Unicast designs and distributes world-leading, high-quality wear parts for the aggregates, mining, cement, oil and gas, and coal industries.
Unicast Global Offices

We are based in Western Canada with representatives in Eastern Canada, USA, Argentina, Peru, Colombia, Nicaragua, Mexico, and the Philippines.
For nearly a quarter of a century, Unicast’s mission has remained the same: To respond to industrial wear part challenges and deliver innovative wear parts with outstanding wear life.

Extreme temperatures, high-impact work, and tough materials wreak havoc on wear parts. The frequent replacement and maintenance of these parts waste huge amounts of time and money. Unicast helps cut down on costs and makes maintenance staff’s job easy by providing wear parts that can withstand even the most abrasive conditions and materials.

Unicast wear parts last longer than other products on the market and are easy to install and maintain. This minimizes downtime while maximizing operations’ profitability.

Founded as a family business in 1994, Unicast sells to distributors, process plants, and mine sites worldwide. Based in Kelowna, British Columbia, Unicast works across multiple continents in the mining, cement, oil, gas, aggregates, and coal industries.

OEM REPLACEMENT CASTINGS
Our capabilities range from investment castings a few grams in weight to sand castings weighing several tonnes.

QUALITY CONTROL
Unicast prides itself on its rigorous quality control procedures such as partner foundry reports, materials characterization, and much more!

METALLURGY
We offer multiple cutting-edge, secondary materials that enhance the durability and quality of products.

FOUNDRIES
Unicast products are engineered by our dedicated team of in-house engineers in British Columbia and manufactured by our partner network of global foundries.
**Crusher Wear Parts**

**JAW CRUSHER**
Unicast’s Jaw Crusher wear parts are cast to last, with a customized fit.

Available for aggregates, cement, and mining industries. Parts designed to improve efficiency and reduce costs by extending wear life and minimizing downtime.

M2, M19, and M22 alloys surpass OEM jaw crusher replacement wear parts.

Custom fit for greater performance and easier replacement.

Titanium Carbide (TiC) options for incredible wear life.

Personalized service by a team of experienced engineers.

See page 10 for case study

**CONE CRUSHER**
Unicast’s Cone Crusher parts are designed to improve efficiency and reduce costs by extending wear life and minimizing downtime.

**GYRATORY CRUSHER**
Unicast’s Gyratory Crusher wear parts feature unique design improvements to extend wear life.

**ROLL CRUSHER**
Our engineers get to know your specific needs through a one-on-one consultation and customize a best-fit solution for your application.

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**Metallurgy**

Unicast has been at the forefront of metallurgical innovation for decades. We offer multiple cutting-edge secondary materials that enhance the durability and quality of products while providing extra protection against abrasion and high-impact wear. Unicast prides itself on its rigorous quality control procedures during R&D and manufacturing stages, aided by advanced research in university laboratories.
## Valves & Pipes

### Diverter Valves
Unicast Diverter Valves and Split Modular Valves set the standard for inline maintenance and durability, providing cost savings and minimized downtimes for cement plants around the world. Single-handedly perform routine maintenance in 4-hours or less, even if it’s installed 200 feet up in the air. No crane. No hoist. No lift. No stress.

<table>
<thead>
<tr>
<th>30-degree (NEW) and 45-degree angled outlets available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic liners in outlets.</td>
</tr>
<tr>
<td>Right-left convertibility.</td>
</tr>
<tr>
<td>Large access panel maintenance.</td>
</tr>
<tr>
<td>One-piece seat with two bolts.</td>
</tr>
</tbody>
</table>

### UNIBall 3-Way Check Valve
Perform regular maintenance on the UniBall Converging Valve without removing it from the pipeline.

### Ceramic-lined Slurry Valves (CLV)
The CLV is designed specifically for the transport of slurry.

### Shut-off Valves
Total protection in abrasive environments. Less downtime.

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Titanium Carbide (TiC) inserts added to the original alloys has shown to significantly increase the wear life and durability up to 7.5x.

Tungsten Carbide (WC) metallurgy mixes tungsten particles into the primary casting metal, resulting in extremely tough wear parts.

Unicast’s Ceramic Reinforced Alloy (CRA) products last up to 10x longer than their traditional alloy counterparts.
Impactor Wear Parts

**HORIZONTAL SHAFT IMPACTOR (HSI)**
Unicast’s HSI Crusher wear parts are designed for the longest usable wear life for significant cost savings. Unique design features combine with proprietary high-strength alloys for greater reliability and bottom lines.

Superior design, HSI Blow Bars deliver up to 7x wear life for significant cost savings.

Allows for plant maintenance team to rotate the bar 3x.

