



TURBOMAQUINAS  
S.A. DE C.V.



We are a company committed to our clients to make efficient, update and modernize process and generation plants.

We have an infrastructure consisting of 4 processing plants with 17,000 m<sup>2</sup> of surface area and more than 350 collaborators.

Equipped with lathes, milling machines, grinding machines, boring machines, 3, 4 and 5 axes machining centers, portable measuring arms, Dynamic balance equipment and hard coating application equipment (HVOF and Arco Spray) cranes up to 60 tons, metrology laboratory, as well as certifications that guarantee our quality standards, which make Turbomaquinas the most reliable supplier in the reconditioning of Turbomechanisms.

## QUALITY POLICY

To comply with the quality standards required in each of our activities to ensure that the products and services offered by TURBOMAQUINAS far exceed the expectations of our clients, with the passion for excellence and teamwork being our best competitive advantage, having competent personnel to perform effectively, self-controlling their processes, complying with the applicable requirements and continuously improving.

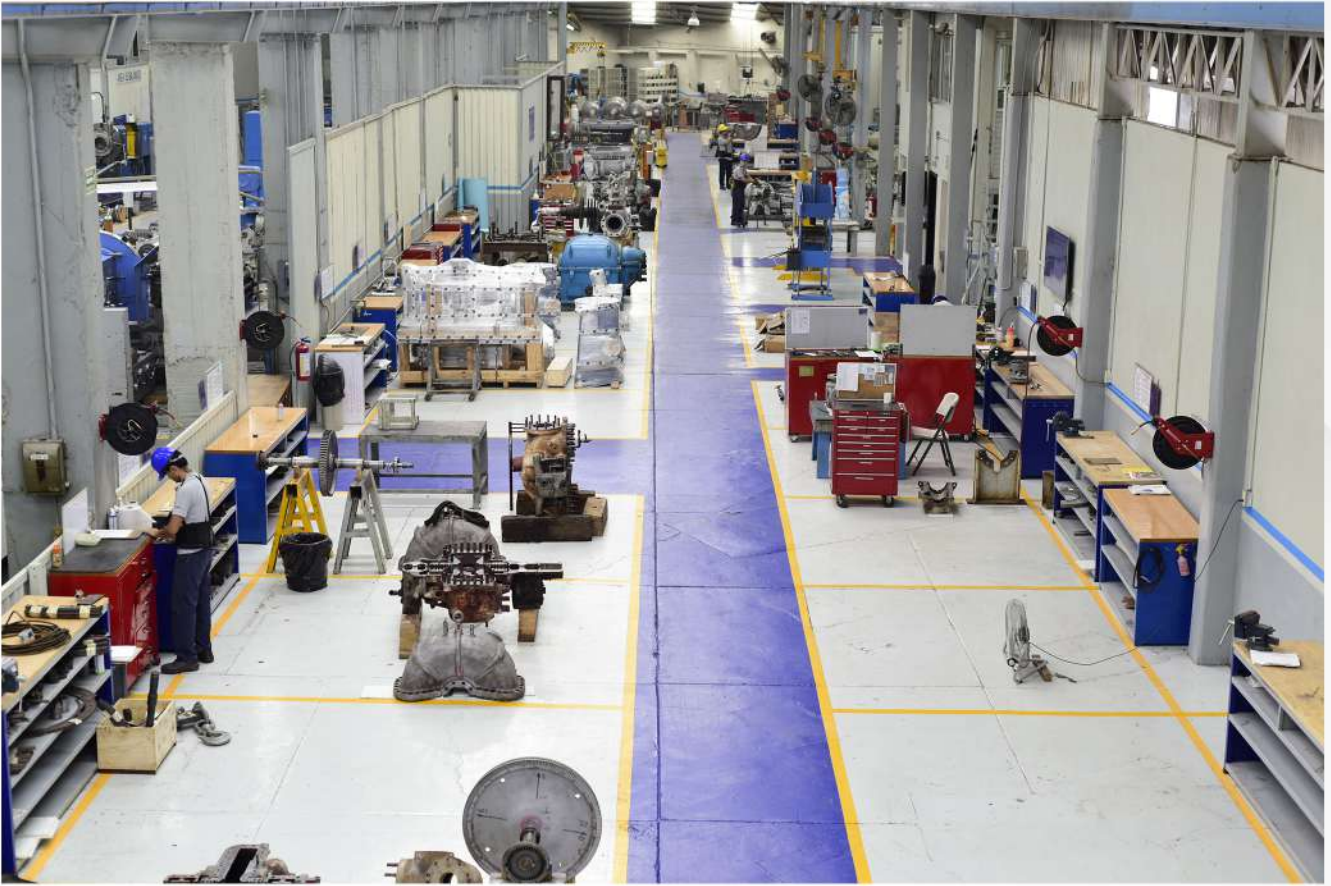


## VALUES

- Honesty and integrity.
- Quality first.
- Personal productivity.
- Teamwork.
- Personal development.
- Service attitude. Creativity and innovation.
- Fighting spirit.

## MISSION

We are a company oriented to solve the steam turbine user needs, centrifugal compressors and equipment in an effective and timely manner, adapting to their expectations to carry out comprehensive maintenance, being the best option for our clients.





## LOCATION

TURBOMAQUINAS S.A. de C.V. is located in the city of La Piedad, Michoacán, in the center of the country. TURBOMAQUINAS is a 100% Mexican company with more than 60 years of experience in the development of technology and service to support the industrial development of our country and the continent, guaranteeing the reliability and availability of turbo machinery equipment.





