

LASERBOND®
PRODUCTIVITY | INNOVATION | CONSERVATION

Capability STATEMENT

LEADERS IN 'BETTER THAN NEW' TECHNOLOGY





LASERBOND[®]

PRODUCTIVITY | INNOVATION | CONSERVATION

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Capability information

LaserBond Limited is an Australian surface engineering company specialising in reclamation and engineering, precision machining and fabrication since 1992. LaserBond manufactures, repairs, reclaims and enhances the performance of high wear critical metal components in a range of capital intensive industries. LaserBond Limited operates under an independently certified PAS 99 certification for its integrated management system incorporating Quality, Environment and Workplace Health & Safety systems. The company has been a winner in the Innovation category of the NSW Government's Industry Awards. LaserBond Limited is a public listed company, ASX:LBL

THREE BUSINESS DIVISIONS:

Services - apply a range of surface engineering technologies and techniques for surface reclamation and re-engineering of high wear metal components, dimensional restoration and repair of damaged or worn machine parts.

Products - research, design, development and manufacture of specialised high wear resistant components.

Technology - design, manufacture, support and licencing of tailored LaserBond® cladding cell systems. LaserBond's workshops are equipped with a wide range of high capacity engineering machinery that supports a comprehensive surface engineering facility.

Extensive experience is available in:

- › LaserBond® cladding
- › High pressure HVOF thermal spraying
- › HVOF thermal spraying
- › Plasma spray of ceramics and carbides
- › Arc spraying / metal spaying processes
- › Specialised and automated welding
- › Wear, corrosion, temperature resistant alloys
- › Metallurgical - wear laboratory
- › Metallographic laboratory investigations
- › Vacuum / gas quenched and conventional heat treatment
- › CNC and conventional milling, turning, boring
- › Large capacity vertical & horizontal machining
- › Cylindrical, surface and internal grinding
- › Super-finishing
- › Specialised machinery manufacture

LaserBond determines the characteristics of the wear affecting the surface then defines the best cladding metallurgy and process, to reclaim the equipment part. Our in-house capabilities allow us to reclaim the part 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. LaserBond also researches, design and manufactures specialised new components to provide improved service life in challenging conditions.

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

Our work and equipment

CLADDING AND THERMAL SPRAY SURFACING MATERIALS:

- › Tungsten carbide, chrome carbide and other cemented carbides
- › Stainless steels – Martensitic, Austenitic, Duplex & Precipitation hardened
- › Nickel alloys such as Inconel, Hastelloy C and Ni Cr alloys
- › Cobalt alloys such as Stellite and Triballoy
- › Bronzes and other copper alloys e.g. aluminium bronze
- › Tools steels – H13, M2 and Vanadium steels
- › Borides
- › Cermets
- › Ceramics such as chrome oxide, zirconia, aluminium oxide, titanium dioxide and blends

EXAMPLES OF OUR WORK:

LaserBond® cladding

- › Valves and seats
- › Pump housings, impellers, shafts and shaft sleeves
- › Conveyor shafts
- › Mining and drilling equipment
- › Steel mill rollers
- › Bearing and seal journals
- › DTH Hammers manufacture
- › High Pressure HVOF, HVOF, Plasma and Arc Thermal Spray
- › Pump bodies and rods
- › Hydraulic cylinder rods
- › Industry rollers
- › Drilling equipment
- › CNC manufacture (incorporating surface engineering)
- › Pump sleeves, impellers, volutes
- › Pump valves and piping
- › Bushes and shafts
- › Various drilling components
- › Mining & mineral process equipment



Laser 5 - Fibre Diode Laser Designed and Built by LaserBond®

EQUIPMENT:

Machining / grinding / finishing:

- › CNC lathes up to 650 dia. x 3000mm between centres.
- › Conventional centre lathes to 1600 dia. x 5000mm between centres
- › Horizontal machining centres including CNC horizontal boring & facing to 4000 x 2300 x 2300mm
- › CNC milling machines to 3000 x 900 x 900mm
- › Cylindrical grinders to 1.25 m swing x 5000mm between centres
- › Vertical boring to 3000 diameter x 2500mm
- › Gantry planer mill capacity to 5500 x 1600 x 1200 mm
- › Internal and planetary grinders
- › Superfinishing to mirror finish on cylindrically ground components

