

# THE AEROSPACE INDUSTRY IN MEXICO

PRODENSA





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The aerospace industry in Mexico has emerged as one of the key cornerstones of the country's manufacturing economy. It has contributed significantly to the nation's **economic** growth, job creation, and technological advancement in recent years. Over the past two decades, Mexico has strategically positioned itself as a significant player in the global aerospace market.

## MEXICO AEROSPACE INDUSTRY QUICK FACTS

Global Ranking of Production	Annual Exports (2022)	Average Annual FDI (2019-2022)	% Exports Destined for the U.S.	Direct Employment in Mexico
12th	\$8.1 billion	\$500 million	80%	60,000

Figures in USD. Source: [trade.gov](https://www.trade.gov), Mexican Secretary of Economy, FEMIA

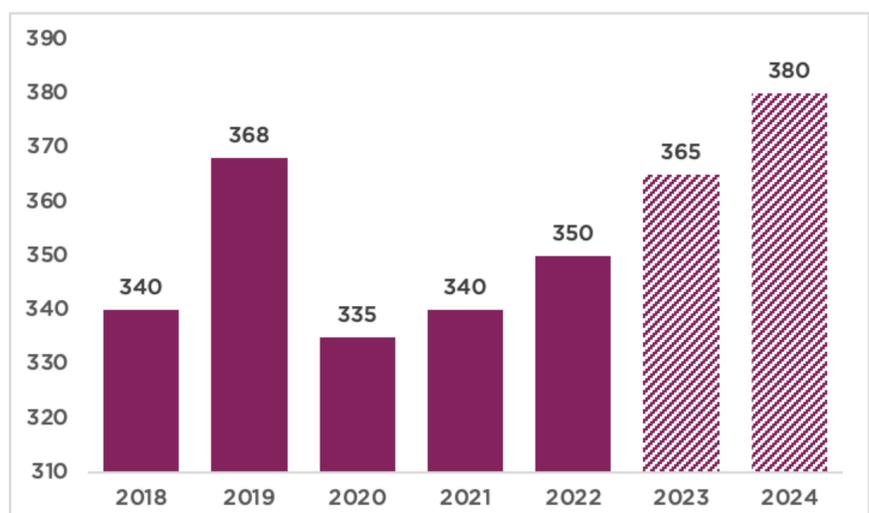
The aerospace exports were greatly impacted by COVID-19 but are expected to recover to pre-pandemic levels within this year. The aerospace industry in Mexico directly employs about 60,000 workers, and in total supports 1.4 million workers throughout related industries in Mexico. Over \$750 million dollars is expected to be invested in the aerospace industry in 2024.

The aerospace industry is the most dynamic sector in Mexico, with 14% sustainable growth over the past 15 years.

## AEROSPACE FOREIGN DIRECT INVESTMENT IN MEXICO



## NUMBER OF AEROSPACE FACTORIES IN MEXICO



Figures in Million USD. Source: Mexico's Aerospace Industry 2023-2024 via MexicoNOW



## INSIGHTS - SUCCESSFUL AEROSPACE OPERATIONS IN MEXICO

The global pandemic created a lot of consolidation in the aerospace industry at the global level. Many small players were absorbed and are now on a path to expansion and prosperity.

Many are looking at Mexico for cost reduction and efficiencies, focusing on their procurement, R&D and production areas. Mexico tends to be a great opportunity for operations with labor intensity. There is a robust workforce with the qualifications the aerospace industries are looking for.

Additionally, aerospace companies in Mexico will need to establish their local supply chain. They will need to seek support from local actors in identifying secondary services such as testing laboratories,

and ensure they have the proper quality processes and certifications to be suppliers.

We continue to work very closely with our aerospace clients. Prodensa is unique in that we serve our clients throughout all aerospace cluster regions in Mexico. This allows us to gain expertise in managing operations and apply that knowledge to new challenges and opportunities.

Our goal is to support our clients in **finding the right location** that will inhibit them to grow and become **Employers of Choice** in their markets, as well as develop a strong talent pipeline and establish **trustworthy suppliers**. These are the keys to sustainable operations in Mexico for aerospace companies.