## STEAM TURBINES

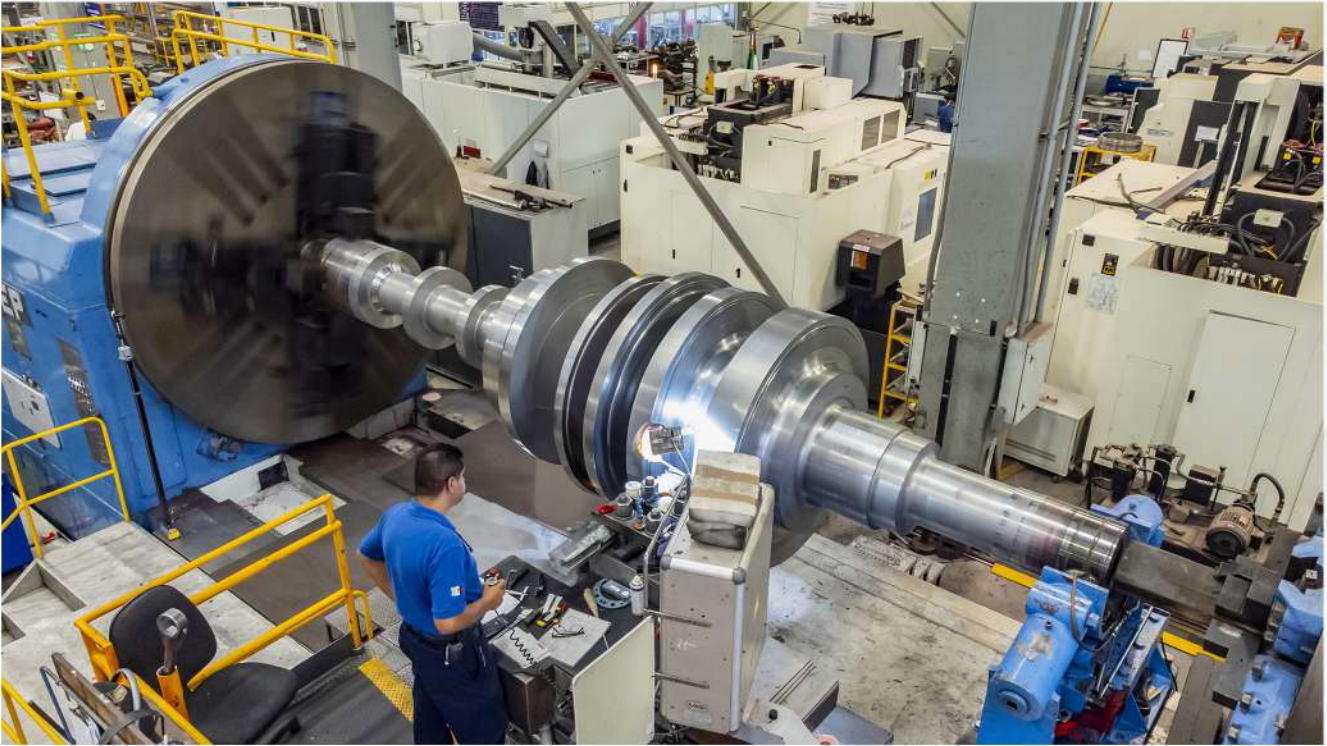
### SERVICES WE PROVIDE

TURBOMAQUINAS offers manufacturing and rehabilitation services for steam turbines of up to 678 MW, replacement turbine rotors, blades, labyrinth seals, diaphragms, nozzles, bearings, valve components, steering systems, among others.

### WE HAVE THE SERVICES OF:

- Inspection and diagnostic of components.
- Alignment and dynamic balancing of rotors.
- Complete supply of sealing system.
- TIG, MIG and submerged arc spray welding.
- Steam turbine repowering and thermo-economic analysis.
- HVOF coatings, to prolong the useful life of the components
- as well as the recovery of dimensions in work areas.

Characterization of materials, metallographic tests, chemical analysis and hardness tests.



## RECONDITIONING AND COMPONENTS MANUFACTURING

- Blades for Steam turbines.
- Nozzles.
- Diaphragms.
- Guiding axes.
- Discs.
- Bearings.
- Coupling.
- Carbon Seals.
- Casing Reconditioning.
- Reconditioning of gas turbine parts.
- Full rotor.

### SPARE PARTS SUPPLY

Through the use of our advanced reverse engineering procedures for part sizing and material characterization we can supply any type of component according to your needs from a blade to a complete rotor.



