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ESCO

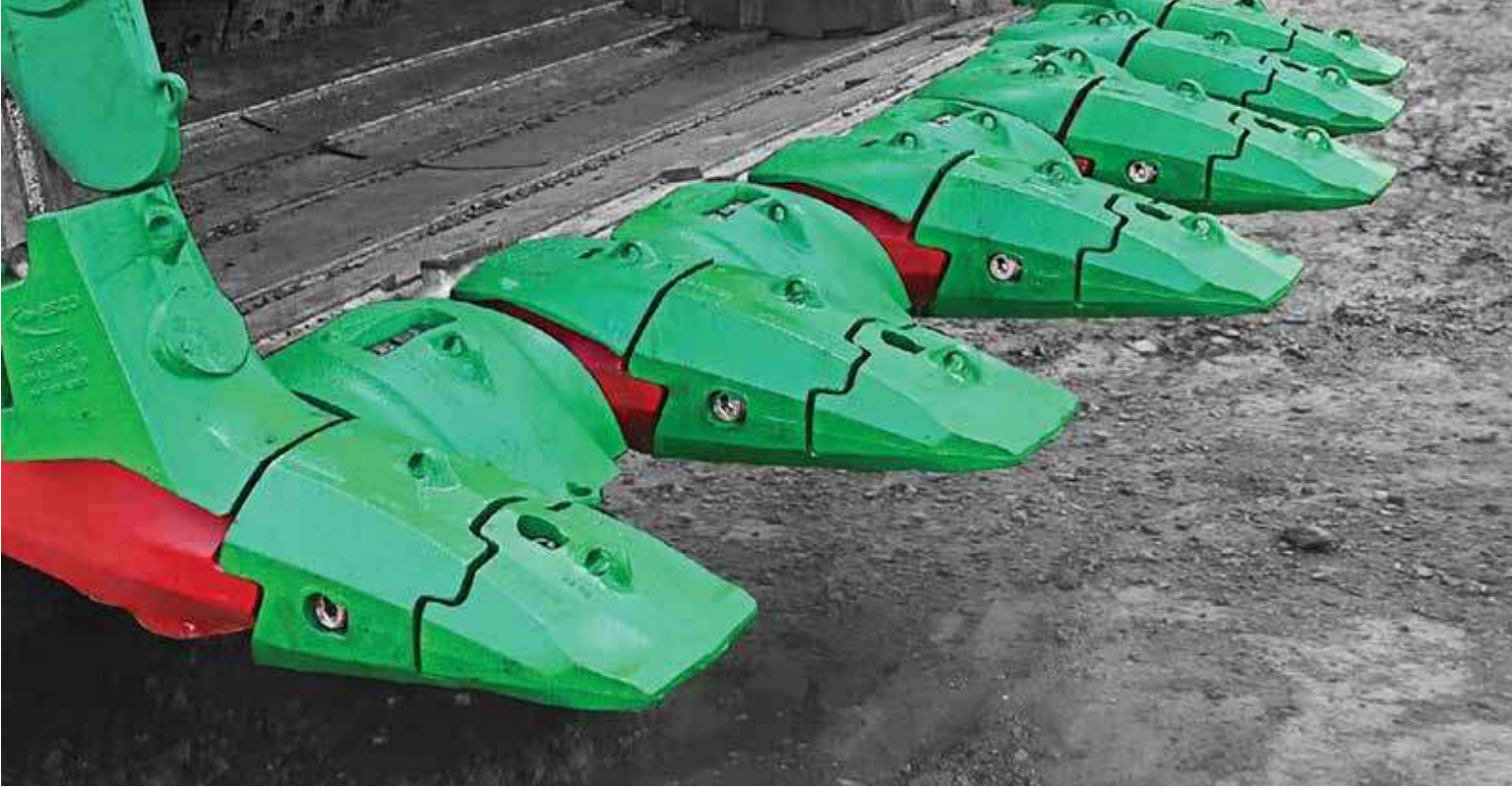
ESCO® Mining Products
Overview



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Nemisys® system – unsurpassed performance for surface mining machines in all applications



ESCO®, the world leader in mining ground engaging tools, delivers once again with the Nemisys system. You want unmatched total cost of ownership, world class mining G.E.T. system safety and unsurpassed product options? Look no further, we have a solution to meet your specific needs.

Whether your site needs to improve safety, increase productivity or reduce maintenance, we have the answer. The Nemisys system features hammerless installation and removal, superior alloys for optimum strength and wear life and reduced component/system weight to reduce stress on your equipment and people. The Nemisys system ensures your equipment operates with maximum productivity and profitability.