### Marco Kuljacha

PRESIDENT

Mexicali, Baja California





## INDUSTRY OVERVIEW: PRIMARY TRENDS

### AUTONOMOUS FLIGHT SYSTEM

Development and implementation of autonomous system in aircraft, which can reduce reliance on human pilots and enable improved efficiency, safety, and operational capabilities.

### ADDITIVE MANUFACTURING (3D PRINTING)

3D printing allows complex components with reduced waste, offering benefits like lighter weight, improved design flexibility, and faster prototyping.

### SUPERSONIC FLIGHT

Aims to bring back commercial supersonic travel, reducing flight times and increasing passenger convenience.

### ARTIFICIAL INTELLIGENCE (AI)

AI technologies enhance aerospace tasks such as predictive maintenance, supply chain management, and data analysis, leading to faster decision-making, improved efficiency, and enhanced safety.

### INTERNET OF THINGS (IOT)

Maintenance by monitoring and analyzing data from aircraft components, enabling predictive maintenance. This trend enhances efficiency, reduces downtime, and improves safety.

### NEW MATERIALS

Advanced materials like graphene in aerospace, offer benefits such as high strength-to-weight ratios and improve energy storage capabilities.

## AEROSPACE IN THE UNITED STATES

The U.S. aerospace & defense sector continues to be a driving force of the manufacturing industry, producing to highest trade balance and second highest level of exports for the United States. The U.S. aerospace & defense market **directly employs over 500,000 workers**, and supports another 2.2 million in related industries. The industry was greatly affected by COVID-19 and necessitated government action, but **exports grew by 4.4%** between 2021 and 2022 to **\$104.8 billion dollars**. The aerospace and defense sector in the United States drives 1.65% of GDP and is valued at \$418 billion in 2020 (AIA).



## MEXICO'S AEROSPACE MARKET

Mexico's Aerospace Industry is projected to **grow to over \$11 billion by 2029**. The favorable ecosystem for the manufacturing sector and the low production costs in the country are attracting investments from aerospace manufacturing firms, thereby driving market growth. The capabilities of Mexican manufacturers include several tier 1, 2 and 3 components, ranging from turbines, fuselages, and sensors for jet engines to fasteners in the fuselage. The decreased cost of logistics for components sourced in Mexico has influenced global companies to look at Mexico as a viable solution to counter the supply chain issues and reduce expenses.

With Mexico specializing in the production of aerospace materials and the demand for regional aviation parts on the rise, the country is set to become an aerospace manufacturing powerhouse in the coming years. Mexico collaborates with the U.S. as co-producers in all industry areas:



Mexico offers foreign manufacturing companies incentives and export programs to operate in the country, and the sector is projected to continue its growth path.

### MEXICO'S AEROSPACE INDUSTRY MARKET SIZE

	2020	2021	2022	2023 (Est.)
Total Exports	\$6.6 billion	\$6.7 billion	\$8.1 billion	\$9.4 billion
Total Imports	\$5.3 billion	\$5.4 billion	\$6.8 billion	\$7.7 billion
Imports from U.S.	\$4.4 billion	\$4.9 billion	\$4.7 billion	\$4.8 billion
Av. Exchange Rate	20.0	20.28	20.12	18.4

Figures in USD. Source: FEMIA via trade.gov



## INDUSTRY INSIGHTS - MEXICAN TRADE PROGRAMS FOR AEROSPACE

The Mexican government's programs can significantly reduce import costs in the aerospace sector, especially for materials or components used in manufacturing goods for export, with particular importance for steel and aluminum products. Duties saw an increase from 0% to 25% following an August 2023 presidential decree.

**The IMMEX Program** applies to industrial processes or services intended to temporarily import foreign goods for manufacturing, transformation, or repair, which are subsequently exported, or to provide export services. This program also offers a special income tax regime for pure maquila (cost centers) or shelter companies by applying a safe harbor provision and preventing the principal company abroad from a permanent establishment in Mexico. The program is authorized by the Ministry of Economy.

