LASERBOND®

PRODUCTIVITY | INNOVATION | CONSERVATION

Capability STATEMENT

LEADERS IN 'BETTER THAN NEW' TECHNOLOGY

Contents

LaserBond Facilities

LASERBOND®
PRODUCTIVITY | INNOVATION | CONSERVATION

SERVICES DIVISION

Repair and refurbishing worn or damaged machine parts

PRODUCTS DIVISION

Specialised surface engineered components for OEM partners and end users.

TECHNOLOGY DIVISION

Design, manufacture, licensing & support of tailored cladding systems

RESEARCH & DEVELOPMENT

New cladding materials and application technologies

Capability Information

LaserBond Limited is an Australian publicly listed company (ASX:LBL) specialising in surface engineering, reclamation, engineering, precision machining and fabrication. We have been in operation since 1992, commencing operations as HVOF Australia Pty Ltd. We were the first to design, build and operate a commercial laser cladding system in Australia.

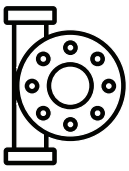
LaserBond manufactures, repairs, reclaims, and enhances the performance of high wear, critical metal components in a range of capital-intensive industries.

We operate under three business divisions including:

Services

The application of a range of surface engineering technologies and techniques for surface reclamation and re-engineering of high wear metal components. We also undertake dimensional restoration and repair of damaged or worn machine parts. Our workshops are equipped with a wide range of high-capacity engineering machinery, that supports a comprehensive surface engineering facility.

Products



We research, design, develop and manufacture specialised high wear resistant components and equipment. Some of our products include steel mill rollers, wear rings, sleeves, and rotary feeders. These are sold locally and exported to global end users and OEM's.

Technology

We design, manufacture, install, commission and licence tailored LaserBond® cladding cell systems throughout the world. Our licensees benefit from our long term, operational experience and investment in research and development and round the clock support to deliver superb outcomes for their customers.

> We were the first to operate a commercial laser in Australia. LaserBond manufactures, repairs, reclaims and enhances the performance of high wear, critical metal components in a range of capital intensive industries.

In addition to the specialised automation, design and manufacturing skills needed for building the LaserBond® equipment, we have extensive hands-on operational experience in delivering high performance outcomes using the following technologies:

- LaserBond® cladding
- High pressure HVOF thermal spraying
- HVAF thermal spraying
- Plasma spraying (especially ceramics)
- Wire Arc spraying
- Combustion wire and powder thermal spraying
- Spray & Fuse coatings
- Plasma Transferred Arc (PTA) weld overlay and hard facing
- Conventional (MIG/TIG/MAG) weld overlays and hard facing
- Polymer and polymer composite coatings
- Specialised and automated welding
- Wear, corrosion, and high temperature resistant coatings
- Metrology - laboratory
- Metallographic laboratory investigations
- Vacuum/ gas quenched and conventional heat treatment
- CNC and conventional milling, turning and boring
- Large capacity vertical and horizontal machining
- Cylindrical, surface, and internal grinding
- Super finishing
- Specialised machinery manufacture.

At LaserBond we determine the characteristics of the wear affecting the surface then define the best cladding material and process to reclaim the equipment part. Our in-house capabilities allow us to reclaim components at far less cost and often in far less time than a new replacement.

Our cladding materials offer 'better than new' characteristics; tailored for improved resistance to corrosion, erosion, abrasion, and impact conditions. We research, design, and manufacture specialised new components to provide improved service life in challenging conditions.

Our Work and Equipment

"LaserBond manufactures, repairs, reclaims and enhances the performance of high wear, critical metal components in a range of capital intensive industries."

