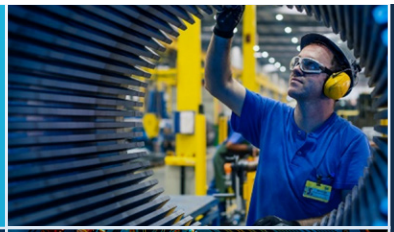
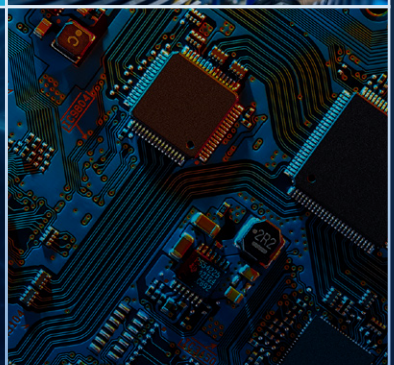
WEGmotion Drives

BOOK OF CASES

Some references of integrated package solutions involving Motors, Drives and Gears.

Driving efficiency and sustainability





WEGmotion Drives

From motors, drives and gears to an integrated motion package.

Industry is always on the move. And WEG doesn't stop evolving. Thinking on this, we developed WEGmotion Drives, an integrated and flexible package that combines motors, gearboxes, drives and digital solutions to improve productivity of your manufacturing plant. Do you know what that means? It means reliability, better control of machines and equipment, more intelligence in operational processes and more efficiency for your industry. It is WEG's partnership getting you ready today for tomorrow's challenge.

CASES - MOTION DRIVES

SEGMENT – PULP AND PAPER

Customer:
Klabin

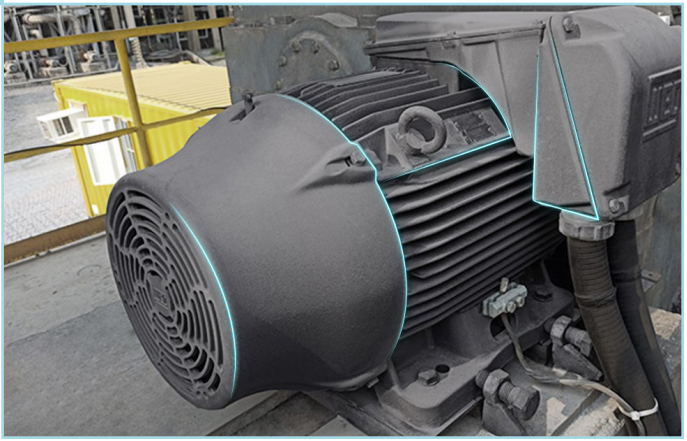
Country:
Brazil

Year:
2020

Type of product:
Permanent magnet motor + VFD

Scope of supply:
1x 125 HP WEG W22 Magnet
1x CFW11 VFD

Application:
Lime Furnace



WEG supplies permanent magnet motor to Klabin.

W22 Magnet brings more productivity for the production of paper and pulp. Continuously investing in innovation, WEG's philosophy is to develop high performance products and efficient solutions in order to offer ideal solutions to its customers. Among them is Klabin, the largest producer and exporter of packaging paper in Brazil.

More efficient motor in the lime furnace.

Aiming at ensuring better results for its production process, Klabin purchased a 125 HP WEG W22 Magnet motor in October 2019 to replace the DC drive of the lime furnace. The lime furnace burns the lime mud generated in the pulp production process and turns it into lime, used in the production of the white liquor, which in turn is used for cooking wood in the digester and for making pulp. As this machinery requires attention from the maintenance teams, DC motors are not usually the preferred option due to the high inertia of the load at the start and in operation. However, the change was carried out successfully and the motor has obtained excellent performance rates.

W22 Magnet: the best performance rate on the market.

The high efficiency W22 Magnet motors have permanent magnets, thus ensuring advantages such as robustness, high performance and higher power density per frame. Driven by WEG CFW11 frequency inverter, they provide constant torque and a wide speed range, operating even at low speeds with efficiency levels above induction motors, without requiring forced ventilation. Ideal to drive paper machines, replace DC drives and solve applications where speed variation is required.

More energy efficiency for the paper and pulp industry.

Energy efficiency cases like this, which promote the replacement of DC motors with high efficiency permanent magnet motors, prove that the return on investment makes good business sense, both in the application and in the selection and acquisition of the equipment, which makes them saving both money and energy in challenging times. For Klabin, this acquisition enabled greater productivity due to the increase in the machine availability and the equipment energy efficiency. According to analysis made since the motor acquisition in October 2019, there has also been a reduction in energy consumption, exceeding the project expectations. WEG, recognized for its energy efficiency solutions for various industrial applications, offers the market several combinations of high performance products to bring more innovation and technology for industrial processes worldwide, building solid relationships with large companies such as Klabin.

CASES - MOTION DRIVES

SEGMENT – PULP AND PAPER

Customer:
Cia Canoinhas

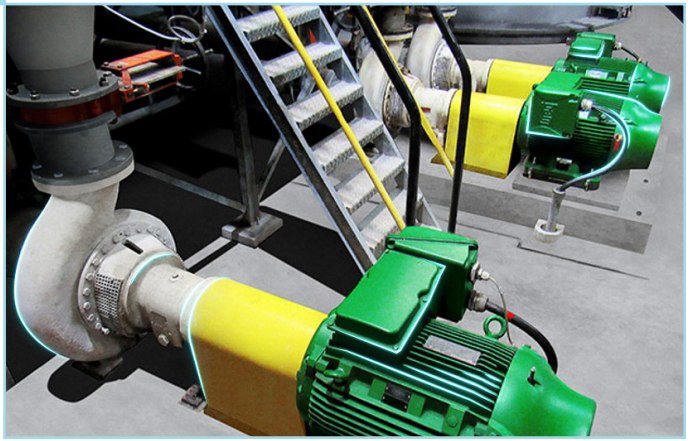
Country:
Brazil

Year:
2017

Type of product:
Induction motor + VFDs

Scope of supply:
31 WEG W22 IE3 motors
CFW11 VFD

Application:
Pumps



Cia Canoinhas boosts production with WEG equipment.

Tissue paper machinery fitted with W22 IR3 Premium and W50 electric motors.

Cia Canoinhas is one of the largest companies in Santa Catarina, state in the South Region of Brazil, and, through its responsible and sustainable environmental management, makes constant investments in new technologies. It was for such purpose that the company has increasingly reduced electricity consumption by modernizing the driving systems in its manufacturing plant in close partnership with WEG.

Electricity is currently one of the main inputs for the toilet paper and paper napkin market. For this reason, Cia Canoinhas maintains investments in energy efficiency projects to achieve energy savings and reduce motor maintenance expenses.

Due to the excellent results from the replacement of 31 old induction motors with high efficiency motors of WEG W22 IR3 Premium line, in 2016, through ANEEL/Celesc Energy Efficiency Program (PEE ANEEL/Celesc), the company expanded the project. This year the company purchased 63 W50 and W22 IR3 Premium electric motors, which meet the new minimum performance level for low voltage electric motors, in force since August 30, 2019. The new motors, with losses between 10% and 40% lower than the previous ones available on the market, were installed in a new machine, acquired in November 2018, to expand and accelerate the tissue paper production.

Cia Canoinhas operates in the segments of toilet paper, paper towels and paper napkins, with the brands Fofinho, Fofinho Absolute, Bambino, Sorella and Sorella Absolute.

For WEG, the projects carried out at Cia Canoinhas represent an example of continuous work for the pulp & paper segment, ensuring equipment reliability, application versatility and much more energy efficiency.

CASES - MOTION DRIVES

SEGMENT – STEEL

Customer:
Hübner

Country:
Brazil

Year:
2020

Type of product:
Induction Motor + VFD

Scope of supply:
1x WEG W22 IE3
1x CFW700 VFD

Application:
Cooling Tower

Hübner ensures more energy efficiency with WEG.

WEG equipment was installed on the Cooling Tower.

The Hübner Group is an important supplier to the automotive industry, with expertise in foundry, machining and assembly, which frequently monitors industrial processes to prevent environmental impacts and improve the use of natural resources.

For better results, the company sought WEG to implement an energy efficiency project. The IR1 efficiency motor installed on the cooling tower fan was replaced with a W22 IR3 Premium motor – which meets the new level of minimum performance for low voltage electric motors in Brazil, in force since August 30, 2019 – operating together with a CFW 700 frequency inverter.

This application uses the exclusive WEG software, not requiring controllers and PLCs and performing direct control by means of the frequency inverter, to reduce the consumption of electrical energy in the Closed Circuit Cooling Tower 26 (Evaporative Cooler), located in HCSA 03 - Industrial Tower. In addition, controlling the speed variation can reduce water evaporation and consequently the consumption of refilling water.

The Cooling Tower is a device for cooling water used in industrial processes. The variation in the conditions that surround its operation allows the system automation, very accessible to any application and with great reduction of operating costs. As a result, the company achieved a 67.3 % reduction in electricity consumption, which corresponds to 18,109.70 kWh/year.

The Hübner Group's commitment to carrying out energy efficiency projects represents the company's values, which focus on continuous improvement through a high performance culture. WEG, recognized for its Energy Efficiency solutions for various industrial applications, offers the market several combinations of high efficiency products to reduce energy consumption and improve industrial processes worldwide.

CASES - MOTION DRIVES

SEGMENT – STEEL

Customer:
Voigt

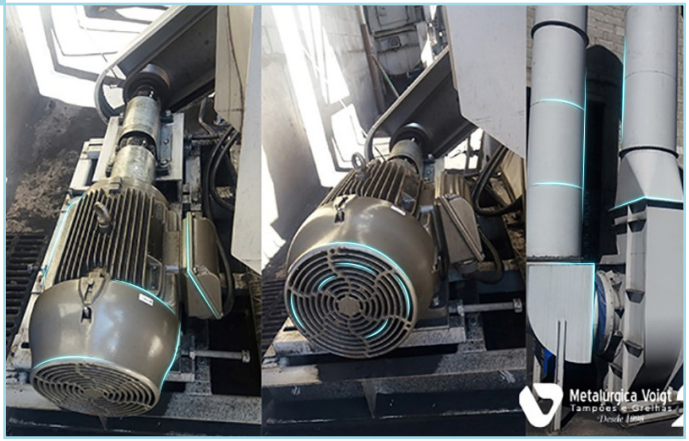
Country:
Brazil

Year:
2019

Type of product:
Permanent magnet motor + VFD

Scope of supply:
1x 75 CV WEG W22 Magnet IE4
1x CFW11 VFD

Application:
Bag Filter



Metalúrgica Voigt implements Energy Efficiency actions.

WEG motor operates on the Bag Filter exhaust fan.

Metalúrgica Voigt, headquartered in Curitiba since 1998, produces plugs and grids in nodular iron on an industrial scale. Specialist in this field, the company is a pioneer in the use of electric induction melting systems and machines and equipment for modeling, molding and deburring, with a high level of automation.

In November 2017, with a view to reducing electricity and operating costs, the company invested in an energy efficiency project with WEG specialists to activate the Bag Filter exhaust fan.

The specification defined the exchange of an IR1 motor for a 75 HP W22 Magnet IR4 motor, together with the CFW11 Inverter, also from WEG, and the DPF REG 20 Pressure Transmitter, supplied by the company Renner Têxtil, automating the exhaustion process.

The bag filter is used to solve problems arising from industrial processes, such as the generation of polluting particles or gases, which interfere with the quality of the environment, the product and even the safety of workers.

Through captors, the contaminated air is sucked into the filtration system, where the particulates are retained in the filtering elements (bags) and the air is returned to the atmosphere in accordance with environmental legislation.