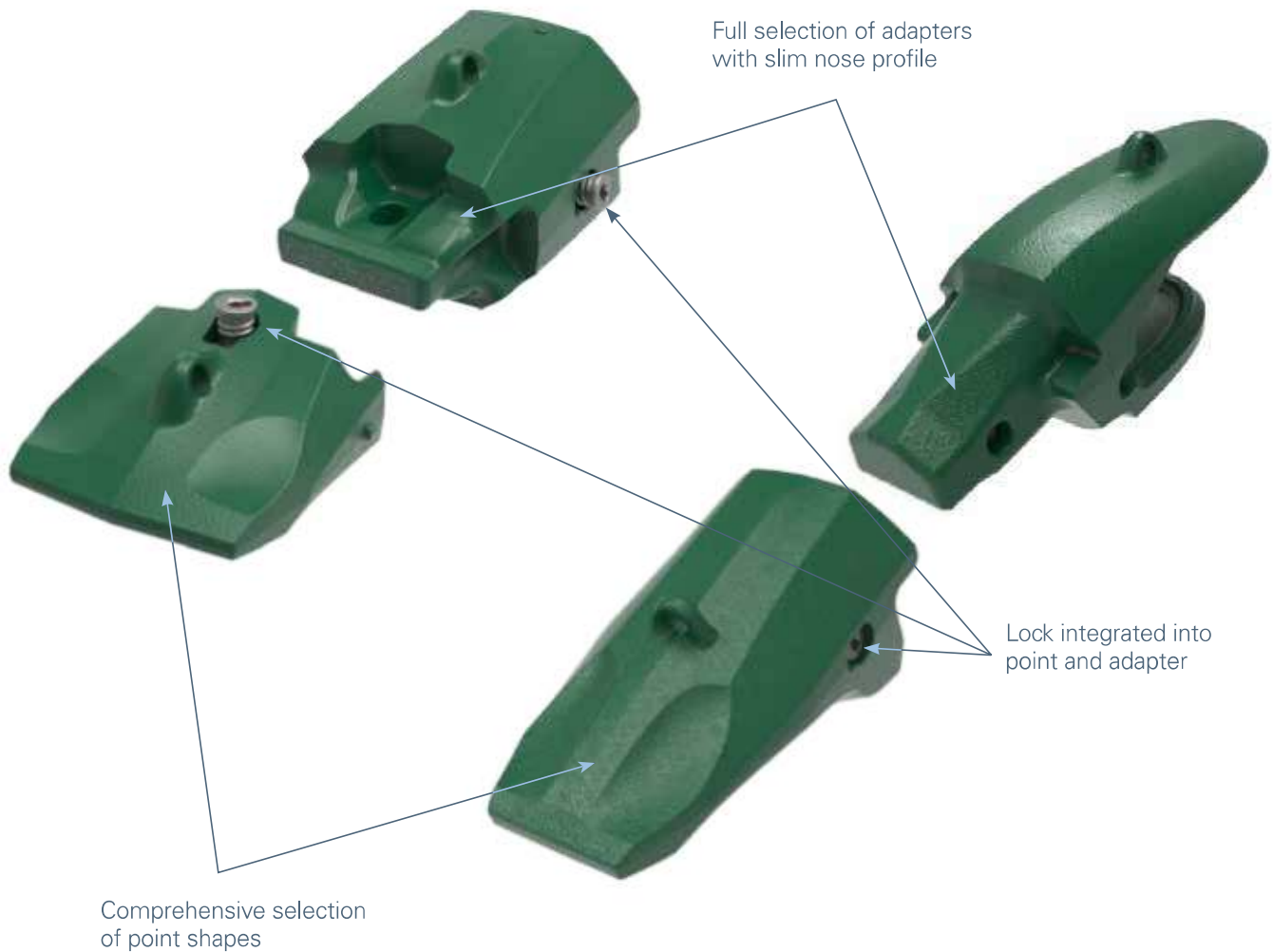


The comprehensive Nemisys offering covers your G.E.T. needs for cable shovels, draglines, mining excavators and wheel loaders - learn more about our offering on the following pages.

Nemisys® system flexibility to meet customer needs

100% increased machine availability attributed to using the Nemisys system

Machines, applications and customer requirements vary from site to site and ESCO's Nemisys system offers flexibility with differentiated design segments to meet those needs. While each Nemisys segmented offering is unique, all feature field-proven strength, wear life, productivity and one of the best hammerless locking systems in the business.



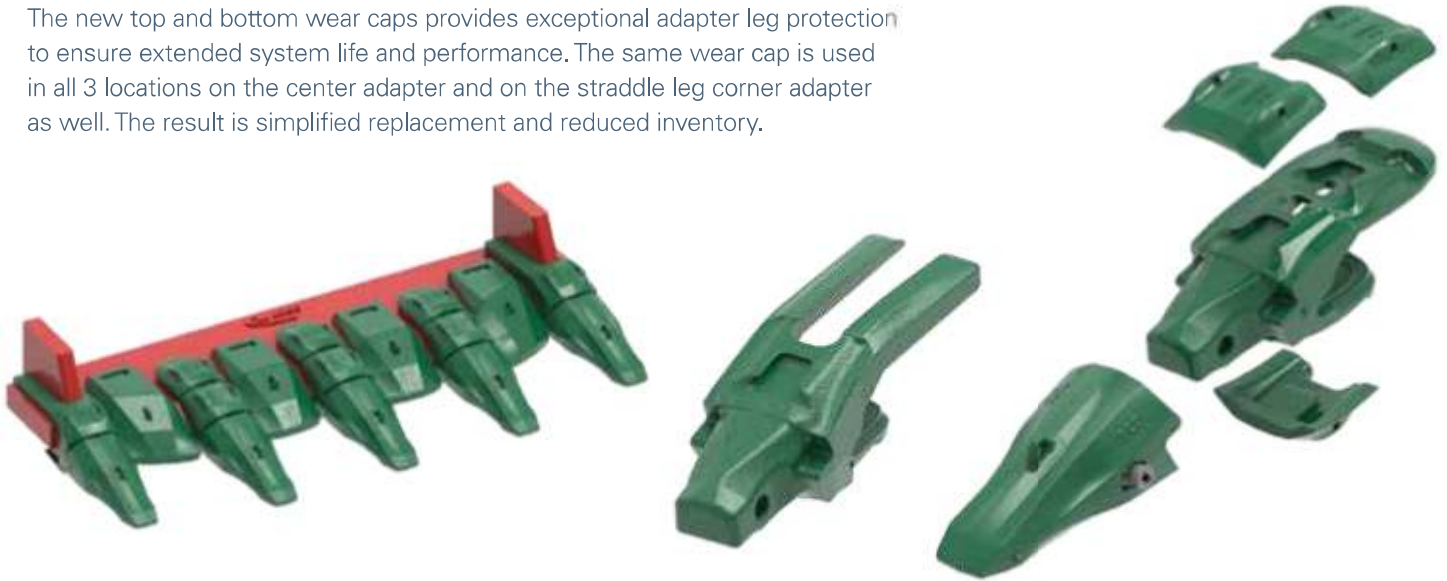
“We moved over 400,000 metric tonnes more between tooth replacement.”

– Coal Mine, Australia

Nemisys® tooth system for plate lip hydraulic excavators

Developed for 160-ton, 200-ton and 250-ton excavators, the Nemisys system is in a class by itself. The field-proven Nemisys mining tooth system is a direct upgrade and replacement for the SV2® system and competitor weld-on systems for plate lip hydraulic excavators.

The new top and bottom wear caps provides exceptional adapter leg protection to ensure extended system life and performance. The same wear cap is used in all 3 locations on the center adapter and on the straddle leg corner adapter as well. The result is simplified replacement and reduced inventory.



Nemisys® N90 and Whisler Plus™ systems developed specifically for cable shovels

The N90 system for cable shovels combines the Nemisys tooth system with the field-proven Whisler Plus adapters to provide an extremely reliable, high-performance solution for even the most extreme cable shovel applications.

Both point and adapter systems feature hammerless locking mechanisms for greater site safety and simplified replacement. The ESCO Whisler Plus lip system offers unsurpassed performance and extended service over conventional cable shovel systems.



ESCO® MaxDRP™ and MaxDRP Plus replacement teeth

In today's competitive environment, operations are looking for solutions to increase production with lower costs. Achieving these goals by investing in new equipment or upgrades may not be an option due to high cost or time constraints. ESCO developed the MaxDRP line of replacement parts for mining class Cat® and Komatsu® side pin systems to meet this challenge.

MaxDRP products are engineered and manufactured to the same exacting standards as other ESCO systems to deliver exceptional performance. MaxDRP products are direct replacements for OEM versions but provide increased wear life and superior reliability. Specify MaxDRP replacement parts from ESCO to be more productive with lower operating costs.



MaxDRP Plus system

When using OEM side pin designs, the MaxDRP Plus system offers a full selection of point shapes and features a unique hammerless lock that is reusable. Extremely reliable and safer to use than conventional side pin systems.

MaxDRP Plus ripper

ESCO introduces a hammerless DRP system for the Cat R-Series ripper system. Includes a variety of point profiles and shank protectors. The parts are direct replacements for the OEM versions and no shank modifications are necessary.



ESCO® ProFill® buckets – Increased payloads, faster cycle times, best-in-class



Optimized productivity

ESCO products are trusted at mines worldwide for improved productivity and safety – our ProFill buckets continue that tradition. A proven performer, the standard ProFill buckets provide increased productivity and cost savings worldwide. Building on the success of the ProFill configuration, we now offer the ProFill Delta bucket, which simplifies the rigging and delivers quality that our customers expect from the ESCO brand.

Built to last

ESCO dragline buckets are built using proprietary cast alloy construction, developed from over 100 years as a manufacturer of premium steel castings. Our engineering and metallurgical expertise offer an optimized cast structure with a balance of strength, impact resistance and wear life. ESCO dragline buckets are built to deliver superior productivity and maximum durability under the toughest digging conditions.

