



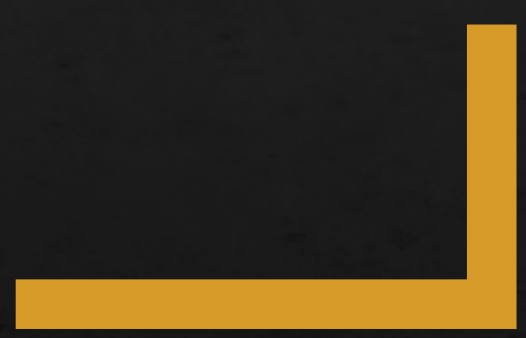
THE WORLD'S MOST
WEAR RESISTANT FUSED
ALLOY STEEL PLATE



ALLOY STEEL INTERNATIONAL (ASI) is an independent international company with its manufacturing facility and head office in MALAGA, Western Australia and has been operating for over 25 years.

ASI is focussed on engineering material handling systems that will ultimately maximise our customer's production through reducing costs per tonne of product.

ASI manufactures specific grades of ARCOPLATE for different applications. The ARCOPLATE product is complemented by our Metallurgical, Engineering & Design Service.



what is ARCOPLATE?

Arcoplate is a wear resistant fused alloy steel plate manufactured by Alloy Steel International. It is a smooth, chromium carbide rich overlay plate manufactured by a patented production process maximising abrasion resistance and reducing hang up.

Arcoplate was developed as an alternative to unpredictable wear rates and high friction characteristics, associated with both – quenched and tempered steel plate and the old technology, often used to manufacture traditional bulk weld overlay plates.

Associated costs with unscheduled maintenance or repair are obvious, but more importantly, hidden costs relating to plant and capital productivity losses need to be eliminated wherever possible.



Inappropriate wear liner packages significantly affect fixed plant and mobile equipment in a number of ways, these include: hang up of product, spillages around plant, increased energy consumption, increased friction causing premature wear.

Alloy Steel International's engineering and design service enables Arcoplate to be supplied as a complete wear and anti hang up kit, designed to suit a specific application. Arcoplate can be supplied with stud bolts, countersunk inserts and can be pressed to shape. Arcoplate kits greatly reduce installation time and ongoing maintenance costs.

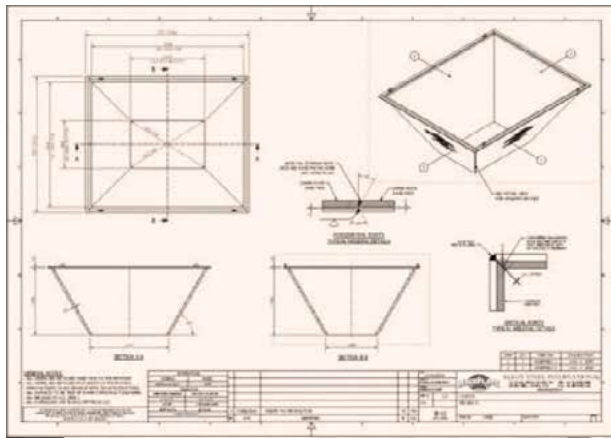


design & FABRICATION

Alloy Steel International's 5000 square meter state of the art Steel Mill and Manufacturing Facility in MALAGA WA is unique and the only running company in Australia to combine both the milling of Chromium Carbide Wear Plate and the fabrication of field ready applications.

ASI will design and fabricate applications to meet your specifications and requirements. ASI also refurbish, enhance and improve existing applications. Infrastructure can be sand blasted, NDT, surface coated, relined and transported to and from site.

No job is too big or small for ASI. All scope of works are carried out to the highest quality and Australian safety standards. This reliability is achieved by highly experienced and trained team of tradesmen and professionals across a wide range of required disciplines.



ASI can deliver the quickest turnaround times for fabrication of items as we manufacture the plate to suit our own production requirements. ASI fabrications include liners, TLO rotables, flow expanders/enhancers, drop in chutes, ROM bins, trommel screens, wear plates and many other tailor made fixed or mobile plant kits. **ASI has over 25 years' experience in, on time in full, custom fabrication and machining of clients various components and assemblies to meet their required budget.**

refurbish & ENHANCE

Alloy Steel International refurbish and enhance a diverse range of plant equipment for numerous clients all over the globe. This service can include a wide scope of specialised services including reverse engineering, logistics, 3D laser scanning and testing, blasting, improved design, repairs, fabrication, surface coating and fitting of Arcoplate.