**Value-Added Tax Certification.** The VAT Certification provides a credit line that exempts companies from paying 16% VAT on temporary import goods and fixed assets, with the condition of exporting a finished

good within the allowed time frame. It is granted by the Tax Administration Service.

**Manufacturing Certificate.** The "Constancia de Manufactura" is an authorization allowing manufacturers, subcontractors producing aircrafts, aircraft engines, and propellers to benefit from duty reductions by applying a single tariff classification for raw materials on their imports. It is issued by the Ministry of Infrastructure, Communications and Transportation.

To maintain the licenses and programs provided by the Mexican government, companies must demonstrate continued compliance. The requirements and obligations include regular inspections at manufacturing sites, frequent submission of reports covering areas such as income, expenses, imports/exports, headcount, and production projections. Moreover, it is crucial for companies to maintain robust inventory control systems for all temporarily imported goods, in accordance with customs regulations.

### María Elena Sierra

VICE PRESIDENT OF OPERATIONS

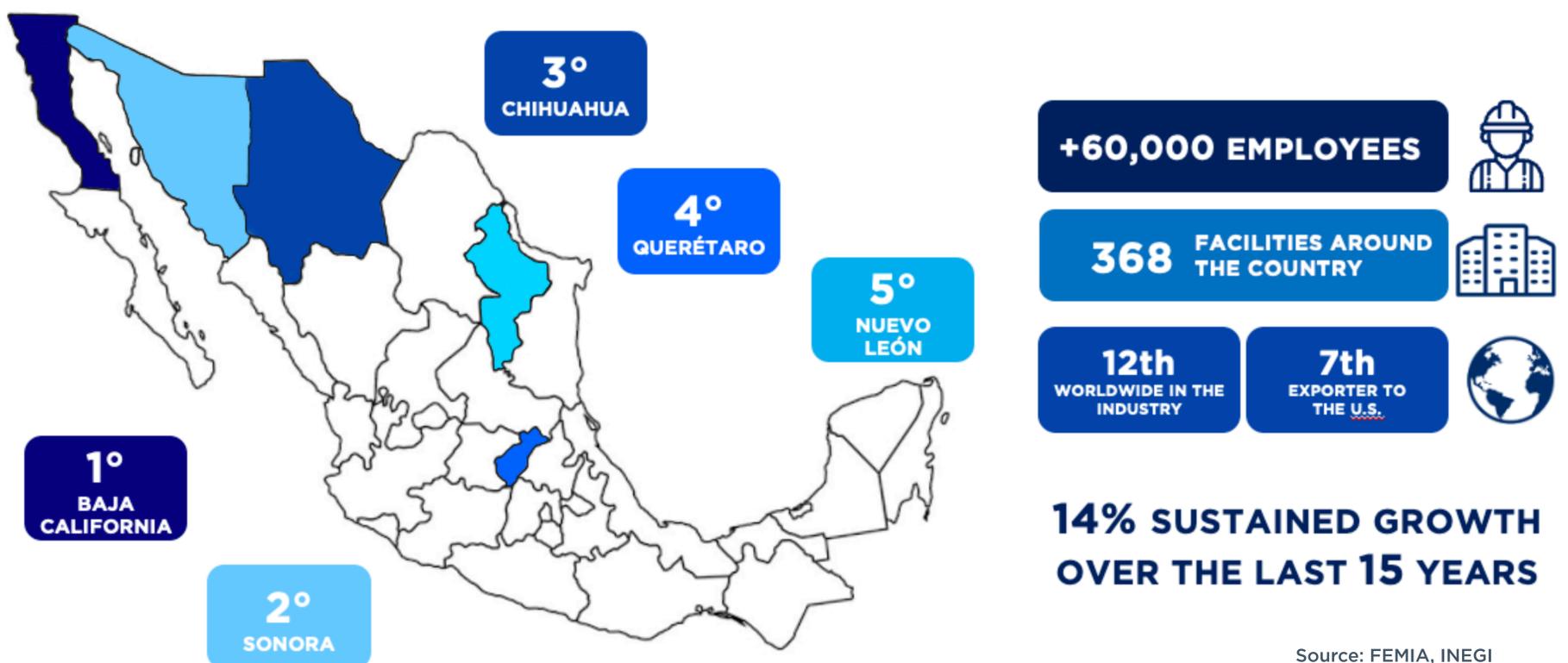
Mexico City





## AEROSPACE INDUSTRY CLUSTERS IN MEXICO

The aerospace industry in Mexico has witnessed exponential growth, with distinct clusters forming nationwide. The most prominent aerospace clusters are strategically located in states such as **Baja California, Sonora, Chihuahua, Querétaro, and Nuevo León**. These clusters have become integral to the industry's success due to their proximity to major markets, logistical advantages, and a skilled workforce.



Source: FEMIA, INEGI

### BAJA AEROSPACE CLUSTER

The Baja California region, specifically Tijuana, has become one of the focal points for aerospace manufacturing in Mexico, housing numerous companies engaged in producing components, electronic systems, and precision machining. The Baja Aerospace Cluster is **the largest in the nation**, directly employing over 30,000 workers in more than 100 companies. The value of exports in 2021 topped \$3 billion dollars (Baja Aerospace Cluster).

The aerospace industry in Baja California has been **growing at more than 20% annually** for more than 10 years. Many world-renowned companies call the region home. Among Baja California's globally recognized aerospace manufacturers are Honeywell Aerospace, Collins Aerospace, Safran Landing Systems, Gulfstream, Triumph Group, Encore, Hutchinson Aerospace, among others.

