

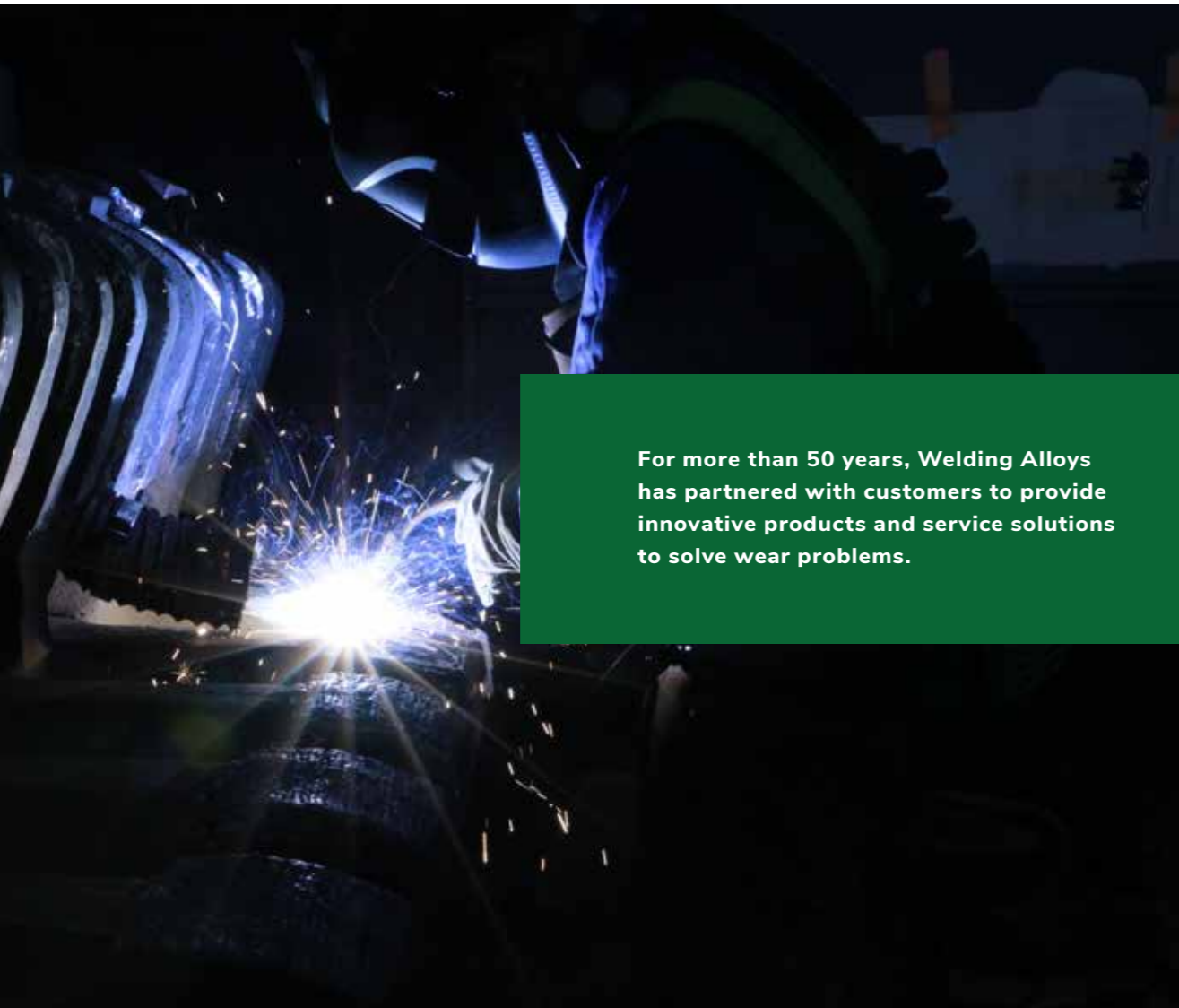


Recycling Equipment Solutions

Wear Protection
Solutions for a
Sustainable Cycle

For Welding **Professionals**

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Our company

Welding Alloys is a global leader in the production of advanced welding consumables and automated welding equipment for hardfacing, cladding, joining and repair.

