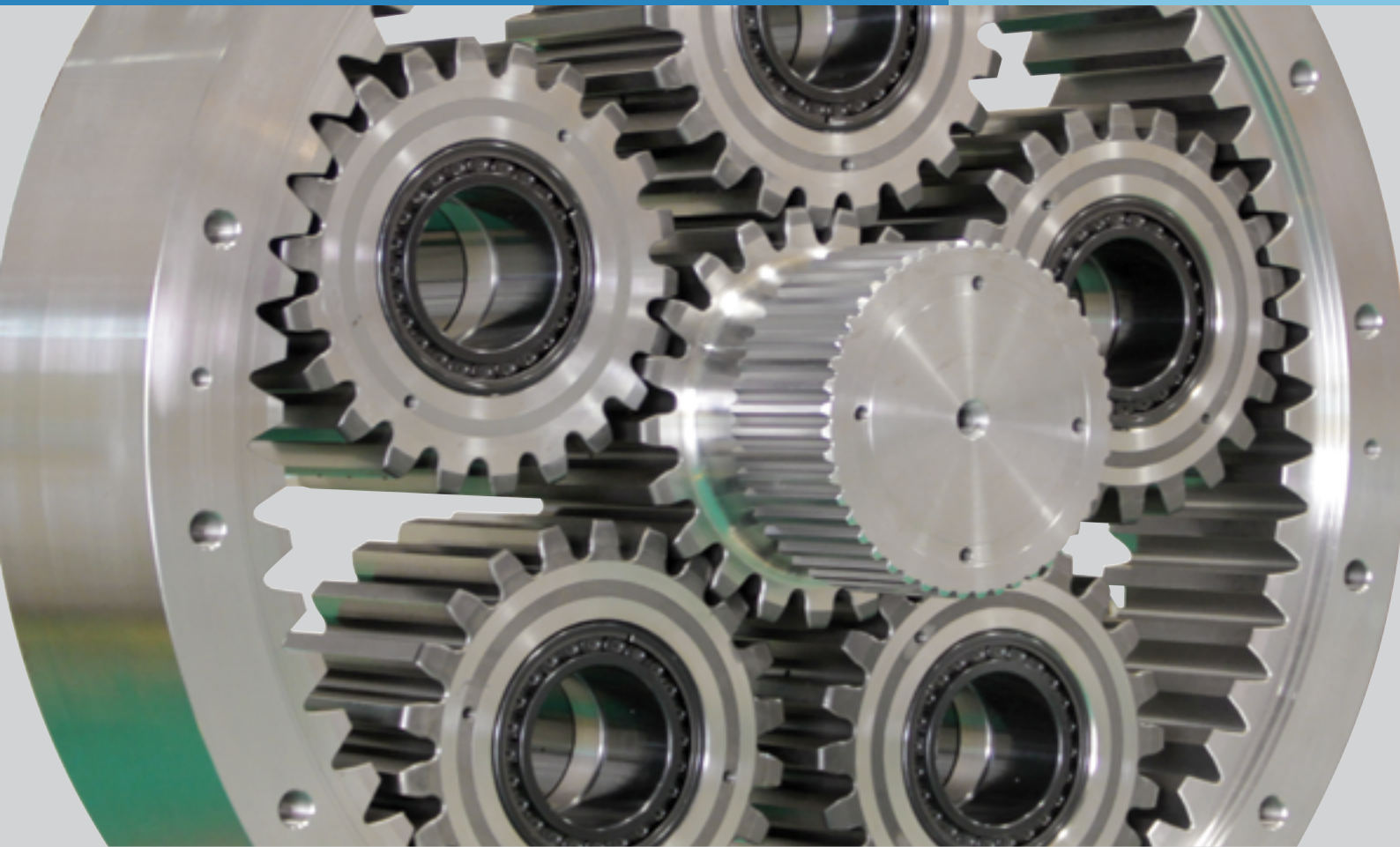


# GEARBOXES AND MULTIPLIERS

Planetary Gearboxes and Parallel Shaft



Motors | Automation | Energy | Transmission & Distribution | Coatings



## Gearboxes and Multipliers

TGM offers complete gearbox lines from small to large sizes for any segment. They are available in lines of planetary gearboxes, turbo gearboxes, special gearboxes, multipliers and flexible couplings.

The company provides relevant product application consulting services in order to obtain the best use of the intended investments.