Cladding and Thermal Spray Surfacing Materials

- Tungsten Carbide, Chrome Carbide, and other cemented Carbides
- Stainless steels - Martensitic, Austenitic, Duplex & Precipitation hardened
- Nickel super alloys - Inconel, Hastelloy
- Nickel hard alloys
- Cobalt alloys - Stellite and Triballoy
- Bronzes and Copper alloys e.g. aluminium bronze
- Tools steels - H13, M2 and Vanadium steels
- Cermets
- Ceramics - Chrome oxide, Zirconia, Aluminium oxide, Titanium dioxide and blends
- Polymers (PTFE, PFA, FEP, epoxies, nylon, and rubber)

The following are examples of our work:

- Valves and seats
- Pump housings, impellers, shafts, and shaft sleeves
- Conveyor shafts
- Mining and mineral process equipment
- Steel mill rollers
- Bearing and seal journals
- Pump bodies and rods
- Hydraulic cylinder rods
- Industry rollers
- Drilling equipment
- Pump sleeves, impellers, volutes
- Bushes and shafts
- Wear plates
- Axles
- Rail tracks

Equipment

We have a large range of equipment for machining, grinding, and finishing including:

- CNC lathes to Ø400mm x 2200mm between centres
- Conventional centre lathes to Ø1600mm x 8000mm between centres
- Horizontal machining centres including CNC horizontal boring and facing to 4000 x 2300 x 2300mm
- CNC milling machines to 3000mm x 900mm x 900mm
- Cylindrical grinders to Ø1250mm swing x 5000mm between centres
- CNC Vertical lathe boring to Ø3000mm x 2500mm
- Internal and planetary grinders
- Surface grinders
- Superfinishing to mirror finish on cylindrically ground components Ø500mm x 5000mm between centres.

Surface Engineering

Over 30 years of leadership in thermal spraying and being one of the founders in industrial laser cladding technologies, makes us specialists in surface engineering.

We have developed, patented LaserBond® deposition and HP HVOF processes offering unique surface characteristics and metallurgy. These are supported by large capacity CNC and conventional machining equipment, highly skilled people, and quality workmanship.

There are a wide variety of repair and refurbishment options on offer. We also have the capability to analyse, design and manufacture components to original equipment manufacturer (OEM) standards and include improved wear-life characteristics.

LaserBond® Cladding

We have a range of high power, flexible laser systems, which allows us to process a large range of components sizes; very small or large (up to 2100mm diameter x 6100mm lengths).

- 9 x high powered lasers (3 x 6kW, 4 x 8kW, 1 x 12kW and 1 x 16kW) within the group, as follows:

NEW SOUTH WALES:

- 1 x CO_2 LaserBond® cladding cell with integrated high-capacity gantry work processing centres
- 1x 8kW diode LaserBond® cladding cell with integrated 6-axis robotic work processing, coupled with a 2-axis manipulator centre capable of cladding complex geometries and internal bores
- 1 x automated 8kW multi robot LaserBond® cladding cell, incorporating robotic pick and load system with measurement capability and integrated thermal control
- 1 x 6kW diode LaserBond® cladding cell with high-speed cylindrical shaft capacity designed and optimised for the E-Clad™ and other rapid cylindrical applications up to 3.5m in length
- Internal cladding heads capable of internal diameters of 75mm at 500mm depth, to 270mm ID at 1000mm depth

VICTORIA:

- 1x 8kW diode LaserBond® cladding cell with integrated 6-axis robotic work processing coupled with a 2-axis centre capable of cladding complex geometries and internal bores, providing up to 10-ton capacity and handling up to 2m diameter and 6m in length.

> “30 years of leadership in thermal spray and founders in industrial cladding, LaserBond are specialists in surface engineering.”

SOUTH AUSTRALIA:

- 1 x 16kW diode LaserBond® cladding cell with integrated high-capacity gantry work processing centre, rotation, and tilt axes for up to Ø1600mm x 6000mm
- 1x 8kW diode LaserBond® cladding cell with an integrated 7-axis robotic manufacturing centre plus twin 10-ton multi axis manipulators.

QUEENSLAND:

- 1 x 12kW diode laser with integrated rotator and gantry system
- 1 x 6kW diode laser with integrated rotator and gantry system.

Thermal Spraying

We have 7 booths equipped with robotics and component manipulation up to 1600 diameter x 4000mm length.

Additionally, we have HP HVOF (x4), HVAF (x2), Arc spray (x8), Plasma spray (x2), combustion wire and combustion powder spray systems.

Heat Treatment

We have 3 Abar- Ipsen positive pressure quenching vacuum furnaces and 2 air recirculating tempering furnaces, providing state of the art heat treatment for air hardening materials to 1300 degrees Celsius. Cooling pressure up to 6 Bar. Capacity to 600 x 600 x 900 mm.