Automation and Industry 4.0 technology are increasingly adopted, and environmentally-friendly practices are gaining traction. The 2nd largest aerospace cluster in the United States, Los Angeles, is located just across the border.



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## SONORA AEROSPACE CLUSTER

The state of Sonora has leveraged its strategic location to establish a strong aerospace presence, particularly in manufacturing components for aerospace engines. In fact, the state has a robust **supply chain in place for the total fabrication of an aircraft**. They are a national leader in the manufacture of turbines and the largest air engine component manufacturing center in the country, according to the Minister of Economy.

According to recent figures from Mexico's Ministry of Economy, there are 69 aerospace companies with a manufacturing presence in Sonora. Among them are Latecoere, BE Aerospace, Daher, TE Connectivity, Sargent Aerospace & Defense, Ducommun, Parker Hannafin, Bodycote.

The aerospace industry in Sonora employs approximately 20,000 workers in various municipalities throughout the state. About **40% of Sonora's manufacturing workforce** is employed in the aerospace industry.

Sonora has a 368-mile long border zone with the U.S. states of Arizona and New Mexico, each with their own budding advanced manufacturing industry. This megaregion is very active in economic development and binational relations.

## CHIHUAHUA AEROSPACE CLUSTER

Chihuahua has emerged as a hub for aerospace industry metal and composite manufacturing. About 25% of the country's aerospace factories are located in the state and about 1/3 of all aerospace workers (20,000) are employed in the state of Chihuahua. It also employs the **highest number of aerospace engineers and technicians** in all of Mexico.

The industry in the state accounts for 70% of manufacturing sector employment in the capital city and contributes 15% of total production in the aerospace industry in Mexico. The Chihuahua aerospace industry exports \$1.5 billion annually.

Among the world-class aerospace manufacturers in Chihuahua are Rexnord Aerospace, Honeywell, Bell Helicopters, Figeac Aerospace, Textron Aviation, GKN. The state boasts 5 OEMs and more than 45 certified suppliers, according to the Chihuahua Aerocluster. Companies like Honeywell and Safran boast world-class facilities located in the state.

In addition to manufacturing companies, Chihuahua is home to significant research and development facilities that promote the technological advancement of the sector. There are **5 design, engineering and innovation centers** specializing in the aerospace industry.