## Projects

With its own technology, TGM meets all customers' needs in products and services focused on the three fundamental pillars of an industry: **Safety, Efficiency and Operational Availability**

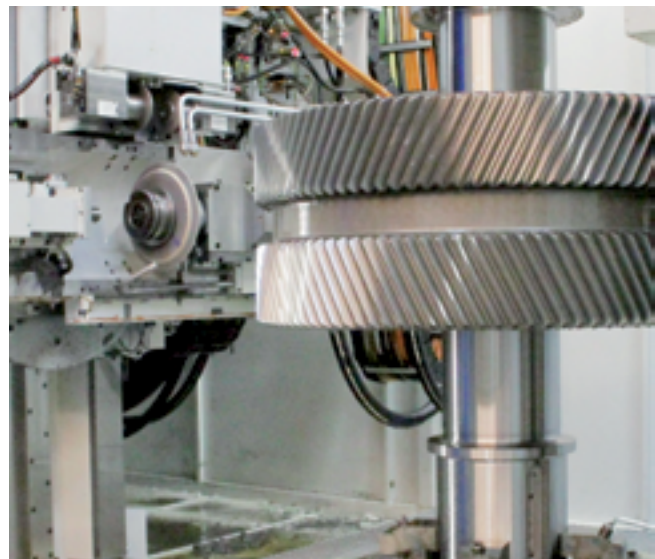


## Quality

The main commitment of TGM is to deliver high quality product, parts and service, meeting the customers highest level of satisfaction. In order to do so, the quality system supervises and seeks the continuous improvement of the processes, complying with administrative procedures, technical instructions, production standards, training and continuous development.

### Certifications

TGM has the ISO 9001 and ISO 14001 certifications, evidencing its quality and respect for the environment.





## Manufacturing Structure

The company has a modern and up-to-date industrial complex with gear machining centers, milling machines and grinding machines, a bearing manufacturing department, a lubricating oil analysis laboratory, an assembly and testing unit for gearboxes and multipliers. In addition to the manufacturing structure, the company has a qualified field team for services available 24/7, 365 days a year.

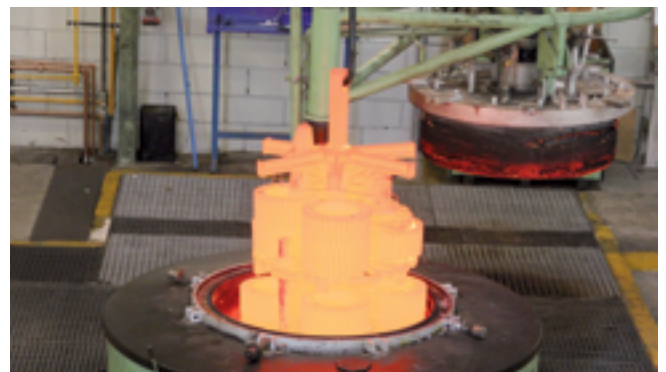
## Oil Laboratory

With a modern Laboratory to analyze lubricating oils, TGM offers the customers this special service for equipment predictive maintenance, aiming at operational availability and safety.



## Heat Treatment

TGM/Maxirate heat treatment has qualified ovens, in accordance with API-6, and it is considered the most advanced in Brazil. It is structured with compliance reports of all the inspections, providing a high level of assurance for gearboxes, gears and shafts.



## Sliding Bearings

The company's structure has several unique features, including the modern manufacturing structure to produce bearings for gearboxes and multipliers.



## Gearbox Testing

The test bench is equipped with electronic instruments and modern controls that assess the conditions of new and overhauled machines, whether manufactured by TGM or not.





# G3 Full Line of Planetary Gearboxes for the Sugar-Power Industry

**Planetary Gearboxes up to 10,000 kN.m**



**Drives in Diffusers and Sugar Mills in Central Drive Applications**



**Pinion-Less and Assist Drive in Sugar Mills**



## Planetary Gearbox Line for small mills

In addition to the G3 Full line, TGM also manufactures and installs planetary gearboxes for mills typically used in Ethanol Distilleries. The company carries out the application and installation studies according to each plant.



## 10-harvest cycle without Maintenance



TGM G3 Full line of planetary gearboxes has consolidated technology to drive diffusers and sugar mills in central and pinion-less drive applications.

Its main advantages are:

- High mechanical efficiency;
- Robustness of gear and bearing sets;
- Flexibility in the installations;
- High-performance smart hydraulic system;
- Electronic monitoring system;
- 10-harvest cycle without maintenance.