FIXED

Plant Applications

Typical fixed plant equipment consists of chutes, transfers, feed bins, fan boxes, fan blades, crushers, screen plates, cyclones and pipe spools.

Fixed plant applications are designed and engineered to maximise the mineral process handling and production. Fixed plant applications face many issues in abrasion and impact wear. Hang up can also contribute to high maintenance and down time.

Arcoplate is commonly used in fixed plant applications and available in mill finish and the polished surface finishes.



In service polished Arcoplate has 39% less coefficient of friction than utility stainless steel making Arcoplate the industry leader for hang up reduction in chutes, conveyor systems hoppers, and feed bins.

Laboratory tests and field monitoring have proven that Arcoplate outperforms Q&T plate by a factor greater than 8 times and up to double the life of conventional welded plate.

Arcoplate delivers a measurable cost per tonne benefit by the reduction of plate, maintenance and mechanical breakdown costs.

FIXED

Plant Applications

TLO



Trommel Screen



Wear plates studded or countersunk inserts



Various Fixed Applications



MOBILE Plant Applications

Arcoplate mobile plant applications are in high demand in mining industry. Arcoplate product offers premium protection against abrasion, impact and carry back material. Arcoplate liners are available in ready to fit kit form and can be formed and cut to the specific needs of the application.

Arcoplate packages reduce maintenance costs, contributing to less downtime and increased production. Typical mobile plant Arcoplate Kits consist of: Dozers, Trucks, Excavators, Shovels, Loader Buckets, Graders.

Arcoplate is the most desirable product in mobile plant applications where high abrasion and/or hang up issues occur.



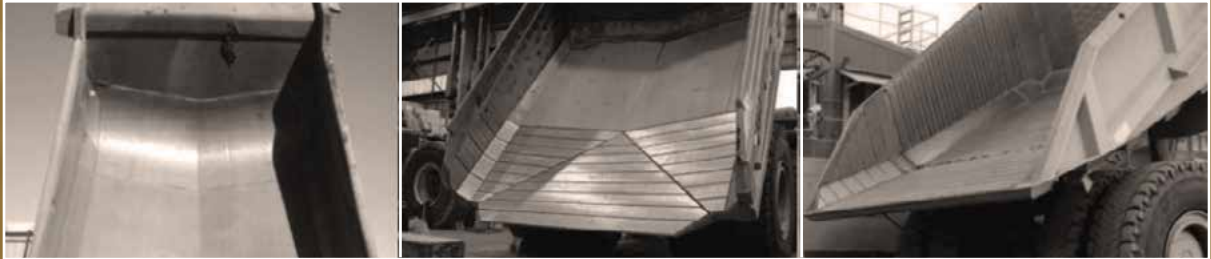
The Arcoplate polished plate has 39% less coefficient of friction than utility stainless steel. The standard Arcoplate anti hang up kit can save up to 30% in tipping time with less than 1% of carry back.

Laboratory tests and field monitoring have proven that Arcoplate outperforms Q&T plate by a factor greater than 8 times and up to double the life of conventional welded plate. Arcoplate delivers a measurable cost per tonne benefit by the reduction of plate, maintenance and mechanical breakdown costs.



MOBILE Plant Applications

Truck Body



Digger Bucket



Shovels



Dozer Blade



ARCOPLATE

Variants & Specifications

The team at Alloy Steel understands that different wear factors call for different product options. Arcoplate is offered in different grades, thicknesses and finishes. With the almost endless combination of product options, there is an Arcoplate solution to suit your wear or hang-up needs.

ARCOPLATE 1600

Arcoplate alloy steel plate has been commercially available for nearly 25 years and it started as a reaction to wear products with unpredictable wear life.

Arcoplate is a wear resistant fused alloy steel plate manufactured by Alloy Steel International in Western Australia. It is a smooth dense, chromium carbide rich overlay plate manufactured by a patented production process to maximise abrasion resistance and reduce hang up no matter what the operating conditions. Manufactured to a patented production process, all mill functions are fully computer controlled within parameters of $\pm 1\%$. This controls the chemistry and minimises the base metal dilution thereby giving predictable wear rates and component life.

This patented process enables greater percentages of chromium to be used resulting in an even distribution and orientation of carbide throughout the alloy matrix. These parameters enable us to provide a much longer lasting undiluted overlay with a very low co-efficient of friction with the finished product having no weld beads to interrupt material flow.