Explore the ProFill® options for superior performance

Configured to match site conditions

Choose from a standard style ProFill bucket profile or our new taper-style ProFill Delta bucket to match the site-specific rigging configuration and application requirements.



ProFill Delta bucket



Standard ProFill bucket

ProFill® bucket lip options

ESCO offers straight lips or the option of the innovative reverse spade lip (RSL) that provides faster fill times than conventional straight lips in hardpan. As the bucket with the RSL lip configuration lifts to engage the cut, the center teeth are pulled out of the material so the full digging force is concentrated on the outer teeth to help stabilize the bucket and provide maximum penetration and digging efficiency.



Straight lip



Reverse spade lip

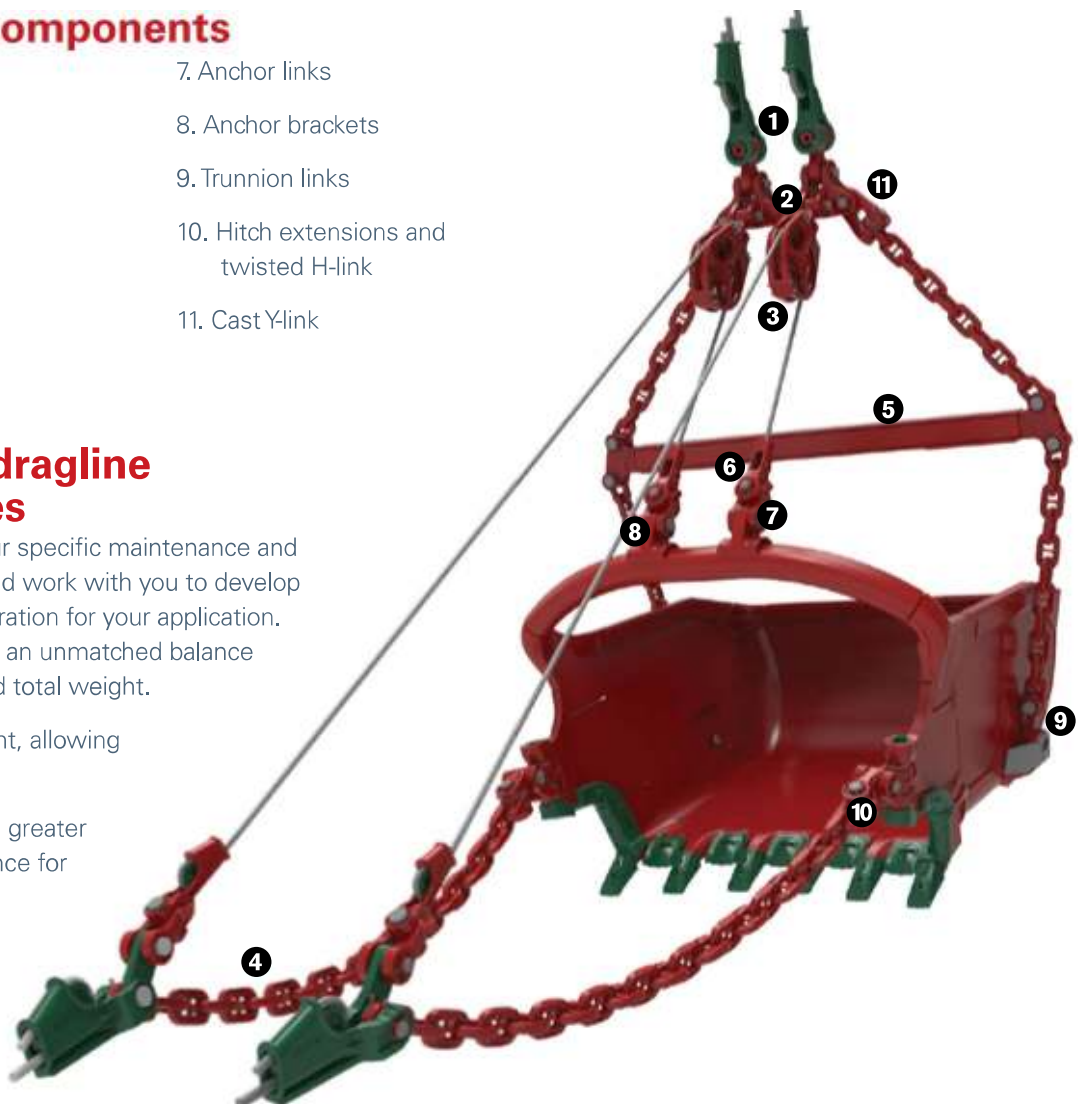
ESCO® rigging components

- | | |
|----------------------------|---|
| 1. Cast sockets and wedges | 7. Anchor links |
| 2. Upper spreader bar | 8. Anchor brackets |
| 3. Delta® dumpblock | 9. Trunnion links |
| 4. ProSeries chain | 10. Hitch extensions and twisted H-link |
| 5. Box beam spreader bar | 11. Cast Ylink |
| 6. Ferrule socket | |

ESCO® custom dragline rigging packages

ESCO engineers analyze your specific maintenance and productivity requirements and work with you to develop the optimum rigging configuration for your application. ESCO rigging packages offer an unmatched balance of durability, functionality and total weight.

- Optimized to reduce weight, allowing additional bucket payload
- Superior ESCO alloys have greater strength and wear resistance for longer life



ESCO® Production Master® cable shovel dippers

ESCO offers world class Production Master cable shovel dippers for all OEM makes and models. Our precision engineering and manufacturing increases shovel availability with more reliable, longer-lasting components that eliminates unplanned downtime, while reducing maintenance costs and increasing safety.

ESCO custom engineers each Production Master dipper to meet mine requirements. Scale model testing is used to maximize productivity and digging efficiency. We consult with mine personnel to address capacity, lip, G.E.T., rope connection and wear package options to improve reliability and productivity.

Unsurpassed productivity

Lighter dipper, higher payload

Extensive Finite Element Analysis (FEA) of the dipper and door results in reduced weight allowing up to 4% more payload than traditional OEM designs.

Increased machine availability

Long-lasting G.E.T. systems improve penetration for higher digging efficiency which increases machine utilization.



Reduced maintenance

Industry-leading tooth systems and wear protection

Nemisys® and WhislerPlus™ systems deliver longer life, fewer replacements and extended intervals between rebuilds.

Best-in-class lip technology

Proprietary lip alloy improves weldability and reduces likelihood of fatigue cracks.