We also offer an industry-leading range of engineered wear services in our Integra™ workshops or in situ, as well as a wide range of wear plates, pipes and components. For more than 50 years, industrial users across the globe have relied on the expertise of Welding Alloys to increase productivity and reduce costs through effective repair and maintenance solutions.

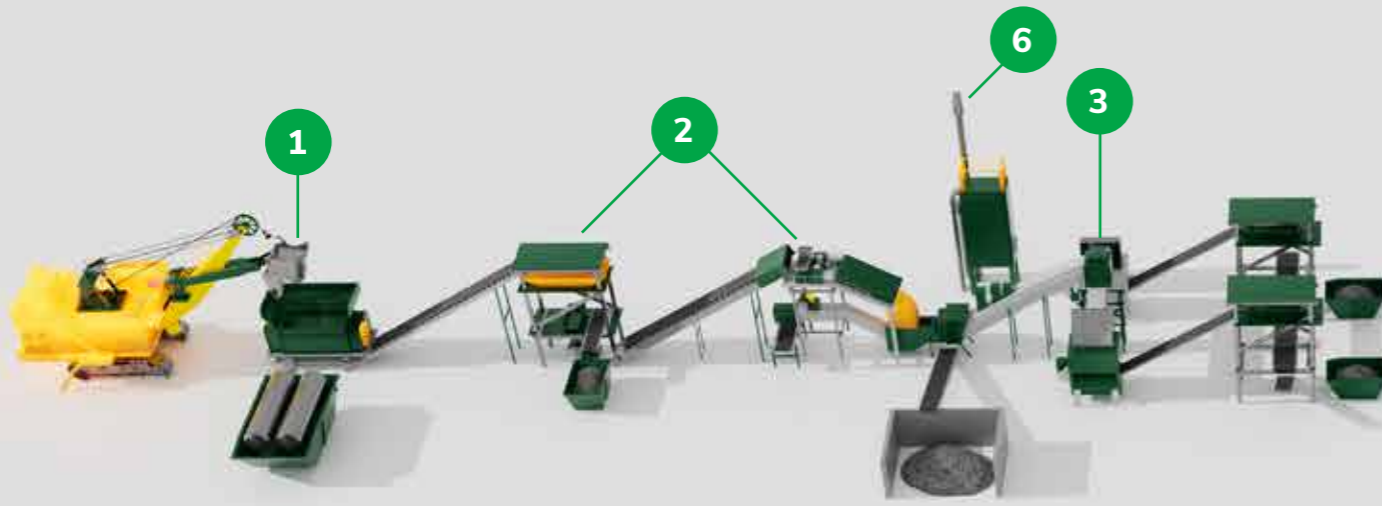
Since 1966, the name Welding Alloys has been synonymous with excellence in research and development (R&D), resulting in a steady stream of innovative products and advanced technical solutions and services.

Today, our R&D and technical teams remain at the heart of the business, able to solve the most complex industrial wear protection challenges by leveraging the latest scientific and engineering practices.

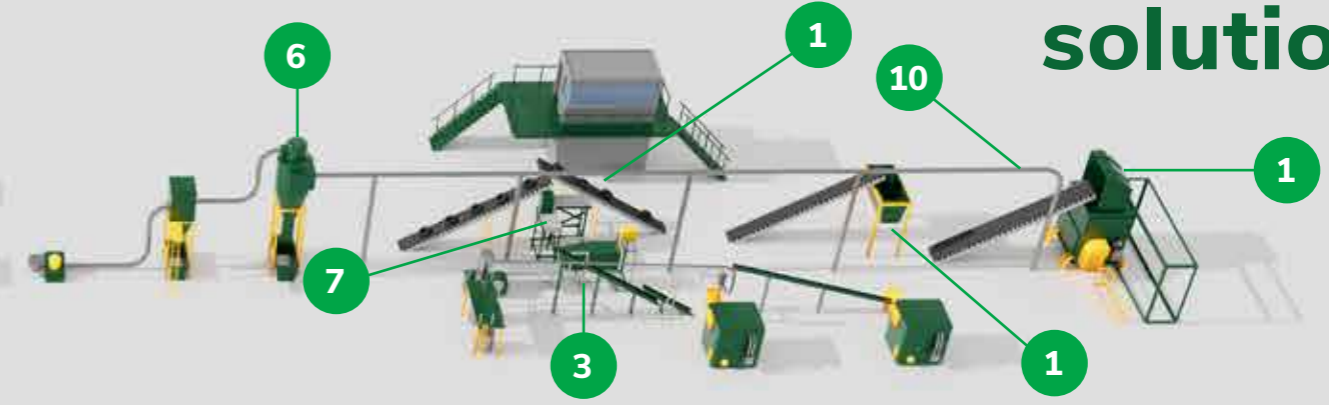
Many of our technological innovations are a result of tapping into our network of academia, standards organisations, welding associations, and research partnerships across the world. We deliver fast-track wear protection solutions in the most challenging environments and industries, through multidisciplinary teams located around the globe.

