THE LATEST IN OVERLAY TECHNOLOGY
Duroxite® overlay products from Hardox Wearparts can add weeks, months, even years of trouble-free operations to your most extreme wear situations.

The Duroxite® product range is targeted at different types of wear, such as abrasion, impact, heat, metal-to-metal and erosion wear. Duroxite® is particularly well suited to fighting sliding wear from exceptionally hard particles such as minerals containing quartz.

By welding chromium or complex carbides, or other abrasion-resistant materials on top of mild or quenched and tempered steel, an extremely wear-resistant compound material is created.

Duroxite® is delivered as plate, pipe, pin and wire, ready for installation on your equipment or further fabrication in your workshop. The products are available through the worldwide network of Hardox Wearparts wear service centers.

GUARANTEED OVERLAY THICKNESS, GUARANTEED OVERLAY PROPERTIES

Duroxite® overlay plates and pipes are delivered with an overlay thickness guaranteed within ±10%. This is consistent throughout the material and between individual plates and pipes.

The wear properties of Duroxite® are also guaranteed throughout the overlay down to 75% of the overlay thickness.

The remaining 25% of overlay is the transition layer necessary to maintain good bonding to the base material.

- Overlay thickness guaranteed within ±10% for plates and pipes
- Wear properties guaranteed down to 75% of the overlay thickness
- High consistency throughout the material and between individual plates and pipes
Duroxite® achieves its groundbreaking wear performance from a combination of SSAB’s metal expertise, a solid knowledge from a wide range of applications, optimized overlay materials, and state-of-the-art production equipment.

The production techniques for Duroxite® are developed by SSAB and monitored at SSAB’s state-of-the-art R&D testing facility, to ensure that wear resistance, welding, cutting, bending, impact, and other properties of all Duroxite® products meet your strictest requirements.
DUROXITE® EMPOWERS YOUR INDUSTRY

The performance of Duroxite® saves money and improves productivity in a wide range of applications through higher output and less maintenance.

Duroxite® overlay is the natural choice for industries active in quarries, mining, cement, energy, steel mills, recycling and many other areas where abrasive materials require extremely hard surfaces.
OVERLAY OVERVIEW

### DUROXITE® 100
- **TYPICAL APPLICATIONS**
  - Liners, silo bunkers
  - Crusher screen plates, screen plates, coal handling pumps, suction pipelines, hoppers, dredging pipes and discharge cones for clinker separator guide vanes, buckets, excavators, shovel buckets, dragline Chutes/hoppers, liners for blast furnace hoppers, piping, ducts, augers, tubing, feed chutes, Slurry pumps, conveyor belts, screw chutes, feed chutes, Surge bins, Screw augers, Wear liner plates, Ash handling equipment lines, Grain stripping hammers, Surge mill knives, Water washers, Fracking blenders, Snow plow shovels, Demolition tools

### DUROXITE® 100 PIPE
- **PRODUCT DESCRIPTION**
  - A chromium-rich overlay deposited on a mild steel backing plate for sliding wear applications up to 350°C (660°F)

### DUROXITE® 100 WIRE
- **PRODUCT DESCRIPTION**
  - A flux cored open-arc wire for hardfacing applications.

### DUROXITE® 200
- **TYPICAL APPLICATIONS**
  - Slurry pumps, chutes, Slurry pipes, Slurry pumps, Spoon section chutes, Ash handling equipment lines, Grain stripping hammers, Surge mill knives, Water washers, Fracking blenders, Snow plow shovels, Demolition tools

### DUROXITE® 200 WIRE
- **PRODUCT DESCRIPTION**
  - A flux cored open-arc wire for hardfacing components subject to sliding wear applications.