## High-performance Hydraulic System



Perfect lubrication is one of the G3 Full highlights. Built to allow the best lubricant oil filtration and cooling conditions, the hydraulic units consist of 10 micron ( $\beta$  200) absolute filtration elements and a high-performance air-oil heat exchanger - everything integrated into the electronic monitoring system.

## Robust Bearings



The bearings are surface treated in Black Oxide and are dimensioned for a life  $L_{10h} \geq 100,000$  hours according to ISO 281 and the service factor  $\geq 2$ , which contributes to the efficiency and safety of the planetary gearbox.

## Control and Monitoring by Highly Reliable System



A pioneer in the electronic monitoring of gearboxes, TGM offers Protetork and Monitork to monitor all operation variables, from the basic that lubrication and torque control to a complete vibration analysis system.

It is a simple and smart system that, in addition to monitoring the oil temperature, pressure and vibration variables, ensures that the gearbox will not be subject to over torque, avoiding accidents and guaranteeing an operation within the established limits. This system provides a better use of the equipment, enabling the user to monitor the operation and reduce maintenance costs.



## ST Line - Turbo Gearboxes from 20 to 60 MW

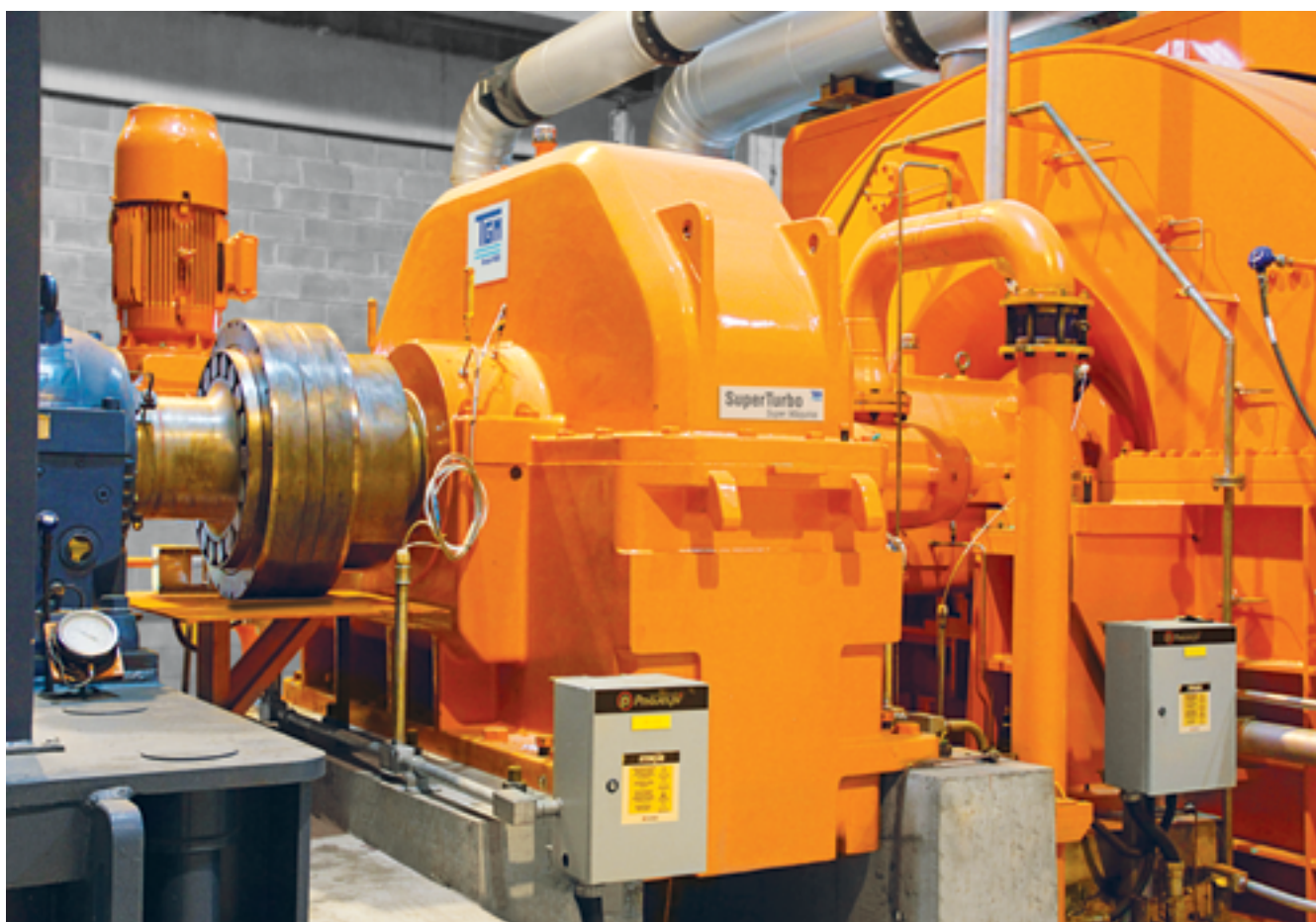
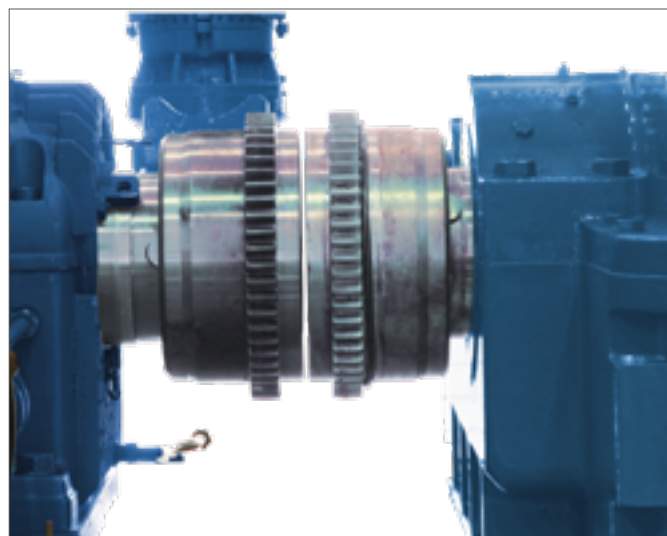
The ST - SuperTurbo Line was developed using the concepts and knowledge TGM acquired with the experience in the manufacture, maintenance and operation of equipment for power generation, increasing the performance, which is necessary in cases where the turbo gearboxes operate under severe conditions. The TGM SuperTurbo is in operation in many units with great results and outstanding performance.



