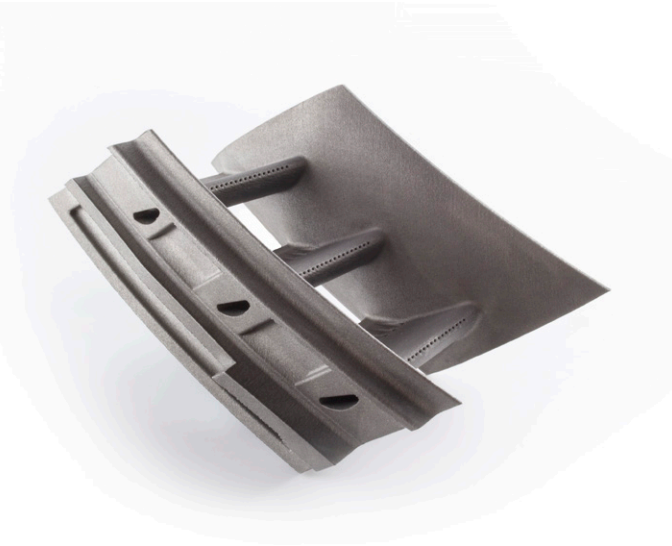
PRECISION ADM

How additive manufacturing is changing energy and industrial sectors through turbine MRO to Pipelines and Down-hole Drilling



Energy

We integrate digital manufacturing into the energy sector to support sustainable manufacturing and a circular economy.

By utilizing reverse engineering techniques, we help our clients replace worn-out vane segments with single additively manufactured components. This eliminates supply chain issues and the need for new casting replacement with brazing and welding steps, or challenging cladding repair.

The durability of our additively manufactured parts has exceeded previous life cycle expectations, presenting significant opportunities for revitalizing and enhancing gas turbine engines.

We have demonstrated the viability of additive manufacturing repair of Recuperator's, with worn component replacement by printing and welding for assembly. This allows for refurbishment for increased service hours at end of life.

Our capabilities include:

- Legacy component manufacture
- High value turbine components delivered with short lead time and competitive pricing
- Critical tolerance features and robust performance

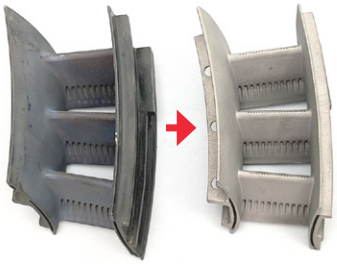
Mining and Industrial

We provide durable and reliable solutions through the use of additively manufactured and machined components. Our integration of additive manufacturing enables us to create customized and precisely designed parts with the required features and critical tolerances.

Our capabilities include:

- Creation of bespoke parts
- Mass customization options
- Utilization of robust and reliable materials
- Machining of additive parts to meet critical tolerances

Applications



Cobalt Chrome RR Spey Gas Turbine Engine HPT Nozzle

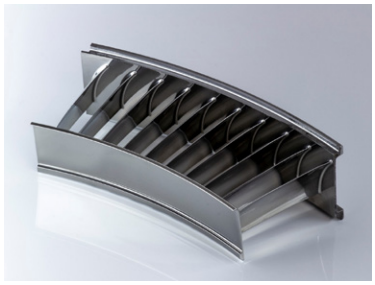
- Reverse engineered from legacy vanes using x-ray and 3D scanning
- Built from CoCr as single-consolidated part
- 0.020" internal cooling channels
- Currently operating in Western Canada (Enbridge)

Cobalt Chrome RR Tyne Gas Turbine Engine HPT Nozzle

- Reverse engineered from damaged vanes to address supply shortages
- Currently operating in Navy frigates
- 316L SS cooling tubes
- Produced for MRO with minimal lead times

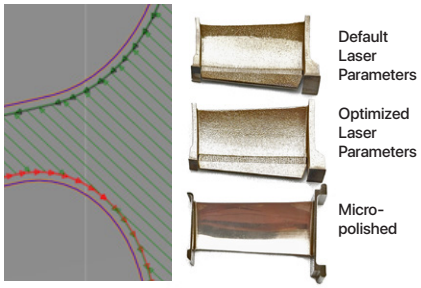
Recuperator

- Reverse engineering of damaged injectors and liners for refurbishment of Recuperator
- Cobalt Chrome and 316L SS printing for replacement components
- Welding assembly



Inconel 718 LPC Vane

- Built from Inconel 718
- Developed post-processing steps including heat treatment, machining, micro-polishing, NDT and CMM inspections
- Undergoing fatigue & performance testing



Custom laser exposure parameter development to optimize part surface properties

- Experts in additive process design
- Micro-polishing of air-path surfaces requires a uniform starting surface
- Design of experiments to find optimal Contour and Downskin laser parameters for improved surface uniformity

Pipeline Sensor Housings

- High volume production by print and machining for assembly and sensor electronic fit out
- Consolidation of complex machined components
- Internal channels for wiring

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