As a result, the company achieved a 55.3% reduction in electricity consumption, from 38.7 kWh to 17.3 kWh.The use of these technologies allows Metalúrgica Voigt to apply modern foundry techniques in the area of plugs and grids, ensuring high-quality production on a large scale, resulting in process and product reliability.WEG, recognized for Energy Efficiency solutions for various industrial applications, offers the market several combinations of high efficiency products with the aim of reducing energy consumption and improving industrial processes worldwide.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer:
Mafresa

Country:
Spain

Year:
2019

Type of product:
Permanent magnet motor + Cabinet build VFDs

Scope of supply:
5x WEG W22 Magnet IE4
CFW11 VFD
CFW700 VFD

Application:
Compressors

WEG collaborates with Mafresa to make cold production energy savings with permanent magnets motor W22 Magnet.
The company, one of the largest producers of Iberian pork products in Extremadura (Spain), have an estimated annual savings in cold production energy costs around EUR 27,000.

WEG, a leading global manufacturer of motors and drive technology, has provided a highly efficient solution for operation of its new refrigeration unit at the Mafresa facilities. The Iberian pork producer located in Fregenal de la Sierra, Badajoz, is using the new cold stores for Iberian pork sausages, shoulders and ham. INITUM EFJ ASESORES, a WEG distributor in Extremadura, recommended that Mafresa refrigeration installer, Jacinto Redondo S.L., use five W22 Magnet IE4 electric motors for the compressors used for the company's cold production.

> *For companies that use industrial refrigeration, it's crucial that their cold production equipment works at maximum efficiency, or rather with a fully optimised COP (Coefficient of Performance). In the food industry, refrigeration can represent more than 80% of a company's total electricity usage. As such, the aim is to provide a solution which meets all the refrigeration requirements of all departments, but with the lowest possible kWh consumption,* explains Francisco Javier Álvarez, Industrial Engineer and Co-founder of INITUM EFJ ASESORES.

The W22Magnet IE4 electric motors are ideally suited to meet these requirements and standing out due to their high efficiency and constant torque across the speed range. They also help to reduce maintenance costs, improve sustainability, increase productivity and extend the useful life of all the equipment. The W22 Magnet IE4 solution combined with CFW11PM for 160 kW and 75 kW compressors, in addition to the 11 kW and 22 kW WEG CFW700 drives used in the Mafresa primary and secondary circuit pumps, enables the system to produce an instantaneous 2,000 kW refrigerating capacity. The WEG solution delivers maximum system efficiency with a COP of 4 (for water cooling) and as high as 8 for water heating, guaranteeing power, torque, performance and above all efficiency. This means Mafresa can control its energy consumption due to the optimum operation of the compressor.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer: **Mafresa**

Country: **Spain**

This means Mafresa can control its energy consumption due to the optimum operation of the compressor.

To establish the specifications for the WEG solution, INITUM EFJ ASESORES produced a technical document that refrigeration installer, Jacinto Redondo SL, presented to Mafresa before the project was awarded. With this document, WEG and its distributor not only offered a completely different and innovative solution, but also an additional service, which clearly demonstrated an interest in winning this project.

> *Energy efficiency was key in this application and the study data was very revealing. According to the study, installing a traditional squirrel-cage open motor system with a drive wasn't the best option since it was estimated that the WMagnet solution would deliver energy savings of between 14% and 20%. Moreover, the monitoring system we are installing will enable Mafresa to verify all the estimations as well as perform rigorous system controls,* remarks Jacinto Redondo.

The study estimated annual savings of EUR 27,400 in energy costs by using the four W22 Magnet motors with CFW11PM converters for the 160 kW compressors. Based on 5,840 hours of operation each year, each 160 kW WMagnet unit plus CFW11PM converter operating between 1000 rpm and 3600 rpm would save EUR 6,850. Based on this data, the cost of investment would be paid back in approximately 18 months. Once Mafresa awarded the project, INITUM EFJ ASESORES and WEG engineers continued collaborating with Jacinto Redondo S.L. to ensure that installation of all the system components would be simple, quick and efficient.

The new Mafresa facilities also contains a fifth W22Magnet IE4 motor with CFW11 converter for its other 75 kW compressor used to harness the residual heat from condensation and transfer it to the SHW system, achieving in this instance a COP of nearly 8 points. As part of this project, INITUM EFJ ASESORES also supplied WEG open-frame switches for the main panel, and various panels manufactured by Autrial (part of the WEG group), such as a 12-metre long motor control panel for the refrigeration unit, a control panel with 11 x 11 kW WEG CFW700 drives, a motor control panel with 2 x 22 kW WEG CFW700 drives and 22 WEG CFW700 drives for self-contained unit conversion.

The entire WEG solution for Mafresa's new refrigerated unit facilities has been designed according to the European ECODESIGN standard (Directive 2005/32/EC) establishing a framework for the setting of ecodesign requirements for energy-using products.

> *We are extremely satisfied with the WMagnet solutions specified by INITIUM EFJ ASESORES S.L; while it's still too early to confirm the estimates of the technical document, we have begun to see the improvement in our energy efficiency. Furthermore, this project has reflected the team work between our installer, Jacinto Redondo S.L., INITIUM EFJ ASESORES S.L. and WEG. The added value provided through the follow-up and service has been magnificent,* says Alfonso Rodriguez Valdelomar, Managing Director of Mafresa.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer:
Citrosuco

Country:
Brazil

Year:
2017

Type of product:
Induction motor + VFDs

Scope of supply:
Cooling Tower Direct Drive
CFW11 VFD

Application:
Cooling towers

World's largest orange juice company uses WEG products.

WEG Direct Drive System operates the cooling tower and reduces operating costs at the Brazilian juice production plant Citrosuco.

Electric motors and drives supplied by WEG are bringing positive results for the production of Citrosuco, the world's largest orange juice company. Citrosuco counts on four factories, three of them in the State of São Paulo and one in the USA. In addition to that, the company owns twenty-nine farms, three storage operations, five shipping port terminals and six commercial offices. The company achieves a production capacity corresponding to more than 40% of all the orange juice produced and exported by Brazil.

Since 2015, Citrosuco, has been using permanent magnet motors from the WEG Cooling Tower Direct Drive System line in its production unit, which ensures high performance levels with high torque, even at low speeds. This system replaces conventional ventilation systems in cooling towers consisting of motor + transmission shaft + gearbox assembly, reducing mechanical losses and resulting in high operational efficiency.

This WEG Cooling Tower Direct Drive System solution operates with the CFW11 frequency drive, where speed is modulated according to the application demand, thus providing energy savings and reducing water consumption.

Implemented in the city of Matão operation unit, state of São Paulo, the solution provided a significant reduction in maintenance costs, making the system more reliable and efficient. Additionally, the corrective maintenance in the system was eliminated, starting to carry out only preventive maintenance.

> *Before using WEG products, the cooling towers used to offer low reliability, requiring constant interventions on the transmission system and gearing system, resulting in high maintenance cost. After installing WEG products, corrective interventions were eliminated, significantly increasing the availability of the equipment and considerably reducing the costs of corrective maintenance. We only carry out a lubrication routine every ten thousand hours of use, as recommended by WEG,* says Wanderley Garcia Cabrera, Reliability Engineer at Matão / Citrosuco operation unit.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer:
Cargill

Country:
Brazil

Year:
2022

Type of product:
Induction Motors
Gearboxes

Scope of supply:
288 W22 WELL motors
2 W60 Motors
Gearboxes

Application:
Pumps, fans, exhausters, conveyors, stirrers and mixers.

WEG supplies 288 motors for new pectin manufacturing plant in São Paulo.

Motors of the WELL and W60 lines are used in the largest manufacturing plant of this raw material in the Americas.

Brazil has stood out on the global market for the manufacture of pectin, a soluble fiber obtained from citrus fruits, such as orange peel, widely used in the production of dairy products and in confectionery, such as jellies, ice cream, yogurts and juices.

Located in the City of Bebedouro, São Paulo State, the pectin manufacturing plant is the first one Cargill has built out of Europe, with its products targeting markets such as Asia and South America.

Starting its operations at the end of 2021, the new factory has WEG motors from the W22 WELL line throughout the plant, having the compliance with the American standard IEEE841 as a special advantage. It is the guarantee of greater reliability, better corrosion resistance and extended service life, both for safe and hazardous areas.

Reliability and maximum performance.

288 WEG motors are used in several applications of this plant, such as pumps, fans, exhausters, conveyors, stirrers and mixers.

Easy installation, low vibration levels and high mechanical precision make the motors of the WELL (WEG Extra Long Life) line highly suitable for the food industry, in addition to having a painting scheme to withstand the corrosive environment produced by pectin.

The plant also purchased two 1316 HP W60 motors. With a compact, lightweight and modular design, these motors are suitable for industrial applications such as compressors, pumps and fans.

In addition, the plant in Bebedouro operates with 15,000 kVA and 45 kVA WEG transformers and WEG-CESTARI gearboxes, ensuring the quality and stability of the processes. Reducing energy consumption and improving industrial processes is WEG's goal by providing a complete portfolio with solutions for different industries.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer:
Koenig

Country:
Austria

Year:
2016

Type of product:
Induction motor
Gearboxes
Geared motors

Scope of supply:
-

Application:
Bread making

Baking rolls on a large scale.

With an output of up to 45,000 rolls per hour, the KGV-H industrial bread roll line from the Austrian manufacturer Koenig sets new performance standards. It is fully designed according to hygiene stand-ards, which impose special requirements on the drive technology. Low-voltage motors from WEG and geared motors from WEG's subsidiary Watt Drive keep the dough moving. At the end of the process chain, the tasty baked goods – fresh rolls, baguettes, ciabatta, hamburger buns or other fine baked goods – drop onto the baking sheet. Koenig has been making machines for commercial and industrial bakeries for 50 years, with the main focus on the core competence of dough processing: dividing, forming and baking. The current product portfolio encompasses the entire production chain of bakery technology. In 2015, the world market leader in machines and systems for producing small baked goods was honoured with the international IBA Award for its new hygienic KGV-H bread roll line.

Hygiene: easy cleaning is key

The hygienic design of the bread roll line imposes especially stringent requirements on its components. For instance, the motors and geared motors must comply with the IP66 specification, which means they must be dust-tight with 20 mbar negative pressure inside the housing and protected against water jets. This ensures that they are reliable and failsafe with low maintenance effort in the entire production process, including hygienic cleaning of the entire line. All geared motors used in the machine are additionally equipped with thermal protection (TH/TF) and class F2 humidity protection. To avoid corrosion despite the high humidity level, the terminal box and fan covers of all motors are secured by screws with especially high corrosion resistance. The gamma ring seals on the fan end of the geared motors are also made from this special material.

Special paint

The paint for the motors (painting plan 212E) corresponds to paint structure LC5 of the geared motors, making it compliant with corrosion class C5-I/ C5-M of EN ISO 12944-5 (NDFT 320 µm). This elaborate painting scheme, based on multiple prime coats, is actually intended for shipbuilding and offshore applications and therefore able to withstand extreme environmental conditions. The bearing shield and the shaft at NDE, as well as the inside of the fan cover, are finished with this special paint. In food manufacturing, it is essential to avoid harmful foreign substances in the product. For this reason, the hygienic motors and gear units are painted in RAL 5010, a blue tint that is not present in any dough. This allows even small foreign objects in the food to be detected immediately. In addition, only food-compatible oils are used in the gear units.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer: **Koenig**

Country: **Austria**

Baking rolls on a large scale.

It starts with the dough

Every manufacturing process for small baked goods starts with mixing and kneading the dough. In the DW 240-H hygienic dual-shaft mixing machine, the dough is mixed by a WEG W22 induction motor with IEC 200L frame size and reinforced bearings, supplementary tropical insulation and special corrosion-resistant sealing.