Welding Alloys is a participating member of the United Nations Global Compact and supports all principles relating to the environment, labour, human rights, and anti-corruption. With this in mind, we have developed welding wires that emit less harmful fumes, and we manufacture a range of our wires using processes that produce less harmful waste for the environment. Our service solutions also contribute to decreased energy consumption and carbon dioxide emissions by extending the life of new and existing parts through repair and maintenance. We continue to improve our products and processes in order to reduce the negative impact on both the welder and the environment.

Application solutions



Metal

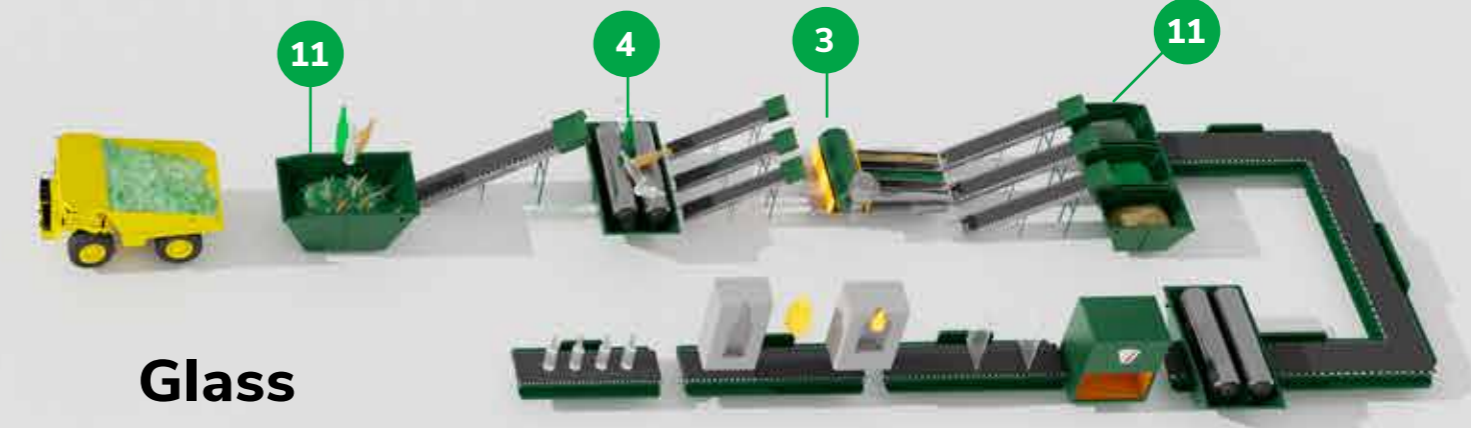


Rubber



Wood

Paper



Glass

- 1. Shredders
- 2. Hoppers & Chutes
- 3. Screening/ Separation
- 4. Hammer Crusher
- 5. Debarking Drum
- 6. Cyclones
- 7. Screwflight
- 8. Roll Maintenance
- 9. Digester
- 10. Pipes & Tubes
- 11. Liners
- 12. Pulper & Rotor



Using our range of welding consumables and wear plates for lining and relining, we offer complete services with technical support to restore shredders to their OEM design and optimal operating performance.