#### MANUFACTURING AND BLADE ASSEMBLY

- TURBOMAQUINAS has diverse and modern machining centers and digital universal milling machines. In addition to having qualified personnel and more than 60 years of experience in the manufacture of blades.
- We supply blades for any brand and model.
- We have highly qualified staff for the assembly of blades of any type.

#### NON-DESTRUCTIVE TESTSING

- Liquid Penetrant Testing
- Magnetic Testing
- Ultrasonic Testing



Complying with the requirements of the "American Society for Mechanical Engineers" (ASME) TURBOMAQUINAS experience includes the reconditioning of static and dynamic components. Our quality System contemplates the qualification of the staff in the application techniques of TIC, MIG, MAC, and SAW welding.





## COMPRESSORS

### PRODUCTS AND SERVICES WE OFFER:

- Inspection and diagnosis of centrifugal and axial compressors.
- Overhaul of centrifugal compressor.
- Retrofit of wet seals and dry seals.
- Maintenance of dry gas seals system.
- Dry seal repair.
- Revamp of centrifugal compressors.
- Supply of compressor .
- Supply of compressor impellers.
- Supply of centrifugal compressor spare parts.
- Overspeed impellers tests.
- Integral services on-site for compressors (Onshore/Offshore).
- Low speed dynamic balancing according to API and ISO standards.

