Welding Alloys

Laser Cladding and Hardfacing Wires

Tailored solutions for superior productivity and performance

For Welding **Professionals**

Contents

Our company

Welding Alloys has been a global leader in the production of advanced welding consumables for more than 50 years. We formulate new fit-for-purpose welding consumables and produce wires tailored to suit more advanced welding processes, such as laser, arc spraying and additive manufacturing. We provide innovative wear protection solutions for even the most challenging service conditions in a range of industries.

Complementary to our welding consumables, we manufacture a range of automated equipment for hardfacing, joining and cladding. We also offer engineered wear solutions, Integra™ services, in our workshops, or in situ, as well as a wide range of wear plates, pipes and components.

Since 1966, the Welding Alloys name 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.

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. Reflecting this, 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. We continue to improve our products and processes in order to reduce the negative impact on both the welder and the environment.

Laser wire cladding & hardfacing: our offer

At the forefront of innovation, Welding Alloys is a pioneer in the development of specialist wires for laser cladding and hardfacing. We understand the demands of laser applications and have engineered our consumables to deliver the performance, durability, and reliability needed.

Enhanced availability and efficiency
Our wires are readily available in convenient lot sizes, ensuring you have the necessary materials on hand without unnecessary delays.

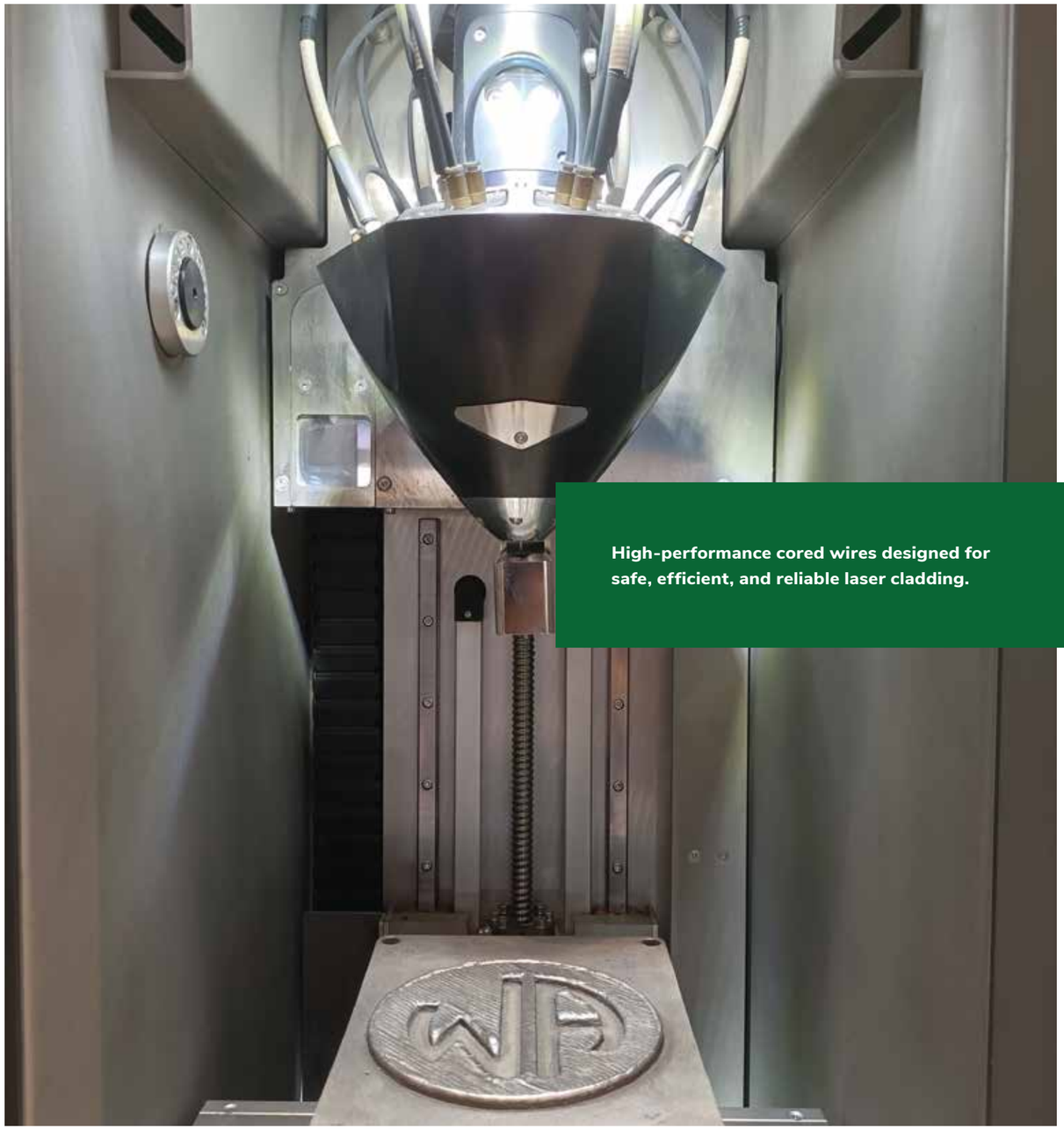
Safer and easier handling
Unlike fine powder particles, which pose significant hazards to both people and the environment, wire products are safer and easier to handle. This reduces the extra effort, cost and time typically associated with managing powders. Additionally, wires are less prone to contamination compared to powders, ensuring the purity and quality of materials remain intact.

