heart of how we do business and operate. Not only do we perform a thorough **AUDIT** and **REVIEW** of your operation, we also carefully simulate and **COMPARE** different options to ensure the solution selected is the right one.

Excellent results can often be achieved by combining materials – such as metals, rubber, polyurethane and ceramics – and taking full advantage of the best features of each.

Our products are **PRODUCED** using state-of-the-art technology and quickly installed using safe tools and methods. And when the parts are in operation, we **MONITOR** closely and make improvements if needed. This way we get better each time, making it possible for you to maximize plant efficiency, minimize downtime and ensure measurable cost savings.

With Metso Outotec, you don't just get wear parts, you get continuous performance **IMPROVEMENT**.

# Reaching your targets

We help you to achieve your strategic objectives by finding solutions that increase the efficiency of your operation.

## How does our solution improve safety?

- Increased uptime means fewer hours of risky maintenance
- Light-weight products and easy change-outs mean safer and shorter maintenance stops
- Minimized manual handling
- Fewer hot work situations and less exposure to confined spaces

## How does our solution maximize throughput?

- Long-lasting and reliable solutions keep materials flowing
- Optimized change-outs means more production

## How does our solution increase uptime?

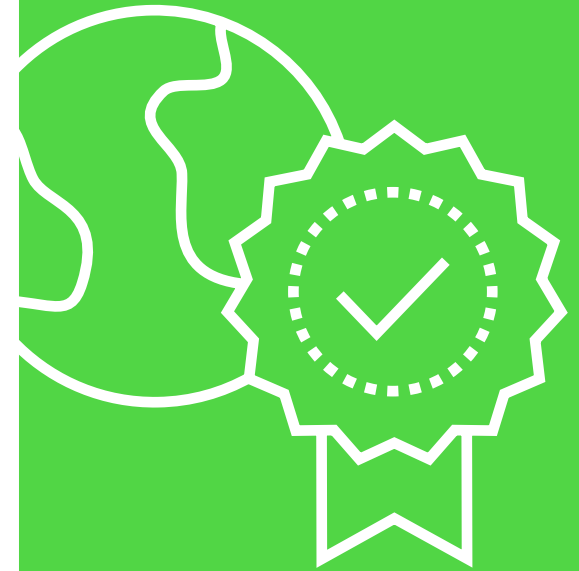
- Long wear life means fewer stops
- Faster installations using our tools, fasteners and installation methods
- Liner design optimized for quick installation and removal

## How does our solution reduce costs?

- Reduced downtime
- Improved wear material utilization
- Lower operational cost per ton

By selecting a responsible partner and optimized wear linings, you not only get more out of your process, you also take part in creating a more sustainable future.

Metso Outotec is committed to delivering solutions that are more sustainable, efficient and safer for the environment and people





# How we deliver results:

Our wear lining solutions are designed with one thing in mind – to maximize the availability and productivity of your equipment, while reducing your costs for service and maintenance.



The market's most complete wear lining offering means we can select exactly the right material and design for your operating conditions



Ability to not only optimize the wear lining, but to also design and offer complete chutes, bins and other transfer points



Continued optimization delivers the best performance – even as the process parameters change