## GF Line - Flexible Coupling for Turbo Gearboxes

Developed for turbo gearbox applications up to 60 MW, TGM GearFlex line of Flexible Couplings - guarantees a high performance operation, compensating for the effects of angular, axial and parallelism misalignments between the shafts.

Developed and patented by TGM, the gear couplings can be applied to turbo gearboxes from any manufacturer and are available in the F and T models, which allows their use in flanged in flanged installations just by changing the gearbox coupling. The other components and installation bases remain unchanged.





## Some G3 Full Planetary Gearboxes installations



GREENFUEL - Zimbabwe  
78" Sugar Mill - G3 Full RPS 3 480 P



PLAN DE AYALA - Mexico  
40" x 85" Sugar Mill - G3 Full RPS 480 P



CERRADINHO - Chapadão de Céu, GO - Brazil  
100" Sugar Mill - G3 Full RPS 3 520 P



UBERABA - Uberaba, MG - Brazil  
78 "and 66" G3 Full Sugar Mill - RPS 3 480 P



DA MATA - Valparaíso, SP - Brazil  
90" Sugar Mill - G3 Full RPS 3 410 F

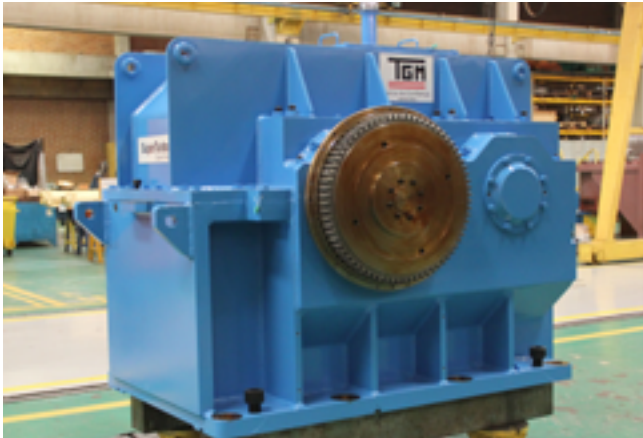


BP TROPICAL - Edéia, GO - Brazil  
Sugarcane Diffuser - G3 Full RPZ 4 600 E





## Some Super Turbo and Gear Flex installations



MODELO BREWERY - Mexico / Turbogenerator - 12.7 MW  
SuperTurbo - ST 630 Y



CERRADINHO - Chapadão do Céu, GO - Brazil / Turbogenerator - 45 MW  
SuperTurbo - ST 710