Our wear audits are conducted to collect application-specific data and offer cost-effective, optimum and fully customisable wear packages, enhancing wear resistance in components such as hoppers and chutes.



We develop tailored screening solutions in our Integra™ service workshops using our range of wear plates that provide lower wear rates in extremely harsh environments, such as recycling separation processes.



Wear from excessive impact and abrasion can be significantly reduced by applying our 3D-Carb™ technology to increase the service life of components that withstand combined wear by crushing materials.



Our global teams deliver complete repair and maintenance services for debarking drums and their vital components, using our range of welding consumables and complex carbide-based wear plates, Hardplate™ and Hardlite™.



Material flow can cause wear to cyclone casings, leading to blockages and disrupted performance. Our advanced wear plates can be cut and shaped to the required dimensions and installed on-site to existing equipment, offering optimal protection against abrasion and erosion.



Our automated welding machines, combined with specially engineered consumables, offer maximum cladding productivity, resulting in increased efficiency of the repaired screws as well as the highest weld quality and accuracy.



Regular maintenance of rolls ensures smooth operation. We collaborate with our customers to offer effective repairs, maintenance and installation services for these essential components, reducing costly downtime.



Corrosion damage to linings from gases can lead to unexpected plant shutdowns. Analysing the wear and applying advanced coatings can increase the lifespan of the digester and improve wear resistance.



Components that transport materials are subject to highly abrasive and erosive wear. Our service teams can re-engineer and manufacture new pipes and tubes, using our range of wear plates or by hardfacing the internal surface.



Our unique wear plates are made with proprietary cored welding wires, designed for adaptability and consistent wear rates when relining components exposed to abrasion and erosion.



We provide preventative solutions by hardfacing high-wear zones of parts such as pulpers and rotors with a combination of our hardfacing welding wires, achieving significant, cost-effective and measurable wear life improvement.

Welding Alloys and recycling: our integrated offer

Welding Alloys offers a comprehensive range of welding consumables and automated equipment, backed by expert consulting and tailored recommendations. Our experienced technical engineers specialise in wear protection solutions for the recycling industry. We provide these services either on-site, in situ, or at our global workshops, specifically designed for recycling equipment.

Our application solutions are engineered to withstand the most challenging conditions, ensuring high resistance to wear, impact, abrasion, and corrosion. From advanced welding consumables to state-of-the-art welding machines, our offerings are cutting-edge, providing reliable repairs and maintenance for all types of recycling equipment.

Welding Alloys' equipment maintenance and repair solutions help recycling operations run more efficiently and contribute to a more sustainable industry. This commitment

to sustainability is integral to our mission, helping clients achieve their environmental goals while maintaining the highest standards of operation.

By partnering with leading OEMs and top recycling facilities, Welding Alloys can provide tailored, innovative wear solutions. Working together, we refine and enhance equipment designs, incorporating welding solutions that address wear and tear right from the manufacturing stage. This proactive approach ensures that the equipment is not just repaired but optimised for the harsh conditions of the recycling industry.



Our Integra™ service engineers offer complete solutions for critical equipment used in the recycling process.



Our solutions

Welding Alloys Group specialises in providing advanced welding solutions tailored to the recycling industry, offering a comprehensive range of consumables, equipment, and expertise. Our solutions significantly improve the durability and efficiency of recycling machinery, ensuring optimal performance in the face of wear, impact, abrasion, and corrosion.

Hardfacing

Our Integra™ service experts have extensive experience in hardfacing and rebuilding components to their original profiles, enhancing wear resistance. They collaborate with customers to analyse existing wear patterns and rates, aiming to extend component lifespan. Our hardfacing

solutions can be carried out in our workshops or in situ using our cored wires. We manufacture a range of low, medium and highly alloyed cored wires specifically for hardfacing parts used in recycling, with more advanced materials and alloys also available.

Why choose Welding Alloys' Hardfacing solutions?

- Significantly improved wear life
- Less machine downtime
- Lower production costs
- Significant savings

3D-Carb™

3D-Carb™ is a welded solution, manufactured by a proprietary method to produce through-thickness hardfacing while maintaining the vital balance between extreme wear resistance and component toughness.

