



# OVERLAY PRODUCTS FOR ULTIMATE WEAR PROTECTION

**SSAB**

# Lighter, stronger and more durable – it's all possible with SSAB overlay plates, pipes and pins

SSAB's goal is to 'push the envelope' in steel performance. No matter how extreme the application, our aim is to provide solutions that will meet and even exceed your expectations.

When deciding to offer a range of steel products that can take extraordinary wear, we made sure they are top of the line in every aspect. They offer outstanding performance. And they are in line with SSAB's promise to deliver lighter, stronger and more durable products.

SSAB's line of overlay products combats wear problems in the harshest working environments. The overlay is made by welding a chromium carbide or complex carbide material to a supporting base metal.

The result is an extremely hard surface bonded to a supporting steel structure. The performance-to-cost ratio in abrasive conditions makes overlay products the perfect choice.

Overlay products give a longer equipment life and increased production efficiency. Maintenance costs are reduced due to the extended service life and less downtime for replacements. Annualized material costs are also reduced by the proven performance of SSAB overlay products.

1. Complex carbide overlay on fabricated Hardox 450 screen plates used in aluminum recycling

2. SSAB technical sales measuring a rock truck box to replace a plastic liner with SSAB chromium carbide overlay plate for a surface coalmine application

3. Coal refuse chute lined with chromium carbide overlay plate

4. SSAB overlay pins used in draglines for surface mine applications

5. Loader bucket lined with chromium carbide on Hardox 450 and complex carbide on mild steel plate







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# Hard surfacing for extended productivity in extreme applications

How much abuse can an overlay product take? The simple answer is: As much as your application requires. By using high-performance overlays and base metals, SSAB can provide a solution with the desired combination of wear protection and structural strength.

SSAB overlay products are the natural choice for industries active in mining, cement production and handling, coal-fired power generation, steel production, pulp and paper, dredging, and many other areas where abrasive materials require extremely hard surfaces.

SSAB is well suited to delivering the right product. You have access to the wide range of SSAB steel qualities for the base metal, from mild steel to the industry's strongest plates. By combining the best in overlay materials and application methods, your most demanding applications will be well protected.

The ultimate product for your application depends on the material, for example rocks, sand, gravel, concrete, or iron ore striking or gliding along the surface. It also depends on the angle and speed of impact.

- 1. Bucket where a plastic liner has been replaced by SSAB chromium carbide overlay lip shroud between each tooth and adaptor
- 2. Grizzly screen fabricated from Weldom and EN30B round bar with complex carbide overlay used for mining and quarries
- 3. Outside bottom of a large dragline bucket with SSAB chromium carbide overlay bottom wear plates
- 4. Coal chute lined with chromium carbide overlay
- 5. Aluminum recycling shredder with SSAB complex carbide overlay on the rotor, end caps and spider caps and 2" Hardox 450 hammers with complex carbide overlay



# All the tough surfaces you need, ready to install or ready for processing

SSAB OVERLAY PLATE is your solution to combat premature failure in critical wear areas under extremely abrasive conditions. SSAB supplies a wide range of chromium carbide or complex carbide overlay plate. Plates are usually delivered in standard formats. The most common are 60"x120" and 72"x120". Overlay thickness varies from 1/8" to 1/2", depending on the thickness of the base metal. Plates can also be cut to size, and shaped according to customer specifications.

SSAB OVERLAY PIPES are manufactured with the same overlay material used to produce our chromium carbide or complex carbide overlay plates. Pipes with a diameter of 2"-5" are produced in standard lengths of up to 3'. Larger diameter pipes, 6"-22" have a standard length of up to 10'. Longer pipes are made by joining standard sections. Overlay pipes can also be made as elbows, Ys, Ts or long sweeps. Larger diameter overlay pipe, of 24" and above, can be fabricated by roll forming of overlay plate. Special fittings such as reducers, sweeping reducers, and some elbows can be hard-surfaced as well.

SSAB OVERLAY PINS are engineered and designed to withstand the severe metal-to-metal wear in dragline shovel buckets, clam shell buckets, crusher shafts, hinge and hoist rigging assemblies, and other heavy mining or industrial equipment. Overlay pins are machined to your precise specifications. The wear surface can be applied only where you need it on the bar material. SSAB has complete machining capabilities, enabling it to produce pins with holes, keyways and attachment points that match your exact specifications. Standard overlay pins have a diameter of 3"-11" and a length of up to 108".



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1. Chromium carbide on 3/4 Hardox 450 as bottom plate for longwall face conveyor pan line sections

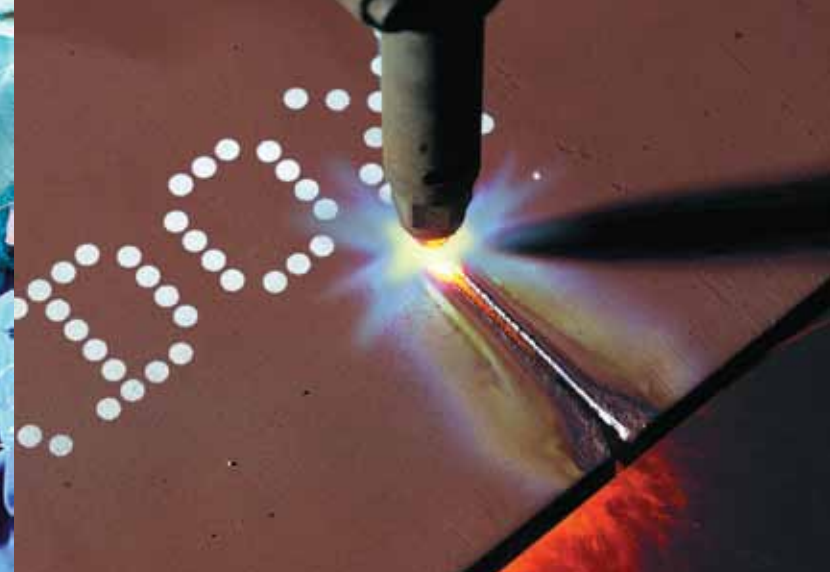
2. Steel mill damper fabricated from chromium carbide overlay plate and Hardox 450

