

ATL Turbine Services

Case Study 2

Suitability for Repair Assessment

ATL was sent a set of turbine vanes by a European customer and was requested to help them understand whether their parts were worthwhile putting through a repair process.

The Process

Once the parts had been suitably cleaned, a test piece was removed from a representative part at initial inspection. The test piece consisted of a section taken from the trailing edge of the aerofoil, which was then mounted and polished. Several metallurgical analyses were carried out including:

- Material composition.
The composition of the substrate material was determined using EDX-measurements on a Zeiss EVO 25 Scanning Electron Microscope with an Oxford X-Act detector. The chemical composition indicated the alloy of the part.
- Material structure and weldability.
Microstructural analysis was carried out pre and post etching to ensure the structure of the part was suitable to be welded and if any microstructure degradation was present, it would be recovered during a solution annealing heat treatment.
- Presence and composition of coating.
The presence and composition of the coating was determined using the same method as the material.

Following these tests, which set a baseline for the material, the part then goes to heat treatment and a further sample is removed. The component is assessed for its material condition and then for its suitability for repair following heat treatment.

Post assessment, the parts were deemed suitable for repair and the part which had the sections removed from the trailing edge was able to be welded and reused again.

Our customer then had the knowledge and confidence that their parts would respond well to the repair process prior to undertaking a full repair cycle.