30 years of leadership in thermal spraying ...
founders in industrial laser cladding ...
LaserBond the go-to specialists in surface engineering

Surface engineering



A wealth of experience – 30 years of leadership in thermal spraying and one of the founders in industrial laser cladding technologies makes LaserBond the go-to specialists in surface engineering. It has developed patented LaserBond® deposition and HP-HVOF processes which offer unique surface characteristics and metallurgy. These are supported by large capacity CNC machining equipment, knowledgeable staff and quality workmanship. There is a wide variety of repair and refurbishment options on offer as well as the ability to analyse, design and manufacture components to original equipment manufacturer (OEM) standards, frequently with improved wear-life characteristics.

LASERBOND® CLADDING

A range of high power flexible laser systems allowing processing of very small components and large components up to 2100mm dia. x 6100mm lengths.

- › 3 x fibre coupled diode lasers (6kW, 8kW and 16kW)
- › 1 x CO2 lasers with integrated high capacity gantry work processing centres
- › 8kW diode laser with integrated 8 axis robotic work processing centre capable of cladding complex geometries and internal bores
- › 16kw diode laser with an integrated robotic 8 axis robotic manufacturing centre, incorporating twin station semi-automatic robotic load and unload facilities. (This is the most powerful laser cladding installation in the Southern Hemisphere).
- › Internal cladding heads capable of internal diameters of 75mm at 500mm depth, to 270mm ID at 1000mm depth.

THERMAL SPRAYING

3 x booths equipped with robotics and component manipulation up to 1600 dia. x 4000mm length.

HP HVOF (x3), HVOF (x1), arc spray (x3), air plasma spray, combustion wire and combustion powder spray systems.

HEAT TREATMENT

3 x Abar-Ipsen positive pressure quenching vacuum furnaces and 2 air recirculating tempering furnaces provide 'state of the art' heat treatment for air hardening materials to 1300 deg C.

Cooling pressure levels vary from 5" HG Vac to 6 Bar, capacity 600 x 600 x 900 mm.

METALLOGRAPHIC LABORATORY

Equipped and staffed to carry out testing and examinations, including metallographic characterisation and chemical analysis.

- › Scanning Electron Microscope (SEM) with Energy Dispersive X-Ray Spectroscopy (EDS) and Wavelength Dispersive X-Ray Spectroscopy (WDS).
- › Optical microscopes, macro and micro hardness testing and sample preparation equipment.
- › FARO portable coordinate measuring machine for precise measurements and reverse engineering restoration projects.

Products, technology and training

MANUFACTURED PRODUCTS:

LaserBond researches, designs, develops and manufactures specialised long wear life/high performance consumables that contain its patent technology. Current products include Down-The-Hole hammers for the drilling industry. Other products are in R&D 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 incorporate an industry specific system. Tailored packages typically include LaserBond® or HP-HVOF hardware/software integration supported by the necessary know-how, training, installation, onsite commissioning and ongoing technical support. The LaserBond option provides fully configured "production ready" systems and open access to many years of the exacting and unique experience and support required to deliver the shortest possible timeline from equipment purchase to return on investment.



LASERBOND STAFF QUALIFICATIONS:

LaserBond Limited is staffed by highly trained and experienced personnel. The company is proud of the knowledge, experience and the high qualifications of its staff members.

Certificates and qualifications include, but are not limited to:

- › Certificate 4 - Mechanical Engineering (machining and fabrication)
- › Masters Degrees in business management
- › Degrees in mechanical and electrical engineering

IN-HOUSE TRAINING & SKILL DEVELOPMENT:

Our leadership in surface engineering is maintained through an ongoing commitment to internal training and upskilling. All staff, shop floor, sales and administration are multi skilled and familiar with many aspects of our services, products and technology.