Built to IP66 specification, the W22 motor can be switched to four or eight poles with a rated power of 27 or 17 kW, respectively. It drives two mixing tools with special twists, arranged at the optimal working angle relative to each other to enhance kinetic energy transfer to the dough. That shortens the mixing time and incorporates more air and oxygen in the dough.

Another pole-switching geared motor turns the dough bowl, which can hold up to 240 kg of dough. With a rated power of 1.5 or 2.5 kW, this motor produces a torque of 840 or 651 Nm, respectively.

Dividing and rounding

After mixing, the dough is placed in a pre-portioning hopper for further processing. This is where the Industrie Rex AW-H dividing and rounding machine comes into play – an essential component of the modular KGV-H bread roll system. Precisely divided dough portions are formed by starwheel rollers and conveyed to the weighing area by a dough pusher driven by a 250 W geared motor equipped with an adjustable safety clutch running in an oil bath.

Then the dough portions are fed out to a transfer belt. Here the motive power is provided by a smaller, unventilated 60 W geared motor with a rated torque of 254 Nm and an enclosed 5 Nm brake with IP66 protection in the weighing drum.

The dough portions are then rounded by an oscillating tumbler drum. The main drive of the dough dividing and rounding machine is a 4 kW geared motor with a rated torque of 747 Nm. Here the external fan and enclosed brake with 60 Nm braking force are also IP66 compliant. After rounding, the dough balls are fed out on the spreading finger belt and seeded with flour, on their way to the pre-prover, with the aid of a 120 W geared motor.

The transfer belt to the stamping station directly below the pre-prover is driven by a 370 W geared motor and a smaller 180 W geared motor.

Forming the rolls

All stamping, pressing and cutting processes take place in the first pre-prover of the bread roll line. This also includes stamping the cooled dough balls to give them the right shape, such as Kaiser rolls or other types of baked goods. The duster that prepares the dough balls for the stamping station is driven by a 120 W geared motor, while a stronger geared motor with a rated power of 1.1 kW, a torque of 158 Nm and a shaft speed of 57 rpm powers the stamping station mechanism. After this the dough balls pass through the forming station, where the processes are powered by another pair of geared motors with rated power of 120 W and 370 W, respectively.

The RR 1000 or RR 1300 dual rollout head is driven by two geared motors rated at 250 W and 120 W, re-spectively. The dough can be dampened and seeded after the final prover before transfer to the baking sheet at the end of the production sequence. Here as well, geared motors from Watt Drive ensure high throughput – as much as 50 per cent more than the usual commercial bread roll lines.

CASES - MOTION DRIVES

SEGMENT – FOOD & BEVERAGE

Customer: **Country:**
Koenig **Austria**

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CASES - MOTION DRIVES

SEGMENT – CERAMIC

Customer:
Oxford

Country:
Brazil

Year:
2016

Type of product:
Parmenent Magnet Motors + VFDs

Scope of supply:
16 W22 Magnet IE4
CFW11 VFD

Application:
Ball Mills

Oxford Porcelanas reduces consumption by 42% with new motors

Demand for electricity went from 69.7 MWh/year to 40.1 MWh/year, which also led to savings of R$6,600/year.

The Oxford porcelain industry achieved savings of 42.4% in electricity consumption after retrofitting the milling machinery at the factory in São Bento do Sul (SC). Consumption went from 69.7 MWh/year to the current 40.1 MWh/year, which also led to an annual financial reduction of R$ 6.6 thousand.

The modernization, led by WEG, focused on exchanging old electric motors for new ones of the W22 Magnet model, with 60 kW of power each and IR4 efficiency, which means a reduction of about 40% in losses in relation to the minimum established by national legislation of energy efficiency (Interministerial Ordinance 553/2005).

The production of the previous engines, which had 40 kW of power, spent BRL 15,600/year on electricity, while the new system spends around BRL 9,000/year. With total investments of R$ 15.9 thousand, the payback of the project was 2 years and four months.

> *Oxford understood the message of energy efficiency as not just a gain in energy itself, but also as an opportunity to improve the manufacturing process, so there was also a rationalization of the production process of the company's shifts, which decreased from 8 hours for 7 hours,* evaluated WEG Motors Unit Sales director Fernando Cardoso Garcia.

The factory cycles add up to 27 per month. Production reaches 34 million pieces annually. The project had its first study carried out in 2010 and was gradually implemented in the following years.

CASES - MOTION DRIVES

SEGMENT – CERAMIC

Customer: **Oxford**

Country: **Brazil**

The Motors

The replacements were implemented in 16 ball mills, installations destined to the grinding of materials for the production of porcelain, which previously had induction motors, considered traditional in the market.

> *Due to the heavy movement characteristic of the mills, we opted for new permanent magnet motors, indicated for large speed variations, with 20% more copper,* emphasized the director.

The increase in the use of copper was essential for increasing the efficiency of the equipment, as explained by the leader of the Sustainable Energy Program of the International Copper Association (ICA) for Latin America, Glycon Garcia. The association accompanied the implementation of the project at Oxford.

> *Copper, as an excellent conductor of electricity, makes the equipment work at lower temperatures, which, in addition to making them more efficient, increases the average useful life.* highlighted the executive. Standard induction motors have a useful life of around 20,000 hours, while permanent magnet motors usually have a life of 100,000 hours.

Another feature of the new equipment is the acceleration control performed electronically with a frequency variator, model CFW11, while the old ones had activation through direct starting. The benefit of the device is to allow smooth starting with constant torque, which reduces maintenance costs compared to older motors.

Enlargement

The project was extended to other machines in the factory, including ovens, fan pumps and others. In this second stage, 82 electric motors, also from WEG, were replaced.

> *Since this second project was an extension of the first, no diagnosis was made. But we have an estimated savings of around 13%,* said director Fernando Garcia.

The second phase, this time financed by Finame, was completed in 2015.

CASES - MOTION DRIVES

SEGMENT – OIL & GAS

Customer:
Oman Oil Company

Country:
Oman

Year:
2022

Type of product:
Flameproof Tube-Cooled Motors
MV Drives

Scope of supply:
4x Tube-Cooled Flameproof Motors
4x Medium Voltage Variable Speed Drives

Application:
Pumps

WEG delivered a Combined Solution to a major hub for crude-oil storage in the Middle East Region.

The Ras Markaz Storage Terminal in Oman is served by Flameproof Tube-Cooled Motors and Medium Voltage Drives designed and manufactured in Portugal.

The Government of Oman is expanding the country's crude-oil export capacity to become a global player in the oil storage market.

At the heart of this strategy, we find the ambitious project of the Ras Markaz crude-oil storage park that is being developed by Oman Oil Company subsidiary Oman Tank Terminal Company (OTTCO), located approximately 70km south of the Port of Duqm, Oman.

The new storage terminal has a strategic location on Oman's Indian Ocean coastline offering easy access to markets in South Asia, the Far East and Africa, as well as the Middle East, and will cover an area of 1,253ha with a total capacity of 200 million barrels of crude-oil upon its completion.

This facility is a critical element to position the Sultanate as a major hub in the region and a key link to the Duqm Refinery that also counts on WEG products (see about Duqm Refinery below).

This prestigious contract has been awarded to WEG Middle East – High Voltage Solutions Team, one of WEG group subsidiaries, for the supply of 4x Tube-Cooled Flameproof Motors, 4x Medium Voltage Variable Speed Drives and start-up and commissioning of the combined solution.

Design and manufactured in the Maia facility, Portugal, this complete solution is driving the large Crude Oil Booster Pumps that is be serving the Ras Markaz storage terminal operations. These pumps were supplied by Ruhrpumpen, one of the most efficient and reliable pump manufacturers worldwide.

CASES - MOTION DRIVES

SEGMENT – OIL & GAS

Customer:
Oman Oil Company

Country:
Oman

The main features of this supply are:

4x W22XdT Flameproof Tube-Cooled Motors
Description: W22XdT 900K/J 3400 kW 4 Poles 11000V B3R;
Marking: II 2G Ex db eb ia IIB T4 Gb;
Cooling: IC511 - Totally Enclosed Air-to-Air Cooled;
Starting: VSD.

4x MVW3000 Medium Voltage Variable Speed Drives
Description: MVW3000 A0225 V110 T5C 110 E A N F R D;
Input voltage (supply grid): 11000 V;
Output Voltage: 11000 V;
Maximum Output Current: 225 A;
Power up to approximately 3950 kW (based on 4P motor, with power factor of 0,87 and 97% of efficiency at full load);
Transformer windings made of copper;
With built-in earthing switch;
With cell bypass and redundancy;
Smart relays and several circuit interlocks.

WEG worked closely with all partners to ensure that the motors and drives met the customer project requirements. Among other decisive factors that resulted in the awarding of the contract, WEG's presence in the Middle East Region, commissioning, start-up and de-commissioning capacity served also as an important role on this project.

The complete solution was subject to a combined testing (string test) at WEG factory in Portugal, the WEG Center of Excellence for classified area products with a customer focused-approach and expertise in supplying customized solutions to major worldwide projects.

About Duqm Refinery (OQ8 Project):

WEG was also awarded with two project frame agreements by the international Joint Venture led by Técnicas Reunidas (Spain) and Daewoo Engineering and Construction (South Korea) covering all the Low Voltage and Medium Voltage products for the refinery process units, totaling over 1400 electric motors and nearly 200 VSDs. This project is part of the Omani government plan for the industrial development of the Special Economic Zone of Duqm, which includes the new grassroot refinery, with an overall investment of 15,000 million dollars in the coming 15 years and already includes a dry dockyard, harbour and related infrastructure such as roads and utilities. The refinery is the key project of the area and is operated by a Joint Venture between Oman Oil Company and Kuwait Petroleum (OQ8).

CASES - MOTION DRIVES

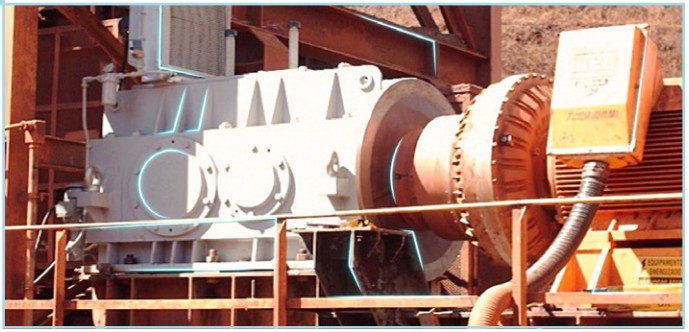
SEGMENT – MINING

Customer: VALE
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
Y58 Right Angle Gearbox
600 kW Induction Motor

Application:
Long Distance Conveyor



TYPE: Y58 Right Angle
RATIO: 16,225
MOTOR: 600 kW – 894 rpm
OUTPUT SPEED: 55.1 rpm

NOMINAL OUTPUT TORQUE: 260,000 Nm
NOMINAL INPUT POWER: 1,530.7 kW
SERVICE FACTOR: 2.6

SEGMENT – MINING

Customer: Beadell
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
E20 Parallel Shaft
55 kW Induction Motor

Application:
Belt Conveyor

TYPE: E20 Parallel Shaft
RATIO: 22.42
MOTOR: 55 kW – 1,200 rpm
OUTPUT SPEED: 53.3 rpm

NOMINAL OUTPUT TORQUE: 11,500 Nm
NOMINAL INPUT POWER: 65 kW
SERVICE FACTOR: 1.58

CASES - MOTION DRIVES

SEGMENT – MINING

Customer:
Taboca

Country:
Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
Y58 Right Angle Gearbox
600 kW Induction Motor