# REFURBISHMENT AND SUPPLY OF COMPLETE CENTRIFUGAL COMPRESSOR ROTORS

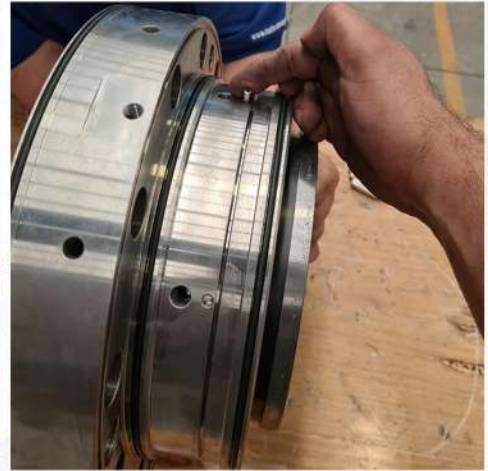


## SPARE PARTS KIT FOR STEAM TURBINES AND CENTRIFUGAL AND AXIAL COMPRESSORS





# DRY GAS SEALS



- Supply and rehabilitation of dry seals.
  - Removal and installation of dry seals.
  - Disassembly, inspection and diagnosis.
  - Supply of seal faces (bidirectional and unidirectional).
  - Supply of metal components.- Supply of wear elements (packings, springs, bolts, etc.).
  - Overspeed tests.
  - Dynamic balancing.
  - Static and dynamic tests.
  - Retrofit of wet seals to dry seals.
- Standards applied: API- 692, ISO-21940



## ELECTRIC GENERATORS

### SPARES AND SERVICES

- Electric generator rotor inspection and diagnostic.
- Reconditioning of shaft and impellers with welding contribution.
- Reconditioning with Hard Coatings (HVOF).
- Generator Impeller Manufacturing .
- Low speed dynamic balancing according to API and ISO standards.
- On-site machining field services.
- Generator blades manufacturing

# DYNAMIC BALANCING



- Capacity to carry out Dynamic rotor balancing of steam turbines of up to 678 mw.
- High-tech balancing equipment from brands such as Schenck, IRD and CSI.
- Balancing in two or three planes, by "modal" type.
- Dynamic standards balancing such as: API 692, Mil-Std 167 and ISO-21940.

# INTEGRAL FIELD SERVICES

THE INTEGRAL FIELD SERVICE IS EXECUTED UNDER THE FOLLOWING PROCEDURE:

- Previous and operation status of the equipment before maintenance.
- Disassembly and cleaning of turbomachine components
- Component inspection.
- Change and/or repair components.
- Dynamic balancing of rotor.
- Laser centering and alignment.
- Turbomachine assembly.
- Start up.





- Detailed visual equipment inspection.
- Dimensional static elements inspection.
- Non-destructive inspection tests as:
  - Penetrant testing.
  - Particle testing.
  - Ultrasonic testing.
- Stellite protections replacement.

# SPARE COMPONENTS MANUFACTURING PRODUCT LIST

## STEAM TURBINE & CENTRIFUGAL COMPRESSOR

### - Bearings

Radial Bearings  
Thrust Bearings  
Cilindrical Bearings  
Liner Bearings  
Supporting Bearnings

### - Seals

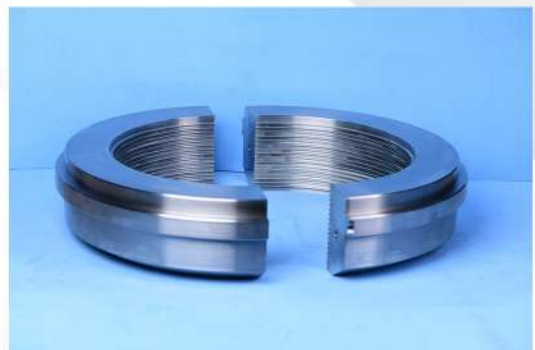
Sheet Seals  
Dry Gas Seals  
Steam Seals  
Labyrinth Seals  
Oil Seals  
Balancing Drums

### - Steam Valves

- Bushing Seals  
- Springs  
- Fixed Seats

### - Main Parts

- Steam Chest  
- Stator  
- Stationary and mobil  
Blades up to 678 MW  
- Nozzles Chamber  
- Spare Rotor  
- Screws  
- Impellers  
- Diaphragms  
- Coupling Bolts  
- Extensions  
- Discs





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