

ABS delivers high-performance gear solutions for Cementos Progreso Costa Rica

Engineering excellence in action

Atlantic Bearing Services (ABS) has successfully manufactured and installed an MGS girth gear and pinion, an industrial brand of ABS renowned for precision and Italian engineering, at Cementos Progreso Costa Rica. This project, executed between December 23, 2024, and January 5, 2025, involved the replacement of the worn-out girth gear and pinion of the 90-ton-per-hour Allis Chalmers ball mill, which had been in continuous operation since its original installation.

The plant, formerly owned by CEMEX and acquired by Cementos Progreso in 2022, is located in Colorado de Abangares, Guanacaste, just 5 km from the La Amistad Bridge. It produces high-quality fresh cement, meeting national demand while contributing to Costa Rica's infrastructure development. Additionally, with 60% of its workforce being local, the plant reinforces its commitment to regional employment.

This project highlights ABS's expertise in delivering advanced power transmission solutions and critical equipment maintenance for the cement industry.



The image shows the girth gear, pinion shaft, and coupling manufactured by ABS and installed in the ball mill during the system alignment phase.



High-Precision execution: Essential phases

The manufacturing and installation process followed a rigorous methodology to ensure optimal system performance and longevity:

1

Preparation and Disassembly: The first phase involved the removal of the existing girth gear and pinion, followed by thorough surface preparation to ensure proper installation and alignment of the new components. The old girth gear and pinion were carefully removed, and all contact surfaces were cleaned and prepared for the new installation.

2

Installation of the New MGS Girth Gear and Pinion: Once the surfaces were prepared, the new MGS girth gear and pinion, known for their precision and Italian engineering, were installed following a structured process. This included positioning the two girth gear sections, aligning the pinion shaft, and progressively tightening the flange bolts and Superbolt fasteners in a random sequence to ensure uniform load distribution and secure fitment.

3

Alignment and Calibration: Precise alignment was essential for optimal performance and minimal wear. Multiple inspections and adjustments were carried out to meet factory specifications, with alignment run-in procedures ensuring accurate axial and radial parameters. The final achieved values were 0.600 mm axial and 0.530 mm radial, with the backlash between the pinion and girth gear set at 2.6 mm, ensuring smooth operation.



4

System Optimization: To maximize efficiency and extend service life, refinements were made to the mill's drivetrain, including adjustments to the couplings, pneumatic clutch, and motor. Contact pattern testing using Prussian blue improved tooth engagement from 40% to 95%, achieved through precise liner adjustments in the bearings and careful calibration of run-in loads.

5

Monitoring and Validation: The final phase involved continuous monitoring to ensure the system operated within optimal parameters. Temperature and vibration levels were consistently tracked, compared against predefined values, and new critical thresholds were established to further optimize performance and extend the girth gear's service life.

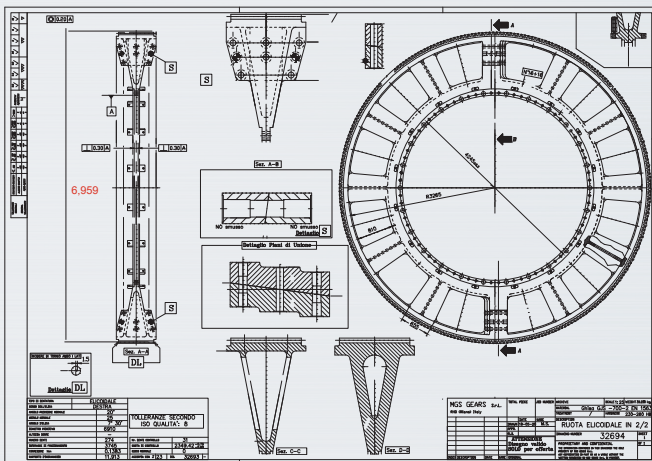
Engineering a solution despite limited technical information

One of the key challenges in manufacturing and installing the new MGS girth gear was the limited availability of technical data from the original manufacturer. The only reference available was the pinion shaft, which required reverse engineering to develop a fully compatible and high-performance solution for the existing mill.

To ensure system reliability, an extensive analysis of the mill's operating conditions was conducted, considering:

- Wear levels and alignment of the existing system.
- Load and operating conditions to optimize power transmission.
- Replication of critical parameters, such as module, pressure angle, and tooth geometry.
- Selection of high-strength materials and application of thermal treatments to maximize durability.

Accurate field data interpretation and design adaptation were essential to achieving a precise installation and long-term operational reliability.



ABS AND MGS: A GUARANTEE OF PERFORMANCE AND DURABILITY

With this project, ABS reaffirms its leadership in the manufacturing and installation of high-precision components for the cement industry. Through a rigorous process of engineering, alignment, dimensional control, and parameter optimization, we guarantee optimal performance and extended equipment lifespan.

The selection of an MGS girth gear and pinion, an ABS industrial brand recognized for its precision and Italian engineering, underscores ABS's commitment to high-value engineering solutions and its position as a key industry reference.

This success story demonstrates our ability to adapt to complex challenges and deliver cutting-edge technical solutions, ensuring operational continuity and efficiency for key industrial plants worldwide.