### DUROXITE® 300
- **TYPICAL APPLICATIONS**
  - Slurry pumps, Spoon section chutes, Ash handling equipment lines, Grain stripping hammers, Surge mill knives, Water washers, Fracking blenders, Snow plow shovels, Demolition tools

### DUROXITE® 500
- **TYPICAL APPLICATIONS**
  - Slurry pumps, Ash handling equipment lines, Grain stripping hammers, Surge mill knives, Water washers, Fracking blenders, Snow plow shovels, Demolition tools

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**SEVERE SLIDING WEAR**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUROXITE® 400</td>
<td>A complex carbide overlay deposited on Hardox® 450 base plate.</td>
</tr>
<tr>
<td>DUROXITE® 201 HARDOX® BASE PLATE</td>
<td>A flux cored open-arc wire for hardfacing components subject to severe sliding wear applications.</td>
</tr>
<tr>
<td>DUROXITE® 200 WIRE</td>
<td>An ultra-fine complex borocarbide overlay deposited on a Q&amp;T bar for metal-to-metal applications up to 480°C (900°F)</td>
</tr>
<tr>
<td>DUROXITE® 300</td>
<td>An ultra-fine complex borocarbide overlay deposited on a mild steel backing plate for a combination of wear and high impact applications up to 600°C (1100°F)</td>
</tr>
</tbody>
</table>

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**OVERVIEW**

- **Chemical composition (wt. %):**
  - DUROXITE® 100: 0.18 g max.
  - DUROXITE® 200: 0.18 g max.
  - DUROXITE® 300: 0.12 g max.
  - DUROXITE® 500: 0.12 g max.

- **Volume fraction of primary carbides:**
  - DUROXITE® 100: 30-50%
  - DUROXITE® 200: 30-50%
  - DUROXITE® 300: 30-50%
  - DUROXITE® 500: 30-50%

- **Bulk hardness:**
  - DUROXITE® 100: 60-65 HRC
  - DUROXITE® 200: 62-67 HRC
  - DUROXITE® 300: 62-70 HRC
  - DUROXITE® 500: 62-70 HRC

- **Chemical hardness:**
  - DUROXITE® 100: 60-64 HRC
  - DUROXITE® 200: 59-62 HRC
  - DUROXITE® 300: 52-54 HRC
  - DUROXITE® 500: 52-54 HRC

- **Surface hardness:**
  - DUROXITE® 100: 30-50%
  - DUROXITE® 200: 30-50%
  - DUROXITE® 300: 30-50%
  - DUROXITE® 500: 30-50%

- **Max. service temperature:**
  - DUROXITE® 100: up to 600°C (1100°F)
  - DUROXITE® 200: up to 600°C (1100°F)
  - DUROXITE® 300: up to 600°C (1100°F)
  - DUROXITE® 500: up to 600°C (1100°F)
PROVEN PERFORMANCE

Duroxite® is tough on wear wherever it is applied. Here are a few examples where Duroxite® has made a difference.

If you are looking for benefits for your particular business, please visit www.hardoxwearparts.com for additional applications.

<table>
<thead>
<tr>
<th>Wear part</th>
<th>Industry</th>
<th>Application</th>
<th>Service life</th>
</tr>
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<tbody>
<tr>
<td>Drum mixer paddles of Duroxite® 101</td>
<td>Concrete – Canada</td>
<td>Drum mixer</td>
<td>5 times longer service life</td>
</tr>
<tr>
<td>Liner plate made of Duroxite® 200</td>
<td>Coal terminal – Canada</td>
<td>Coal chute</td>
<td>Increased service life from 6 to 30 months</td>
</tr>
<tr>
<td>Liner plate made of Duroxite® 500</td>
<td>Copper mine – China</td>
<td>Belt machine</td>
<td>Increased from 15 to 45 days</td>
</tr>
<tr>
<td>Conveyor liner plate using Duroxite® 300</td>
<td>Steel foundry – Mexico</td>
<td>Conveyor</td>
<td>The service life of Duroxite 300 plate is about 2 years.</td>
</tr>
<tr>
<td>Bail pin made of Duroxite® 400 Pin</td>
<td>Coal mine – USA</td>
<td>Dragline bucket</td>
<td>Increased service life from 800 to 3,500 hours</td>
</tr>
<tr>
<td>Drift pin made of Duroxite® 101</td>
<td>Concrete – Canada</td>
<td>Drum mixer</td>
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EXTREME SLIDING WEAR