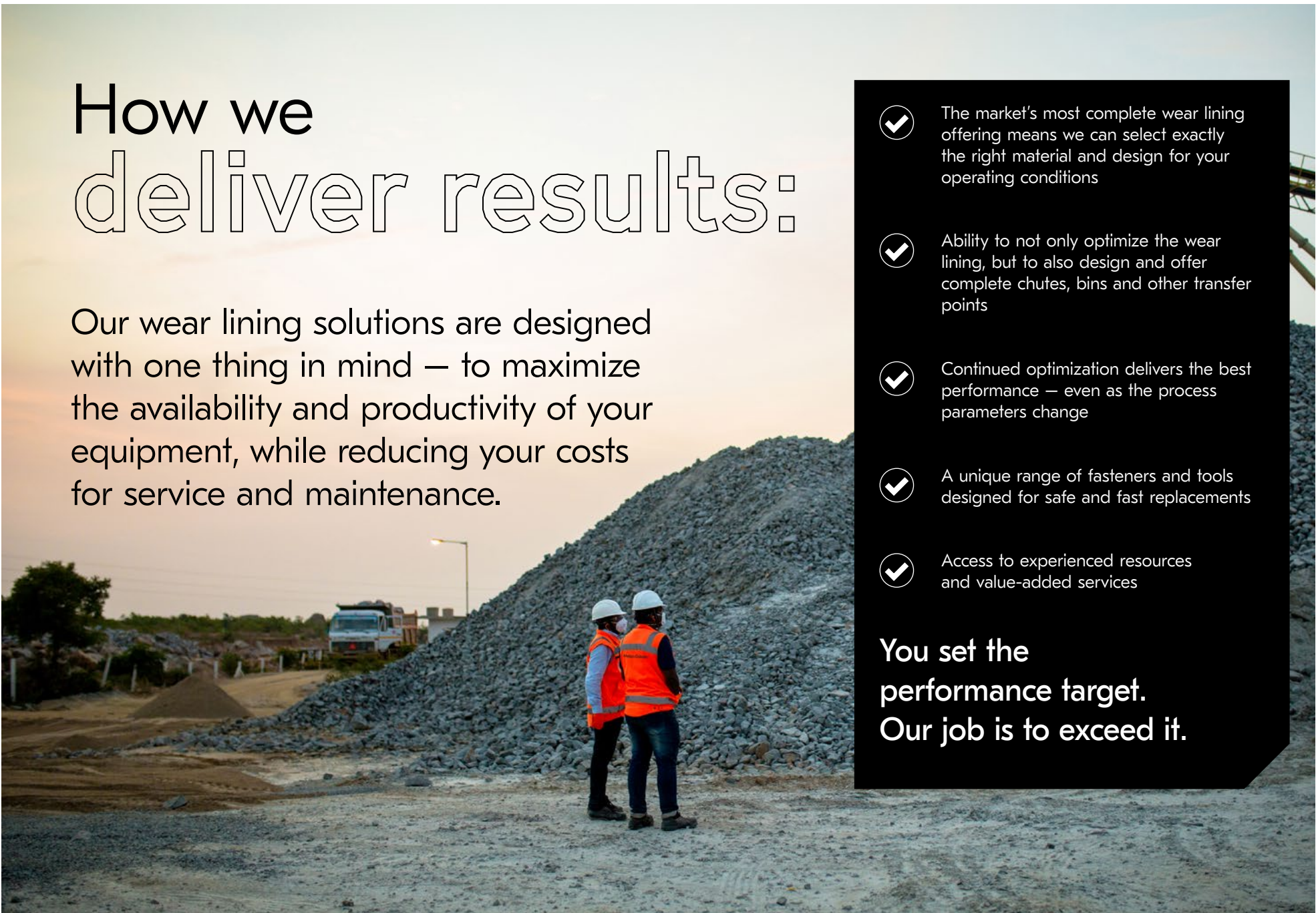


A unique range of fasteners and tools designed for safe and fast replacements



Access to experienced resources and value-added services

**You set the  
performance target.  
Our job is to exceed it.**



Case: Newcrest Cadia East, Australia

# Maximized plant availability during maintenance shutdown

## Challenge

Design and deliver eleven transfer chutes for the Cadia East project to provide exceptional performance and deliver the results expected by a world's best-practice mining operation.

## Solution

- Metso Outotec designed custom transfer chutes with the chute as a focus and the transfer station designed to suit
- The chutes were fully rotatable with only two chute sections to remove and replace
- Wearback™ design creates rock-on-rock wear to minimize chute wear and maximize ore control

## Results

- Improved uptime — the sections were replaced during a 10-12 hour outage, most chutes changed within 6 hours
- Increased throughput — from 850,000 to 6,000,000 tonnes between maintenance
- Increased safety — custom cradles allowed maintenance to be completed outside of shutdown periods







Wearback™ transfer chutes help maximize plant availability and reduce workloads during maintenance shutdowns.

#### Wearback™ features

- Control ore flow — speed and direction
- Protects both the chute and the belt
- Centralized belt loading
- Reduced skirt wear
- Reduced operating noise
- Increased liner performance
- Reduced liner mass
- Rotatable chute upgrades
- Xledge™ liner design to maximize utilization
- Minimized liner stock holdings

