

## Girth Gear Installation for Ball Mill in Cementos Santo Domingo S.A.

### Operation Background

Cementos Santo Domingo, S.A., specializes in the grinding and shipping of cement for use in the construction sector. The plant has a Portland-type cement milling process, possible through an Allis Chalmer Ball Mill composed of two chambers 3.35 m in diameter and 9.75 m in length with an 80 Ton/h capacity.

The existing girth gear, manufactured by Falk had been used prior to being installed at the Cementos Santo Domingo plant, wear was present as a result of prior operation period. At the beginning of the year 2000, it was necessary to flip the girth gear to use its unworn face in order to complete the gear life of 20 years of operation.



*Momento en que eran ensambladas las dos mitades de la corona, con posterioridad al control y limpieza de la brida.*

### Success Story

After 5 days of intense precision work and close collaboration with the plant's technicians, the ABS and MGS teams made it possible for Cementos Santo Domingo to resume normal operation thanks to a newly installed girth gear with a 30-year operation life.

### Technical Solution

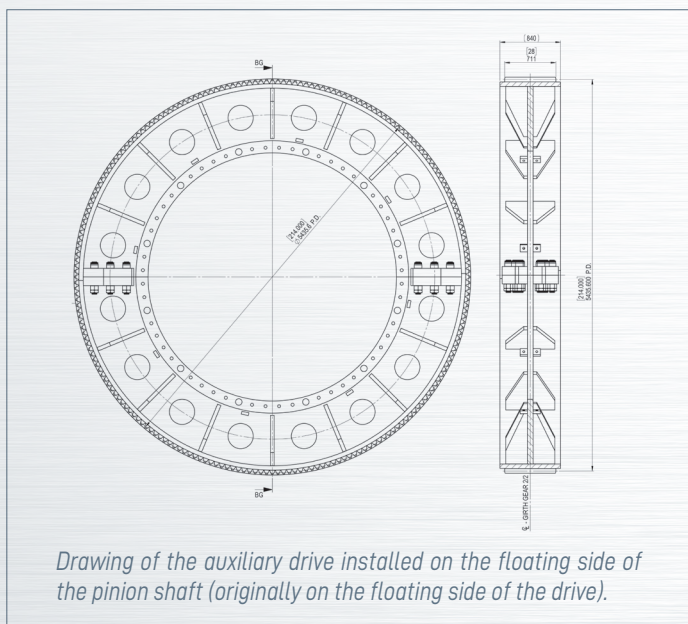
Using the pinion shaft the client had available as a baseline, the girth gear was manufactured in 2 sections with an electrowelded structure.

The outer ring is made of quenched and tempered forged steel to guarantee a hardness equivalent to 240-270 HB and has undergone ultrasonic testing.

### Additional Challenges

The state of emergency resulting from the COVID-19 pandemic and restrictions on international travel proved challenging for the execution of this project.

It was necessary to make different itinerary changes to complete the installation during the year-end holidays.



## Installation

After disassembly of the Falk gear (previous), controls, cleaning, and preparation of the flange is performed to ensure alignment between the gear and the mill are within recommended parameters.

Once the two sections were installed and the Superbolt screws are set in place, the flange screws were adjusted and several corrections were made to the alignment using a calculation program designed to make adjustments in specific correction points, thus achieving a maximum axial deviation of 0.035 and 0.040 radial deviation.

After girth gear is centered pinion-gear alignment is performed using gages to fix tooth position and necessary adjustments to the mill's drivetrain are carried out.

To conclude the installation, the lubrication system was tested, and a lubrication and load application protocol was created so that loads are gradually applied, starting at 60% until a maximum load of 100% is reached while monitoring vibration, temperature, and lubrication efficiency.



*"With the new Girth Gear the CSD mill puts out lower temperature and vibration levels, allowing for higher durability and operation stability."*

### GIRTH GEAR SPECIFICATION

TOOTH QTY	Z1	216
MODULE	m (")	1,005
PRESSURE ANGLE	*	20
ELIX ANGLE (RH)	*	7.30 (rh)
FACE WITH	*	28"
WORKING SPEED	n2 (RPM)	0.24
PINION TOORH QTY	z2	19

### Technical service offer

ABS and MGS Gears teams count with extensive experience to offer practical solutions for all types of industrial drive applications such as Ball Mill, Rotary Kiln, and Bucket Elevators among others that utilize gearboxes and drive components while adapting to installation requirements, available space, and power and ratio requirements.