Optimal productivity
Cored wires offer 100% material recovery, meaning all the material contributes to the deposition. Wire feedstock systems also require less maintenance, resulting in maximum productivity.

Developed for laser cladding
Our range of metal cored wires produces clean weld beads with minimal silicate islands, low fume emissions, and very little spatter. The precise chemical composition, combined with low dilution, delivers superior results for cladding applications with excellent bonding.

Wide range
Our dedicated laser cladding and hardfacing range includes chromium carbide, boron carbide, tungsten carbide, and cobalt based wires, providing solutions for a wide variety of applications.

We develop our wires with the user in mind. We invest in research and development and continuously enhance our range to ensure our wires are the best-in-class solution for laser applications.



High-performance cored wires designed for safe, efficient, and reliable laser cladding.

Highly alloyed steels with hard phases

Cored wires can be designed and manufactured by adjusting or adding specific alloying elements. These alloying elements improve resistance to abrasion, impact, metal-to-metal friction, corrosion, high temperatures, or a combination of these wear phenomena.

These wires consist of hard phases in a matrix, where the structure depends on the metal composition.

Optimised cored wires for superior results
Products with high levels of carbon and chromium result in chromium cast iron deposits that contain hard primary chromium carbides. These are ideal for abrasion resistance in applications that involve moderate impact.

High boron content results in boron carbides and borides, providing the best solution for resisting various types of pure abrasive wear.

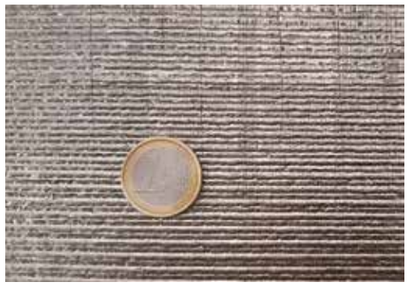
The laser process results in low dilution with the substrate. This means a high hardness is achieved right from the first layer, whilst still maintaining strong bonding.

Consumables:
HARDFACE HC-LD
HARDFACE BN-LD

Applications:
Equipment used in agriculture, quarrying and mining, screw flights, for example.


Lateral multi-wire feed laser head


Cultivator point hardfaced with HARDFACE BN-LD


Wear plate made with HARDFACE HC-LD

HARDFACE BN-LD Video

Tungsten carbides

Cored welding wires filled with advanced tungsten carbides offer exceptional resistance to abrasion. These cast tungsten carbides are added to the wire during the production process.

Ideal for laser applications
By using laser welding technology, the wire melts in the laser-formed weld pool without damaging the tungsten carbides. As this process has a low heat input and a fast cooling rate, the tungsten carbides are trapped during the solidification, ensuring an even distribution throughout the deposit.

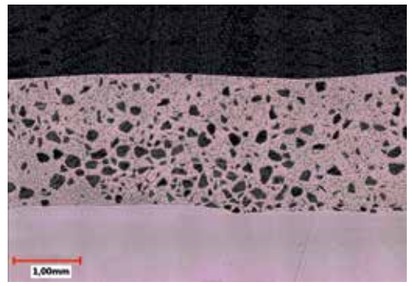
In contrast, using a different process with higher energy levels could damage the carbides or cause them to settle at the bottom of the weld pool.

Consumable:
HARDFACE NICARBW-LD

Applications:
Equipment used in oil & gas, stabiliser, trenchers, screws, for example.


Coaxial laser wire head


Knives hardfaced with HARDFACE NICARBW-LD



Macrography of HARDFACE NICARBW-LD

HARDFACE NICARBW-LD Video

Cobalt based alloys

Cobalt based cored wires are mainly alloyed with carbon, chromium and tungsten. However, sometimes they are alloyed with nickel and molybdenum. These alloys are ideal for resisting wear caused by metal-to-metal friction and abrasion at high temperatures, as they retain high hardness over time.

Chromium provides a protective layer, playing an anti-oxidation role. Chromium, tungsten and molybdenum combined with carbon create hard carbides.

