



Project references

Project References – Energy, industrial and offshore structures



mageba



Project references

Introduction

mageba – your one-stop partner

The **Swiss company mageba** is one of the world's leading suppliers of **structural bearings, expansion joints** and other **high quality products and services** for the transport infrastructure and building construction sectors. In the last 10 years, mageba has also significantly expanded its range of products and services relating to **earthquake protection and structural monitoring**.

engineering connections® – since 1693

Whenever static and dynamic forces are transferred between structural elements, whenever forces interact with movements and rotations, whenever structural elements need to be protected against over-stress, whenever vibrations and noise need to be reduced: **mageba provides systems with its wide range of engineered products and services**.

Originating decades ago from the bridge industry, mageba has continuously extended its expertise in engineered connections to different types of structures. As a provider of high-quality structural support systems, mageba **supports owners, engineers, designers, architects and main contractors** from planning stage to project completion.

Infrastructure, Industrial structure and Building products



Structural bearings



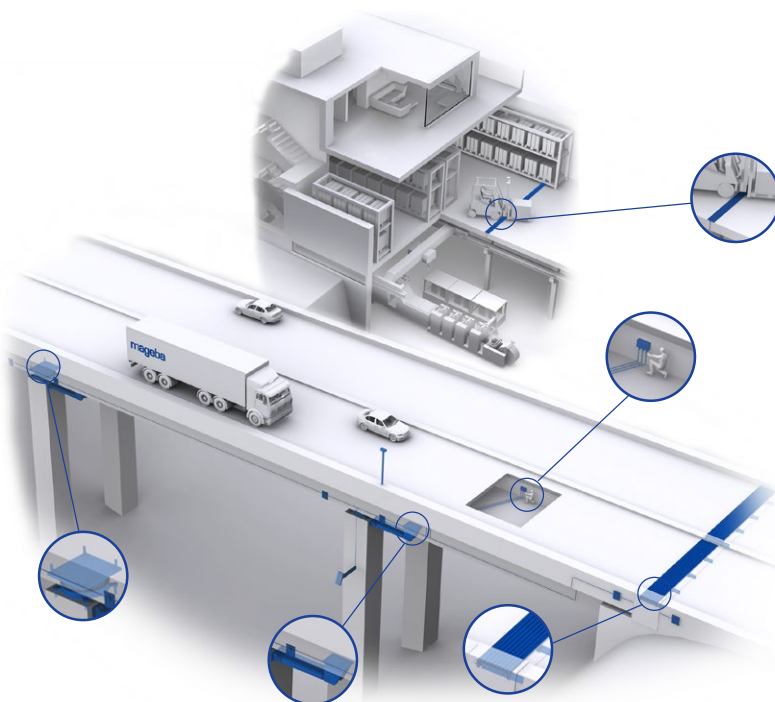
Expansion joints



Seismic devices



Structural monitoring



mageba's Systematic Quality Management and Technical Excellence:



The particular challenges presented by energy, industrial & offshore structures

Our world provides a variety of resources. Thanks to the great accomplishments of technologies for energy generation and raw materials production we can directly make use of the treasures and conditions provided to us. It is hence a crucial task to secure these facilities in accommodating movements and rotations and resisting forces.

Having supported a broad variety of **renowned and challenging projects worldwide** during the past five decades, mageba is your reliable partner in **ensuring your structure's safety and durability**.

The following is a **brief overview of selected projects**, highlighting some of their **specific structural design challenges and developed solutions**.