3D-Carb™ is not an off-the-shelf product, it is designed and produced to address specific wear problems and is then supplied ready for installation. Through our wear audit concept, Welding Alloys analyses wear data and applies this to the design, development and production of wear-resistant liners and components to address individual customer needs.

Why choose Welding Alloys' 3D-Carb™ solution?

- Reduced component wear rates
- Reduction in maintenance requirements
- Longer lasting components that reduce total cost of ownership (TCO)
- Application-specific designs ensure wear protection tailored to address the root cause, not the symptoms
- Parts maintain their designed profile for prolonged periods of time, which facilitates reduced energy consumption
- Increased production tonnage



SprayClad®

SprayClad® is a unique thermal spray solution best suited to prevent erosion, abrasion and corrosion. This includes the protection of fan impeller blades, fan casings and ducting. The solution also protects the internal parts of furnaces from chemical and abrasive damage, which can cause corrosion and increases thermal insulation.

By applying a durable, high-performance layer to surfaces exposed to severe wear and extreme conditions, SprayClad® effectively protects equipment against the intense wear commonly experienced in the recycling industry.

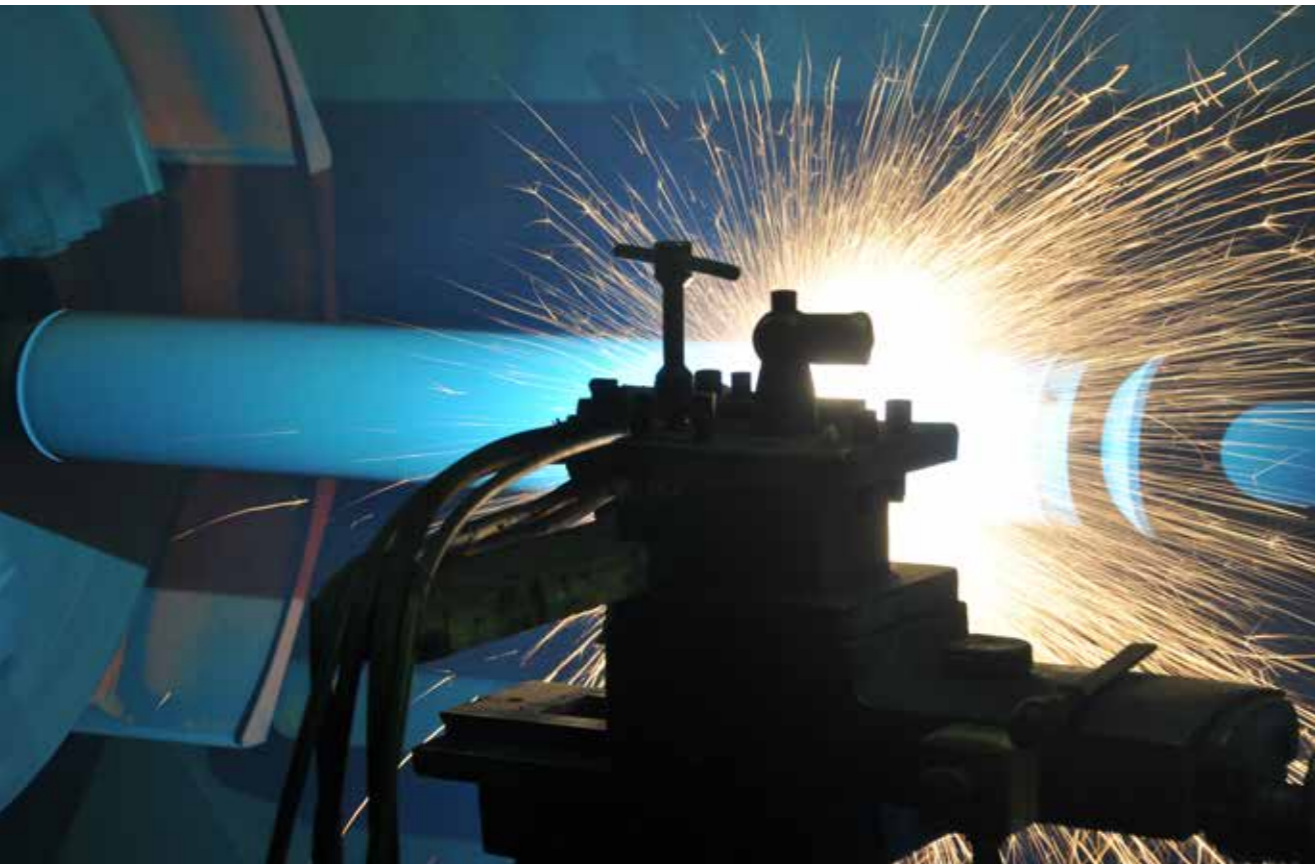
The outcome is a notable enhancement in recycling performance, characterised by improved equipment reliability and efficiency. This not only reduces operational costs by decreasing the