Available in material options to suit your application (high-strength alloys, manganese, TiC, and CRA).

See page 10 for case study

**VERTICAL SHAFT IMPACTORS (VSI)**
Get the longest wear life between changeouts. Trusted product in the aggregates and mining industries.

**HORIZONTAL SHAFT IMPACTOR LINERS (HSI)**
HSI wall liners, side liners, and apron liners deliver outstanding wear life.

Mill Wear Parts

**ROLLE R MILL WEAR PARTS**
Unicast supplies replacement castings for roller mills, including roller wear segments, roller mill wear liners, table segments, roller wheels/tires, ported air rings, bearing housings, and roller mill bases.

Perfect fit design for worry-free changeouts.

Different materials and welding options available.

**BALL MILL/SAG MILL WEAR PARTS**

**SHELL & HEAD LINERS**
Cast in materials ranging from chrome-moly steels to high chrome white iron.

**DRIVERS, GEARS, PINIONS, BEARINGS**
With infield measuring with a high accuracy 3D scanner, we can reverse engineer your existing wear parts.

**GRATES & SCREENS**
Our headliners, partition, and discharge grates are designed for efficient mill performance with reduced maintenance needs.
Hammermill Wear Parts

**TIC HAMMERS**
Unicast Hammers with TiC inserts deliver outstanding durability and strength where needed. Our successful hammer design cast in M2-M19 alloy is even tougher with TiC columns embedded within the hammer’s high impact zone.

 Fewer changeouts and more uptime.

 Decreased downtime reduces maintenance and operation costs.

 Hammer body is cast in durable manganese steel (M2-M19) that gets harder the longer you work it.

 More consistent wear profile for uniform product output.

**ALLOY HAMMERS**

 Made to exceed OEM standards.

 Efficient cast design is superior versus other hammers prone to deforming and cracking.

 Stronger alloys deliver longer wear life and fewer part changeouts.

**CAGE ASSEMBLIES & GRATES**
A Unicast innovation designed to save time and hassle. Save time with a cast block of cage bars for quick and easy installation.

**BREAKER BLOCKS**
Unicast Breaker Blocks are cast in manganese steel for improved wear life and decreased costs.

**CRUSHER ROTOR ASSEMBLIES**
One-piece cast disks in wear-resistant WR3 for longer wear life. Crusher rotor assemblies are precision balanced to eliminate vibration.

**END LINERS**
Unicast Hammermill End Liners are cast to include welded supports and bolt protectors for longer wear life.
Cooler Wear Parts

**DRAG CHAIN**
Unicast Drag Chains are the industry choice for a wide range of heavy-duty applications where superior strength and abrasion resistance are needed. The Unicast casting process enables the design of many wear protective features.

| Two choices of alloy to suit your application. |
| Chromium carbide overlay to extend chain wear life. |
| One-piece casting produces a more consistent, solid chain links with no welds to fail. |
| Multiple performance features designed to increase longevity. |

**COOLER GRATES**
Unicast Cooler Grates are available in a variety of styles: RFT, CFG, and flat panelgrates. They are precision cast using high integrity molding methods producing an excellent surface finishing and absolute dimensional control.

**CLINKER BREAKER HAMMERS**
Made in a manganese steel with controlled carbon-manganese ratio for optimum high temperature impact resistance.

**CLINKER BREAKER ROTORS**
Precision balanced for optimum wear life. Our rotors are designed with an extra set of pin holes to allow for repositioning of the hammers when the holes wear. Designed to reduce replacement costs and downtime.

**Grizzly Panels**

**GRIZZLIES**
Unicast Tapered Grizzly Panels are cast in one-piece for extreme impact applications.

| Cast in a high-strength alloy is made to perform over the long haul. |
| Self-cleaning tapered openings, and pre-drilled for quick installation. |
| Cast in one-piece. |

See page 11 for case study
Feeder Wear Parts

APRON FEEDER PANS
Unicast Apron Feeder Pans are cast for exact fit and outstanding wear life making them a top choice for mining facilities around the world.

Cast using the V-Process molding technique creating accurate dimensions and a good surface finish. The one-piece casting method eliminates failure due to weld cracks—a common problem with traditional fabrication—ensuring greater durability and wear life.

WOBBLER FEEDER BARS
Cast in alloy steel for longest wear life and lower costs. Wobbler bars are customized to suit your specific application. Available in both solid and hollow versions.

VIBRATING GRIZZLY BARS
Uniquely designed for easy installation. Double tapered to reduce product buildup and feature a rounded surface in high-wear areas for longer wear life.

CHUTE LINERS
Unicast Chute Liners are cast, which lowers manufacturing costs. The benefits of casting include greater durability, custom designs at a lower cost than fabricated steel plate, and a variety of material options.