Engineered to outlast

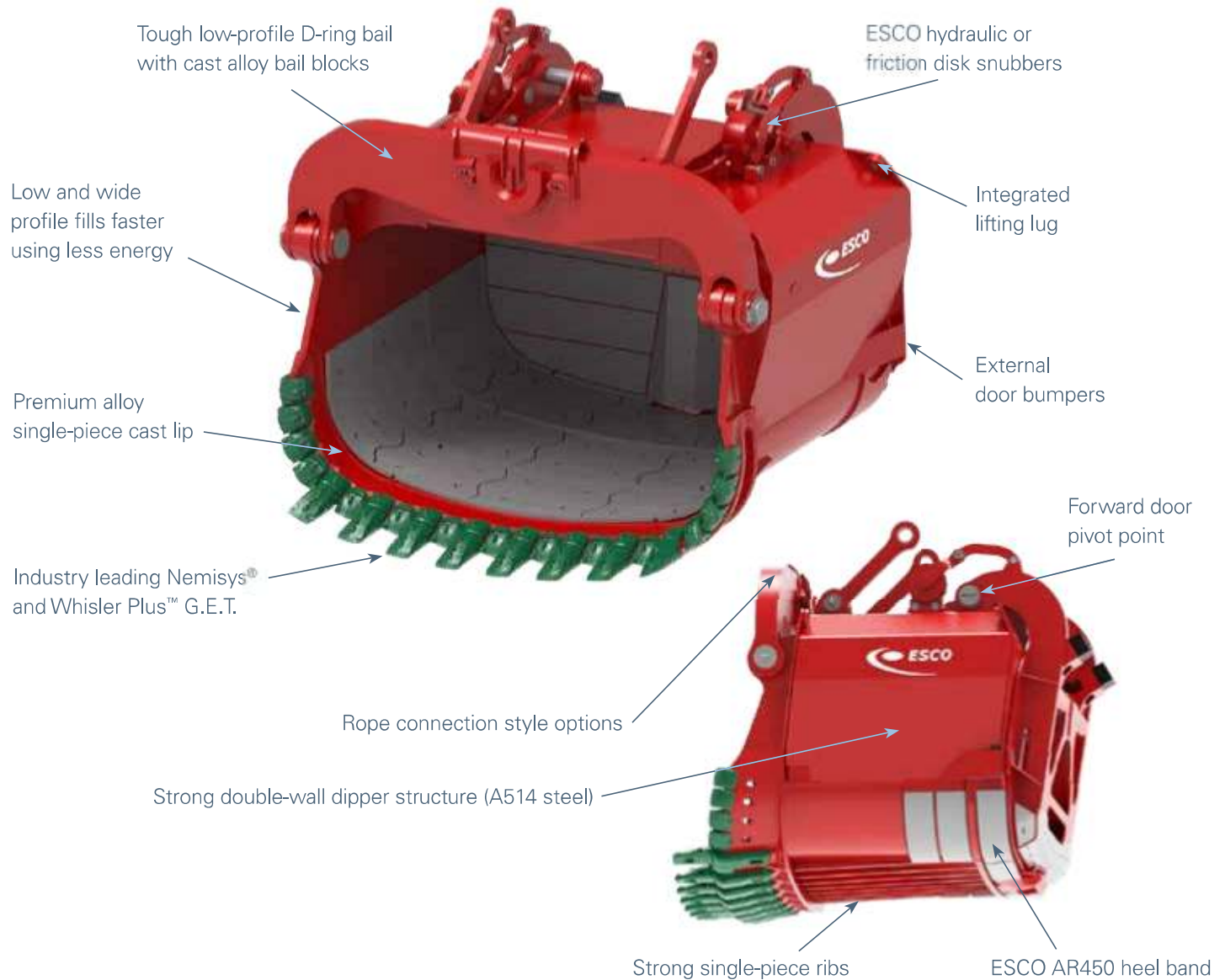
ESCO doors and bails provide superior strength over OEM versions.

Less planned maintenance

The rear-taper door's short travel lowers truck impact during loading and softer closing for reduced dipper and snubber wear and tear. A 35% lower peak side-loading stress results in better reliability and longer service life.



ESCO® Production Master® dipper standard features



A recent customer comparison of an ESCO Production Master vs. OEM dipper resulted in:

- A sustained 5.7% hourly production rate increase (same shovel in similar conditions)
- Over 70% reduction in unplanned downtime for dipper maintenance



ESCO® mining class hoe buckets

From loading loose material to extreme rock conditions, ESCO Mining Hoe Buckets are designed to deliver unsurpassed performance and durability. Our buckets are custom engineered to match the required capacity and duty cycle for each application. Choose from standard or fully customized wear packages.

ESCO mining hoe buckets are performing at hundreds of locations on 6 continents. A proven performer that keeps machines operating with excellent reliability and significantly less maintenance.



Enhanced productivity

- Optimized payload by engineering to site material density while striking a balance between maintenance requirements versus capacity
- Increased machine availability using high-strength steel fabricated to exacting specifications to reduce the chance of unplanned maintenance
- Industry-leading Nemisys® lip system and G.E.T. provides unmatched reliability and service life with maximum weight efficiency

Reduced maintenance

- Enhanced beam shapes, configuration and weld-joint design using advanced finite element analysis (FEA) tools distributes operational stresses for increased durability
- Lower maintenance costs by site-tailored wear protection proven to lower G.E.T cost of ownership over competitive systems
- Fewer and faster wear parts replacement with the reliable Nemisys® G.E.T. that maximizes wear metal utilization with ESCO premium alloys and easy-to-use integral hammerless locks

ESCO® mining hoe bucket duty class

Selecting the ESCO bucket duty class best suited to the target mining application is essential to maximize bucket life, minimize maintenance and reduce the chance of unplanned downtime. The right choice will increase productivity and reduce operating cost.

GP

General purpose/standard-duty application

- Well-blasted
- Re-handling
- Dirt / Coal
- Low density
- Low impact

HD

Heavy-duty application

- Blasted or easily fractured rock and ore
- Overburden
- Medium density
- Medium impact

XHD

Extra heavy-duty application

- Severe duty
- Un-blasted hard rock
- Heavy ore
- High density
- High impact



HDPM



XDPM

CAPACITY

DURABILITY

Hoe buckets shown are representative examples.

ESCO® hydraulic face shovel buckets

ESCO produces reliable, performance-driven face shovel fronts and backboards for the world's most demanding mine sites. Available for 120 to 800-ton machine classes, sized to match site payload specifications.

Our offering is customized for production requirements and material conditions for maximum machine productivity and lower total cost of production. OEM compatible profiles allow for easy integration into an operation's existing bucket fleet.



Increased productivity

High efficiency lip and G.E.T.

Industry leading Nemisys® lip system provides unmatched reliability and wear life without extra weight.

Optimized payload

Engineered to site material density to achieve the desired balance of maintenance requirements and payload demands.

Increased machine availability

High-strength steel fabricated to exacting weld specifications results in less unplanned maintenance.

Lower maintenance cost

Wear protection is customized to site needs. ESCO G.E.T. has proven lower cost of ownership compared to competitor systems.

Prioritizing safety

Engineering integrity

Collaborative engineering process provides precise bucket weight and capacity information. The safety of your personnel and the health of your equipment is essential.

OEM compliant

Buckets are developed using machine OEM guidelines including gross allowable load (GAL), pin-to-point, machine breakout force (BOF) and rated capacity.

Fabrication standards

Welding is performed to exacting standards and stringent quality controls using only high-quality steels. Specifications meet or exceed industry standards.