Application:
Belt Conveyor

TYPE: E32 Parallel Shaft
RATIO: 40.4
MOTOR: 280 kW – 1,800 rpm
OUTPUT SPEED: 44.5 rpm

NOMINAL OUTPUT TORQUE: 60,000 Nm
NOMINAL INPUT POWER: 150 kW
@ 1,800 rpm
SERVICE FACTOR: 1.9

SEGMENT – MINING

Customer:
CSN

Country:
Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
Y58 Right Angle Gearbox
1,000 kW Induction Motor

Application:
Belt Conveyor

TYPE: Y58 Right Angle
RATIO: 18.41
MOTOR: 1,000 kW – 1,150 rpm
OUTPUT SPEED: 62.5 rpm

NOMINAL OUTPUT TORQUE: 300,000 Nm
NOMINAL INPUT POWER: 2,236 kW
SERVICE FACTOR: 2.24

CASES - MOTION DRIVES

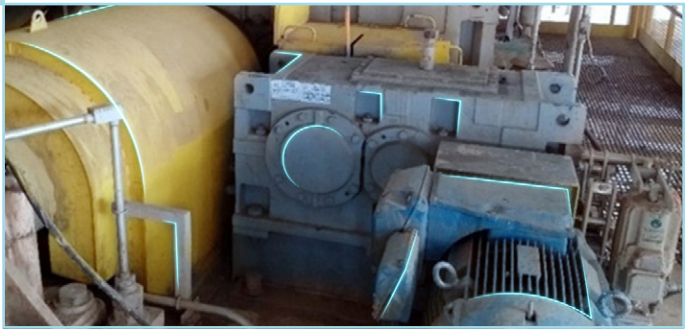
SEGMENT – MINING

Customer: Metso
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
E58 + E32 Parallel Shaft
3,600 kW Induction Motor

Application:
Ball Mill with auxiliary drive



TYPE: E58 + E32 Parallel Shaft
RATIO: E58 - 6 + E32 - 141
MOTOR: 3,600 kW – 1,190 rpm (E32) and 75 kW – 1,750 rpm (E20)

OUTPUT SPEED: 197 rpm
NOMINAL INPUT POWER: 7,635 kW for E58 and 81 kW for E20
SERVICE FACTOR: 2.12

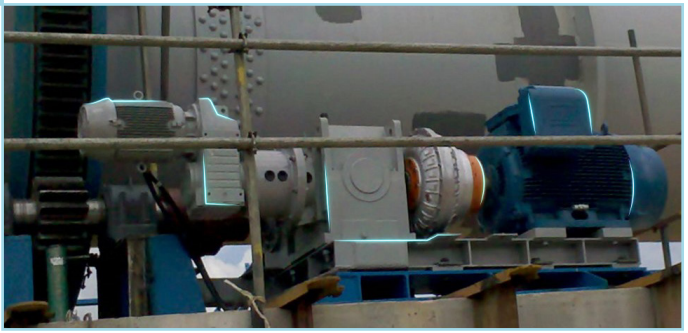
SEGMENT – MINING

Customer: B&A
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
E32 – 31.43 + V60 – 355.15
132 kW Induction Motor
18.5 kW Induction Motor

Application:
Rotary Kiln with auxiliary drive



TYPE: E32 + V60 Parallel Shaft + Fluid copling
RATIO: E32 – 31.43 + V60 – 355.15
MOTOR: 132 kW – 1,190 rpm (E32) and 18.5 kW – 1,770 rpm (E20)
and 18.5 kW – 1,770 rpm (E20)

OUTPUT SPEED: 34.86 rpm
NOMINAL INPUT POWER: 240 Kw for E32 and 48.7 kW for V60
SERVICE FACTOR: 1.82

CASES - MOTION DRIVES

SEGMENT – MINING

Customer: Usiminas
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
E40 Parallel Shaft
110 kW Induction Motor

Application:
Agitators and flotation cells

TYPE: E40 Parallel Shaft
RATIO: 82.4
MOTOR: 110 kW – 1,785 rpm
OUTPUT SPEED: 21.45 rpm

NOMINAL OUTPUT TORQUE: 120,000 Nm
NOMINAL INPUT POWER: 274 kW @ 1,800 rpm
SERVICE FACTOR: 2.5

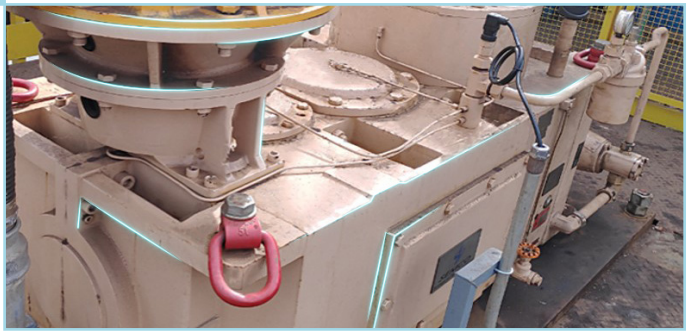
SEGMENT – MINING

Customer: VALE
Country: Brazil

Type of product:
Gearbox
Induction Motor

Scope of supply:
E32 – 31.43 + V60 – 355.15
132 kW kW Induction Motor
18.5 kW Induction Motor

Application:
Rotary Kiln with auxiliary drive



TYPE: E32 + V60 Parallel Shaft + Fluid copling
RATIO: E32 – 31.43 + V60 – 355.15
MOTOR: 132 kW – 1,190 rpm (E32) and 18.5 kW – 1,770 rpm (E20)

OUTPUT SPEED: 34.86 rpm
NOMINAL INPUT POWER: 240 Kw for E32 and 48.7 kW for V60
SERVICE FACTOR: 1.82

CASES - MOTION DRIVES

SEGMENT – MINING

Customer:
Minera Mantoverde

Country:
Chile

Scope of supply:
Motor (40%): 02 x W51 HD 5010H11
Gear (60%): 02 x WCG50 W11
Total: USD 215.000,00

Application:
Conveyor

SEGMENT – MINING

Customer:
COMESA

Country:
Peru

End-users:
COLQUIRI MINING (Bolivia)

Scope of supply:
Motor (47%): W50 700 HP 6P Frame NEMA 70
Gear (22%): Helimax 40 - 1 Stage
Soft Starter (31%): SSW700
Total: USD 230.000,00

Application:
Grinding mills

Special project with “Inching Drive” system: this system was designed to meet the customer’s need for the mills to operate at reduced speeds for cleaning and maintenance. For this, the motors was designed with a double shaft end, and the low speed reducer was attached to the back of the motor. Special electrical design of motors to meet torque, current and other criteria; Loyalty of the manufacturer that is present in several other mining companies in the country and in neighboring countries that will serve as a opportunities to increase the installed base, because the manufacturer, in addition to mills, manufactures crushers, conveyors and others.

CASES - MOTION DRIVES

SEGMENT – MINING

Customer:
Aceria Paz del Rio

Country:
Colombia

Scope of supply:
Motor (30%): W22 200 HP 4P Frame 315
Gear (40%): WCG50 W08
Soft Starter (30%): SSW07

Application:
Ball Mills

Second largest steel company in the country. The customer had an old installed base and opted for WEG as a benchmark for energy efficiency in the country. Important strategy to work with a local partner and offer the complete skid providing to the customer a completed solution. Also, a synergic work of engineering in Brazil for the supply of couplings;
Special project with “Inching Drive” system: this system was designed to meet the customer’s need for the mills to operate at reduced speeds for cleaning and maintenance;
The strategy of offering the complete solution + startup allowed WEG a great advantage over other competitors;

SEGMENT – CHEMICAL

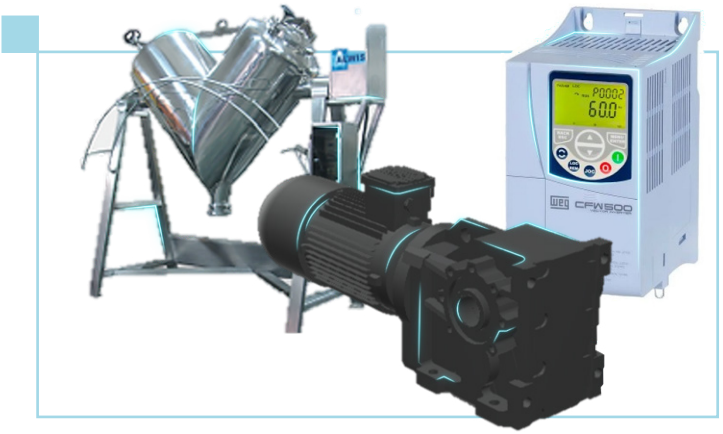
Customer:
ALWIS

Country:
Brazil

End-users:
ACHE, EUROFARMA, PFIZER and others.

Scope of supply:
Gearmotors (70%): WCG20 Conimax N07
Drives (30%): CFW 500 5 HP 380 V
Total: USD 3.240,00 per equipment

Application:
Mixer



ALWIS was one of the first suppliers of systems for the chemical industry, which gave us an opportunity for the gear motors. They bought geared motors from SEW and our inverter frequency CFW. After a few meetings, where we presented our differentials, we managed to convince them of an opportunity for a first 100% WEG machine;

In these meetings, we addressed mainly the interchangeability with the competitor, with no need to adapt the machine to receive our equipment and we also demonstrated the ease of working with a single supplier. Our equipment was accepted and the only reason we didn’t serve 100% of the machines was due to the requirement of some end users by SEW;

We also focus on the approval of our products for end users, in parallel with the work carried out in OEM’s.

CASES - MOTION DRIVES

SEGMENT – MATERIAL HANDLING

Customer:
Nedcranes

Country:
Netherlands

Year:
2020

Type of product:
Induction Motor + Gearboxes

Scope of supply:
4x WEG W22 IE3 30 kW motor
2x WEG W22 IE3 22 kW motor
1x WEG W22 IE3 7.5 kW motor
1x WEG W22 IE3 170 kW motor
5x Gearboxes

Application:
Crane

WEG retrofits port's overhead crane drive system in the Netherlands.

The repurposing solution guarantees new life and energy efficiency of the equipment.

WEG participated in the modernization of a port's overhead crane drive system in the Netherlands. The project involved dismantling an old crane, adjusting its track width and beam length and turning its cat around. A new hoisting solution was installed replacing DC motors with VFD driven alternating current (AC) motors. In addition, an energy recovery system was developed to convert gravity and braking into electricity to reduce energy costs. The supply was made in partnership with the company Nedcranes, who specialize in inspections and repairs to complete overhauls including maintenance of port cranes.

Understanding the need to determine indicators such as speeds, transmission ratios, pole pairs, magnetization currents and required braking power, Nedcranes invited WEG to be the main supplier. To retrofit this project, it was necessary to use WEG AC motors which have the advantage of already coming with a gearbox, as well as other accessories.

According to the WEG team, this type of project is always customized and all steps must be properly coordinated. After identifying loads, speeds and weather conditions such as wind and rain, WEG selected the most suitable motors from its portfolio. In total, 4 x 30 kW motors for crane movement, 2 x 22 kW trolley motors, a 7.5 kW motor for the lifting device and a 170 kW motor for the winch were provided. All motors, except for the winch motor, are equipped with gearboxes and mechanical brakes, this last one being a standard safety requirement in the world of cranes.

