

Laser Scanning for Liner Wear

ALS Asset Care offers 3D laser scanning as a preferred method for wear liner assessment replacing traditional methods of manual ultrasonic thickness testing and visual inspection.

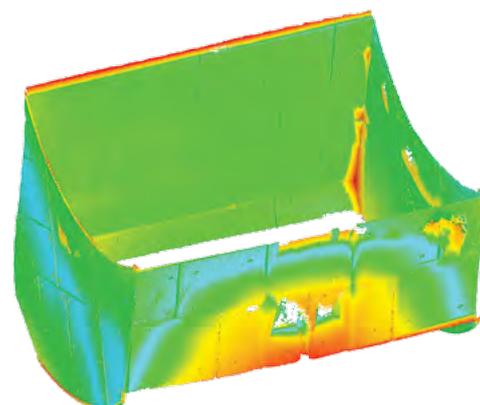
An ideal wear assessment should be able to quantify the amount of material lost from the liner over time to predict remaining life. Laser scanning builds a 3D picture of the liner surface geometry which, when compared to the reference geometry, provides a comprehensive wear assessment to support strategic wear liner management.

ALS Laser Scanning offers numerous benefits over traditional assessment that significantly **reduce operational downtime and safety risk** while providing a comprehensive assessment of the entire wear area:

- Safer – non-contact measurement from a safe distance or remotely eliminating the need for confined space entry.
- Rapid process – enabling a greater number of wear surfaces to be assessed during a given period.
- Less personnel requirements – single operator with up to two site support staff.
- Complete analysis of any wear profile – not limited to accessible areas.
- Wear determination available from a single laser scan.
- Wear forecasting in both planes (i.e. thickness and width).
- Structural deviations can be corrected for accurate analysis.
- Post-scan processing performed offsite.
- Clear representation and reporting of results using colour wear maps.
- As built drawings can be generated from scans.
- Identify areas of high risk by overlaying liner profiles with wear profile.
- Identify individual wear plates for replacement, areas for design improvement and wear plate material performance.
- Reduce wear plate stock requirements.

Features of ALS Laser Scanning Services

- Customised to client requirements and supported by ALS Engineering resources
- Responsive mobilisation for emergency requests
- Strong safety performance
- Integrated service contracts covering all ALS Asset Care services
- Reduced mobilisation cost as ALS personnel capable of providing multiple asset care services whilst on site
- Full in-house drafting capability for creation of 3D reference models for one off assessment against 'as constructed' condition
- Trending for wear and distortion trending
- Supported by other testing and inspection techniques to assess overall equipment condition
- Online reporting capability
- Engineering services for complete wear management
- Dimensional assessments of tanks, vessels, kilns, drums and structures.



ALS Laser Scanning Process

1. Obtain a reference model
2. Acquire laser scan and process data
3. Align the scanned data to the reference model
4. Compare the scanned data to the reference model
5. Produce a wear forecast

Fundamental to laser scanning for wear assessment is the computation of the difference between two geometric representations, one in original pre-wear/as found condition and the other in a deteriorated state.

The reference model can be created from either an as-built CAD model or a reference laser scan. The wear representation is obtained via a laser scan that produces a spatially dense point set, known as a point cloud.

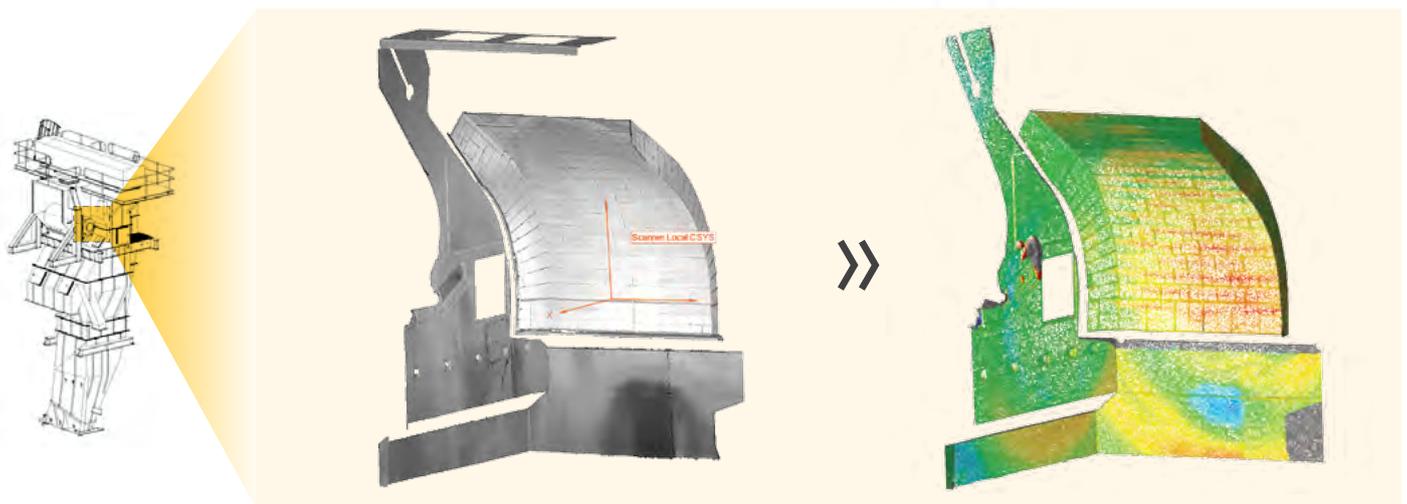
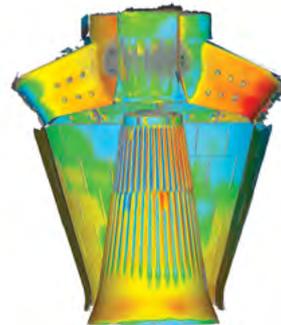
All wear surfaces of interest should be free of build up at the time of scanning laser scan to ensure the scan data represents surface geometry accurately. The reference model and scanned data are then accurately aligned (registered) to for wear assessment and

future trending. The registration process negates the need to place the laser scanner in an identical position for each scan. Multiple scans can be overlaid to provide a complete profile of complex geometries.

Comparing the aligned models delivers a quantifiable assessment of wear typically represented in a colour plot or as per client requirements with the different colours correlating to the amount of wear experienced (eg. green indicates little or no wear, red indicates the most wear and blue indicates regions of surface build-up).

Wear forecasting, if required, will then be produced to client's specific needs based on wear data collected and trending information taking into account volume throughput/time/other and then fitting an appropriate wear projection model to predict future wear characteristics and rates.

ALS Laser scanning offers increased operational efficiency, reduced safety risk and accurate forecasting supporting complete wear management.



Specialist Knowledge

Effective processing and interpretation of laser scanning data requires expert knowledge and specialised skills. ALS Industrial has the ability to provide this expertise, in conjunction with the latest scanning technology, anywhere in Australia. This service can also be expanded to a comprehensive wear management advisory service.

ALS Industrial also offer a variety of non-destructive testing, condition monitoring, reliability and integrity engineering, mechanical testing, metallurgy and inspection services.

For more information on laser scanning inspection or any of our other services please contact,

Perth 109 Bannister Road, Canning Vale WA 6155
P +61 8 9232 0300 | assetcarewa@alsglobal.com

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www.alsglobal.com/asset-care