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## QUERÉTARO AEROSPACE CLUSTER

Querétaro, located in central Mexico, has rapidly developed into one of the most prominent aerospace clusters in the country, hosting a diverse range of activities, including manufacturing, maintenance, repair, and operations (MRO), as well as research and development. The Querétaro Aerospace industry has earned a large share of the country's **foreign direct investment** in the last 10 years, consolidating its importance as a hub in Mexico.

The Querétaro Aerospace industry employs more than 10,000 workers throughout 80 companies. Nearly all of the production is exported to countries like the United States, Canada, Germany, France and Spain, according to the [Querétaro Aerocluster](#).

Critical characteristics of Querétaro's aerospace manufacturing industry include a skilled workforce bolstered by **dedicated training programs and educational initiatives**. Querétaro's business-friendly environment and government support have encouraged investment and the establishment of cutting-edge facilities. Some of the primary aerospace companies include Safran, Bombardier, Aernnova, Parker Aerospace, Groupe Lauak, Airbus Helicopters, among others.

## NUEVO LEÓN AEROSPACE CLUSTER

Nuevo León, Mexico, boasts a robust aerospace industry cluster, showcasing advanced manufacturing capabilities and diverse product offerings. The region is a crucial player in aerospace manufacturing in Mexico, with companies specializing in aircraft components, avionics, and precision engineering. Its state-of-the-art facilities leverage **cutting-edge technologies**, including CNC machining, composite materials, and additive manufacturing.

The state hosts 20 Tier 1 & 2 suppliers in the aerospace industry and employs about 5,000 workers and exports nearly \$1 million dollars.

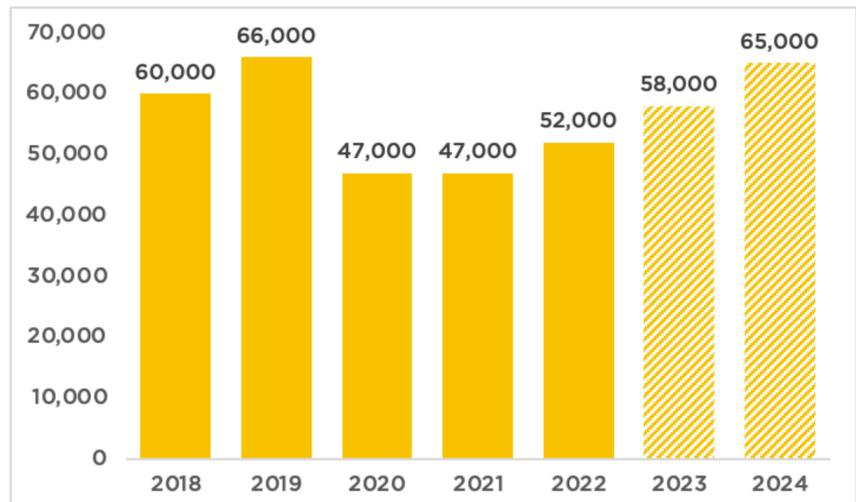
The aerospace cluster in Nuevo León has earned a reputation for **high-quality production** and meeting stringent international standards. From structural components to electronic systems, the industry excels in producing a wide range of aerospace products, contributing significantly to Mexico's global supply chain position. Among the industry manufacturers in Nuevo León are Frisa Aerospace, AZKO Nobel, Parker Aerospace, Piaga Aviation, Wyman Gordon, and PCC Aerostructures, Castle Metals, among others.