WEG's solution brings additional benefits to the project, all motors are W22 IE3 Premium Efficiency and the whole set is low noise, which is another important consideration, since the Railport Brabant rail terminal is located near a residential area. Van Beijnen, senior project manager at Nedcranes, adds:

> *"In the crane market, you must find balance, not only in terms of severity, energy, technology and costs, but also in terms of partners with whom you perform this type of large-scale projects. Fortunately, we found that in WEG solutions."*

CASES - MOTION DRIVES

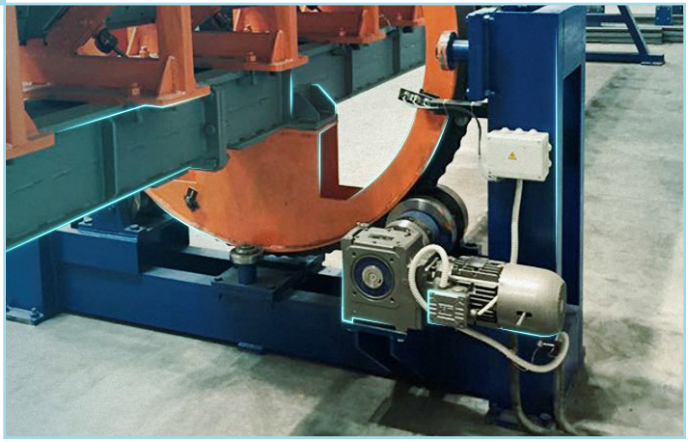
SEGMENT – MATERIAL HANDLING

Customer:
Pnevmaticheskie

Year:
2019

Type of product:
Geared motors (MAS and WG20)

Scope of supply:
180 helical worm (MAS line) and parallel shaft (MAS and WG20 lines) geared motors from 0.18 kW up to 3 kW.



Application:
Cranes

WEG Branch in Russia supplied geared solutions to a key train car builder.

Geared motors were manufactured at WEG facilities in Austria.

A partnership between WEG and the OEM - Pnevmaticheskie sistemy became a great reference for the company in the Russian market in the railroad segment with the supply of over 180 helical worm (MAS line) and parallel shaft (MAS and WG20 lines) geared motors, ranging from 0.18 kW up to 3 kW.

The final equipment driven by the WEG geared motors were supplied to the end user Tverskoj Vagonostroitelnyj Zavod (TVZ, manufacturer of train cars) by the OEM company who designed and produced the metal constructions for automatic welding scaffoldings as well as welding manipulator mechanisms.

For WEG this is an outstanding opportunity to participate in the railroads segment and to get actually involved with the described applications as well as to show the customers the reliability of WEG solutions. Currently, the OEM is satisfied with the supplied geared motors and has been cooperating with WEG on new ongoing projects related to the train cars manipulators installed in Zone 2 + 22 areas.

Pnevmaticheskie sistemy came to be a regular WEG customer, after the first supplies in the beginning of 2017. Nowadays, the OEM is loyal to WEG, visits WEG on a regular basis to discuss further opportunities and makes good volumes for gearboxes and geared motor product ranges. For the end user TVZ, the performance and capacity have increased and they are able to handle and process bigger volumes of train cars during the manufacturing process. All supplies made to him are related to factory increasing capacity and refurbishing old equipment.

Product quality, flexibility and price were the key points for the customers to select WEG and for the success of the project. For 2019, orders of 24 pieces of MAS Helical worm brake geared motors for Zone 2 + 22 (ATEX Zone) + 24 pieces of WG20 Parallel shaft brake geared motors for Zone 2 + 22 (ATEX Zone) are already confirmed. The WEG Branch team keeps visiting the customers on a regular basis to monitor the implemented solutions in operation and strengthen business relationship.

CASES - MOTION DRIVES

SEGMENT – MATERIAL HANDLING

Customer:
Global Logistics Co.

Country:
USA

Year:
2022

Type of product:
W22 motors, gears, drives

Scope of supply:
CFW500
WG20 Gears
Electric Motor with C-face and Stearns brake

Application:
Conveyor belt

CASES - MOTION DRIVES

SEGMENT – PLASTIC

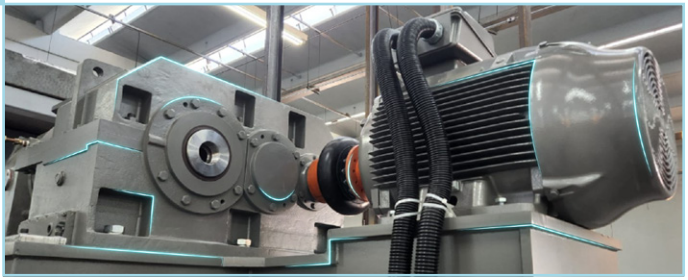
Customer:
RULLI STANDARD

Country:
Brazil

End-user:
NORFLEX (Plastic Film Maker – Stretch and Silage Film in Hudson, US).

Scope of supply:
Motor (25%): WMAGNET – 50 HP, 75 HP, 100 HP, 125 HP and 150 HP
Gear (50%): Helimax – E16, E18, E23 and E25
Panel (25%): Electric Panel

Application:
Extruder



Rulli uses our equipment in several machines, such as simple extruders and two- or three-layer coextruders, which are the company's main products;

As one of our main customers for this line of motors, they have standardized WMagnet motors for all extruders and use the energy efficiency discourse as an additional argument for their commercial team;

Bearing in mind that we are the main, if not the only, manufacturers of this type of motor, we are loyal to the manufacturer that is present in several plastics companies in the country and in neighboring countries, which will serve as an opportunity to increase the installed base.

For Rulli, we are exclusive suppliers of automation and motors, and we are working to also achieve 100% of the account in gearboxes and geared motors.

In 2022, approximately 60 machines were sold but not all of them had this set, this is the biggest set they buy, about 30% of the 60 machines use these items.

The remaining 70% are assorted in smaller sizes.

Rulli has already sold 3 machines to Norflex with this same set.

CASES - MOTION DRIVES

SEGMENT – PLASTIC

Customer:
VALMART

Country:
Brazil

End-users:
Plastic films manufacturers in Latin America

Scope of supply:
Motors (20%): 2 x W22
Gear (20%): 2 x MAGMA
Automation (60%): CFW 500, IHM

Application:
cutting and welding machine

Flexible plastic packaging segment. Founded in 2004. Client also exports machines to Africa and Latin America. WEG Partner – carries out important synergistic work, including with Digital.

SEGMENT – PLASTIC

Customer:
FERRETI

Country:
Brazil

End-users:
polypropylene film manufacturers

Scope of supply:
Gearmotors (40%): 3 x GSA41 with motor W22 1/2 cv / 1 x GSA51 with motor W12 1/6 cv; 1 x GH70 with motor W22 40 cv
Automation (60%): CFW11, CFW700, IHM, contactors, circuit breakers

Application:
Extruder

CASES - MOTION DRIVES

SEGMENT – OEM

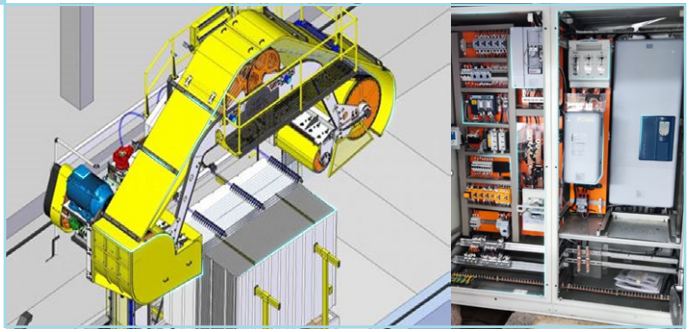
Customer:
RAMOS UNIVERSO

Country:
Brazil

End-users:
Granite and Marble suppliers

Scope of supply:
Motors (25%): W22 300cv
Gear (15%): WCG20 Conimax N05 e WCG20 Conimax N07
Automation (60%): CFW11, PLC300, IHM CTM352X, circuit breaker and contactors

Application:
multi-wire cutting machine



For this customer, WEG has been the exclusive supplier of motors for 05 years, Gearboxes we have been exclusive since Nov/2022 and Automation started supplying in Oct/2022 (already supplying 50% of the customer's programming).

SEGMENT – OEM

Customer:
HVLS fan manuf.

Country:
USA

Year:
2022

Type of product:
Geared motors, gears, drives

Scope of supply:
CFW300 and CFW 500
WG20 gears

Application:
High volume low speed fan

CASES - MOTION DRIVES

SEGMENT – SUGAR, ETHANOL AND ENERGY

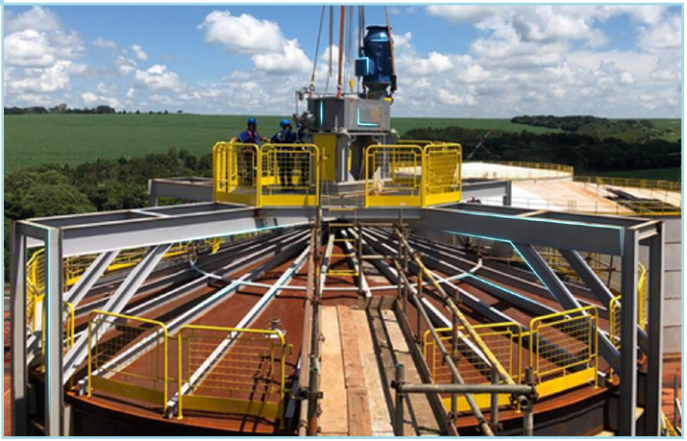
Customer:
i9Tech

Country:
Brazil

End-user:
RAIZEN (largest ethanol and bioenergy company in Brazil)

Scope of supply:
Motors (30%): W22 350 HP 4P Frame IEC 355
Gearmotors (70%): 12 x Helimax E54
04 x WCG50
05 x WCG20

Application:
Mixer bagasse hydrolyzer for e2g (Second Generation Ethanol)



Raízen is the principal group of Sugar and Ethanol in Brazil. The company invest a large amount in the E2G (Second Generation Ethanol) projects.

Synergic development between the OEM's engineering (i9Tech) and equipment supplier (WEG) to design the appropriate technical solution in gear boxes to the mixer hydrolyzer application.

Preference in WEG equipment in the Raízen group across more than 30 plants in Brazil. A reason for trust in our brand.

CASES - MOTION DRIVES

SEGMENT – SUGAR, ETHANOL AND ENERGY

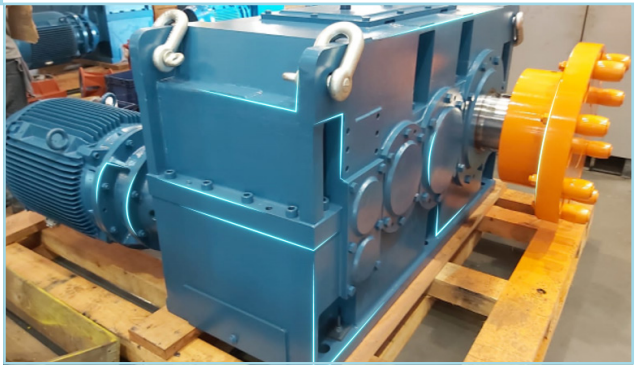
Customer:
AGSA (WEG distributor in Bolivia)

Country:
Bolivia

End-users:
INGENIO AZUCARERO GUABIRÁ (in Bolivia)

Scope of supply:
Motor (10%): W22 125 HP 4P Frame 280
Gear (75%): Helimax E50
Drive (15%): CFW11

Application:
Table cleaning system



The Customer is the largest sugar mill in Bolivia and employs more than 50.000 people in the country's production chain. Synergic development between the local Distributor (AGSA) and WEG in visiting the end customer; Competitive costs, strength and solidity of the WEG name in South America and Knowledge and of applications in the sugar and alcohol segment were decisive in closing the complete package; The strategy of offering the complete solution + support of local Partner are the great advantage over other competitors; Productive and technical capacity verified with a visit to the WEG factory in Monte Alto - SP – Brazil;

CASES - MOTION DRIVES

SEGMENT – CEMENT

Customer:
SBM Mineral Processing

Country:
Austria

Year:
2015

Type of product:
K Series gears; Helical bevel geared motors

Application:
Conveyor belt

Drives for construction machinery: reliable raw material feed in mobile concrete mixing plant.