frequency of repairs and replacements but also increases productivity by extending the service life of crucial machinery.

Why choose Welding Alloys' SprayClad® solution?

- Adaptability of the coating tailored to your plant's needs
- Improved corrosion, abrasion and/or erosion resistance
- Up to 75% faster than traditional cladding techniques
- No water needed in the heat exchanger as process is "cold"
- Reduced fouling and cleaning
- Total cost of ownership reduced through increased wear life and fewer maintenance cycles

SprayClad® is unavailable in the USA



Composite wear plates



Welding Alloys offers an advanced range of composite wear plates specifically designed for the recycling industry, engineered to withstand the toughest operating conditions. These plates deliver outstanding durability and superior resistance to wear and impact, helping to extend the life of critical recycling equipment.

By reducing maintenance needs and minimising operational downtime, our plates offer a cost-effective solution that boosts overall productivity. Custom-engineered to your specifications, they can be shaped, rolled, and formed to protect key components such as shredder chambers, conveyors, and sorting equipment.



Hardplate™

Our heavy-duty composite wear plates are supplied with a standard overlay thickness from 4 to 15 mm. Hardplate™ is designed to endure elevated operating temperatures and harsh environments. Suitable for applications such as impellers, chutes and liners.

Hardplate™ FlowMax

Our smooth wear-resistant plates are designed for applications where hang-up, carryback and impact occur in combination with abrasive wear. These plates have a low coefficient of friction, offering better-sliding properties. Suitable for applications such as mobile equipment, hoppers and chutes.



Hardlite™

Our ultra-thin composite wear plates offer the ideal solutions when weight is a key factor, delivering unrivalled wear protection with a hardness of 64 to 66 HRC. Suitable for applications such as hoppers, chutes and dynamic separator rotor blades.

Tuffplate™

Our impact resistant wear plates are designed for applications susceptible to a combination of abrasion and impact. The wear resistance of Tuffplate™ is fully maintained at temperatures of up to 200°C. Suitable for applications such as hammers, bucket liners and crusher components.



Welding consumables



Welding Alloys manufactures a range of consumables specifically designed for applications in the recycling industry. We offer both seamed and seamless cored wires, formulated to resist multiple types of wear, including abrasion, impact and metal-to-metal friction.

With decades of experience, we have expert knowledge in hardfacing applications - both preventive and remedial, to protect components such as knives, shafts, discs, and hammers used for shredding or crushing material. Our solutions extend the service life and improve the performance of these parts.

Welding Alloys collaborates with customers to provide tailored solutions. Depending on the unique requirements, we can offer bespoke products to significantly increase the wear resistance of components, helping to reduce the total cost of ownership. Our technical experts are available to support in determining the right solution for the specific operating environment and wear phenomena.