ESCO® hydraulic face shovel standard features

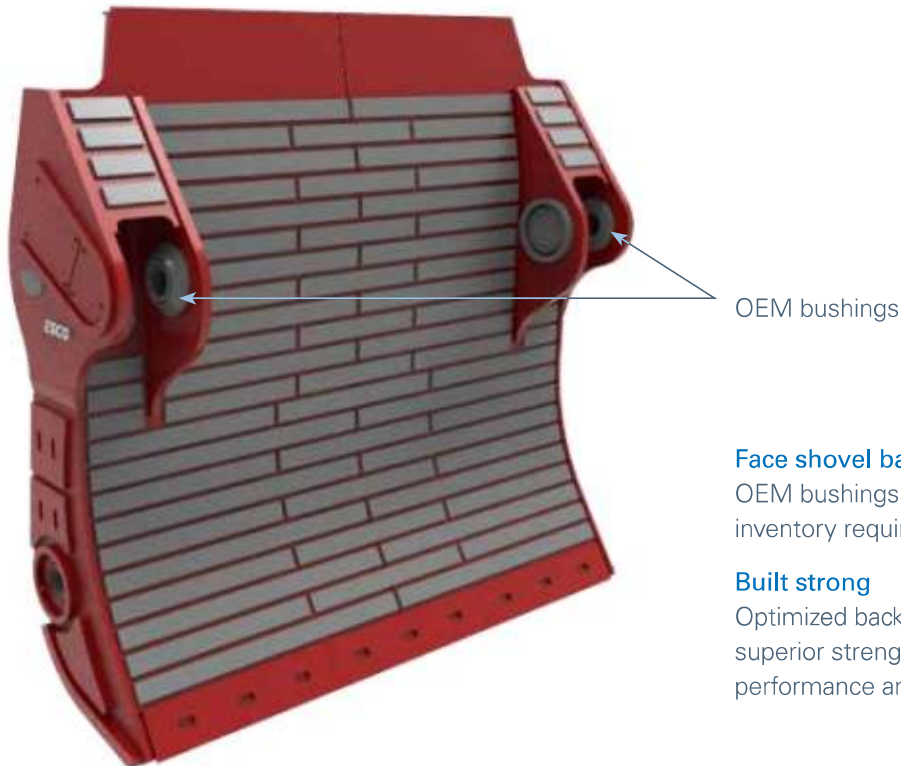
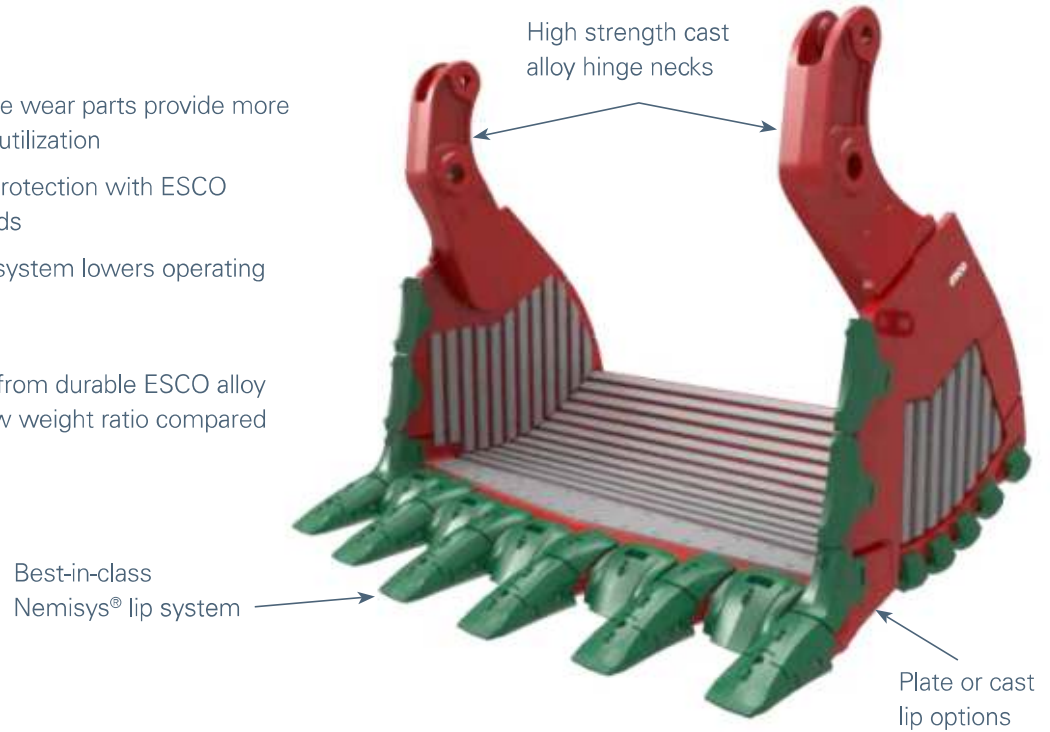
ESCO mining bucket fabrications exhibit excellent toughness as they are made from high grade A514 plate and welded and inspected to rigid ESCO standards.

Face shovel fronts

- Longer wearing, easy-to-change wear parts provide more uptime for increased machine utilization
- Exceptional lip and side plate protection with ESCO mechanical lip and wing shrouds
- Industry leading lip and G.E.T. system lowers operating cost per ton

Engineered to outlast

Reliable cast hinge necks made from durable ESCO alloy 12T provides high strength to low weight ratio compared to fabricated hinges.



Face shovel backboards

OEM bushings simplify maintenance and reduce inventory requirements.

Built strong

Optimized backboard interior ribs and gussets provide superior strength and rigidity resulting in reliable performance and extended life.

ESCO® mining class wheel loader buckets

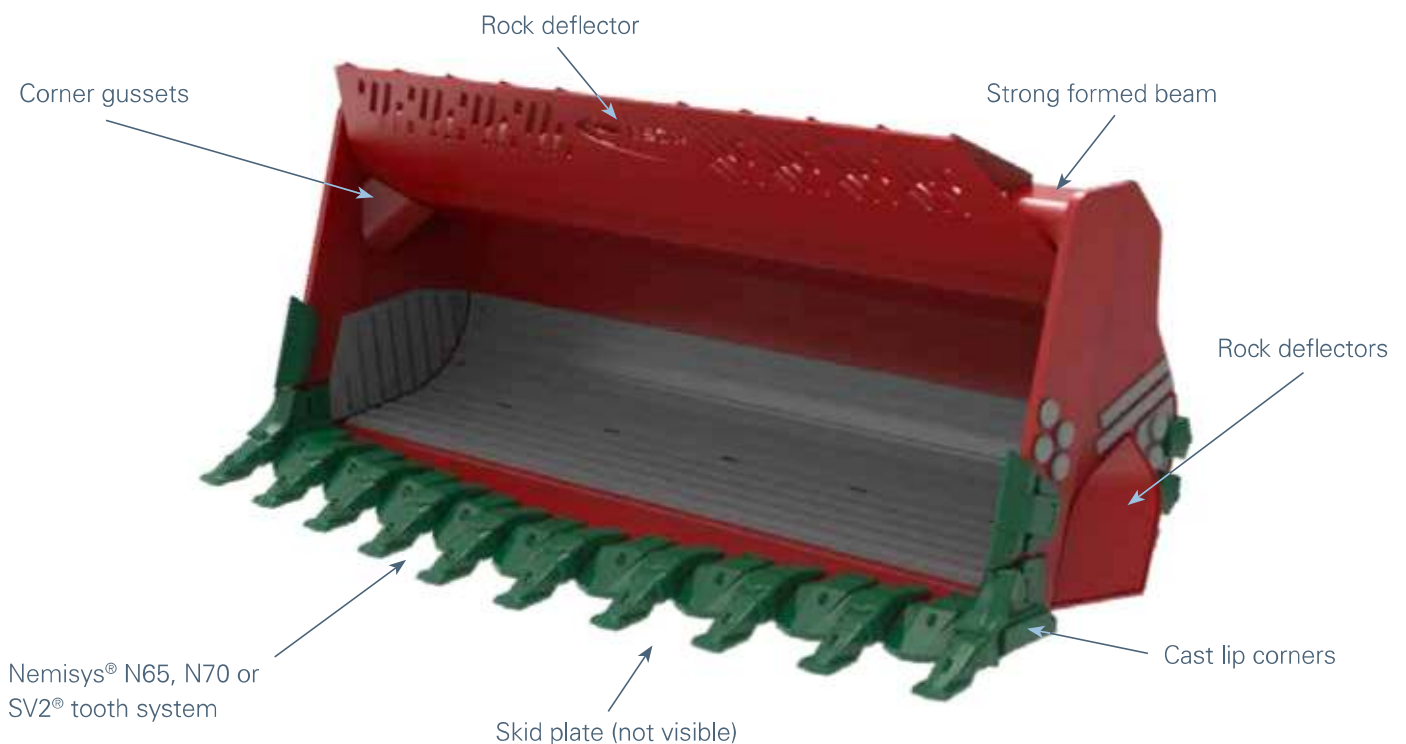
ESCO produces reliable, performance-driven wheel loader buckets built for the world's most demanding mine sites. ESCO buckets are compatible with most 5 m³ (6.5 yd³) class and larger loaders from CAT®, LeTourneau™, and Komatsu®.