Arcoplate can be plasma cut, rolled or pressed and all grades and thicknesses can be polished. It is high wearing and high impact resistant. Arcoplate is stress relieved in manufacture and maintains a true hardness value that is constant from the surface right to the fusion line. As an added benefit, Arcoplate is also the only fused alloy plate that has outstanding Anti Hang-up properties. As the patented method of production allows for higher percentages of chromium and as it is produced flat with no weld bead, Arcoplate can be ordered pre-polished as an "Anti Hang-up"/ wear plate. The polished surface is maintained by the natural material flow throughout the life of the plate creating smooth laminar flow that doesn't allow micro particles to build causing hang-up/carry back on equipment which is another major cause of production loss.

Alloy Steel International's full engineering and design service enables Arcoplate to be supplied as a complete wear kit fully designed and tailored to suit specific applications.

Customer Tailor Made Metallurgy

Tailoring our products to your operational requirements, ASI now also offers specialised custom made wear resistant Arcoplate alloys. Metals with strong affinity to carbon are strong carbide formers and can be used in production of specialised wear resistant Arcoplate alloys in varying proportions.

Substantial cost increases are prevalent in manufacturing of specialised alloys due to very high additional cost inputs. Nevertheless, final product perceived high price is always much lower when compared to productivity gains in demanding high production volume, high capital and operational cost applications.

ARCOPLATE 1600T

Arcoplate 1600T is Alloy Steel International's newest development designed for areas that experience the most severe abrasion. Alloy Steel International is known worldwide for ability to engineer universal, specialised and custom made wear resistant alloys. – Arcoplate 1600T is no exception. ASI's special manufacturing process allows Arcoplate 1600T to offer an addition of tungsten carbides dispersed consistently throughout the alloy matrix. Tungsten carbides present in 1600T alloy fill in spaces between larger chromium carbides, further reducing already tight inter-carbide spacing within the alloy matrix, in effect limiting matrix exposure to fine and coarse particle abrasion.

Arcoplate 1600T alloy matrix is also made more impact resistant by other added alloying elements, ensuring stronger bond between tungsten carbides, chromium carbides and carbide retaining matrix.

1600T alloy manufacturing process is computer controlled and the unique fusion technology provides just enough base metal dilution for 100% metallurgical bond between alloy and base metal. Measured and controlled cooling rates provide perfect conditions for carbides formation, producing a dense and very tough alloy composite micro-structure.

Our manufacturing process produces complex metal carbide saturated wear resistant alloy that is: consistent, predictable and dependable. As always, every thickness of every Arcoplate alloy type – is produced in a single pass deposition ranging from 4mm Alloy on a 7mm backing plate, right through to our new 31 mm Alloy on a 13 mm backing plate.

Arcoplate's manufacturing process is superior to the outdated technology of multi-pass conventional /submerged arc welding methods which is still commonly used throughout the industry. This old technology used by other manufacturers can result in uneven heating producing high dilution, poor carbide formation, surface cracking and non-uniform hardness.

ARCOPLATE

Variants & Specifications

GRADES

ALLOY GRADE	ABRASION	ASTM G65 G LOSS	IMPACT	HIGH TEMP	ANTI HANGUP
1600	HIGH	0.0758	HIGH	350°C	YES
1600T	HIGH	0.0312	HIGH	350°C	YES

ARCOPLATE THICKNESSES

ALLOY STOCK THICKNESS	BASE METAL THICKNESS
4mm	7mm
6mm	7mm, 9mm, 11mm
8mm	7mm, 9mm, 11mm
10mm	7mm, 9mm, 11mm
12mm	9mm, 11mm
16mm	11mm
20mm	11mm
24mm	13mm, 15mm
31mm	13mm, 15mm

Arcoplate consists of a dense, chromium-carbide rich alloy overlay that is fused onto a mild steel base plate. Arcoplate is offered in a range of thicknesses to meet various material handling applications.

The range starts with the 4/7 (4mm alloy on 7mm base plate) for applications where liner weight reduction is important. The long wearing 31/13 (31mm alloy on 13mm base plate) completes the range and is a popular choice among operations where material wear is at its greatest. Whatever your needs, there is a thickness option to suit.

Other thicknesses available on request

Arcoplate Stock Sheet™: 1270 mm x 3080 mm

Arcoplate Broad Sheet™: from 1900 mm x 3080 mm

facts AND BENEFITS

ASI are the manufactures of Arcoplate, the world's most wear resistant fused alloy steel plate. Arcoplate is a hard faced wear plate that gives the following benefits: Manufacturing process is fully computerised: Uniform hardness (58 – 62 Rc) and microstructure down to fusion line enabling predictable wear rates.