Hardfacing consumables for shredders & hammer mills

Product	Hardness HRC (3 layers)	Machinable	Description and applications
ROBODUR K 600-G	54 - 60	Yes	Martensitic weld metal with hard carbides for abrasion, friction, and impact resistance. Seamless cored wire with unique welder appeal. No moisture pickup and excellent wire feeding. 20% increased deposition rate vs solid wire. Applications: shredder shafts, spacers, blades.
ROBODUR K CERAMIC-G * HARDFACE L-G **	56 - 60	Yes	Martensitic, crack-resistant deposit. Recommended to apply 2-3 layers for wear resistance. Designed to combat abrasion and impact. * Seamless version of HARDFACE L-G. ** Modified version for all position welding is HARDFACE LP-G, with a rutile slag. Applications: shredder shafts, spacers, blades.
ROBODUR K 650-G	57 - 62	Yes	Seamless cored wire for semi-automatic gas shielded hardfacing. Overalloyed version of ROBODUR K 600-G. Advanced solution for hardfacing and rebuilding shredder components. Martensitic weld metal. Excellent moisture resistance and wire feeding. Applications: shredder shafts, spacers, blades.
HARDFACE AR-G	57 - 63	Yes	Exceptional wear resistance. Ideally suited for components subject to metal-to-metal wear with moderate impact. Applications: shredder shafts, spacers, blades.
HARDFACE HC-O	58 - 64	No	High chromium cast iron deposit containing a high proportion of hard primary chromium carbides in a tough austenitic matrix. The deposit is suitable for hardfacing components subject to extremely severe abrasive wear and moderate impact. Applications: shredder rotors, cutting knives, counter knives.
HARDFACE NB-G	55 - 58	Yes	Martensitic steel with finely dispersed hard niobium carbide particles. Produces a hard overlay resisting abrasion and impact. User friendly for welding multiple pass welds as there is no slag. Applications: shafts, discs, hammers
HARDFACE TIC-O	57 - 60	No	Chromium cast iron for hardfacing components subject to severe abrasion and heavy impact. The weld deposit contains extremely hard titanium carbide particles in a high chromium martensitic matrix. Applications: shafts, discs, hammers

Speak to one of our technical experts to find out which consumable is best suited to your needs.

Welding machines



Automating the welding process can improve efficiencies by offering consistent and high-quality repairs, whilst minimising downtime. Customers can benefit from a comprehensive range of advanced welding equipment from Welding Alloys, designed for hardfacing, cladding, rebuilding, and joining components.

Our machines feature state-of-the-art technology to deliver precise, consistent and repeatable welding results. This ensures

high-quality welds across a wide range of applications and minimises variability between operators. The entire process is supported by our advanced D3 Touch and D3 Pendant control systems, which provide intuitive interfaces and flexible programming to optimise performance

The range includes heavy-duty fixed installation machines, portable machines, and custom machines tailored to specific applications.

H-Frame

For precision overlay welding on components used in recycling plants, our H-Frame welding machine is the ideal choice. Available in both lightweight and heavy-duty models, it suits any workshop size and adapts to various configurations, maximising your welding versatility

Rotary Yoke Cladder

For cylindrical parts such as shredder rotors and blades, our Rotary Yoke Cladder offers a dedicated solution. The five-axis machine, with automatic stick-out length adjustment, ensures uniform deposition and high productivity. The perfect solution for rotating components that require hardfacing or rebuilding.



Innovation



Innovation is at the core of everything we do, we never stop learning.

Innovation is an integral part of Welding Alloys' approach to industrial solutions, and we have consistently invested in this area since our inception in 1966.

Our continuous development approach has aided the identification of new opportunities and given birth to numerous innovative solutions for the recycling industry, always with customer satisfaction as our focus. Our simple philosophy allows us to continue to deliver best-in-class products and services to every major industrial sector across the globe.

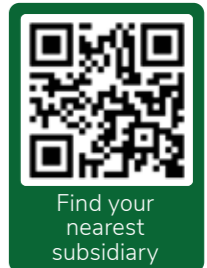
Our unique culture of continuous innovation forms the backbone of the company and our teams of engineers are constantly interacting to share knowledge, information and ideas. Collaboration across on-site operations and a focus on customer needs drive the

improvement of existing products and the development of new ones, all based on sound scientific principles and engineering solutions.

Over the past three decades, Welding Alloys has built, and continues to grow, a global network of universities and research organisations. This allows us to remain at the forefront of the latest market trends and state-of-the-art technological innovations.

Our global footprint

Our specialists and industry experts are active in 150 countries across the world and have an in-depth understanding of the operating conditions and customer requirements across a wide range of sectors.



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