Feeder Wear Parts

ROTARY BREAKER SCREEN PLATES
Inspired by hands-on, in-the-trenches frustrations with traditional fabricated breaker screen plates, lifters, and ploughs, Unicast Rotary Breaker wear parts are designed to work for you.

Cost saving, hassle-free design features guarantee quick and easy removal and replacement.

Eliminates common problems of cracking, warping, high maintenance costs, downtime, and costly man-hours.

Productos
Jaw Plate Wear Life Increase from 3.5 to 30 Days

Unicast supplies mine with TiC Jaw Crusher wear parts to combat extremely hard and abrasive material.

**PRODUCT**
M2TiC Jaw Plates.

**APPLICATION**
Mining, Jaw Crusher.

**CHALLENGE**
Standard manganese jaws wore out in 3.5 days which was not acceptable.

**SOLUTION**
Switch to Unicast’s TiC reinforced manganese alloy jaw plates.

**RESULTS**
Wear life increased to 30 days for a 8.57x improvement.

“**A great benefit was obtained from the primary crusher because the size of the material feeding the SAG mill was consistent.”**

MAINTENANCE MANAGER, TRITON MINERA

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TiC Blow Bars Deliver 94% Increase in Runtime

Unicast’s innovative use of TiC inserts nearly double wear life of impactors and blow bars for significant cost savings.

**PRODUCT**
80mm TiC M19 Blow Bar.

**APPLICATION**
Cement Plant, Horizontal Shaft Impactor.

**CHALLENGE**
Crush more limestone before needing to be replaced or rotated.

**SOLUTION**
Replace OEM blow bars with Unicast’s TiC reinforced blow bars.

**RESULTS**
The TiC Blow Bars delivered a 94 percent increase in runtime.

“**The performance of Unicast’s TiC Blow Bars far exceeded our production expectations, and also translated into a substantial annual labor cost savings.”**

RELIABILITY ENGINEER CEMENT PLANT TEHACHAPI, CALIFORNIA, USA
40mm TiC Hammers Last 2.5x Longer Than Hammers Without

Unicast’s innovative TiC Hammer inserts result in less frequent hammer replacements and significant cost savings.

PRODUCT
40mm TiC Hammers.

APPLICATION
Cement Plant, Clinker Cooler.

CHALLENGE
Improve wear life and avoid unscheduled shutdowns of the kiln due to part replacement.

SOLUTION
Replace M2 Hammers with applied manual hard surfacing with 40mm TiC Hammers.

RESULTS
Unicast’s 40mm TiC Hammers outperformed the previous parts by more than 3x.

Grizzly Panel TiC Tips Deliver 89% Reduction in Parts Costs Over 10 Months

Unicast’s replaceable TiC Tips bolt on to a grizzly panel’s high-wear zone and significantly mitigate wear on the grizzly panel body.

PRODUCT
Replaceable TiC Tips.

APPLICATION
Limestone Quarry, Grizzly Panel.

CHALLENGE
Mitigate downtime and decrease maintenance costs incurred by frequent grizzly panel replacements.

SOLUTION
Removable TiC Tips were bolted onto the high-wear zone of the grizzly panel.

RESULTS
Unicast’s TiC Tips decreased part costs by 89 percent in 10 months.

“Original hammers only last 11 months. We installed (TiC) hammers two years ago now, running for 20 months, and still going.”

SUPERVISOR CEMENT PLANT
EDMONTON, ALBERTA, CA

“Best design out of five companies brought on site to improve our crusher anvil.”

MAINTENANCE MANAGER, LIME PLANT
DELTA, UTAH, USA
# TYPICAL ALLOYS

## AUSTENITIC MANGANESE STEEL

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>-</td>
<td>1.2</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>1.0</td>
<td>Drag Chains. High Temperature Applications</td>
</tr>
<tr>
<td>M2 (210-230)</td>
<td>ASTM A128 Gr.C</td>
<td>1.2</td>
<td>2.0</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
<td>Crusher Parts. Medium Sections, Hammers</td>
</tr>
<tr>
<td>M19 (210-250)</td>
<td>-</td>
<td>1.4</td>
<td>2.0</td>
<td>-</td>
<td>18.0</td>
<td>-</td>
<td>Crusher Parts. High Abrasion, Lower Impact</td>
</tr>
<tr>
<td>M22 (230-250)</td>
<td>-</td>
<td>1.3</td>
<td>0.7</td>
<td>-</td>
<td>23.0</td>
<td>-</td>
<td>Special High Abrasion</td>
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## CARBON LOW ALLOY STEEL