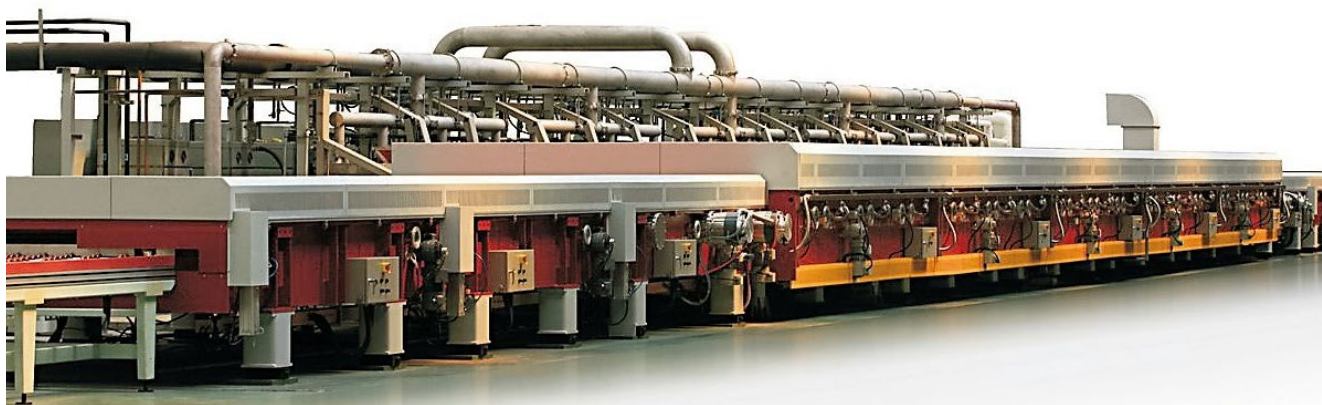


Index

Project	Country	Installed	Products delivered	Page
Glass Melting Plant	Costa Rica	2016	LASTO®LRB seismic isolators	4
JT4 Offshore Bridge	UAE	2015	LASTO®BLOCK elastomeric bearings	5
Petrobras FPSO units	Brazil	2014–2015	RESTON®POT HP, LASTO®BLOCK bearings	6
Malampaya Phase III	Philippines	2014	LASTO®BLOCK elastomeric bearings	7
Riga Hydropower Plant	Latvia	2014	TENSA®GRIP single gap expansion joints	8
Kusile Power Plant	South Africa	2013–2017	RESTON®SPHERICAL, RESTON®POT bearings	9
Hay Point Port	Australia	2013	Pre-drilled elastomeric strip bearings	10
Beznau Nuclear Power Plant	Switzerland	2013	LASTO®LRB lead rubber bearings	11
Medupi Power Plant	South Africa	2012–2016	RESTON®SPHERICAL, RESTON®POT bearings	12
Oil Refinery	Venezuela	2012	LASTO®LRB isolators	13
Estação de Carregamento	Brazil	2012	RESTON®SPHERICAL bearings	14
Constanta Wind Farm	Romania	2010	RESTON®SA shock absorbers, LASTO®BLOCK elastomeric bearings	15
Shougang Jingtang Steel Plant	China	2009	LASTO®BLOCK elastomeric bearings	16
Boddington Gold Mine	Australia	2008	RESTON®SPHERICAL bearings	17
Clinker Silo	Cyprus	2007	RESTON®SPHERICAL uplift bearings	18
Hazardous Waste Site Kolliken	Switzerland	2006	LASTO®FLONBLOCK LASTO®BLOCK bearings	19



Glass Melting Plant (Costa Rica)



Project description

The glass melting plant is located in Cartago, Costa Rica, and is one of the most significant glass melting furnaces in Central America.

Costa Rica is located in one of the most active areas in terms of earthquakes since it is surrounded by the boundaries of four tectonic plates.

In order to protect the melting furnace against earthquakes, its structure has been redesigned to consider the installation of seismic isolators at the base of the furnace. These devices will prevent seismic damage and hence avoid service interruption.

mageba scope

The solution chosen by the structural designer is based on the installation of 28 mageba LASTO®LRB (lead rubber bearing isolators) which support the furnace in order to isolate movements generated by earthquakes.

This project considers seismic isolators of 400 mm of diameter, with maximum displacement of 60 mm and vertical load capacity of up to 1,100 kN.

This bearing consists of internal layers of elastomeric material and vulcanized reinforcement steel plates, but features a lead core. The lead core deforms plastically under shear deformations while dissipating energy through heat.