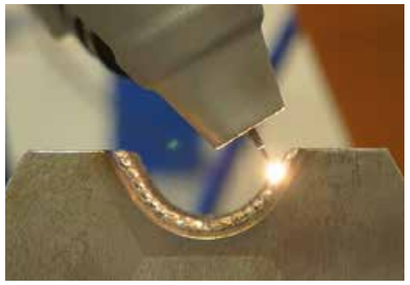
Advanced laser wires
All of our cobalt based alloy wires, including grades 1, 6, 12, 21, 25 and 188, have been developed for use in laser welding.

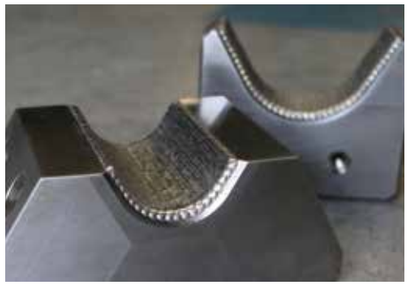
These materials have a low coefficient of friction and a self-polishing tendency, making them highly resistant to scratching while maintaining excellent surface quality.

Laser cladding is a well-suited process for applying these high-performance alloys, as it allows for a precise deposition of the exact amount of material needed to the specified working area.

Consumables:
STELLOY 25-LD
STELLOY 21-LD
STELLOY 6-LD
STELLOY 1-LD
STELLOY 188-LD

Applications:
Industrial valves and seats, forging dies, hot shearing blades, for example.


Coaxial laser wire head


Hot shear blades hardfaced with STELLOY 21-LD


Cladding of a plug valve using STELLOY 6-LD

STELLOY 21-LD Video

Stainless steels

We manufacture a full range of stainless steel metal cored wires, including ferritic, martensitic, soft martensitic, austenitic and super-austenitic, austenitic-ferritic duplex, and super duplex stainless steels. These are specifically designed for cladding, joining or additive manufacturing applications. Some stainless steel wires are also suited for heat-resistant tasks, as well as repair and maintenance.

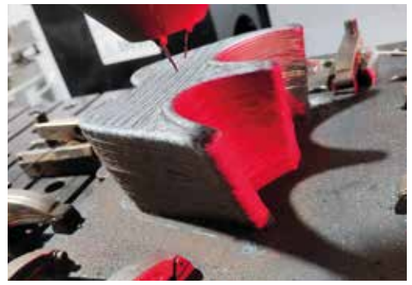
Tailored solutions for DED
With cored wires, we maintain complete control over the design, development and production processes. This means we can tailor solutions that exactly meet our customers' requirements.

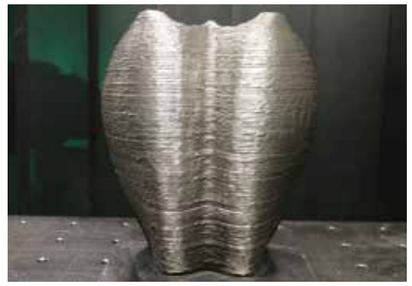
We have the ability to tailor the chemical analysis and mechanical properties as required. This includes the ability to regulate ferrite levels.

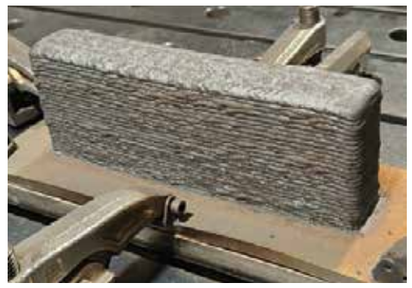
Our range of stainless steel metal cored wires is ideal for wire laser additive manufacturing (WLAM), using direct energy deposition (DED).

Consumables:
CHROMECORE M 410NiMo-G
TUBE S 316L-G
TUBE S 22 9 3L-G

Applications:
Hydropower, pressure vessels, nuclear, oil & gas, defence, for example.


Lateral multi-wire feed laser head


Pelton bucket manufactured with CHROMECORE M 410NiMo-G


Additive manufactured wall for material qualification of CHROMECORE M 410NiMo-G

WLAM with CHROMECORE M 410NiMo-G Video

Quality & innovation

Welding Alloys has a wealth of experience and expertise in the design and manufacture of flux and metal cored welding wires. We have globally located R&D teams capable of designing a large range of hardfacing and cladding cored wires, based on a culture of continuous development and innovation. For more than five decades, innovation has played a key role at Welding Alloys.

We partner with customers globally to develop new opportunities and unique solutions for a range of applications and welding processes. Our R&D and technical teams remain at the heart of the business, able to solve the most complex industrial wear protection challenges.

We have total control over design, development and production. Our wires are produced using our own manufacturing equipment, which is installed in our production plants worldwide. This means we can ensure the highest quality is maintained throughout the manufacturing process. We pride ourselves on our stringent quality control measures. Regular laboratory tests and quality checks are carried out at various stages of production.

Welding Alloys backs its products and services with teams of technical experts active in 150 countries across the world who work closely with customers to deliver best-in-class solutions to every major industrial sector.

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

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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Welding Alloys

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