

# Advantages of Active Magnetic Bearings



  
**L.A. Turbine™**  
*Rethinking Turboexpanders*

[www.LATurbine.com](http://www.LATurbine.com)

# Advantages of Active Magnetic Bearings

When designing a turboexpander unit, the decision to use one bearing style versus another depends on many factors. The most important factors are the pressure, installation location (onshore vs. offshore), gas composition and physical space available for the unit placement. The L.A. Turbine team's experience with Active Magnetic Bearing (AMB) systems and oil-film (oil) or hydrodynamic bearings spans decades. In fact, some members of the product design and engineering team in California can claim involvement in the design and manufacture of the world's first AMB-equipped turboexpander and many since that time.



**SEE...**

**How they compare and what's the best solution.**

## Magnetic vs. Oil Bearings

| Factors/Considerations  | Magnetic Bearings                                          | Oil Bearings                                                            |
|-------------------------|------------------------------------------------------------|-------------------------------------------------------------------------|
| Applications            | High Pressure or Heavy Gas                                 | Lower Pressure or Lean Gas                                              |
| Installation Site       | Offshore Platform (ideal) and Varied Onshore Sites         | Varied Sites                                                            |
| Physical Space Required | Small and Adjustable Foot Print                            | Larger Space for Oil System                                             |
| Reliability             | 98%                                                        | ± 90%                                                                   |
| Training                | Turboexpander and AMB Training                             | Turboexpander Training                                                  |
| Maintenance & Operation | Very Minimal Maintenance Over Longer Duration (~24 months) | More Frequent Maintenance Primarily to Check Oil Viscosity (3–6 months) |

## CASE STUDIES

# Active Magnetic Bearings (AMB)

**Redesign & Modification:** Two AMB Turboexpander-Compressor Units

**Application:** LPG application on an offshore platform

**Frame Size:** L.A. Turbine L4000

**Project:** Redesign units to handle change in process conditions and increased capacity due to plant revamp.



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**New Design:** Two AMB Turboexpander-Compressor Units

**Application:** Gas separation within a centralized gas processing facility

**Frame Size:** L.A. Turbine L3000

**Project:** Design AMB units to handle high pressure and plant processing flow range of 200MMSCFD.



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**New Design:** Two AMB Turboexpander-Compressor Units

**Application:** Ethylene gas processing

**Frame Size:** L.A. Turbine L3000

**Project:** Design a two-stage AMB unit for the expansion of an existing ethylene plant.

# Turboexpander Bearing Designs

## New Equipment

L.A. Turbine has notable experience in designing AMB and oil bearing systems for turboexpanders used in a variety of applications and configurations. Our team works with leading magnetic bearing suppliers to design new AMB units as well as provide aftermarket repair and redesign of AMB equipment. We take a consultative approach to understand your process conditions and performance requirements. Rest assured you are working with experts. Not only does L.A. Turbine have some of the turboexpander industry pioneers on our team, we also have best-in-class engineers and field service technicians. On average, our engineers have 17+ years of industry/technical experience paired with an average of 20+ years of hands-on AMB and oil bearing turboexpander-specific knowledge acquired by our field service technicians.

L.A. Turbine turboexpander configurations range from 3kW to 14MW and include expander-compressor, expander-generator, expander-dyno (brake) units and expander-compressors with active magnetic bearings capable of handling up to 3000 PSIG pressure, speeds up to 105,000 RPM and temperatures from  $-195^{\circ}\text{C}$  to  $260^{\circ}\text{C}$ . Frame sizes include L1000–L6000. Recent examples of L.A. Turbine-designed AMB turboexpanders include units for gas separation and ethylene processing as well as a redesign and modification of a large-scale AMB unit used for LPG processing on an offshore platform.

We have extensive experience in building turboexpanders with oil bearing systems. Whether the design represents a single-stage turboexpander or two-stage turboexpanders operating in series with a common auxiliary system on a single skid, L.A. Turbine can build it and, in most cases, better and faster than other OEMs. In addition to providing our standard sleeve bearing, the company also offers tilt pad bearing types.



# Aftermarket Needs:

## Repair, Reverse-Engineer, Redesign or Retrofit

We also provide aftermarket field service, equipment repair and redesign, and spare parts production for all brands and configurations of turboexpanders and bearing systems. A global field service team, including AMB-specialized technicians, provides diagnostic, maintenance, troubleshooting and consultative support 24/7/365. Emergency help is available anytime at +1 855 FX-TURBO or +1 855 398-8726.



Bearings of any type and configuration can be produced from drawings or can be reverse-engineered from an existing bearing. If the original drawings are not available, L.A. Turbine uses the latest technologies such as 3D laser scanning and CMM to facilitate reproduction of the spare part. In cases where the existing component is damaged and not suitable for reverse engineering, L.A. Turbine draws upon the knowledge and expertise of our engineers and technicians as well as software and advanced machining resources to design a new component.

In addition, L.A. Turbine provides complimentary turboexpander evaluations. If an equipment or operational issue can't be resolved by phone, L.A. Turbine will take the diagnostic session one step further and offer a hands-on evaluation to uncover the root cause of the problem. This no-obligation, comprehensive evaluation is available for any turboexpander brand at L.A. Turbine service center locations including California headquarters and our Belgium sales and service center.

**Ready to help:**

+1 855 FX-TURBO





## Our Company

L.A. Turbine delivers innovative turboexpander design, manufacturing and testing of application-specific, highly engineered turboexpanders used in hydrocarbon processing, geothermal power generation and other industrial power recovery or refrigeration applications. As the manufacturer, we control the entire process from concept through commissioning so customers benefit from faster delivery, strict quality control, competitive pricing and exceptional customer service.

L.A. Turbine has a global presence on five continents, with 16 international offices and partner locations. World headquarters and manufacturing is located in Valencia, California plus sales and service in California, Texas and Belgium. U.S. operations also support the needs of Canada, South America, Asia and Australia. European headquarters located in Belgium serve Europe, the Middle East and Africa.

Visit [www.LATurbine.com](http://www.LATurbine.com) to learn more.

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**Here to help:**

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