- › Annual intakes of apprentices
- › Trade assistants become certified tradespeople
- › Developed formal training documentation in surface engineering technologies and techniques
- › Robotics, automation and advanced manufacturing programming

INFORMATION SYSTEMS AND SOFTWARE:

IT systems are used to manage and track quotes, orders, scheduling, deliveries, invoicing and other important information. Project documentation and correct invoicing are vital to the smooth running of any project. LaserBond Limited's software includes, but is not limited to:

- › M1 Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) System
- › Access to experienced Mastercam and AutoCAD operators

Industry collaboration and safety

DEVELOPMENT PROJECTS WITH MAJOR CLIENTS:

- Alcoa World Alumina LLC - Exporting, manufacture and LaserBond® cladding of wear components for slurry pumps
- Androck Engineering and Mining Pty. Ltd. - Refurbishing and LaserBond® cladding of mining equipment wear components
- BHP Billiton Ltd. - Refurbishment and wear life extension of wear components within Olympic Dam project
- Bluescope Steel Ltd. - Reclamation and LaserBond® cladding of mill rollers, stripper rolls for Port Kembla plant
- Boart Longyear - Collaborative development of new wear resistant drilling components for mining
- Sandvik Australia Pty. Ltd. - Repair, refurbishing and LaserBond® cladding of underground mining wear components
- Weir Minerals Australia Ltd. - OEM supplier - manufacture and LaserBond® cladding of wear components for Warman slurry pumps
- WesTrac Pty. Ltd. - Repair of machinery wear components
- Sydney and Melbourne Tunnels - long wear life tunnelling rock cutting picks, wear plates and Road Header components

DELIVERY PERFORMANCE AND RELIABILITY:

LaserBond's focus is always to 'Deliver in full, on time and in specification.' The company has a track record of good 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 through their processes efficiently and reliably.

SAFETY MANAGEMENT SYSTEM:

LaserBond is committed to "Zero Harm". It is understood that safety is a key component of performance for clients and major project supply chains. LaserBond 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 (see website)
- Certified workplace health & safety (BS OHSAS 18001 & AS/NZS 4801:2001) PAS 99 integrated management system
- Senior manager responsible for safety management
- Trained First Aid officers
- Ability to track and report on safety statistics
- Health & Safety representatives



LEAN MANUFACTURING:

Our facilities are designed to meet the standards of Lean 5S manufacturing, a methodical team-based approach to organising the work space which ensures the process is arranged ergonomically, efficiently and is capable of repeatable, quality output.

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

Environment, risk and quality



ENVIRONMENT MANAGEMENT SYSTEM

Environment protection is extremely important at LaserBond. Efficient internal processes, monitored utilities usage and waste management are fundamental principles to internal operations. Customers also benefit from this. It requires approximately 30 gigajoules of energy to produce 1 tonne of steel. LaserBond can typically reclaim that 1 tonne of steel using only 1 gigajoule of energy, ensuring reclaiming and remanufacturing is cost effective and also good for the environment. The system includes:

- › Environmental and safety policy statement policy (see website)
- › Certified Environment (ISO 14001:2004) PAS 99 integrated management system
- › A senior manager responsible for the environmental management

RISK MANAGEMENT

This system includes:

- › Risk management matrix to identify and assess potential risks- Risk management system and procedures to manage the actual risk e.g. risk assessment procedures for work on site or at customers' premises
- › The company is compliant with local, state and federal regulations

INSURANCES

- › \$20,000,000 public liability insurance
- › Workers compensation
- › Industrial special risks/Business interruption insurance

MANUFACTURING MANAGEMENT SYSTEMS

The M1 ERP system effectively documents

- › Quote requests
- › Job cards
- › Quotes
- › Non-conformance records
- › Purchase orders
- › Drawing register
- › Invoices
- › Material certificates

QUALITY MANAGEMENT

Robust quality assurance systems are fundamental for LaserBond and its customers. 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 system includes:

- › Published quality policy (website)
- › Independently certified Quality (ISO 9001:2008) PAS 99 integrated management system
- › Test inspections and test plan
- › A Our Quality Manager is responsible for quality management
- › Procedures for assessing and approving the quality systems of subcontractors

Communication and reporting

CAPACITY LEVELS:

- Employee base Globally between 85-100
- Company Revenue in excess of \$21M p.a.
- LaserBond facilities have the ability to scale up workforce levels to handle large projects and handle additional shift work when applicable.