Highlights & facts

mageba products:

Type: LASTO®LRB seismic isolators

Installation: 2016

Structure:

City: Cartago

Country: Costa Rica

Completed: 2016

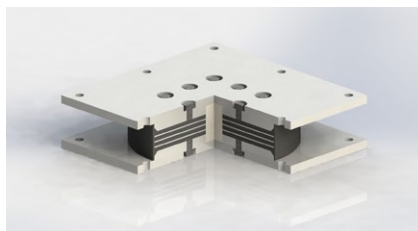
Owner: Vidriera Centroamericana S.A. (Vicesa)

Contractor: Hulera Costarricense Ltda

The glass melting plant is located in Cartago, the capital of Cartago province in Costa Rica



Illustration of one the isolators that will support the furnace



The lead rubber bearing isolator LASTO®LRB ready for installation



JT4 Offshore Bridge (UAE)



Project description

The Jebel Ali Terminal 4, phase 1, is located to the operational Terminal 2, in the vicinity of a LNG import terminal and the shipping fairway to Jebel Ali.

To connect the terminal with the mainland a causeway will be constructed with an approximate total length of 2,240 m. This causeway will be split in two, the northern and southern causeway, by a 440 m long bridge. This is to ensure water circulation through the existing port. The causeways will consist of two rock structures containing reclamation fill with an approximate width of 35 m. The 440 m dual carriageway bridge will be a concrete gravity structure founded on rock foundations. The gravity piers significantly reduce the interface with buried gas line from the LNG facility.

mageba scope

mageba supplied a total of 264 elastomeric bearings that act as elastic connection between the elements of this offshore bridge.

Type B, the laminated bearing, is fully covered with elastomer, comprising only one steel reinforcing plate and can be positioned between the elements without anchoring.

Production according to American Standard AASHTO LRFD Section 14 and in-house testing was performed by mageba's ISO-certified production facility in Kolkata, India.

Highlights & facts

mageba products:

Types:	LASTO®BLOCK type B elastomeric bearings
Features:	According to American Standard AASHTO LRFD Section 14
Testing:	In-house testing of finished bearings by mageba India
Installation:	By general contractor BAM International LCC
Year:	2015

Structure:

Location:	Dubai
Completed:	2015
Type:	Offshore bridge
Length:	440 m
Contractor:	BAM International

The bridge is located close to Dubai International Airport and connects the terminal with the mainland



The piers on site ready for installation. The bearings are the connection elements to the bridge



The elastomeric bearings LASTO®BLOCK have been produced and tested by mageba India





Petrobras FPSO units (Brazil)



Project description

A Floating Production Storage and Offloading (FPSO) unit is a floating vessel used by the offshore oil and gas industry for the processing of hydrocarbons and storage of oil.

An FPSO vessel was designed to receive hydrocarbons from the nearby platforms or subsea templates, process them, and store oil until it can be offloaded onto a tanker or less frequently, transported through a pipeline.

Petrobras, Brazil's semi-public multinational energy corporation, is the largest company in the Southern Hemisphere by market capitalization and a major user of FPSOs around the world.

mageba scope

6 Petrobras FPSO units, designated as P66, P67, P68, P69, P70 and P71, were fitted with new topside modules which required structural bearings to support and fix them in place while accommodating specified movements and rotations.

A large number of mageba structural bearings were used for this purpose, including 768 LASTO®BLOCK elastomeric bearings, with ROBO®SLIDE sliding material, 256 RESTON®POT HP pot bearings, some of them designed to resist uplift as well as downward forces, and 176 RESTON®SPHERICAL bearings, all of which were engineered to resist uplift forces.

RESTON®POT HP pot bearings were introduced as the new "High Performance" version of the well-proven RESTON®POT bearing.