HIGH IMPACT AND SLIDING WEAR

SEVERE SLIDING WEAR

HEAT AND METAL-TO-METAL WEAR
WHEN EXTREME IS THE NORM

**Duroxite® 300**

A high-performance and cost-effective alternative to tungsten carbide overlay.

The specially formulated materials in Duroxite® 300 result in a product with better impact resistance and a long service life when exposed to extremely severe sliding wear.

Duroxite® 300 performs exceptionally well in both wet and dry abrasive environments. It can also absorb 25% more impact energy than a traditional chromium overlay plate as measured in a continuous high impact lab test.

In addition, the overlay thickness for Duroxite® 300 is reduced resulting in a lighter weight product compared to traditional overlays while increasing service life.

**Duroxite® 500**

Designed for applications involving abrasive wear and high impact in dry and wet environments.

Duroxite® 500 can replace cost materials, titanium carbide overlay products or ceramic materials. The applications suitable for Duroxite® 500 involve rock sizes of up to around 0.5 m x 0.5 m dropping from 5 m or lower.

The overlay contains a unique high volume of ultra-fine chromium-niobium-rich complex borocarbide phase with a grain size refined down to 500 nm. The complex borocarbides are completely wetted in a ductile matrix preventing premature pull-out delamination, crack nucleation and bridging.

This results in a product with significantly improved service life that maintains high toughness in sliding wear and high impact applications. Lab testing shows that the impact resistance of Duroxite® 500 can be up to 6 times higher than chromium carbide overlays.
Duroxite® is designed to be hard, without giving you a hard time in the workshop.

Even the most worn-out equipment can be rebuilt and repaired to perform as new. With our broad product offering, including Hardox wear plate and Duroxite®, and top-of-the-line processing equipment, you are able to restore products of practically any condition, size and design.

INSTALLING DUROXITE®

No special equipment is needed to install Duroxite® products. Welding and bolting are the common methods for installing Duroxite® overlay plate or wear parts onto your equipment.

When joining base metal use 480 MPa (70 ksi) or 560 MPa (80 ksi) consumables. Any surface exposed to severe wear should be protected with hard-surfacing consumables. Cap welding a Duroxite® product with Duroxite® Wire ensures the weld will have the same wear resistance, resulting in a consistent service life for the entire overlay product.

SAFETY PRECAUTIONS

When welding or cutting Duroxite products, smoke is produced containing harmful fumes and gases that are chemically highly complex and difficult to easily classify. The major toxic component in the fumes and gases produced in the process is hexavalent chromium. The proper exhaust ventilation equipment and fume-extraction torches are recommended, as well as suitable protective clothing and respiratory protection for operators.

Duroxite® is typically formed with overlay to the inside but can be rolled formed with overlay to the outside. Avoid bending plate parallel to the welding bead direction. The staggered cracking pattern on the overlay surface ensures good formability when bending. For bending radius recommendations, see chart on right.

The table covers bending radius recommendations for Duroxite® 100, 101, 200 and 201. Specific forming recommendations for Duroxite® 300 can be found on www.duroxite.com.

Machining Duroxite® with conventional methods is not recommended. It can be finished by grinding. Countersunk holes can be precisely produced by EDM (Electrical Discharge Machining). Pre-machined mild steel inserts can be used if extra machining is required.