AREA OF OPERATION AND SUPPLY:

Australia, but also with the ability to export globally. LaserBond is currently exporting to North America and Canada, South America, South Africa, Asia and Europe.

PROACTIVE REPORTING

Consistent superior customer service is our highest priority. Effective proactive reporting occurs via their M1 Enterprise Resource Planning system, whereby all shopfloor, supervision and management staff can monitor electronic job status reports in real-time - even remotely - from a customer site.

Face to face weekly toolbox, production and sales meetings ensure any delays, changes or issues affecting delivery are swiftly communicated to clients.

STRATEGIC PARTNERSHIPS

LaserBond develops long term strategic relationships with quality industry partners by undertaking research and development collaboration to create tailored solutions to wear life problems. Partners include;

- Alcoa World Alumina
- Androck Engineering and Mining
- BHP Billiton
- Bluescope Steel
- Boart Longyear
- Flowserve Pump
- Sandvik Australia
- Weir Minerals Australia
- WesTrac

RESPONSIVENESS

LaserBond is very aware of the cost of production downtime, be that via breakdown or extended shutdown time. Our staff are highly responsive and offer our substantial capacity to give clients, quick and reliable quotes, undertake work efficiently and work extended hours to reduce downtime costs. We offer 24 hour contact access to key staff and facilities. Clients have access to their after hours contact details and there are staff on hand to handle emergency and breakdown work 24 hours a day, 7 days a week.



Innovation and collaboration



INDUSTRY LEADERSHIP

LaserBond has 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. Surface engineering is 'in their DNA'. High Pressure HVOF and LaserBond® cladding are relatively young so new applications continue to be researched and developed.

R&D TEAM

LaserBond's surface engineering innovations have resulted in the development of new processes, equipment and patents. Our R&D team is fully equipped with their own in-house laboratory to carry out testing and examination including metallographic characterisation, hardness testing and chemical analysis. One of the main tools for this research is the in-house SEM – Scanning Electron Microscope. This allows for investigation of coatings and metallurgy down to the nano scale. LaserBond's lab is routinely used for the optimisation of coatings and overlays, quality control of incoming materials, reports to clients 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.

WEARLIFE PERFORMANCE CRCp

LaserBond has founded a Cooperative Research Centre Programme with partners Boart Longyear and University of South Australia for "Extending WearLife in Drilling for Mining". This is a 3 year project supported by a \$2.6M Commonwealth Government grant.

INDUSTRY ASSOCIATIONS

- AIDN Australian Industry Defence Network
- AustMine
- AIG Australian Industry Group
- ASM American Society of Materials
- ADIA - Australia Drilling Industry Association
- LIA Laser Institute of America
- WTIA Welding Technology Institute
- SACOME - SA Chamber of Mining & Energy

INDUSTRY PRESENCE, SPEAKERS AND EXHIBITORS

- AIMEX - Asia Pacific's International Mining Exhibition, NSW
- Drill & Blast – Drilling Industry Conference, QLD
- QME - Queensland Mining Expo, QLD
- AOG – Australasian Oil and Gas Exhibition and Conference – WA Perth.
- SACOME - South Australian Chamber of Mining and Engineering, SA
- IMARC - International Mining and Resources Conference, VIC
- ITHC- International Thermal Spray Conference, GER
- MinEX - International Mining Expo - USA
- PDAC - Prospectors and Developers – CAN

R&D COLLABORATIONS

- University of South Australia - Future Industries Institute
- Australian Synchrotron
- SEAM - Surface Engineering of Advance Materials through ARC (Australian Research Centre)



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Quality 9001,
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