Traction and Release Coatings

LaserBond is a licensee of a range of traction and release coatings developed by Plasma Coating International. Coatings combine a thermal spray bond coat with a polymer topcoat. Properties inducing; durability, wear resistance, traction, and release, hydrophobic, antimicrobial, and antifungal.

Metallographic Laboratory

We are equipped and staffed to carry out Research and Development activities, including metallographic characterisation, mechanical tests, and chemical analysis using the following equipment:

- JEOL JSM-IT200 Scanning Electron Microscope (SEM) with Energy Dispersive X-Ray Spectroscopy (EDS)
- Optical Microscopy
- Rockwell Hardness Testing
- Vickers Microhardness Testing
- Presi Mecatome Cutting Machine for high capacity cutting of samples
- Struers LaboSystem Equipment for sample preparation.

Products, Technology and Training

Our People

We pride ourselves on our team of highly skilled, experienced and qualified industry experts. Qualifications include, but are not limited to:

- Certificate 4 - Mechanical Engineering (Machining and Fabrication)
- Degrees in Mechanical and Electrical Engineering
- Masters Degrees in Business Management
- PhD's in Mechanical Engineering

Training and Development

Our leadership in surface engineering is maintained through an ongoing commitment to internal training and upskilling. All shop floor, sales, administration, and management team members are multi skilled and familiar with all our services, products, and technology. Some further examples include:

- Our annual intake of apprentices
- Trade assistants becoming certified tradespeople
- A dedicated learning and development manager to coordinate all workplace training and development, including our apprentice program
- Formal documentation and training in surface engineering technologies and techniques
- Robotics, automation, and advanced manufacturing programming.

Manufactured Products

At LaserBond we research, design, develop and manufacture specialised long wear life/ high performance products that contain our patented technology.

Current products include steel mill rollers, wear rings, sleeves, and bark blower rotary feeders.

We have other exciting innovations currently in the research and development phase.

Proprietary Technology Licensing

LaserBond® cladding or HVOF systems licensing can be acquired from LaserBond via tailored equipment, software, training, and support packages. Licensing offers a range of complete multi-component turnkey solutions to OEM's and service providers seeking to deliver greater customer value in their target markets.

Tailored packages typically include LaserBond® or HPF/HVOF hardware/ software integration supported by the necessary know-how, training, installation, onsite commissioning, and ongoing technical support. We provide fully configured "production ready" systems and open access to many years of the exacting, unique experience and support required to deliver the shortest possible timeline from equipment purchase to return on investment.

Industry Collaboration and Safety

> We are committed to a zero harm workplace. Safety is a key component of performance for customers and major project supply chains.

Performance and Reliability

Our focus is always to deliver in full, on time and to specification for our customers. We have a track record of strong performance, reliability, and timeliness.

Supervisors work closely with Lean Manufacturing professionals, an excellent Quality Assurance System, and an ERP system with Risk Management. Large projects move though their processes efficiently and reliably.

WH&S Management System

We are committed to a zero-harm workplace. Safety is a key component of performance for customers and major project supply chains. Our systems integrate with site and customer safety requirements. A disciplined approach to risk management and effective safety leadership is rewarded by continuous improvements in safety performance records. The system includes:

- Published health and safety policy
- Certified workplace health & safety (ISO 45001) as part of our Integrated Management Systems
- A senior manager is responsible for safety management
- Trained first aid officers and emergency response wardens
- Ability to track and report on safety statistics

Lean Manufacturing

Our personnel are trained, and facilities designed to incorporate Lean 5S manufacturing. A methodical team-based approach to organising the workspace, which ensures the processes are arranged ergonomically, efficiently and is capable of a repeatable, quality output.

Strict process controls deliver measurable improvements in quality, on-time delivery, waste, and organisation culture. Lean 5S is applied throughout our company from the front desk to the despatch dock.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Environment, Risk and Quality

Environment Management Systems

Environmental protection is extremely important to us and our customers. We have achieved IMS certification for Environmental Management Systems (ISO 14001:2015). ISO 14001 is the internationally recognised standard for Environmental Management Systems (EMS). It provides the framework for us to implement our EMS and continually improve our environmental performance. We ensure we take proactive measures to minimise our environmental footprint, comply with relevant requirements, and achieve our environmental objectives.