Engineered to deliver payloads meeting site production requirements, buckets are available in extra heavy-duty (XHD), heavy-duty (HD) and general purpose (GP) duty classes. Plate lip system options include best-in-class Nemisys® N65 and N70 or SV2® tooth system.

Unsurpassed durability

- Lower maintenance cost over competitive designs
- Fewer and faster wear parts replacement
- Full wear protection options available
- Greater productivity
- Engineered to outlast
- Reduced stress points

ESCO wheel loader bucket standard features



ESCO® precision engineered LHD buckets

Custom engineered to meet customer needs, ESCO offers a variety of direct replacement LHD bucket styles for all popular machines. Manufactured to exacting standards with the finest materials available, ESCO buckets out-perform OEM versions in standard or ejector configurations. ESCO LHD buckets are available with the innovative UltraEdge lip system, EverSharp lip system or ESCO weld-on shroud lip system.



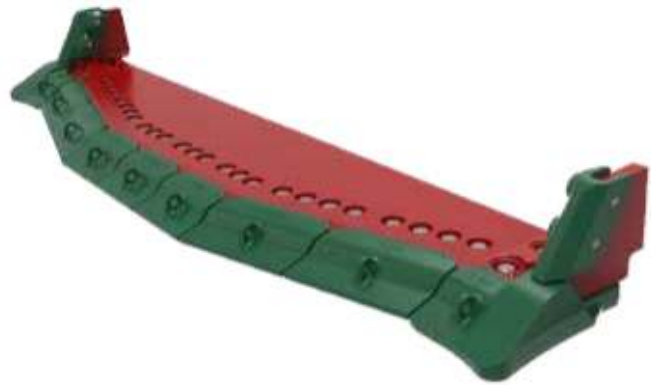
ESCO standard LHD bucket



ESCO ejector style LHD bucket

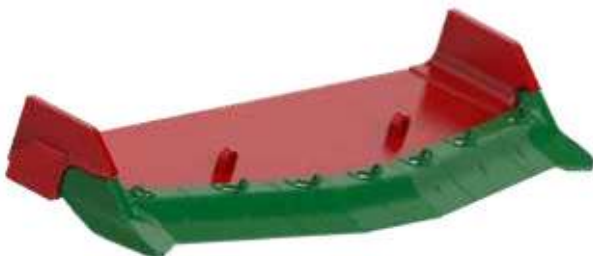
ESCO UltraEdge™ lip system

ESCO's newest LHD offering is the UltraEdge lip developed for exceptional performance, increased mine safety and reduced maintenance. The unique locking system allows easy adjustment to maintain shroud tightness against the lip for optimum performance. The system is available for 50mm / 2.00in and 60mm / 2.25 in lip thicknesses and can be configured to any lip width.



Additional LHD lip options

ESCO also offer the field-proven EverSharp LHD lip with mechanically attached continuous edge for medium to large sized underground loaders. ESCO's weld-on shroud LHD lip is an excellent economic alternative to mechanically attached configurations. The system reduces inventory by utilizing interchangeable intermediate shrouds and is suitable for back blading applications.



EverSharp® LHD lip



ESCO® weld-on shroud style lip

Engineered to outperform



Extensive product offering

- Choice of custom-engineered or ready-to-order wear parts
- Range of ESCO alloys
- Inventory on hand
- Competitive lead times

Technical services

- Chamber Drawings + Analysis
- Alloy Selection Assistance
- Chamber Optimization

Crushing expertise

- 100+ years of casting expertise
- In-house engineering
- In-house metallurgy
- Global manufacturing and field support

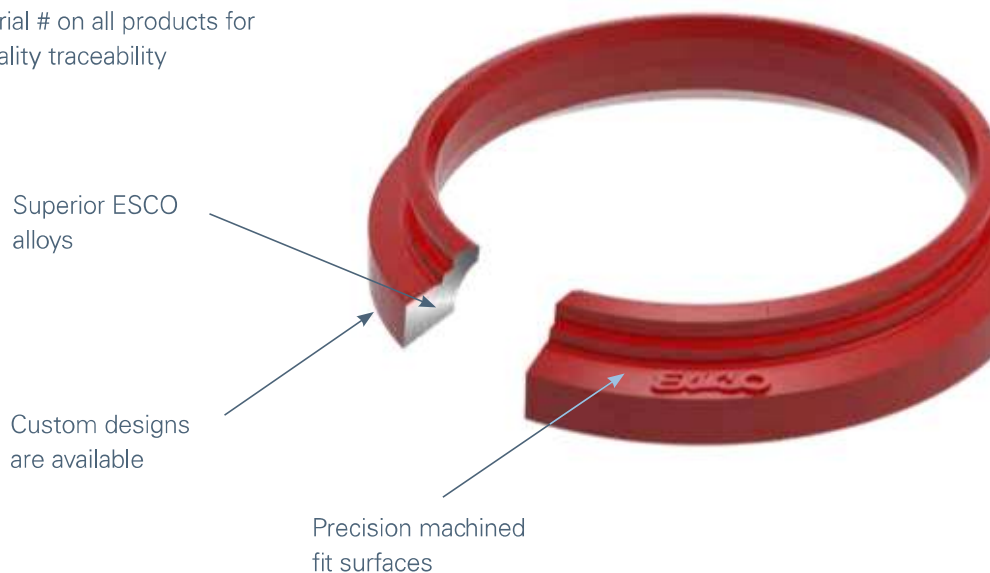
Quality and consistency

- Consistent, accurate lead times
- Regular manufacturing audits
- Serial # on all products for quality traceability

ESCO® crusher upgrades

Looking to take your crusher to the next level? Upgrade to high performance wear parts from ESCO. Built to take a beating and engineered to deliver consistent performance you can rely on.

