PSM
a Hanwha company

Innovative Clean Energy Solutions for Future Generations

New Parts Manufacturing & Repair

Maximize Performance, Reliability, and Longevity

PSM delivers high-quality components and advanced restoration services, ensuring operational excellence and extended turbine life.

PSM New Parts Manufacturing and Repair Overview

PSM offers new manufacturing of gas turbine components and a comprehensive range of gas turbine parts reconditioning and repair services. Supported by PSM engineering and advanced technology, our state-of-the-art reconditioning services can extend component life and optimize maintenance budgets.

Full-Service Solutions

+ Reconditioning of both OEM and PSM parts
+ Our 105,000 sq. ft. facility in Florida serves customers in the U.S. and global customers
+ Advanced F-Class process technologies:
  - » CNC laser welding
  - » Diffusion brazing
  - » Chemical stripping
  - » APS/HVOF thermal spray coatings
+ Complete machine shop services
+ CNC grinding and milling
+ 6-axis and RAM CNC EDM hole drilling
  - » On-site NDT and metallurgical services:
  - » FPI
  - » Digital x-ray
  - » CMM
  - » Scanning Electron Microscopy
+ Spare and Emergency parts Warehouse
+ Advanced flow testing including combustion wheeling
+ Upgrades combining new make solutions with advanced repairs
+ Compressor blade manufacturing cell
+ Fuel nozzle and part replacement manufacturing supporting repair and new make production lines

LASER WELD

New Parts Manufacturing

PSM's Jupiter workshop integrates new-part manufacturing, offering proven technology for all our new parts and repairs.

Fuel Nozzles

+ In-house gas tip manufacturing: Ensures strict tolerance control
+ Assembly methods: Welding and/or brazing
+ Quality assurance: Extensive control measures

New Parts Service

PSM leverages its global supply chain and Engineering Departments to provide:

+ Advanced and standard coatings for new capital components
+ Hard-faced blade application and machining
+ Combustion machining
+ Electrical Discharge Machining (EDM)
+ Additional in-house services for our full product line

Inspection and Kitting

+ 100% inspection of all products from our global supply chain
+ Compliance assurance with all engineering requirements
+ Complete kit arrangement for installation at your next outage
+ Customization options:
  - » Specific gas turbine unit adaptations
  - » Multiple part assembly
  - » Associated quality review of assemblies

PSM Reconditioning Process

The typical PSM reconditioning process comprises:

Assessment → Cleaning/ Preparation → Repair → Machine Shop Services → Coating → Quality / Final Inspection

Assessment

+ Visual Inspection
+ Metallurgical Investigation
+ Ultra-sonic Wall-thickness Measurement
+ Eddy Current Testing
+ Airflow Analysis
+ Fluorescent Penetrant Inspection (FPI)
+ Digital X-ray Examination

AIRFLOW ANALYSIS

Cleaning/Preparation

+ Sandblasting
+ Chemical/Acid Stripping
+ Ultrasonic Cleaning
+ Insert Removal

CHEMICAL STRIPPING

Flow Testing

+ Seven Air and Liquid Flow BenchSystems
+ R&D and Production Air Flow Support
+ Portable Air Benches
+ Full Engine and Individual Component Fixtures

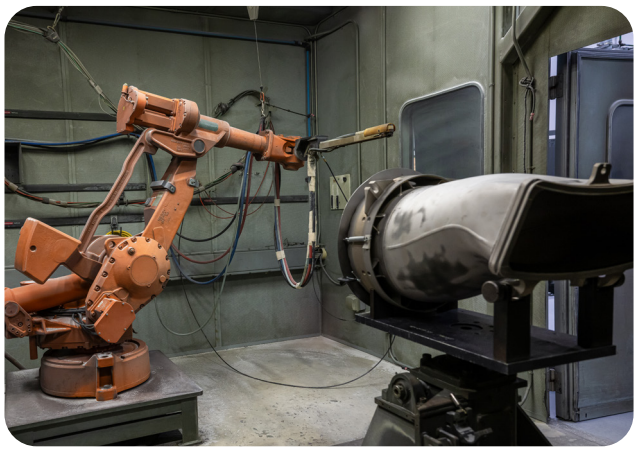
Repair

+ Belting/Finishing
+ Manual Welding
+ Laser Cladding
+ Diffusion Brazing
+ Heat Treatment
+ Honeycomb Replacement
+ Insert Replacement
+ Coupon Repair

BELTING/FINISHING

Machine Shop Services

+ CNC Grinding
+ CNC Milling
+ RAM EDM
+ CNC 6-axis EDM
+ Horizontal Milling
+ Coating Applications:
  - » MCrAlY
  - » HVOF (MCrAlY, CrC)
  - » APS (TBC, MCrAlY)
  - » External Aluminide
  - » Dual Wire Arc (Al Root Seal)



COATING BOOTH

Quality/Final Inspection

Our workshop is Quality Certified to both AS9100 and ISO9001 standards and EHS certified to ISO14001. Our quality control process includes:

+ Part identification numbers
+ Detailed documentation of each process step
+ Relevant process specifications
+ Design upgrade records
+ Quality check records after each stage

PARTS INSPECTION

Additional Services

+ Metrology Laboratory
+ Failure Analysis/Fractography
+ Materials Laboratory
+ Radiographic Testing
+ Portable Life Extension Services
+ Structured Light Scanning

METROLOGY LABORATORY

Bringing New Manufacturing Concepts to Repair

PSM specializes in understanding engine performance to design parts that solve design issues, increase performance and efficiency, and extend maintenance intervals. Through this process, PSM has developed a fundamental understanding of engine components, enabling them to rework existing parts for improved performance.