Smooth Finish: No weld beads to interrupt material flow thereby eliminating turbulence and accelerated abrasion. Arcoplate can be supplied pre-polished: Eliminates hang up/carry back on mobile equipment or fixed plant. Single Pass Alloy Deposition (4mm to 31mm): No under bead cracking and spalling as experienced with multi pass layers.

All products can be produced in different thicknesses;

Alloy depth: 4, 6, 8, 10, 12, 16, 20, 24, 31mm

Base metal depth: 7, 9, 11, 13, 15 mm

QUALITY

We're committed to quality. Alloy Steel International is committed to providing excellent value and cost effective wear solutions. These solutions include the manufacture and supply of products in sheet form or fully engineered and fabricated sections.

Alloy Steel products are produced with total commitment to establishing and maintaining a quality standard which will meet or exceed ISO9001 standards. Alloy Steel International's quality policy is to fully support and provide the necessary resources for the implementation of the quality system. Stressed relieved during manufacture: Very low residual stresses and able to take severe impact and bending. Performance: Laboratory and field tests show that millimetre for millimetre Arcoplate will outlast Quenched & Tempered wear plate by a factor of up to 8 to 1 and conventional welded overly plate by up to 2 to 1. Non – Directional Wear Plate: Can be fitted in any direction to material flow.

This policy shall be understood, implemented and maintained at all levels of the organisation. Alloy Steel International has invested significant resources to ensure its employees are not only aware of the importance of our quality policy and quality systems, but are also actively involved in the implementation and continuous improvement of all aspect of our quality system. Alloy Steel International makes every endeavor to buy raw materials at the highest quality from suppliers that are ISO certified. However, there may be instances where material specifications may change slightly which are beyond control of the supplier.



DIVERSITY

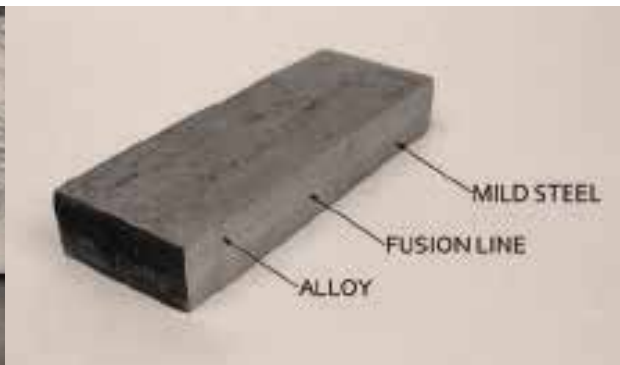
ASI's primary industry of supply is mining. ASI also provide product support for a diverse number of industries including but not limited to Port, Military, Dams, Power Stations, Construction, Cement and Waste Management.



Surface Finishes

Material hang-up and carry-back are costly issues. Arcoplate is available in either standard or polished finishes. Arcoplate is available in three finishes for different material flow requirements.

Arcoplate's standard finish offers a smooth finish that actually becomes smoother the more it is used. Arcoplate's polished finish is recommended for applications where hang-up and carry-back are experienced. The ultra finish is recommended for the most demanding of situations where material flow needs to be instantly improved.



MISCONCEPTIONS

HARDNESS MISCONCEPTIONS

The chemical composition, microstructure and bulk hardness are the factors that influence abrasion resistance

The Higher the Hardness the Better – False

Greater hardness does not always mean greater abrasion resistance or longer wear life. Hardness values only become relevant when the comparisons are made within a family of steels. i.e. Comparing quenched & tempered plate with other Q&T plate.

ABRASION RESISTANCE

An “abrasion resistant” Q&T plate of 500HB will wear better than a 400HB plate, however a 500HB high chromium iron fused alloy steel plate has a substantially better abrasive resistance than a 500HB Q&T plate.

Microstructure Influences Abrasion Resistance – True

When comparing Chromium Carbide Overlay plate the high bulk hardness ratings are not the only factor assuring resistance to wear. Abrasion resistance depends on a combination of both.

BULK HARDNESS AND THE METALLURGICAL MICROSTRUCTURE OF THE ALLOY.

The alloy with the highest percentage, the most evenly dispersed and the hardest carbides will have the best resistance to abrasion.

ARCOPLATE Solution

The various grades of ARCOPLATE derive their high abrasion resistance from the very hard M7C3 carbides (1500 – 1800HV) combined with an average of 60% of carbides dispersed through a softer, tough matrix.





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