Mobile EUROMIX concrete mixing plants from SBM Mineral Processing (SBM), a member of the international MFL Group, which is headquartered in Oberweis (Austria), enable economical concrete production and processing directly on site. SBM consistently relies on drive systems from WEG to drive a variety of conveyor belts in its mobile mixing plants. This includes the extremely mobile EUROMIX 400C plant.

SBM specialises in the development and production of concrete mixing plants and in processing and conveying systems for the natural stone and recycling industries. The Austrian company is a full-service supplier in the ready-mixed and prefab concrete sector and has both mobile and stationary concrete mixing plants in its product line. The supermobile EUROMIX 400C unit is one of the company's special solutions and boasts its own electrical generator for fully autonomous operation. It is compact, powerful and has approval to be transported via the public highway.

The Dutch recycling company Van Gansewinkel uses the EUROMIX 400C to process materials such as excavated soil, bottom ash, sludge and sieved sand into concrete suitable for long-term storage. The plant operates in continuous operation with an effective production capacity of more than 400 t/h. For the 400C model as for other EUROMIX plants, SBM relies on geared motors from WEG for the conveyor belt drives.

Hard work in construction

Several conveyor belts with reliable drive systems are necessary for smooth operation of the concrete mixing plant. The aggregate is weighed and dispensed according to the desired concrete grade and fed to the steep-angle conveyor belt, which in turn transports the material to the double-shaft mixer. Cement, water and the necessary additives are fed directly into the mixer. The resulting concrete can be taken away by lorry or by ready-mix concrete trucks.

Extreme operating and environmental conditions, high availability and optimal plant use impose high demands on the drive systems. The geared motors must be protected against humidity as well as extreme dust loading. Along with robustness, reliability is especially crucial for job-site operation. Particularly for motorway or tunnel construction, a continuous supply of concrete is essential. The compact design and high mobility of the EUROMIX 400C also requires low-profile gear units with flexible mounting options.

CASES - MOTION DRIVES

SEGMENT – CEMENT

Customer:
SBM Mineral Processing

Country:
Austria

Compact powerhouses

The drive technology from WEG used in the SBM mixing plants includes various types of gear units from the K Series with torque ratings from 2,700 to 20,000 Nm. The EUROMIX 400C has a pair of helical bevel geared motors (type KUA 85A 70 134M4) rated at 7.5 kW for the two dispensing belts and an angle parallel shaft geared motor (type CSA 80A 70 161M4) rated at 11 kW for the steep-angle conveyor belt. • Helical bevel geared motors: efficiency class IE2, speed 22 rpm at 50 Hz, torque 3,274 Nm, controlled by frequency inverters and housing in UNIBLOCK design. Included motor options: humidity protection, condensation bores, temperature control (PTC), forced ventilation and protective covers.

Angle parallel shaft geared motors: efficiency class IE2, speed 80 rpm at 50 Hz, torque 1,321 Nm, controlled by frequency inverters and housing in UNIBLOCK design. Included motor options: humidity protection, condensation bores, temperature control (PTC), forced ventilation, protection covers and modular backstop.

Versatile, compact and reliable

The reliability and high quality of the geared motors from WEG reinforce the confidence of SBM's customers in the availability and productivity of the SBM concrete mixing plants. Low maintenance, robustness and long life are especially crucial attributes of drives for mobile use in job-site conveyor systems. The combination of high operational reliability and outstanding versatility makes the modular drives units from Watt Drive an optimal solution for flexible, demanding applications such as the EUROMIX 400C. There's a good reason why SBM relies on gear systems from WEG for all EUROMIX plants.

The combination of high operational reliability and outstanding versatility makes the modular drives units from WEG an optimal solution for flexible, demanding applications such as the EUROMIX 400C.

Current EUROMIX references A current project employing the combination of SBM concrete mixing plants and WEG technology is the 4.4-km Götschka Tunnel on the S10 motorway in Austria, which forms the traffic corridor between Linz and Prague. Here three mobile EUROMIX plants (types 2000, 3000 and 4000) will produce a total output of 300,000 m3 of concrete from spring 2012 to 2015. The plants operate 24/7 regardless of season and weather, and thanks to its high-quality configuration – including K-Series gear units from WEG – they fulfil the demanding Austrian specifications for tunnel construction. WEG and SBM are also partners in the on-going construction of the S10 motorway in Austria, where a EUROMIX 4000 with conveyor belts powered by reliable WEG technology produces concrete for the motorway substructure.

CASES - MOTION DRIVES

SEGMENT – TIMBER INDUSTRY

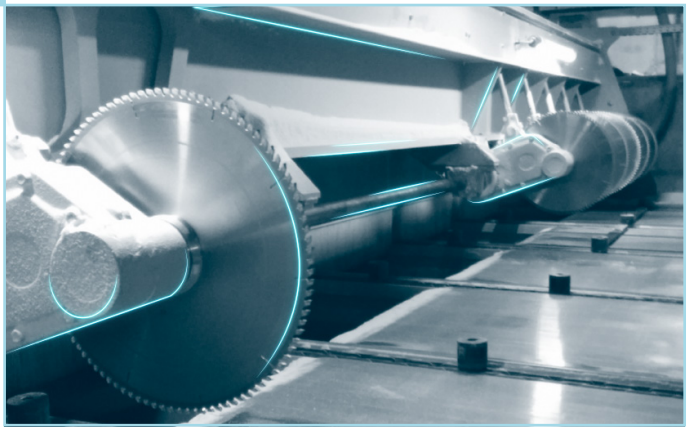
Customer:
Springer Group

Country:
Austria

Year:
2015

Type of product:
Helical bevel geared motors; W22 motors

Application:
Beltless trimmer



Trimmed to perfection: Beltless drive for the woodworking industry

The Springer Group, Austrian specialist in machinery and conveying systems for the timber industry, offers timber producers an innovative machine concept with the E-CUT 200 trimmer. The core of the innovation consists of electrically operated geared pivot saw arms – the first ever without belts. They were developed by Austrian gear unit specialist and drive manufacturer WEG. The E-CUT 200 also incorporates helical bevel geared motors and W22 induction motors from WEG.

The Springer Group, with headquarters in Friesach (Austria), is an international manufacturer of machinery and conveying systems for the timber industry, including log yard systems, planning machines, sawn timber sorting machines and production systems for woodworking. As the first electrically operated beltless trimmer, the E-CUT 200 represents a revolution in the timber industry in terms of drive type, operation and maintenance.

The novel crosscut saw arms are electrically operated, giving them higher efficiency than comparable models with hydraulic or pneumatic drive. The well-defined, precise operating curve enables optimal control of the crosscut saws and exact positioning of the saw blades in every sawing process. The E-CUT 200 is equipped with 21 saws in 300 mm modules as standard and designed for timber with standard lengths up to six meters and thicknesses up to 100 mm.

The challenge: beltless drive

Conventional trimmers operate with belt drive, resulting in high belt wear due to wood dust. To reduce wear and simplify maintenance, Springer aimed to develop a novel beltless geared pivot saw arm. They also wanted the trimmer to set new standards for precise cutting and temperature immunity

Our customers expect technologically mature solutions from us that sustainably improve their production processes. As the first electrically operated beltless trimmer, the E-CUT 200 puts an end to the weaknesses of conventional trimmers. The basis for this innovative solution is the special gear unit from WEG, explains Egon Eisner, Engineering Manager at Springer.

CASES - MOTION DRIVES

SEGMENT – TIMBER INDUSTRY

Customer:
Springer Group

Country:
Austria

Springer turned to WEG for the special beltless gear units. Based in Markt Piesting, the company specialises in the development and production of gear units and geared motors. WEG also offers full range of electric motors and automation products. WEG designed and produced a completely new drive system for each saw. It consists of the innovative trimmer gear unit, a helical bevel geared motor, and one or two W22 motors for the main drive, depending on the configuration. Before the definitive product launch of the E-CUT 200, the trimmer was tested for more than 1,000 hours under practical conditions with the new drive system.

Special solution: geared pivot saw arm In the E-CUT 200 the saw blades are turned by centrally positioned, external electric motors through the pivot arms, which are uniquely implemented as beltless gear units. The individual saws are operated by electrically actuated crank mechanisms with pushrods. This electrical operation allows the motion of the individual saws to be controlled precisely, independent of temperature variations. The sturdy pushrods prevent any damage to the mechanism from the motion of the trimmed timber. The trimmed lengths fall freely through a large chute onto an underlying conveyor belt for removal.

The circular saws are driven by one or two four-pole W22 IE2 motors with frame size IEC225 (model 225S/M-04). With a rated power of 37 kW each, the motors drive the input shaft of the special gear units via V-belts. The gear unit cases are made from nodular cast iron for especially high strength and resistance to ambient conditions, which is essential for the harsh operating conditions in the timber industry.

With a torque rating of 593 Nm, the special gear units have a gear ratio of 2.42 to boost the blade speed. This gives a circular saw speed of 3,570 rpm with a four-pole motor speed of 1,475 rpm. However, the circular saw speed can also be changed to 4,307 or 4,748 rpm to meet specific customer requirements. This is achieved by a V-belt transmission with various sizes of belt pulley. The special gear units are specifically designed for high ambient temperatures up to +50°C and are especially well sealed for operation in dusty environments. All covers are additionally glued in place. Each of the circular saw blades is raised and lowered by a 3-kW helical bevel geared motor equipped with forced-air cooling and a brake (model KUS 60A 70 91L4 TH BR20 FL), which is controlled by a variable-speed drive. These drive units can optionally be fitted with incremental encoders.

Lower wear and minimal maintenance The new geared pivot arms dramatically reduce machine wear and maintenance effort by eliminating the drive belts, which were previously prone to wear due to the high dust burden. That yields material and cost savings for the plant operator. The E-CUT 200 also scores well for ease of maintenance with the new drive concept. All drive components are mounted externally, so they can be accessed easily and safely by service technicians without opening the actual trimmer. It is fitted with a newly designed dust enclosure with linear travel that is especially compact and additionally enables unrestricted access to the machine‘s maintenance bridge. That facilitates fast, uncomplicated saw blade exchange. “We are an innovative family business. To be successful internationally in plant engineering for the woodworking industry, we have to conttions. The E-CUT 200, which is a revolutionary product in the trimmer market, is a good example of our innovation strength. We are pleased that WEG played a role in making this technological solution possible”, says Timo Springer, CEO of Springer Maschinenfabrik AG.

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY

Customer:
ArcelorMittal

Country:
Luxembourg

Year:
2015

Type of product:
Helical bevel geared motors

Application:
Rolling mill

Hot steel - Cool gears: Upgrade of a straightening unit in the steel industry.

WEG helical bevel gearboxes are being used in a new straightening unit at steel producer ArcelorMittal's plant in Belval, Luxembourg. The project was carried out by engineering company TBR casting technologies (part of the Inteco Group). The Type K139 gearboxes prove that compactness and robustness can deliver with high performance.

With annual steel production of 130 million t and around 245,000 employees, ArcelorMittal is one of the world's largest steel producers. At its plant in Belval, Luxembourg, ArcelorMittal wanted to convert one strand on a six strand caster to a new casting format, the Beam Blank 4 (BB4). The requirements for this strand included a new straightening unit in order to be able to cast the BB4 format, which is around 30% larger than the previously biggest format, which will continue to be produced on the other five strands (BB3). The new casting format is intended mainly for the production of girders as well as special profiles in the downstream rolling mill. The annual production of the BB4 strand is planned to be around 100,000 t of steel.