**DUROXITE® IN FABRICATION**

**WELDING AND BOLTING DUROXITE® TO YOUR SUBSTRATE**

<table>
<thead>
<tr>
<th>Joining Duroxite® plate on mild steel</th>
<th>Joining Duroxite® plates end to end</th>
<th>Stud welding of Duroxite® plate from base metal side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duroxite® Wire</td>
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</tbody>
</table>

480 MPa (70 ksi) or 560 MPa (80 ksi) consumable

**Plugging and bolting Duroxite® plate to your substrate**

<table>
<thead>
<tr>
<th>Plugging Duroxite® plate from overlay side</th>
<th>Plugging Duroxite® plate from base metal side</th>
<th>Bolting Duroxite® plate through countersunk hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duroxite® Wire</td>
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480 MPa (70 ksi) or 560 MPa (80 ksi) consumable

**Duroxite® can be cut by plasma, laser, water jet, arc gouge, and abrasive saw cutting. It cannot be cut by oxy-fuel flame cutting. Duroxite® should be cut from the base metal side only to avoid carbon contamination. When beveling, Duroxite® overlay plate can be burned from the hard side. Cutting speeds need to be reduced when cutting carbides.**

**RECOMMENDED CUTTING SPEED AT DIFFERENT PLASMA CURRENTS AND THICKNESSES**

<table>
<thead>
<tr>
<th>Plate thickness</th>
<th>Duroxite® 100</th>
<th>Carbon steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 mm on 3 mm 1/8&quot; on 1/4&quot;</td>
<td>1920 mm/min 75 inches/min</td>
<td>2555 mm/min 105 inches/min</td>
</tr>
<tr>
<td>6 mm on 6 mm 1/4&quot; on 1/4&quot;</td>
<td>1920 mm/min 75 inches/min</td>
<td>2655 mm/min 105 inches/min</td>
</tr>
<tr>
<td>10 mm on 10 mm 3/8&quot; on 3/8&quot;</td>
<td>1600 mm/min 60 inches/min</td>
<td>1265 mm/min 50 inches/min</td>
</tr>
<tr>
<td>12 mm on 12 mm 1/2&quot; on 1/2&quot;</td>
<td>552 mm/min 20 inches/min</td>
<td>1225 mm/min 45 inches/min</td>
</tr>
</tbody>
</table>

**Hard layer face in, hard layer face out**

**MIN INSIDE RADIUS**

<table>
<thead>
<tr>
<th>THICKNESS</th>
<th>MIN INSIDE RADIUS</th>
<th>MIN OUTSIDE RADIUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mm on 6 mm 1/8&quot; on 1/4&quot;</td>
<td>200 mm 8&quot;</td>
<td>900 mm 36&quot;</td>
</tr>
<tr>
<td>3 mm on 10 mm 1/8&quot; on 3/8&quot;</td>
<td>300 mm 12&quot;</td>
<td>900 mm 36&quot;</td>
</tr>
<tr>
<td>6 mm on 6 mm 1/4&quot; on 1/4&quot;</td>
<td>300 mm 12&quot;</td>
<td>1260 mm 48&quot;</td>
</tr>
<tr>
<td>10 mm on 10 mm 3/8&quot; on 3/8&quot;</td>
<td>400 mm 15&quot;</td>
<td>1500 mm 60&quot;</td>
</tr>
<tr>
<td>13 mm on 13 mm 1/2&quot; on 1/2&quot;</td>
<td>500 mm 20&quot;</td>
<td>1800 mm 72&quot;</td>
</tr>
</tbody>
</table>

**MIN OUTSIDE RADIUS**

6 mm on 10 mm 3/8" on 3/8" 75 inches/min 120 inches/min 140 inches/min 165 inches/min 200 inches/min 2655 mm/min 105 inches/min 1265 mm/min 50 inches/min 1225 mm/min 45 inches/min 120 inches/min 480 Mpa (70 ksi) or 560 Mpa (80 ksi) consumables. Any surface exposed to severe wear should be protected with hard-surfacing consumables. Cap welding a Duroxite® product with Duroxite® Wire ensures the weld will have the same wear resistance, resulting in a consistent service life for the entire overlay product.
LEARN MORE AT
www.duroxite.com