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 (140-170)</td>
<td>ASTM A27 70-36</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
<td>Mild Carbon Steel, Adjusts to WCB &amp; LCB</td>
</tr>
<tr>
<td>CS1 (250-300)</td>
<td>ASTM A148 90-60</td>
<td>0.35</td>
<td>0.7</td>
<td>-</td>
<td>1.1</td>
<td>-</td>
<td>General Purpose Medium Strength Steel</td>
</tr>
<tr>
<td>CS2 (275-350)</td>
<td>AISI 4130</td>
<td>0.3</td>
<td>0.9</td>
<td>-</td>
<td>0.5</td>
<td>0.2</td>
<td>Higher Impact Strength Medium Carbon Steel</td>
</tr>
</tbody>
</table>

## WEAR ALLOY STEEL

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR1 (min. 45HRC)</td>
<td>-</td>
<td>0.25</td>
<td>1.1</td>
<td>0.7</td>
<td>0.8</td>
<td>0.4</td>
<td>Impeller Bars, Hammers</td>
</tr>
<tr>
<td>WR2 (450-500)</td>
<td>-</td>
<td>0.35</td>
<td>1.1</td>
<td>-</td>
<td>1.0</td>
<td>0.4</td>
<td>General Wear, Impact Resistant</td>
</tr>
<tr>
<td>WR3 (380-450)</td>
<td>AISI 4140 Modified</td>
<td>0.4</td>
<td>1.2</td>
<td>-</td>
<td>1.0</td>
<td>0.3</td>
<td>Diaphragm, Grate Liners</td>
</tr>
<tr>
<td>UI11 (48-57 HRC)</td>
<td>-</td>
<td>1.6</td>
<td>13.0</td>
<td>-</td>
<td>0.5 max</td>
<td>-</td>
<td>Shell Liners</td>
</tr>
</tbody>
</table>

## HEAT RESISTANT STEEL

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3</td>
<td>ASTM A297 HH</td>
<td>0.4</td>
<td>25.5</td>
<td>12.5</td>
<td>2.0 max</td>
<td>0.5 max</td>
<td>Cooler Grates. High Heat Strength (up to 1800°F)</td>
</tr>
<tr>
<td>S4</td>
<td>ASTM A297 HK</td>
<td>0.4</td>
<td>25.5</td>
<td>21.0</td>
<td>2.0 max</td>
<td>0.5 max</td>
<td>Nose Ring Segments. High Heat Strength (up to 1900°F)</td>
</tr>
<tr>
<td>S5</td>
<td>ASTM A297 HN</td>
<td>0.4</td>
<td>21.0</td>
<td>25.0</td>
<td>2.0 max</td>
<td>0.5 max</td>
<td>Improved High-Strength at 1900°F</td>
</tr>
<tr>
<td>S8</td>
<td>Unicast Proprietary</td>
<td>0.4</td>
<td>25.0</td>
<td>25.0</td>
<td>0.3</td>
<td>-</td>
<td>Cooler Grates &amp; Kiln. High Heat Strength (up to 2300°F)</td>
</tr>
</tbody>
</table>

## STANDARD IRON

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1 (185-210)</td>
<td>ASTM A536 65/45/1</td>
<td>3.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.6 max</td>
<td>Ductile Iron</td>
</tr>
<tr>
<td>HE3</td>
<td>-</td>
<td>3.4</td>
<td>0.6</td>
<td>-</td>
<td>-</td>
<td>0.6 max</td>
<td>Heat Resistant Iron</td>
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</tbody>
</table>

## MARTENSITIC IRON

<table>
<thead>
<tr>
<th>Nominal Hardness HRC (BHN)</th>
<th>Typical Equivalent Standard</th>
<th>Carb</th>
<th>Cr</th>
<th>Ni</th>
<th>Mang</th>
<th>Moly</th>
<th>Remarks &amp; Common Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI15 (min. 52HRC)</td>
<td>ASTM A532 IIB</td>
<td>2.7</td>
<td>16.0</td>
<td>2.5 max</td>
<td>2.0 max</td>
<td>3.0 max</td>
<td>Shell Liners, Impeller Bars</td>
</tr>
<tr>
<td>UI25 (min. 58HRC)</td>
<td>ASTM A532 IIIA</td>
<td>2.7</td>
<td>26.5</td>
<td>2.5 max</td>
<td>2.0 max</td>
<td>3.0 max</td>
<td>Shell Liners, Valve, Pump Parts</td>
</tr>
<tr>
<td>UN1 (min. 52HRC)</td>
<td>ASTM A532 IA</td>
<td>3.2</td>
<td>2.5</td>
<td>4.0</td>
<td>2.0 max</td>
<td>1.0 max</td>
<td>NiHard Equivalent, Thin Section Castings</td>
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</tbody>
</table>