ArcelorMittal contracted engineering specialist TBR (previously Technisches Büro Rumpler) Casting Technologies to modify the plant. TBR, an innovative engineering company for customer-specific, high-end solutions for the metallurgical industry, took care of the engineering, planning and delivery of the components such as the mould, segment comprising secondary cooling and straightening unit. The decision was made to install the K139 helical bevel gearbox to drive the straightening rollers. WEG delivered five of these models as geared motor units, four of them for use on the straightener and one as a spare.

Compact, robust design essential

The drives are designed for a maximum ambient temperature of +100°C without additional oil cooling. At the client's wish, Hot steel - Cool gears: Upgrade of a straightening unit in the steel industry 3 WEG's developers also fitted a water cooling system. The water cooling system ensures a lowering of the oil temperature by means of internal gear pipework. At these high temperatures, special motor and gearbox seals are also required. Here, WEG used temperature-resistant shaft seal rings (Viton) on hardened running surfaces. The almost 100 mm wider BB4 format results in extremely cramped conditions between the strands with the strand spacing kept unchanged. Thanks to the especially compact, slim design of the WEG gearboxes, it was possible to implement the new straightener alongside the existing five strands.

> *The comparatively slim design of the K139 gearbox was a fundamental prerequisite for creating a reliable and easy to maintain straightener,* Leonhard Paar, Engineering Manager at TBR Casting Technologies explained.

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY

Customer:
ArcelorMittal

Country:
Luxembourg

A gearbox for all occasions With its application-specific, customised helical bevel gearboxes for the driving rollers in ArcelorMittal's new straightening unit, WEG has demonstrated that its gearboxes can be quickly and precisely customised to extremely demanding applications. Thanks to their robust, compact design, the K139 models supplied meet all application-specific requirements while being especially easy to maintain. The partnership with TBR Casting Technologies could soon be repeated as it is anticipated that a further strand at ArcelorMittal Belval will be converted.

Technical features of K139 helical bevel geared motors: - Drive power: 5 kW - Torque: 17,580 Nm - Rotation Speed: 2.2 rpm at 50 Hz - Designed for frequency inverter operation - Integrated 100 Nm temp.-resistant brake with manual release - Customised water cooling system - More prominent and easy to read oil level indicator - Additional special expansion tank or oil expansion chamber - Units delivered: 5

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY – MATERIAL HANDLING

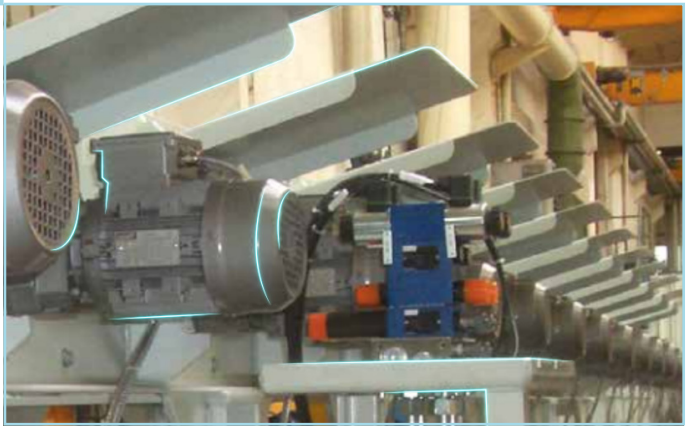
Customer:
Braun

Country:
Italy

Year:
2015

Type of product:
68 x geared motors

Application:
Cut-off machine stainless steel mill



Complex material handling task in a stainless steel plant.

Braun Maschinenfabrik („Braun“) has supplied a complete abrasive cut-off machine for hot cutting of radially forged bars at a stainless steel plant in Bolzano, Italy. To integrate the machine in the forging line, Braun had to completely review the material handling process and installed 68 geared motors from WEG on the implemented, fully automated conveyor solution.

Set up in 1848, Braun is a family-owned business which is currently centred on three fields: hydraulic steelwork, steel cutting and grinding machines, and concrete cutting and drilling machines. The company, whose headquarters are in Vöcklabruck, Austria, is one of the leading international manufacturers of state-of-the-art high-performance abrasive cut-off machines for cold and hot cutting, and high-pressure grinding machines for steel and non-ferrous metals. Customised material handling and automation systems, together with professional design engineering and comprehensive after-sales support complete the service package for the steel industry.

To drive the various units of the specially developed material handling system, which Braun implemented together with a TS 12 W type abrasive cut-off machine in the stainless steel mill - operated by Acciaierie Valbruna S.p.a. („Valbruna“) in Bolzano - the firm installed various Watt Drive geared motors.

Tricky handling task

The abrasive cut-off machine in Bolzano was integrated by Braun in an existing forging line. Its task is to cut off the ends of the hot forged parts upon completion of the forging process. Previously, finished forged pieces 2.5 to 5.5 m in length were unloaded by the forge manipulator, transferred onto a roller table running parallel to the system, and then ejected as single steel bars. Longer forged pieces between 5 and 13 m in length were grasped by a simple device behind the manipulator and pushed out using the manipulator.

One challenge for the new design of the material handling system was the limited transfer height of 0.5 m for the forge manipulator, because the roller table on the abrasive cut-off machine was substantially higher, at 1.09 m. The aim here was hence to move the forged pieces from both the unloading positions onto a single roller table line at the same height as the table at the abrasive cut-off machine.

> *The compact, modular design of the WEG geared motors enable us to deal with many new and above all complex tasks in the field of material handling for our high-performance abrasive cut-off and surface grinding machines,* said Stefan Purrer, the head construction and project engineer for steel cutting and grinding machines at Braun.

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY – MATERIAL HANDLING

Customer:
Braun

Country:
Italy

Two paths, one goal.

Several new conveyor system designs were required to implement the ambitious handling process. Firstly, the 2.5 to 5 m long forged pieces are now fully automatically moved on by a material transfer device consisting of four transport carriages from the unloading roller table to the height-adjustable roller table located 3.5 m away, or placed in one of five buffer positions.

The larger forged pieces 5 to 13 m long are now fully automatically taken out of the forge manipulator by a material transfer unit applying power and guide rollers and placed continuously on the height-adjustable roller table. The locking movement is provided by hydraulic cylinders with synchronized controls and the conveyor rollers are driven electromechanically. The latter drive systems consist of two WEG K75 type helical-bevel geared motors with power ratings of 3 kW. The geared motors feature protection class IP55 and provide a reduction ratio of i=51.02 with an output speed of 28 rpm and an output torque of 1,012 Nm.

Compensation of the height difference.

The height-adjustable roller table, which is about 11.5 m long, removes the shorter forged pieces from the transport carriages using a lifting movement, featuring electromechanical onward movement and lifting movement using hydraulic cylinders. It picks the longer forged pieces up directly from the drawing unit. All the forged pieces are then moved by the height-adjustable roller table from the outlet height of 0.5 to 1.09 m, the level of the roller table at the abrasive cut-off machine.

The materials are carried by 17 individually electromechanically driven rollers. There, and on the cut-off machine feed and outlet roller tables as a whole, 59 identical WEG A46 type shaft-mounted geared motors with a power rating of 0.75 kW each are used, two of which have incremental encoders (1,024 HTL). With an output torque of 106 Nm and a reduction ratio of i=20.86, the geared motors run at a speed of 68 rpm. Due to the large amounts of heat generated during hot cutting, the drives are specially designed to operate in surrounding temperatures of up to +60°C and are also fitted with a temperature control (bimetal switch).

The lifting movement of the height-adjustable roller table is also provided (very economically) via an electromechanical system powered by a WEG F131 type parallel shaft geared motor with a power rating of 15 kW. The drive system features a spring-loaded brake (holding brake) with a braking torque of 100 Nm and through the reduction ratio of i=76.05 selected, it produces an output torque of 7,462 Nm.

> *The automation technology for the synchronisation of these three interrelated material handling units, together with the interface with the existing radial forging machine, constituted a particular challenge in this project, explained Purrer. We really appreciate WEG's expert support and high levels of supplier reliability. Together with their short delivery times, these also contribute to our ability to deal with such ambitious projects efficiently. Over and above that, we can guarantee the highest levels of availability for our customers thanks to the use of high-quality Watt products.*

Finally on to the cooling bed Upon completion of the abrasive cutting procedure, the forged pieces are taken out of the machine and moved on for cooling to the chain conveyor or the chain vat. The chain conveyor drive systems, two F111 type parallel shaft geared motors with a power rating of 3 kW each, are designed to operate in surrounding temperatures of up to +60°C, and are fitted with a temperature control (bimetal switch). For gradual cooling of the forged pieces, the geared motors have a reduction ratio of i=207.08, with a speed of just 7 rpm. The space-saving modular Watt geared motors enable very fine speed adjustments, even at low speeds. For example, the two six-pole F137 type parallel shaft geared motors of the chain vat swivel drive with a power rating of 1.5 kW run considerably more slowly, at 1.4 rpm. To prevent the forged pieces from falling, the motors are fitted with brakes giving a braking torque level of 20 Nm.

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY – MATERIAL HANDLING

Customer:
Binder+Co

Country:
Austria

Year:
2021

Type of product:
68 x geared motors

Application:
Cut-off machine stainless steel mill

Economic screening with a decentralised drive.

Based in Gleisdorf, Austria, Binder+Co can look back on a company history that spans over 125 years. Today, the Austrian machinery manufacturer is a global market leader in technologies for processing raw and recycled materials. The company offers its customers solutions for no less than six different process steps – from crushing, screening and wet processing to thermal processing, sorting and packaging/palletising. The product portfolio ranges from standalone systems to turnkey processing plants for the mining and recycling industries. A company where innovation is always given pride of place, Binder+Co is rightly proud of technologies such as the world's first sensor-based system for sorting glass cullet (by colour and contaminations), an industrial-scale solution for sorting glass ceramics (also a worldfirst), the fastest high-performance machine in open-mouth bagging and screening solutions for bulk materials typically difficult to screen, such as damp coal or recyclables.

Economic processing for a wide range of difficult-to-screen material

With around 65 years of experience in screening systems, the company has been supplying the world with its proven BIVITEC flip flow screening machine for decades. As part of product range expansion plans, the company was aiming to develop an even more cost-effective solution for its customers in terms of both the initial investment and operating costs. The new machine needed to be able to cover a wide range of applications, from screening sand, gravel, crushed stone, salt and ores to handling a variety of tasks in recycling, while providing support for sorting waste electrical equipment, plastic waste, glass cullet and compost or wood classification.

To achieve this, processing specialists Binder+Co combined the features of their resonance screening machine – which uses mass balancing to keep dynamic loads low for a lightweight design – with the proven flip flow system. This new BIVITEC e+ flip flow screening machine also needed a drive system that was capable of providing optimal support to Binder+Co in achieving its goals. Here, the Austrian company decided to make use of its long-standing and successful relationship with WEG to achieve an optimum solution.

Significant benefits with a decentralised approach to systems Four-pole WEG three-phase motors with an efficiency class of IE3 are used to drive the eccentric drive on the BIVITEC e+ via a V-belt. The decentralised variable frequency drive mounted directly on the motor can then be used for continuous adjustment of motor speed and to achieve smooth ramp-up performance. This approach to system design from Binder+Co offers a number of advantages. The first benefit is seen in the motor power required for the flip flow drive – the use of a VFD means this can be significantly reduced. Instead of the 11 kW motor used in a comparable conventional BIVITEC machine, only a 4 kW motor is required for this new screening machine. This enables users to achieve operational energy savings of over 60 percent.