4. SSAB overlay products are available in a wide range of sizes and shapes, from large standard plates to customized wear plates and parts. The picture shows SSAB chromium carbide roll-formed overlay liner with countersunk bolt holes, two Hardox 450 fabricated weld-on center lip shrouds, SSAB chromium carbide overlay bolt-in crusher liner and Hardox 450 with complex carbide overlay weld-on vertical wing shroud

4. Rotor cap for aluminum recycling



Welding of the base metal is done with standard welding techniques



Cutting of overlay plate from the base metal side is recommended

## Workshop how-to guide for overlay products

### Cutting

SSAB overlay products can be cut using plasma arc cutting, water jet cutting, carbon arc gouging, and abrasive saw cutting. Oxy-fuel flame cutting cannot be used to cut SSAB overlay plate. It is recommended to cut from the base metal side to avoid carbon contamination.

### Machining

SSAB overlay products cannot be conventionally machined. Precise countersunk holes can be produced by EDM (Electro Discharge Machining). Pre-machined mild steel inserts can be used if extra machining is required. Finishing of the overlay surface should only be done by Branchard grinding. Reduced friction from a finely finished surface increases the slide ability of the material and decreases the build-up and carry-back problems.

### Forming and Bending

SSAB overlay plate has excellent forming characteristics. It can be roll formed and formed by press brake. The overlay plate is commonly formed with the hard layer to the inside of the application.

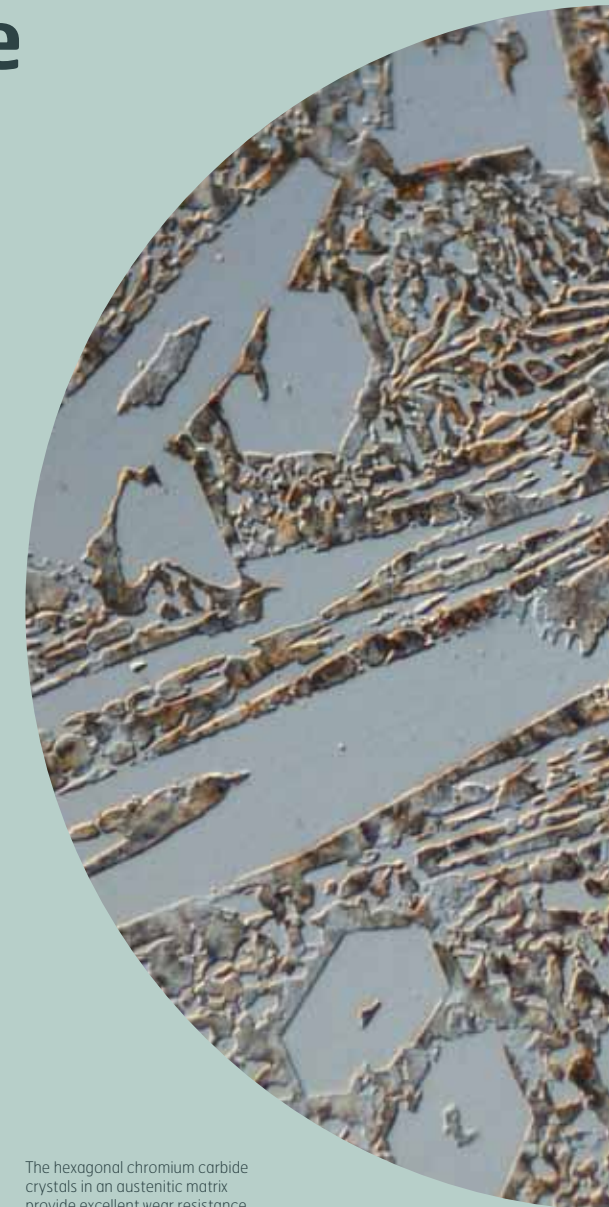
Depending on the radius it can also be formed with the hard layer to the outside. For pipes with diameter smaller than 24", SSAB overlay pipe is recommended. Please contact SSAB for more detailed forming and bending information.

### Welding

Pre-heating is not necessary to weld overlay plate and other overlay products. The base metal can be welded to other steels using standard welding procedures. AWS E7018 and E8018 are the commonly used consumables for welding the base plate. After welding, capping the weld with overlay material is recommended for wear protection.

### Lining

SSAB overlay plate can be applied to the substrate by plug welding from the hard surface side or from the base metal side. Other methods are stud welding or using a bolt with countersunk hole. Note that any surface exposed to severe wear should be protected with hard-surfacing consumables.



The hexagonal chromium carbide crystals in an austenitic matrix provide excellent wear resistance

SSAB is a global leader in value added, high strength steel. SSAB offers products developed in close cooperation with its customers to create a stronger, lighter and more sustainable world.

SSAB has employees in over 45 countries and operates production facilities in Sweden and the US. SSAB is listed on the NASDAQ OMX Nordic Exchange, Stockholm.

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