For example, it requires approximately 30 gigajoules of energy to produce 1 tonne of steel. We can typically reclaim a worn component manufactured from that 1 tonne of steel using only 1 gigajoule of energy, ensuring reclaiming and remanufacturing is cost effective and more beneficial for the environment. The system includes:

- Environmental policy statement
- A senior manager is responsible for environmental management.

Risk Management

- Risk management matrix to identify and assess potential risks
- Risk management system and procedures to manage the actual risk
- Compliance with local, state and federal government regulations.

Insurance Coverage

- Public Liability Insurance of $20,000,000
- Workers Compensation
- Industrial Special Risks Insurance
- Business Interruption Insurance.

Quality Management

Robust quality assurance systems are fundamental for our customers and us. For capital intensive industries where downtime and throughput have significant cost implications, it is clearly understood that products and services must meet or exceed specifications. The systems we have in place includes:

- Published quality policy
- Independently certified Quality (ISO 9001:2015) as part of our Integrated Management Systems
- Test inspections and test plans
- On all projects a dedicated quality manager and support team is responsible for all aspects of quality management
- Non- conformance records (NCR) tracked and managed in M1 ERP
- Procedures for assessing and approving the quality of subcontractors.

Communication and Reporting

Capacity Levels

- Over 150 employees across Australia and globally
- Revenue in excess of $40M per annum
- Our facilities can scale up workforce levels to manage large projects and accommodate additional shift work when required.

Area of Operation and Supply

We operate throughout Australia and export globally. We have customers in North America, South America, Africa, Asia, and Europe.

Proactive Reporting

Consistent and superior customer service is our priority. Effective and proactive reporting occurs via our M1 Enterprise Resource Planning system, whereby all shop floor, supervision and management teams can monitor electronic job status reports in real time, as well as remotely from a customer site.

Face-to-face weekly toolbox, production and sales meetings take place to ensure that any delays, changes, or issues affecting delivery can be managed and communicated promptly to our customers.

Key Customer Relationships

We have developed long term, business relationships with quality industry partners by undertaking collaborative research and development to create tailored solutions to wear life problems. Some of these partners include:

- Alcoa World Alumina
- Androck Engineering and Mining
- BHP Billiton
- BlueScope Steel
- Flowserve Pumps
- FLSmidth
- Komatsu
- Liebherr
- Nucor Steel
- Sandvik Australia
- Weir Minerals
- WesTrac

Innovation and Collaboration

Industry Leadership

We have held an industry leadership reputation since the early days of metal reclamation and protection. From inception in 1992 with thermal spraying, then in 1999 by introducing laser cladding. High Pressure HVOF and LaserBond® cladding are relatively young, therefore new applications continue to be researched and developed.

Research & Development Team

Our surface engineering innovations have resulted in the development of new processes, equipment, and patents. The R&D team is fully equipped with an inhouse laboratory to conduct testing and examination including metallographic imaging and characterisation, hardness testing and chemical analysis.

One of the main tools for this research is our Scanning Electron Microscope (SEM). The SEM allows for investigation of surface engineered layers and base material metallurgy down to the nanoscale.

Our lab is routinely used for the optimisation of coatings and overlays, quality control of incoming materials, reports to customers on new applications and materials, and failure analysis as required. Examination of the effects on substrate metallurgy of the coating and cladding operation is routinely performed to ensure component integrity, or structural properties are not compromised.