Highlights & facts

mageba products:

Type:	RESTON®POT HP, LASTO®BLOCK and RESTON®SPHERICAL bearings
Features:	ROBO®SLIDE high-grade sliding material Special internal seals
Installation:	2014–2020
Structure:	
Country:	Brazil offshore industry
Completed:	2020
Type:	FPSO units
Contractor:	P66 & P69 Lindel PTE Ltd P68 & P71 Jurong Shipyard PTE LTD P67 & P70 COOEC
Owner:	Petrobras

Spherical bearings with clamps for non-frequent uplift forces



Illustration (exploded view) of a LASTO®BLOCK bearing with a sliding surface, installed vertically

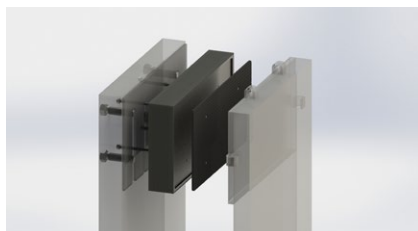
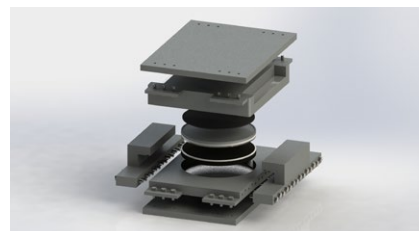


Illustration (exploded view) of a RESTON®POT HP bearing featuring uplift clamps



Malampaya Phase III (Philippines)



Project description

The Malampaya Phase III deep-water gas-to-power expansion project encompasses two stages. The first stage involves the drilling and development of two additional wells. In the second stage, a depletion compression platform is installed which will be linked by a bridge to the existing shallow-water platform. The Malampaya Phase III project aims to maintain a steady level of gas production.

The platform is located 80 km off the coast of Palawan Island and is the first concrete gravity substructure (CGS) in Southeast Asia. The Malampaya platform supplies natural gas to three power plants in Luzon with a combined capacity of 2700 megawatts.

mageba scope

mageba supplied LASTO®BLOCK elastomeric bearings for the depletion compression platform leg footings as well as a newly developed sliding bearing with LASTO®BLOCK as core and a PTFE plate recessed into a steel plate as sliding element.

The resulting bearings are able to withstand up to 7280 kN and a deflection of up to 15 mm in order to provide minimum friction for 100 meters of sliding during installation of the platform.

Another new design of LASTO®BLOCK was supplied for the bridge linking the depletion platform to the already existing gas processing platform on site.

Highlights & facts

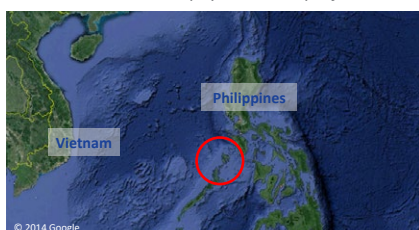
mageba products:

Type:	LASTO®BLOCK elastomeric bearings
Features:	Special sliding bearings
Installation:	2014

Structure:

Location:	Offshore Palawan
Country:	Philippines
Construction:	2013–2015
Type:	Offshore Platform
Contractor:	Fluor

Location of the Malampaya Phase III project



mageba LASTO®BLOCK elastomeric bearings with CE certification



Rendering of the Malampaysa Phase III project





Riga Hydropower Plant (Latvia)



Project description

The hydropower plant complex of Latvia's capital city Riga is one of the three hydropower plants (HPPs) on the river Daugava. The first stage of the Daugava hydropower plants cascade was built on the island Dole, 35 km from the Daugava mouth. The construction of Riga HPP was started in 1966 as an emergency substitution for the Ignalia nuclear power plant. The first hydroaggregate was put into operation in 1974, and in 1976 the hydropower plant was operated at full capacity.

A total of six generating units, two transformers and two 330 kV power lines provide a power generating capacity of 402 MW. Besides the production of energy, Riga HPP serves as a synchronous compensator for the state energy network.

mageba scope

mageba provided a total of 10 single gap expansion joints for the bridge over the spillway of the power plant. The given bridge is part of the first category state road A5 and constitutes an integral part of the Trans-Baltic Route which is again part of the North Sea-Baltic Core Network Corridor.

The joints feature elevated pedestrian paths with steel cover plates perpendicular to the carriageway.