CASES - MOTION DRIVES

SEGMENT – STEEL INDUSTRY – MATERIAL HANDLING

Customer:
Binder+Co

Country:
Austria

The variable frequency drive also allows operators to easily adjust vibration characteristics to the task in hand. This is a key benefit, since the material to be processed or the composition of input materials may change in terms of moisture content or 'screen ability', for example. Virtually at the press of a button, the screening machine's vibrator dynamics can be varied between gentle and vigorous to suit the current application. To do so, the operator simply alters the motor speed.

A plug-and-play screening machine solution.

The decentralized drive system also means that Binder+Co can offer its customers a plug-and play solution. An external switch cabinet with motor cables is not needed: instead, the machine is programmed and parameterized as a turnkey unit. The new model is also easy to integrate into end customers' existing machinery. In terms of the motor, material processing specialist Binder+Co opted to use the voltage switchable EUSAS (EUROPE, USA and ASIA) motors from WEG. These motors feature a wide range winding design that offers the possibility of switching between as many as four separate voltage levels (wye, delta, wye/wye and delta/ delta). With certification that includes CE, CSA, UL and EAC, the motor is designed for use worldwide – so Binder+Co can also export its screening machine anywhere in the world as standard.

The motors are also ideal for operation with electronic speed control: with an 87/100/120 Hz voltage/frequency characteristic, these can be operated in VFD mode even without any special windings. This approach means that rated power can be doubled without risking a motor thermal overload. The series model features a bimetallic strip and PTC thermistor protection to provide robust thermal protection. Thanks to the blanket agreement signed with WEG, Binder+Co simply calls off motors with various outputs from 2.2 to 7.5 kW as needed when constructing their screening machines. The variable frequency drive used is the MW500 from WEG, which is available for motor powers ranging from 0.12 to 9.2 kW. The heavy-duty housing design with an IP66 and NEMA 4X rating means that the VFD can be attached directly to the motor terminal box frame. The MW500 features an integrated PLC (SoftPLC), which avoids additional space and costs for an external PLC. An EMC filter conforming to EN 61800-3 is integrated into the unit. The variable frequency drive can handle a high overload of 150 percent for 60 s every 10 minutes and deployed with motor mounting.

Ambient temperatures up to 50°C. For user-friendly operation of the MW500, Binder+Co is using the CFW500 remote control. Efficient screening made easy "At Binder+Co, innovation doesn't simply mean inventing new machinery," explains Franz Anibas, Head of Engineering at Binder+Co:

> *"we also want to give our customers the opportunity to make the most of their valuable raw materials and recyclables during processing. With the BIVITEC e+ and the drive solution from WEG in particular, we've developed a flip flow screening machine that transmits minimal mechanical loads to the environment and therefore saves up to 40 percent on weight compared with previous models. The new machine is also very energy saving and simple to operate and features preconfigured operating modes that easily adjust the machine to individual task specifications – which maximizes the benefits for our customers."*

CASES - MOTION DRIVES

SEGMENT – PUMP - FILTRATION

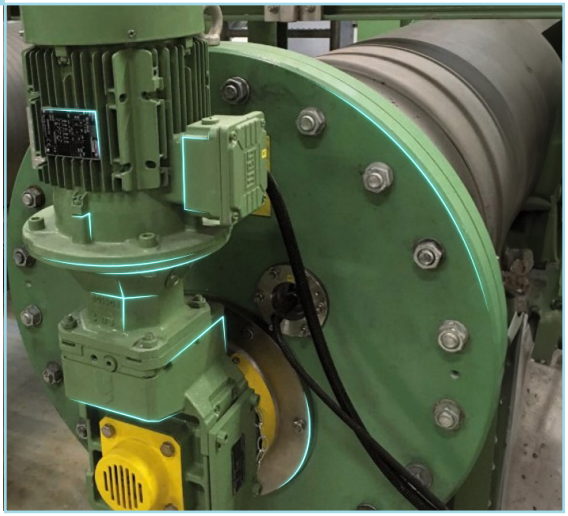
Customer:
Lenzing

Country:
Austria

Year:
2021

Type of product:
geared motors

Application:
Backflush filter



Less space required, lower costs and no leaks.

LenzingFiltration is a worldwide leader in offering filtration and separation technology. The Austrian company has a mechanical manufacturing facility, LenzingTechnik, which manufactures equipment for the filtration and separation technology of corporate customers as well as production critical machine and plant components for all Lenzing Group sites. The filtration and separation technology section specializes in the development and manufacturing of high-quality filtration equipment for solid-liquid separation. Originally founded for the purification of high viscosity spinning solutions for fiber production in the parent company, LenzingFiltration has been able to continuously develop and adapt its range of products over the past 40 years. The broad range of products ranges from disposable filter systems to patented automatic filtration systems. The company‘s focus is on automatic backflush filtration systems for the purification of low to high viscosity media, used in multiple industries. LenzingFiltration‘s filtration products can be used for liquids of different viscosities.

Optimization is the goal In all applications – including backflush filters – the space requirement is the determining criterion for the success of a product on the market, along with the costs. Lenzing Filtration‘s goal is the reduction of manufacturing costs of fully automatic Lenzing AKF/KKF/ViscoFil® backflush filter, optimizing the overall drive and improving handling. At the same time, they wanted to find a way to construct the backflush filter in total more compact and space saving.

Filtration and backflushing process of Lenzing AKF/KKF/ViscoFil® The Lenzing AKF/KKF/ViscoFil® is a fully automatic, continuous system that works on the principle of depth filtration. It is suitable for highest viscosities and the filtration of gel particles. Filter fineness’s of up to 3 µm can be used in this system. The filter material used is a metal fiber fleece, which retains particles of different sizes and shapes due to its depth effect. After a predetermined degree of soiling has been reached, a backwash process with a small amount of filtered medium begins, which clears up the filter material by flushing. During this process, filtration is maintained. The Lenzing AKF/ KKF/ViscoFil® is mainly used for media of spinning and casting solutions, such as viscose, polyacrylics, polyamide, cellulose acetate, spandex and aramid.

CASES - MOTION DRIVES

SEGMENT – PUMP - FILTRATION

Customer:
Lenzing

Country:
Austria

It is also used for media such as resins, lacquers, petrochemical products, hot-melt adhesives and gelatin. Initially, the unfiltered medium is transported into chamber P1 via the inlet with the aid of a feed pump (figure 4). The particles are separated as the medium flows from chamber P1 (unfiltered medium) into chamber P2 (filtered medium). Between these two chambers, the filter material is stretched on a perforated drum. The filtered medium flows out through the outlet to a P2 pressure regulating valve or P2 tank. The covering of the filter material with impurities causes a constantly increasing differential pressure (delta P) between chamber P1 and chamber P2. This increase is then evaluated by the control system.

After reaching a preselected differential pressure increase, a backwash is automatically triggered in which the filter material is cleaned (figure 5). This is done by moving the backwash piston from the cover to the bottom or in the opposite direction. The piston rings seal against the inner surface of the perforated drum (carrier of the filter material). Due to the differential pressure between chamber P2 (filtrate) and chamber P3 (reject), backwashing takes place with a minimum amount of own medium (filtrate). After cleaning the entire filter surface, the backwash device remains in waiting position until the preselected differential pressure increase is reached again.

Sophisticated drive solutions for high requirements

WEG supplied three sample drives from the MAS geared motor series for the Lenzing AKF/ KKF/ViscoFil® to test a new drive solution. The helical bevel gear motors (KFA 60A IAK ES2 3C 100L-04E TH TF) are each equipped with an ES2 safety release clutch, which is installed in the IEC adapter. The MAS gear motor has a torque of 107 Nm and an output of 2.2 kW at a supply voltage of 230/400 V at 50 Hz. The motor protection class corresponds to IP55/F, the shaft seal rings of the hollow shaft are made of nitrile rubber (HNBR) and equipped with a double dust lip. The MAS gearbox is connected to the IE3- EUSAS motor with an IEC adapter of size 100. The output speed is 185 rpm. The emergency drive is carried out via the stub shaft on the B side of the motor, which is designed as a hexagon. If something is wrong with the machinery, the fan cover of the motor can be removed very easily and without tools. The drive can then be turned manually with a hexagonal key.

Another advantage: Use of EUSAS motors As voltages and mains frequencies vary all over the world, the modular EUSAS system motors used represent a flexible drive solution. An EUSAS motor can be used in Europe, the USA or even in Asia. EUSAS motors have a wide voltage range and offer the option of voltage switching, which enables worry-free use at most voltages and mains frequencies. In addition to the requirements of the Energy Efficiency Directive for Europe, the motors also meet further requirements of other markets, such as the USA (Nema Efficiency) or China (China Energy Label). This simplifies processes such as ordering and logistics significantly, increases flexibility and in addition, reduces costs.

Everything from a single source – with worldwide certificates LenzingFiltration was convinced by the unsophisticated and quick offer of drive solutions, especially off-standard ones. WEG, one of the largest motor manufacturers in the world, offers a wide range of different gearbox designs and solutions for all aspects of the drive train. These include, for example, the extensive MAS modular gear motor system and motors with global certifications. Among them the China energy label already mentioned, as well as UL, Ex, CSA, EAC and others. This is very decisive for LenzingFiltration as worldwide operating company.

Safety release clutch prevents mechanical damages LenzingFiltration also needed a gear motor that integrated overload protection in the form of a torque clutch. Watt Drive implemented this requirement with an ES2 safety release clutch with a disengagement torque of 26 Nm and an adjustment range of 20 to 28 Nm. It serves as an effective torque monitor and prevents mechanical damage to the gear motor. This protective function is now very simply designed with the new WEG drive, as the safety release clutch sits directly between the gearbox and drive motor on the motor shaft. It is also a sustainable solution: In the event of an overload, the safety release clutch can be re-engaged manually and is immediately functional again.

CASES - MOTION DRIVES

SEGMENT – PUMP - FILTRATION

Customer:
Lenzing

Country:
Austria

Compact design saves space In the filter, the drive drives a threaded spindle, which in turn sets the backwash piston in motion. By implementing the WEG solution, the complete backwash filter is significantly shorter in the axial direction (figure 6). Previously, the drive protruded at least one meter further into the room, now it is mounted vertically. This new and compact design improves the space situation considerably. The use in backwash filters places very high demands on the resistance of the drive technology. The pressure in the filter generates considerable axial forces that need to be absorbed by the gearbox. For this purpose, the WEG specialists have designed a reinforcement plate. The bearing of the hollow shaft was also reinforced and withstands an axial pressure as well as a tensile load of a maximum 30 kN.

No more leakage The new drive solution also avoids leakage: Since the pressure in the filter is very high at roughly 10 bar, a stuffing box was previously used for the shaft. Due to its design, however, this always had a certain amount of leakage, which is now prevented with the new drive. Everything is installed closer to the cover, and the newly used lip seal ensures that the complete filter can now function leak-free.

Maximum satisfaction Johannes Kneissl, Technical Manager Filtration & Separation, sums up:

> *"WEG provided us with a one-stop drive solution that significantly reduced the overall cost of our design and allowed us to optimize our backwash filters in many ways. A smaller footprint, the overload protection with safety release clutch and the prevention of leakage are three examples. We were also able to make the design less complicated, reduce the number of components and significantly save on storage costs compared to the past. The line of different designs and approvals as well as their worldwide availability are additional important factors for us. LenzingFiltration is very satisfied with WEG as a supplier in all respects. Not only were the performance and results right, but the cooperation and reliability also proved to be excellent."*

WEGmotion
Drives

Driving efficiency and sustainability