Industry Associations

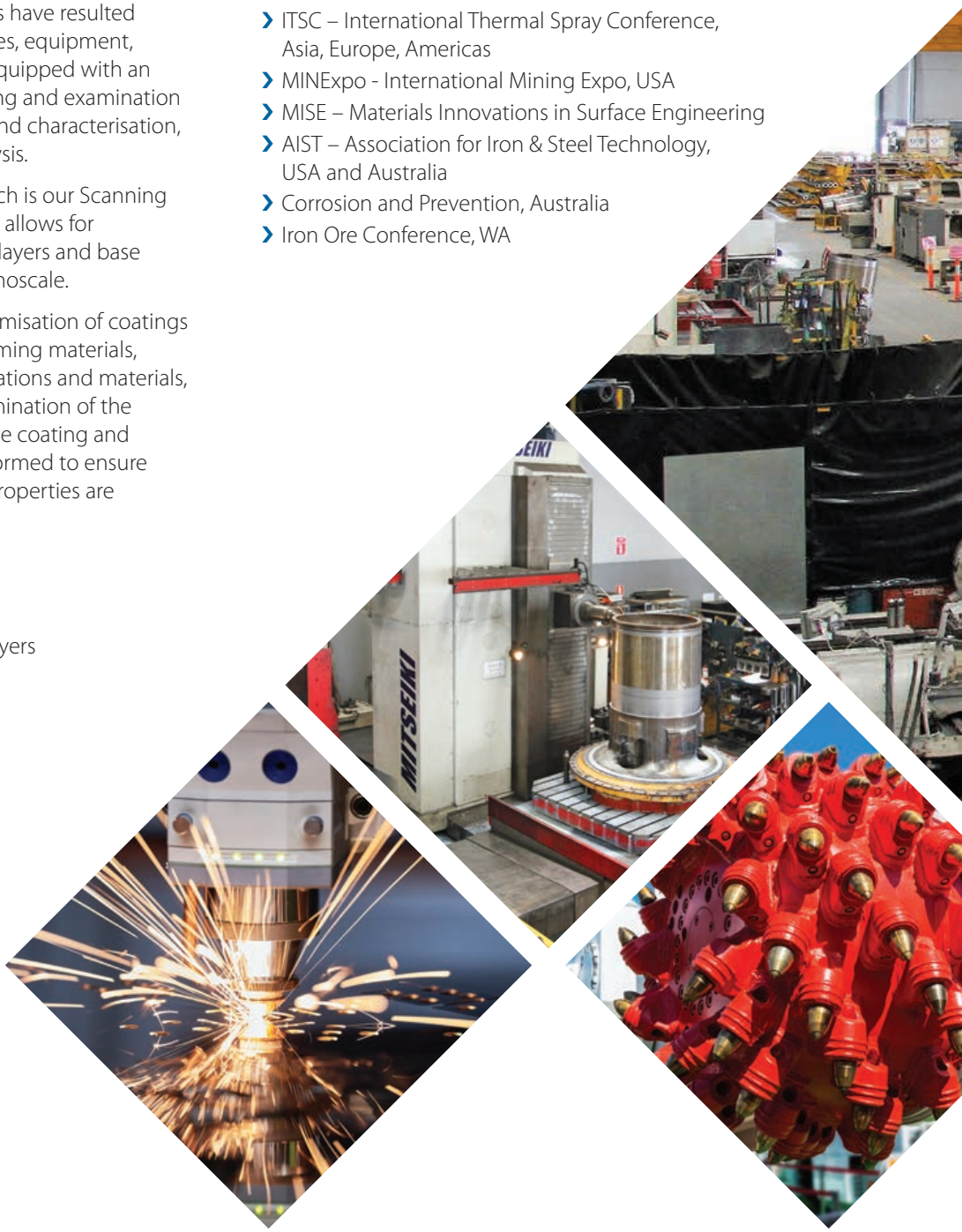
- Austmine
- GTS – Association of Thermal Sprayers
- Materials Australia

R&D Collaborations

- University of South Australia – Future Industries Institute (FII)
- Monash University – Institute of Railway Technology (IRT)
- Swinburne University
- University of NSW
- ANSTO – The Australian Nuclear Science and Technology Organisation
- SEAM – Surface Engineering of Advance Materials through ARC (Australian Research Centre) and with FII and Swinburne University.

Industry Presence, Speakers and Exhibitors

- AIMEX – Asia Pacic's International Mining Exhibition, NSW
- QME – Queensland Mining Expo, QLD
- AOG – Australasian Oil and Gas Exhibition and Conference, WA
- IMARC – International Mining and Resources Conference, NSW/ VIC
- ITSC – International Thermal Spray Conference, Asia, Europe, Americas
- MINExpo - International Mining Expo, USA
- MISE – Materials Innovations in Surface Engineering
- AIST – Association for Iron & Steel Technology, USA and Australia
- Corrosion and Prevention, Australia
- Iron Ore Conference, WA




100 Years
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PRODUCTIVITY | INNOVATION | CONSERVATION

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ISO 9001 Quality management system
ISO 45001 OH&S management system
ISO 14001 Environment management system
JAS-ANZ