## MEXICO AEROSPACE INDUSTRY TALENT

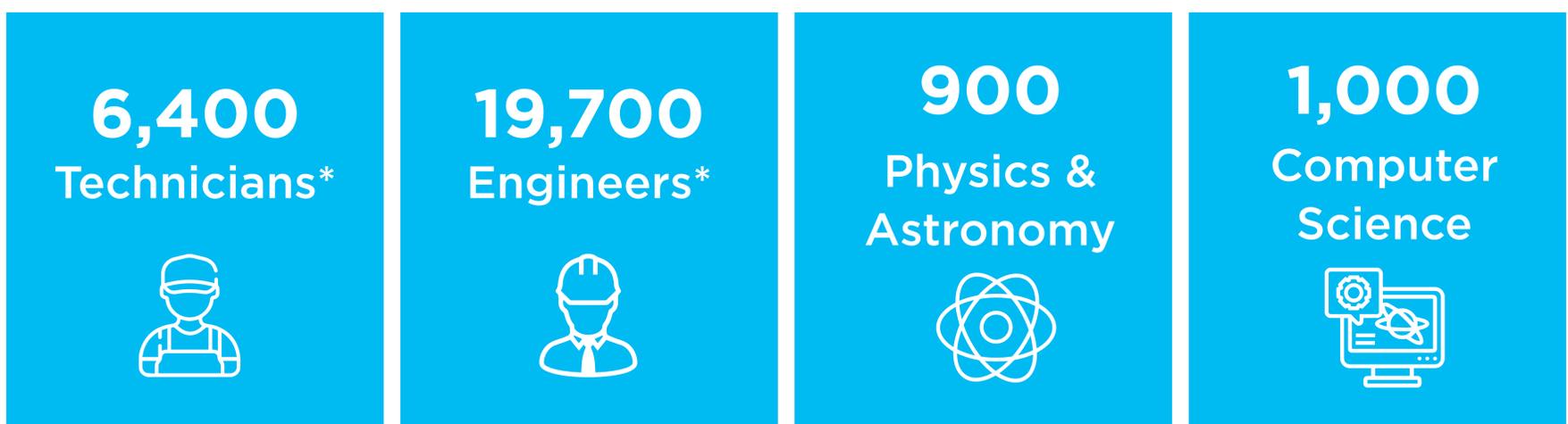
During the last few years, the number of factories and engineering centers that have been established in Mexico has grown. Impacted by COVID-19, the industry is expected to fully recover by the end of 2024, and continue growing beyond. The Secretary of Economy of Mexico estimates that by 2025, the aerospace industry will be the **10th most important globally**, with employment **topping 110,000 in the country**.

### AEROSPACE EMPLOYMENT IN MEXICO



Source: Mexico's Aerospace Industry 2023-2024 via MexicoNOW

Mexico has been developing special educational programs aimed at increasing the skills level of Mexican students and driving the competitiveness and attractiveness of the industry. In the 2022-2023 academic year, **over 25,000 students** graduated from programs related to the aerospace, including technical and bachelor degrees in mechanical, electrical engineering, physics and astronomy and computer science.



Source: ANUIES 2022-2023 Cycle \*Includes categories: Mechanical + Electrical + Motorized Vehicles, Boats & Aircraft

Recently, aerospace research centers have been created to support R&D, not only for new turbines, motors, and components, but also to drive technological solutions for other complex systems, software, and engineering applications in manufacturing processes. About 13% of Mexico's aerospace companies focus on research and development. Some of those facilities:

- Center of Aeronautical Technologies of Queretaro**
- Industrial Development and Engineering Center of Queretaro**
- CONCAMIN-Mexico France Chamber Innovation & Design Center of Tijuana**
- UANL/CIIA Aerospace Research Center of Nuevo Leon**
- Institute of Aerospace and Advance Manufacturing of Sonora**



Additionally, various aerospace companies have opened their own technical training and R&D Centers in Mexico to support talent pipeline development and continuous education among its workforce.

## INDUSTRY INSIGHTS - MEXICAN TALENT FOR THE AEROSPACE INDUSTRY

The quality of talent in the Mexican aerospace industry is considered to be high and improving, with some specific challenges to be addressed. It is an industry whose primary component is knowledge, talent and skills.

The aerospace industry in Mexico has some of the highest skilled technicians, and the Mexican government is very vested in preparing more young people for this industry. But the speed of output of these engineers has not kept pace with investment in the sector. Many large aerospace companies have found success in

establishing their own training operations and creating a talent pipeline.