TENSA®GRIP expansion joints of type RS-A are particularly used for asphalted structures with surfacing thicknesses between 50 and 300 mm. The edge profiles feature flanges for connection of deck waterproofing membrane.

Highlights & facts

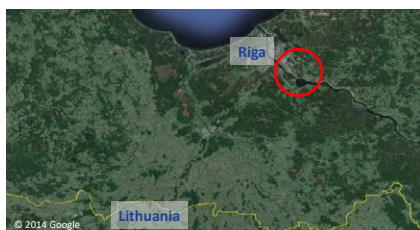
mageba products:

Product:	TENSA®GRIP single gap expansion joints
Type:	RS-A80/7
Features:	Elevated pedestrian paths
Installation:	2014

Structure:

City:	Riga
Country:	Latvia
Built:	1966
Type:	Bridge over hydropower plant spillway
Length:	300 m
Operator:	Latvenergo
Contractor:	JSC Latvijas Tilti

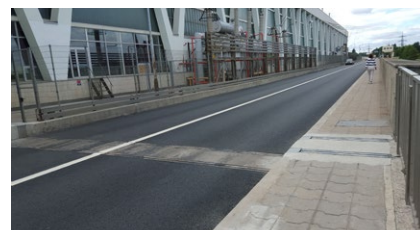
The Riga hydropower plant is located on the road A5/E67, approximately 50 km outside Riga



The refurbishment of the hydropower plant included new expansion joints with steel cover plates



A total of 10 joints with lengths from 10.9 m to 11.7 m has been supplied by mageba



Kusile Power Plant (South Africa)



Project description

Kusile is a coal-fired power station that is currently under construction in South Africa, close to the cities of Johannesburg and Pretoria.

When fully commissioned (expected in 2018), the station will consist of six units, each rated at approximately 800 MW, giving a total of 4800 MW – approximately 12.5% of South Africa's power generation capacity. As such, it will be one of the largest coal-fired power stations in the world.

The plant is being built by Hitachi Power Africa, using turbines provided by Alstom, whose turbines generate 80% of South Africa's electricity.

mageba scope

To support coal conveyors in each of the power plant's six units, mageba supplied 48 RESTON®SPHERICAL bearings (for primary conveyors) and 4 RESTON®POT bearings (for inclined conveyors).

These were designed for loads of up to 8500 kN. While some of the bearings are of the fixed type, resisting movements in all directions, most can accommodate longitudinal sliding movements of up to +/- 220 mm – some as free sliding and others as guided sliding bearings.

Sliding is facilitated by PTFE in the case of the pot bearings, and ROBO®SLIDE high-grade sliding material in the case of the spherical bearings.

Highlights & facts

mageba products:

Type:	RESTON®SPHERICAL and RESTON®POT bearings
Features:	ROBO®SLIDE high-grade sliding material
Installation:	2013–2017

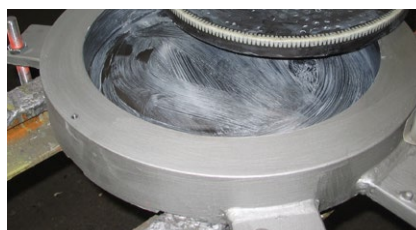
Structure:

Country:	South Africa
Type:	Power plant
In service:	2014
Capacity:	4800 MW
Contractor:	Hitachi Power Africa
Owner:	Eskom

The plant is located close to South Africa's capital, Pretoria, and biggest city, Johannesburg



Assembly of a RESTON®POT bearing, showing its elastomeric pad during placing into its steel pot



Assembly of a RESTON®SPHERICAL bearing, showing its two ROBO®SLIDE sliding surfaces





Hay Point Port (Australia)



Project description

The Port of Hay Point in north-eastern Australia is one of the largest coal export ports in the world, serving the state of Queensland's strong coal mining industry.

It comprises two terminals, each of which has purpose-built rail in-loading facilities, onshore stockpile yards and offshore wharfs.

The offshore wharfs are serviced by conveyor systems, supported on jetties, which run out to sea and allow loading in deep water.

