AMiRIS

In Situ Quality Assurance for Metal Laser Powderbed Fusion

Qualifying and certifying Laser Powder Bed Fusion (L-PBF) parts are non-trivial problems. AMiRIS™ is an in situ quality assurance complete suite from Additive Assurance, designed to reduce the QA burden of metal AM and enable AM part certification. The system is commercially available on 12+ machine types as a retrofittable solution, and an integration package for machine OEMs.

Capabilities

System Architecture

Unique Sensor: 8 near-infrared sensors positioned to view the build plate via the machine's existing window. These sensors capture hybrid long-exposure images of meltpool emissions from each layer.

Superior Resolution: The sensor configuration achieves a spatial resolution of 30-40μm per pixel across the whole bed, to resolve individual meltpool scan tracks and variations.

Wide Compatibility: 3D Systems, Colibrium, EOS, Nikon SLM Solutions, Trumpf, Sisma, Additive Industries and more. Two versions:
- AMiRIS (200-300mm build plates),
- AMiRIS-LF (400-600mm build plates).

Real-time Analytics

Defect Detection: Machine learning algorithms are employed to identify and segment process anomalies and potential defects, including: lack of fusion, porosity, hot/cold spots (thermal irregularities), distortion & warping, spatter generation, part/support failures, recoating issues and powder anomalies.

Real-time Alerts: Know within seconds for operator intervention or process adjustment.

Automated Part Grading: User adjustable thresholds for defect count & density reduces QA burden from hours to seconds.

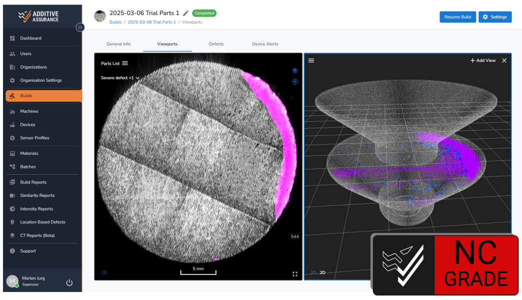
Production Go/No-Go: Rapidly qualify parts with direct part to part similarity score.

Intuitive Software

Browser Based: Complete 3D data visualisation tool on any device.

CT Comparison: Align and validate your results against CT scan data directly in the app.

On Premise or Cloud: Secure and scalable data management built in.



Benefits

1 **Early Failure Detection:** High-resolution imaging allows for the detection of defects as they form, potentially enabling intervention or stoppage before significant material waste or time loss occurs. Real-time alerts notify users of defect formation.

2 **Process Development Acceleration:** Real-time feedback on melt pool stability, spatter generation, and thermal distribution during test builds provides immediate data for iterating on process parameters for new materials or geometries. This rapid feedback loop can significantly shorten development cycles compared to traditional methods relying solely on post-build analysis.

3 **Part Certification Support:** Provides layer-wise documentation of build quality. Automatic reporting and data traceability can assist in the rigorous certification requirements common in industries like aerospace, reducing the iterative cycles between manufacturing and inspection.

4 **Condition Monitoring & Preventative Maintenance:** Analysis of data over time can reveal subtle drifts in machine stability or recurring location-specific issues (e.g., spatter patterns related to gas flow). This facilitates a shift from scheduled to condition-based preventative maintenance.

5 **CT Scan Augmentation/Reduction:** AMiRIS detects porosity at a resolution potentially exceeding standard CT capabilities. While CT detects consolidated defects post-build, AMiRIS observes them in situ. Direct comparison between AMiRIS data and imported CT data allows for correlation studies, potentially reducing the reliance on extensive CT scanning for production parts.

Additive Assurance is your competitive advantage.

Speak to our team today to discover what we can do for you.

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