The workforce is well-educated with numerous industries offering aerospace engineering programs. Also, many aerospace companies in Mexico work with major international companies like Airbus and Boeing, so their workforce are typically aligned to crucial standards for safety and quality.

Talent is a priority for the aerospace industry as the near shoring trend in Mexico is creating a higher demand for top talent and skills.

### Carlos Loyola

BUSINESS DEVELOPMENT DIRECTOR

Mexicali, Baja California







One of the key strengths of Mexico's aerospace manufacturing is its specialization in precision machining. The country excels in producing high-precision components that meet stringent quality standards. This includes machining complex parts made of aluminum, titanium, and advanced composite materials essential for the construction of modern aircraft.

Moreover, Mexico has become a leading producer of aerospace wiring systems. The production of wiring harnesses, avionics, and electronic systems has experienced significant growth, driven by the expertise of Mexican companies in electronics manufacturing. This has strengthened the supply chain for global aerospace manufacturers and elevated Mexico's status in the aerospace value chain.

<b>Aerospace Industry-Related Certifications</b>		
Chemical Processing	Coatings	Composites
Electronics	Fluid Distribution Systems	Heat Treating
Metal Systems	Heat Treating Processes	Heat Treating Equipment
Brazing	Materials Testing Laboratories	Non-Destructive Testing
Nonconventional Machining & Surface Enhancement	Nucap-HQ	Surface Enhancement
Sealants	Welding	
<b>Aerospace Industry Quality Management</b>		
AS9100 – Design & Manufacture	AS9110 – Maintenance, Repair & Reconditioning	AS9120 – Distribution of Materials

Source: FEMIA

Finding qualified suppliers can be one of the more important yet challenging endeavors in Mexico. According to FEMIA, the primary challenges of aerospace clients' supply chains in the coming years will continue to be procurement of raw materials, and availability of certified suppliers that meet increasing technological requirements.

The Mexican organization FEMIA has identified the need for small companies to integrate into the second and third tiers of the aerospace industry in Mexico. These include: thermal treatments, coatings, painting, precision machining processes for small/medium parts, non-destructive testing, casting, aluminum and magnesium alloys, titanium, stainless steel, Inconel, among others.



## FEMIA LEADING THE INDUSTRY FORWARD

FEMIA, founded in 2007, champions Mexico's aerospace sector. It united stakeholders, lobbies for policies, and promotes sustainability and innovation. Through collaboration, advocacy, and sustainability focus, FEMIA ensures the industry stays competitive and primed for opportunities.

FEMIA fosters growth by connecting members through events, sharing knowledge, and facilitating collaboration with government and academia. Their events gather thought leaders and internationally-renowned experts as premier to the industry. They discuss critical challenges, technological advancements, and opportunities in the aerospace sector.

The industry is booming, driving economic growth and creating jobs throughout North American supply chains. Mexico's strategic clusters and high precision parts production shows its depth beyond assembly. Foreign investment fuels expansion, with advanced facilities and research centers established. Government support and infrastructure development further bolster growth. Poised for further expansion, Mexico's aerospace industry looks to capitalize on rising global air travel and play a major role in shaping its future.

Industry Associations that shape the aerospace industry in Mexico:

**FEMIA** - Mexican Federation for the Aerospace Industry

**CANAERO** - National Chamber of Aerotransport

**AIA** - Aeronautic Engineering Association of Mexico

**SCT** - Secretary of Communications and Transport

**AEM** - Mexican Space Agency

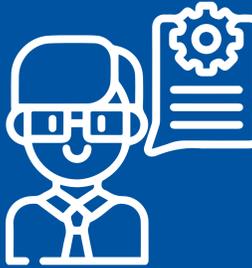
### MEXICO'S AEROSPACE INDUSTRY IN NUMBERS



Source: FEMIA



**PRO DENSA IS DEDICATED TO PROVIDE EXPANSION SOLUTIONS THAT DRIVE REGIONAL INTEGRATION IN NORTH AMERICA**

 <p><b>Operational Partners</b></p>	 <p><b>Trusted Advisors</b></p>
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