To enable the port to cater for growing demand, it had to be expanded with the addition of new wharfs and associated infrastructure.

mageba scope

To provide bearing support for the new wharfs and a number of other critical structures during the port's expansion project, mageba supplied a large number of elastomeric strip bearings.

These pre-drilled bearings, typically with a thickness of 25 mm and of elastomer of type 60 H in accordance with AS5100.4 Appendix B, had a total length of over 1.25 km.

By absorbing vibrations, the use of these bearings enables the supported heavy-duty structures to withstand the impacts and demanding loading conditions arising in this industrial facility.

Highlights & facts

mageba products:

Type:	Pre-drilled elastomeric strip bearings
Quantity:	1.25 km in length
Installation:	2013

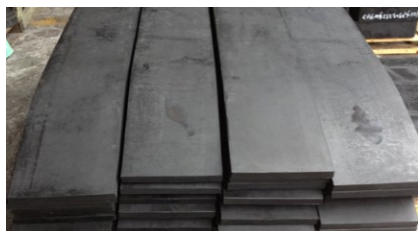
Structure:

City:	Hay Point
Country:	Australia
Built:	1971
Expansion:	2013
Type:	New wharfs and associated structures
Contractor:	MDGS JV

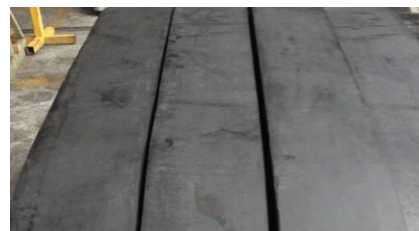
Hay Point Port is located in northeast Australia, on Queensland's east coast



Elastomeric bearing strips of thickness 25 mm, prior to drilling of 50 mm-diameter fixation holes



Construction of an offshore wharf, using mageba elastomeric strip bearings



Beznau nuclear power plant (Switzerland)



Project description

The Beznau nuclear power plant is a facility of the Swiss energy supplier Axpo. It is located in northern Switzerland, on an artificial island in the Aare river. Producing energy since 1969, it can claim to be the world's oldest operating nuclear power plant based on service life to date.

In the aftermath of the Fukushima accident, additional safety measures were implemented in order to minimise the effects of natural phenomena such as floods and earthquakes. These included the installation of a new diesel powered generator, at an elevated position, which will supply the power needed to turn off the nuclear reactor, if required, in case of loss of normal power. To ensure its ability to survive an earthquake, it was decided to structurally isolate the generator from seismic ground movements by supporting it on seismic isolator bearings.

mageba scope

mageba supplied four LASTO®LRB lead rubber bearings to support the new emergency power generator, isolating it from violent seismic ground movements. These were designed for vertical loads of 320 kN and design displacements of 80 mm.

All of the seismic isolators were subjected to laboratory testing according to EN 15129, in Italy, before delivery to site. This included compression stiffness tests, and tests to determine horizontal characteristics under cyclic deformation.

Following successful completion of testing, the isolators were installed at the plant in 2013.

Highlights & Facts

mageba products:

Type: LASTO®LRB lead rubber bearings
Testing: Italy
Installation: 2013

Structure:

City: Döttingen
Country: Switzerland
Type: Emergency Power Generator
Completed: 1969
Owner: Axpo Holding
Engineer: Studio Sciarini SA

The power plant is located in northern Switzerland



Testing of a LASTO®LRB lead rubber bearing prior to installation



Installation of the LASTO®LRB lead rubber bearings on site at the power plant





Medupi Power Plant (South Africa)



Project description

Medupi is a coal-fired power plant in northern South Africa. When completed in approximately 2018, it will have six boilers, each powering an 800 MW turbine. In total, it will thus produce 4800 MW of power, making it the fourth largest coal plant in the southern hemisphere and the biggest dry-cooled power station in the world. The planned operational life of the station is 50 years.

The primary construction contractor is Hitachi Power Africa, with Alstom providing the steam turbines.

mageba scope

In total, mageba supplied 52 structural bearings to support parts of each of the power plant's six units. These comprised 4 RESTON®POT bearings and 48 RESTON®SPHERICAL bearings, designed to carry vertical loads of up to 8100 kN and to accommodate sliding movements of up to 440 mm.