ESCO is a leading developer of heavy-duty wear parts for all major makes and models of cone, gyratory, and jaw crushers. Our product range is backed by stringent quality control measures, and over 100 years of cast wear parts expertise, coupled with in-house metallurgy and engineering.



Choose from our premium ready-to-order products, or upgrade to an ultra-performance custom solution. The crushing experts at ESCO can assist you in selecting an enhanced replacement part, pre-engineered for your specific crusher. Or, for those seeking a serious boost in productivity, we deploy our engineering group to analyze your crusher setup and engineer fully customized wear parts, built to get the most out of your machine and withstand even the most demanding applications.

ESCO crusher wear parts can be produced in a range of proprietary, field-proven ESCO alloys. Due to the complex interplay between the alloy, wear metal allocation, and your local material conditions, our engineering team will assist you in selecting the optimal alloy for your specific needs and objectives.

Contact us today to learn why the world's most productive operations upgrade to ESCO crusher parts.



Cone

- Mantles and liners: ready-to-order, or custom-engineered
- Torch rings: ready-to-order



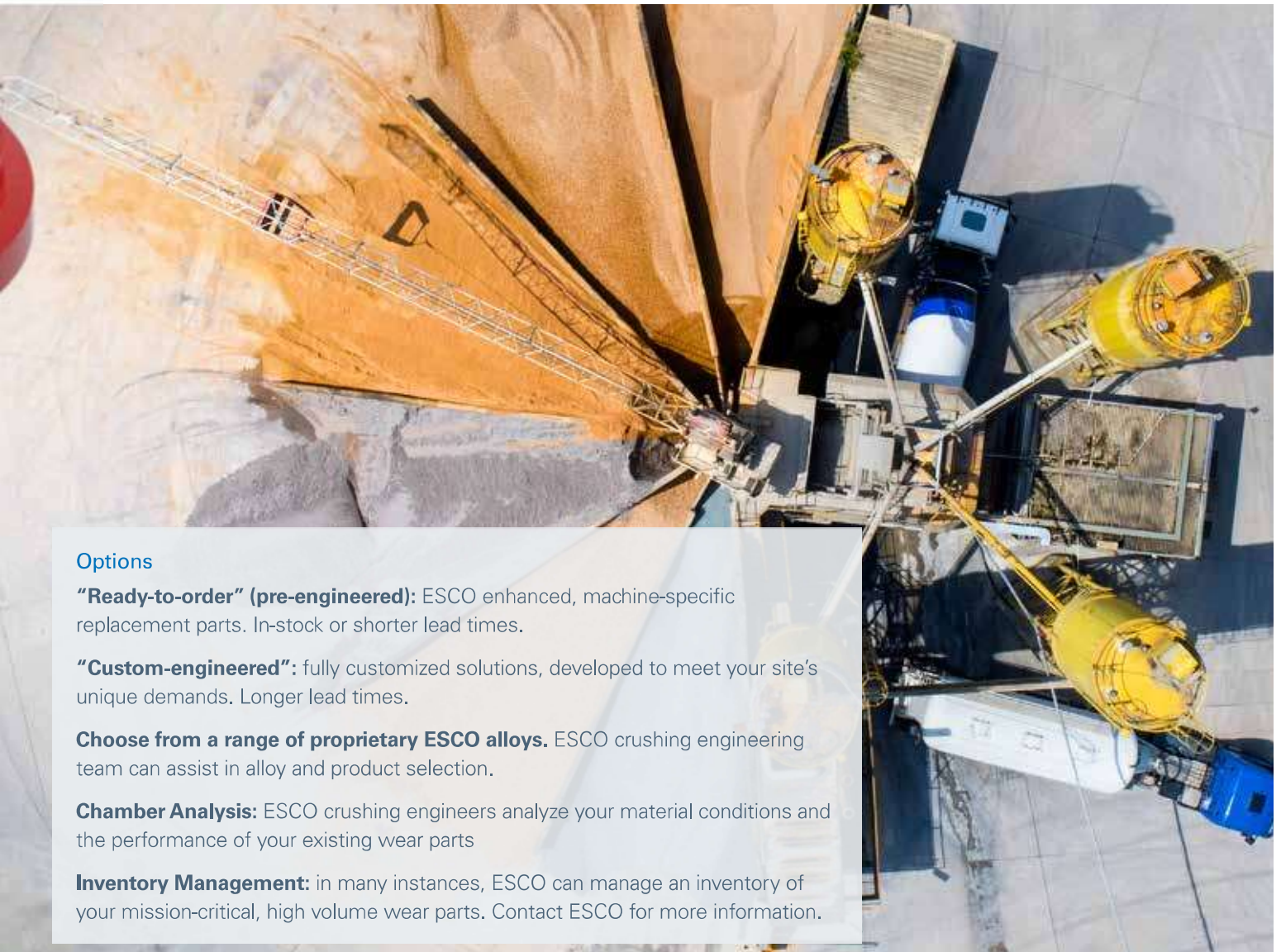
Jaw

- Jaws: ready-to-order or custom-engineered (select from Maximum Productivity, Longer Life, or Special Application variants)
- Fabricated Cheek Plates: ready-to-order



Gyratory

- Mantles: ready-to-order or custom-engineered
- Liners (Rim and Spider Arm): custom-engineered
- Caps (Ball and Spider): custom-engineered
- Rock Splitters: custom-engineered



Options

"Ready-to-order" (pre-engineered): ESCO enhanced, machine-specific replacement parts. In-stock or shorter lead times.

"Custom-engineered": fully customized solutions, developed to meet your site's unique demands. Longer lead times.

Choose from a range of proprietary ESCO alloys. ESCO crushing engineering team can assist in alloy and product selection.

Chamber Analysis: ESCO crushing engineers analyze your material conditions and the performance of your existing wear parts

Inventory Management: in many instances, ESCO can manage an inventory of your mission-critical, high volume wear parts. Contact ESCO for more information.

ESCO® All-Cast™ blades and end bits

Dozing and grading at heavy construction or mine sites are among the toughest jobs around. To help these operations run efficiently, ESCO developed a comprehensive cast blade package to withstand the extreme abrasion and impact of these applications.

ESCO offers All-Cast blades and end bits for Caterpillar® and Komatsu® dozers. All-Cast blades are also available for Caterpillar graders. In addition to individual components, select kits are available containing the blades and bolt package required to upgrade a specific machine.

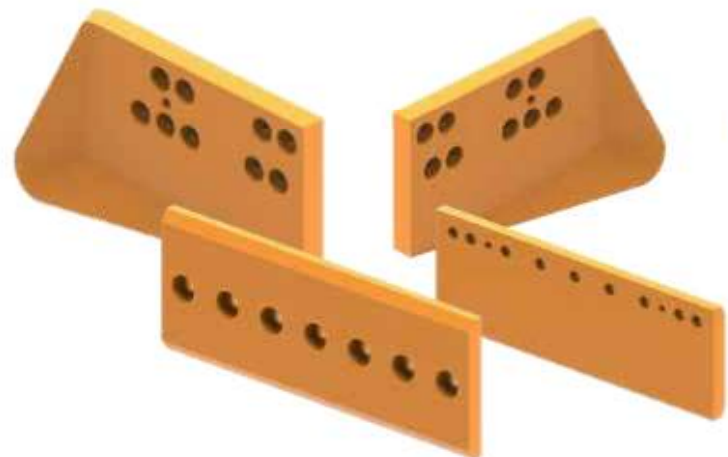
ESCO All-Cast blades and end bits for dozers can withstand the toughest impact and abrasive applications – lasting up to 2-3 times longer than rolled steel blades. One installation can eliminate 1 or 2 costly sets of bolts and replacement downtime over rolled steel products. Cast products are available for Caterpillar D8 through D11 dozers (U, semi-U and carry style machines) and Komatsu D375 dozers.