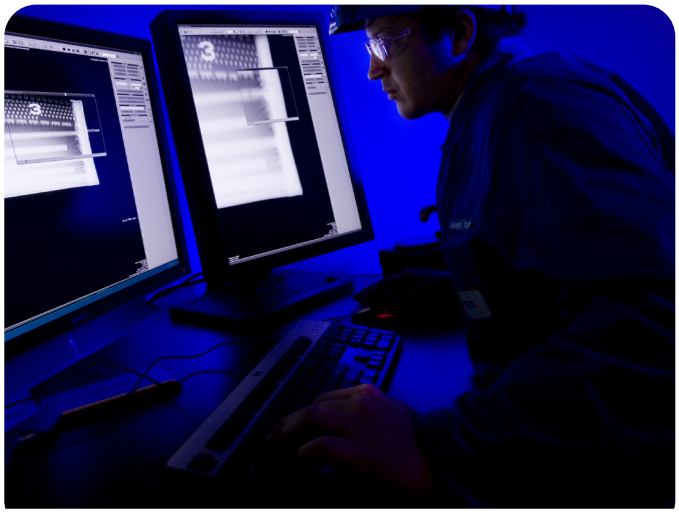
PSM's reconditioning process allows for monitoring specific problematic design or alloy defects, informing design changes for their full suite of new manufactured products and service solutions. This strategic approach has led PSM to position their Repair Engineers alongside New Manufacturing Engineers for efficient service and product development.

Advanced repairs are designed to extend the life of OEM components or provide customers with alternative solutions by combining PSM design concepts with a deep understanding of geometrical design, metallurgy, and component operation. PSM's goal is to deliver superior products whenever possible.

LASER WELD

BRAZING PREP

WELDING



DIGITAL X-RAY

Advanced Repair Examples

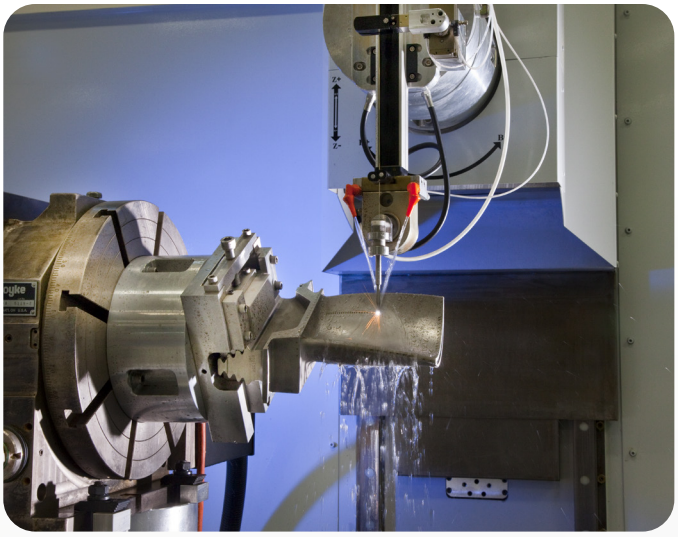
+ 7FA EB (Electron Beam) Welded End Cover Conversion
+ Combustion Wheeling and Detailed Flow Targeting for Emissions Improvements
+ 501F Hybrid Basket (Combining OEM with PSM New Make)
+ 501F Blade Seal Pin Modification
+ AGP Repair Development
  - » Single Crystal (SX) Alloy Repairs
  - » Advanced Alloy Braze Techniques
+ 501F VGP Blade Repairs
+ 7FA S2 Shrouded Blade Repair
+ 7FA S1 Nozzle Cooling Upgrade and Key Slot Modification
+ ThomELT Life Extension of OEM E-class DLN Components
+ Porous TBC Coating Designed for F-Class First Stage Operational Conditions
+ 7FA 32k Combustion Cap Conversion
+ 7FA Turbine Wheel Cool Mod
+ Redesigned 501F Rotor Bolting with Standard Repair and Advanced Life Assessment