ADECOAGRO - Ivinhema, MS - Brazil / Turbogenerator - 42 MW  
SuperTurbo - ST 800



CMAA Vale do Tijuco - Uberaba, MG - Brazil / Turbogenerator - 49 MW  
SuperTurbo - ST 630



WD - João Pinheiro, MG - Brazil / Turbogenerator - 32 MW  
SuperTurbo - ST 710



CPFL Bio Alvorada - Araporã, MG - Brazil / Turbogenerator - 31 MW  
SuperTurbo - ST 710

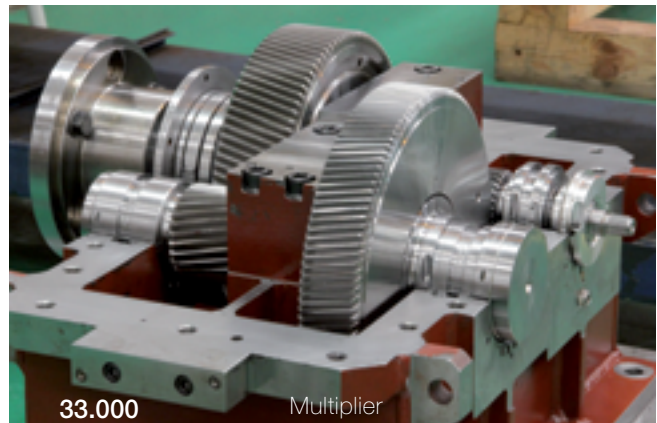
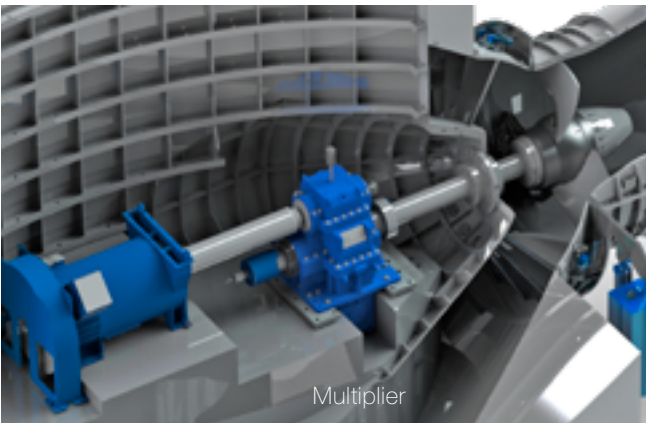




# Industrial Gearboxes and Multipliers RTS/RTM Lines



Manufactured using cutting-edge technology, TGM industrial gearbox/multiplier is used in a wide range of industrial applications. Built with parallel or orthogonal shafts, the gearbox is available in several sizes, from one to four reduction stages, and it can be driven by steam turbines or electric motors.



## Services in Gearboxes and Multipliers in the Field or Factory

TGM is specialized in performing services in gearboxes of any model and manufacturer. TGM performs services of Overhaul, Recovery, Overhauling Revamping, Retrofit, Balancing, 3D Engineering, Installation and Startup, Inspection and Monitoring, Spare Parts and Parts, Planned Maintenance, Long-Term Contracts and Training.

When is identified that the replacement of the existing equipment by a new one is not feasible, service will play a key role in the process by reducing the environmental impacts, once it is possible to repair the equipment.



### Technical Assistance



TGM performs technical assistance, installation, operation and services in rotating machines. The 24/7 availability for any emergency is TGM's great competitive edge, speeding and assuring the most reliable and efficient performance in mechanical and electrical drives 365 days a year in Brazil and abroad.

TGM, headquartered in the city of Sertãozinho/SP, is a company of the WEG Group, belonging to the WEG Energy business unit. WEG Energia develops and applies solutions for electric power generation in Wind Power, Biomass and Hydroelectric Power projects, providing large-sized electric motors, alternators, generators and wind turbines. It also provides inspection and overhauling services of electrical rotating machines.



The WEG Group's scope of solutions is not limited to the products and solutions presented in this catalog. To learn more, contact us.

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Subject to change without notice.

The information contained are reference values.