All-Cast grader blades are available for the Caterpillar 14, 16 and 24 machines. The straight edge version is an excellent choice for most extreme conditions. When more penetration is required –like winter or hard pack applications–serrated versions are available.

All-Cast blade and end bit benefits

- Designed to stay sharp for more efficient cutting
- Long life ensures maximum machine availability
- Cast steel resists severe impact, reducing the chance of breakage



Bucyrus Blades™ products

ESCO also offers a full selection of rolled steel blades, end bits and cutting edges for all popular mining machines. Available with tungsten carbide inserts and carbide overlay for highly abrasive applications

ESCO® wear materials for mining applications

Custom wear packages are available for new buckets or for retrofit to existing customer buckets. ESCO wear materials are also an excellent option to protect high wear areas in processing plants and other support equipment. The wide variety and versatility of our cast, plate and bimetallic wear products ensures the right protection in the right location to best match the application.

Infinity® metallic chrome white iron

Abrasion resistant, bimetallic buttons, bars, blocks and runners are made from 700 Brinell chrome white iron (CWI) on a mild steel backing. Available in a variety of sizes and shapes, it is ideal for high abrasive applications.



ESCO abrasion resistant (AR) plate

Available in AR400, AR450 and AR 500 grades, our plate is through-hardened for optimum performance. All have superior toughness and abrasion resistance over conventional wear plate. AR400 has excellent toughness with high abrasion resistance; AR450 has the optimum balance of toughness and wear resistance; and AR500 has high toughness with maximum wear resistance. All three are formable with very good weldability.



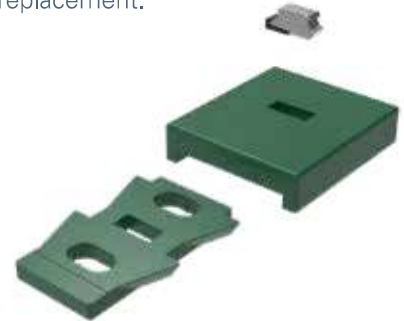
Infinity® chromium carbide overlay plate

Infinity plate has a minimum hardness of 573 BHN and offers optimum wear protection in extreme abrasion and medium impact applications. The overlay plate is formable and is available in custom designed kits to fit a wide variety of surface configurations.



Kwik-Lok® II wear runners

Cast steel, heavy-duty wear runners in a wide variety of profiles are sized for easy handling and placement where needed most – including high impact locations. The system features a one-piece locking system that provides safer and faster replacement.

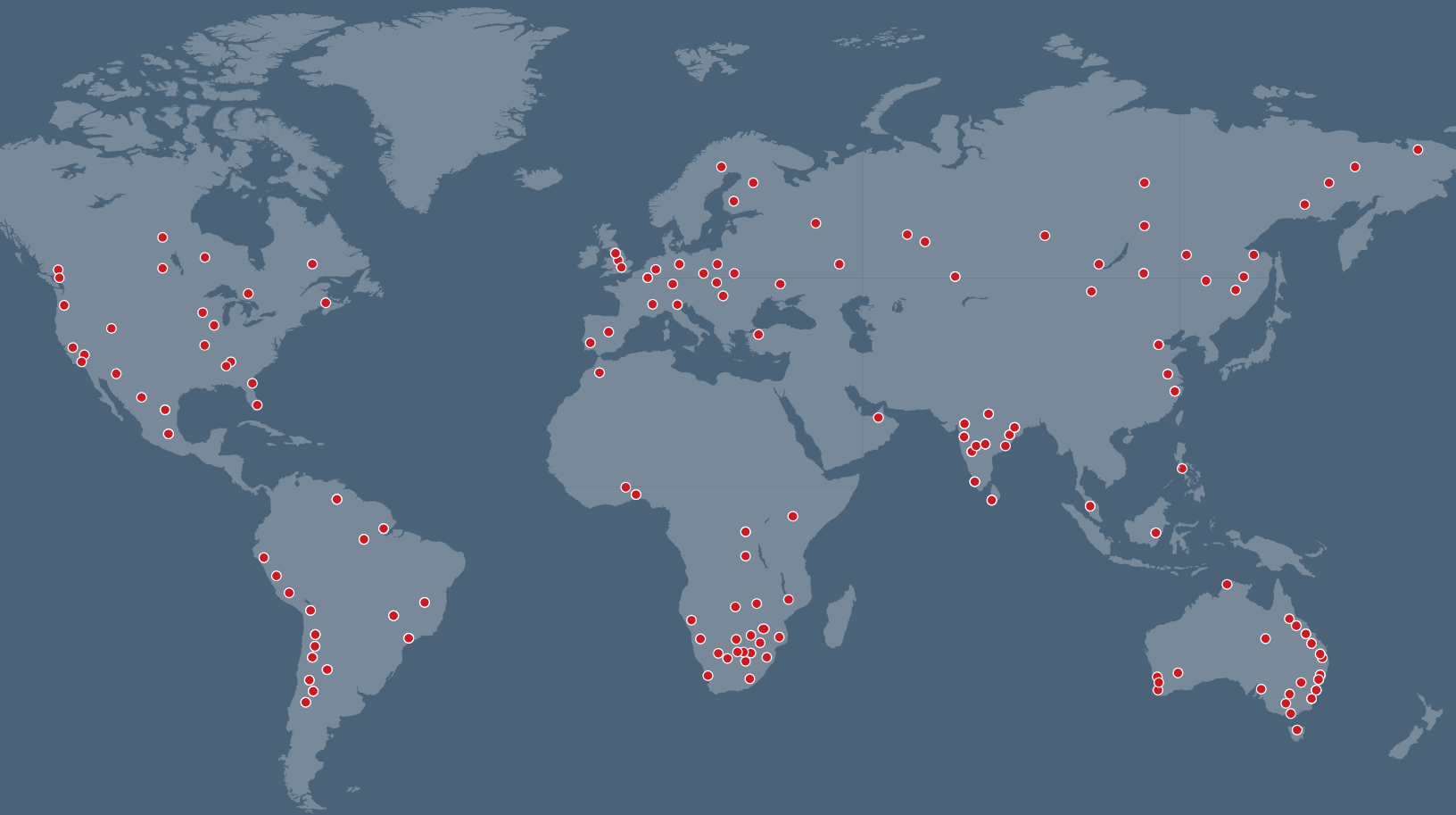






ESCO® – The proven leader in mining and aggregate applications

Today's mining and aggregate operations are under increasing pressure to improve production levels while controlling costs and maintaining the safest working environment possible. As with any operation, the key to achieving these goals is an optimized equipment system. This is where ESCO's quality products and application professionals can deliver results that are unmatched in the industries we serve, and profitability.



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