Local Repairs, Advanced Engineering Expertise

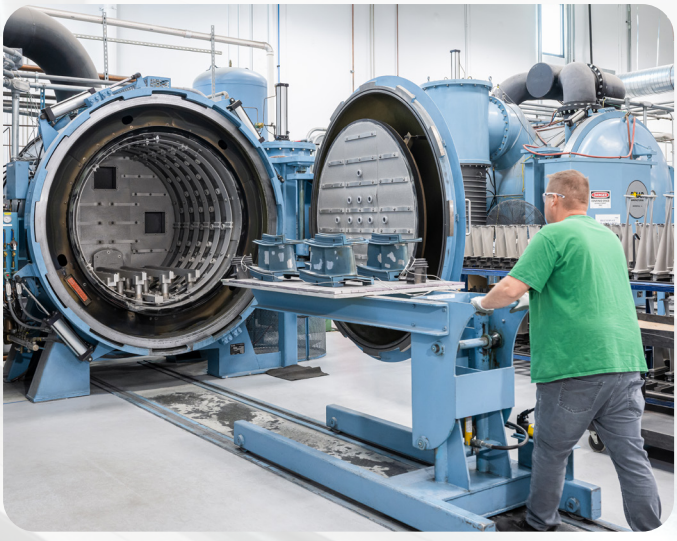
PSM and our sister companies Thomassen Energy and PSM Thomassen Gulf, offer global repair capabilities for advanced industrial gas turbines. With facilities in the US, The Netherlands, and the Middle East, we serve customers worldwide. Our repair and manufacturing locations have 24/7 access to Service and Design Engineering teams at PSM's headquarters in Jupiter, FL, Thomassen's headquarters in Rheden, The Netherlands, and PSM Thomassen Gulf in Dubai, UAE.

Comprehensive Services for All Engines

PSM specializes in services for GE, MHI, and Siemens/Westinghouse industrial gas turbines through F-class engines, focusing on Combustion, Hot Gas Path, and Rotor Components. Our integrated approach to repair and new manufacturing enables us to provide comprehensive engine services that surpass our competitors. We excel in engine performance upgrades and maintenance extensions, allowing our customers to maintain a competitive edge in today's demanding power market.



EDM HOLE DRILL



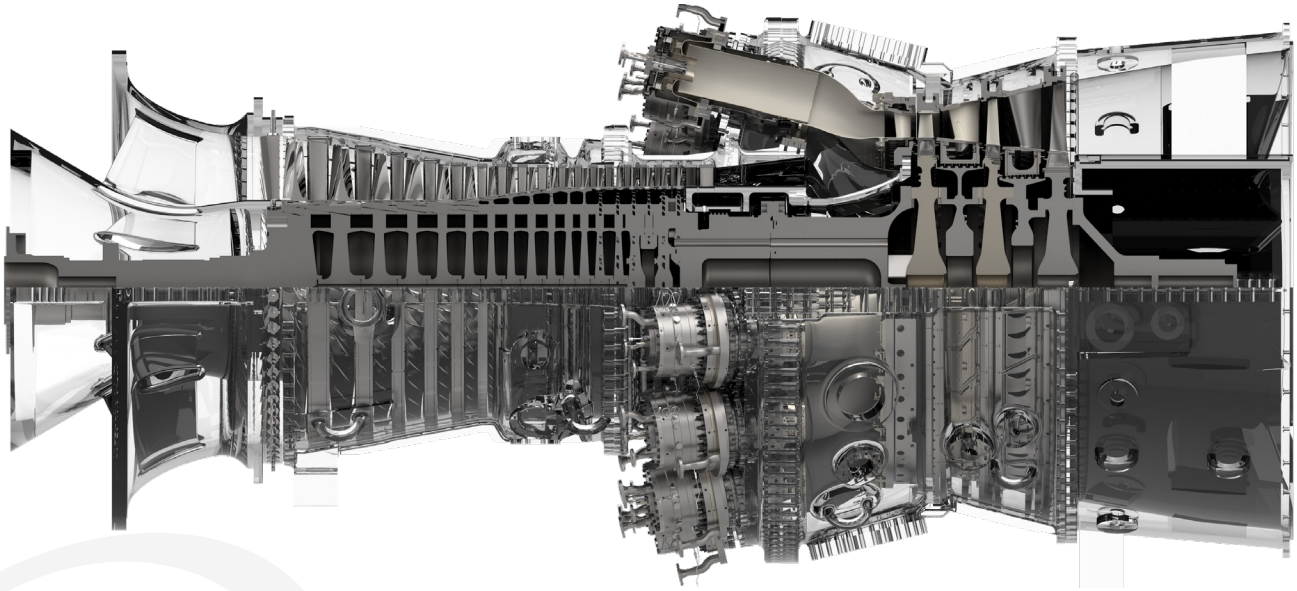
COATING

PSM - A Hanwha Company

The growing interest in the hydrogen economy is driven by the need to address climate change and transition to sustainable energy sources. However, challenges remain, including high production and storage costs, and extensive infrastructure requirements for distribution and transportation.

As a Hanwha subsidiary, PSM is uniquely positioned to leverage the expertise and resources of the Hanwha family to accelerate hydrogen development and adoption as a clean energy source. Hanwha's global presence and diverse business interests in areas like solar energy and defense provide PSM access to a wide array of technologies, markets, and partnerships.

Collaboration with Hanwha Q CELLS, a leader in large-scale solar projects, enables PSM to integrate hydrogen production with solar energy systems, fostering more sustainable and efficient energy solutions.



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Thomassen Energy
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Contact a PSM Sales Representative for additional information.
Phone: +1 561 354 1161
Email: sales@psm.com

www.psm.com | https://thomassen.energy | www.psm.com/ptg