The RESTON®SPHERICAL bearings were fabricated using ROBO®SLIDE high-grade sliding material as an alternative to PTFE.

As well as being far more durable than PTFE, ROBO®SLIDE is also much stronger, greatly increasing the load-bearing capacity of spherical bearings in particular since these otherwise consist almost entirely of steel.

Highlights & facts

mageba products:

Type:	RESTON®SPHERICAL and RESTON®POT bearings
Features:	ROBO®SLIDE high-grade sliding material
Installation:	2012–2016

Structure:

Country:	South Africa
Type:	Power plant
In service:	2014
Capacity:	4800 MW
Contractor:	Hitachi Power Africa
Owner:	Eskom

The plant is located in northern South Africa, near the country's border with Botswana.



Illustration (exploded view) of a RESTON®POT bearing of the guided sliding type.



Assembly of a typical RESTON®SPHERICAL bearing, showing greased ROBO®SLIDE disc.



Oil refinery seismic isolation (Venezuela)



Project description

In the process of making an oil refinery in a seismically active part of Venezuela safe from the destructive effects of earthquakes, heat exchange tanks were seismically isolated from ground movements in 2012. The ongoing operation of such refineries is of great importance to the Venezuelan economy, with revenue from petroleum exports accounting for over 50 % of the country's GDP and roughly 95 % of total exports. Venezuela has the world's largest proven oil reserves (20 % of global reserves), and is one of the top four suppliers of foreign oil to the United States.

mageba scope

mageba supplied six LASTO®LRB lead rubber bearings with a diameter of 220 mm and height of 165 mm including 20 mm steel connection plates. Each bearing is designed for a vertical service load of 780 kN and to allow seismic displacements of up to 100 mm. The lead core at the bearing's vertical axis has a diameter of 44 mm and provides dissipation of seismic energy, while the natural rubber (NR) elastomer around it provides the desired re-centering after the earthquake. To ensure proper installation and functioning, mageba also supervised the installation.

Highlights & facts

mageba products:

Type: LASTO®LRB isolators
Installation: 2012
Supervision: Installation supervised by mageba

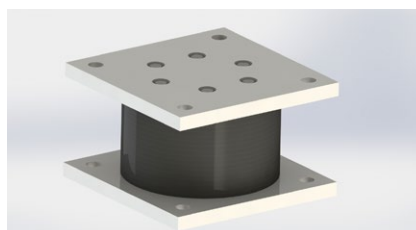
Structure:

Location: Falcón State
Country: Venezuela
Type: Oil refinery
Client: PDVSA

The refinery is located in Falcón State, one of Venezuela's 23 states, in northern Venezuela



A LASTO®LRB lead rubber bearing of the type supplied – with 220 mm diameter



The LASTO®LRBs protect heat exchange tanks from ground vibrations during earthquakes





Rail car loading station, Pará (Brazil)



Project description

Transport of freight by rail accounts for a large proportion of the total transport of goods around the world, especially in relation to dry bulk commodities such as coal, ore and grain. Within the U.S., for example, railroads carry 39.9 % of freight by ton-mile, followed by trucks (33.4 %), oil pipelines (14.3 %), barges (12 %) and air (0.3 %). Hopper cars, which are loaded from above and emptied through the bottom, are widely used to transport dry bulk commodities. This project involved the construction of a hopper car loading facility for iron ore in a mining area of northern Brazil.

mageba scope

The hopper car loading facility, which allows trains to be parked beneath it for loading from overhead silos, is supported by 22 RESTON®SPHERICAL bearings. These are designed for vertical loads of up to 7950 kN. Some of the bearings also resist horizontal forces, while others accommodate longitudinal and/or transverse sliding movements. The long-term sliding performance of the bearings in this demanding industrial location, where impacts and dust can be expected at all times, is ensured by the use of mageba's ROBO®SLIDE high-grade sliding material instead of the typically used PTFE.

Highlights & facts

mageba products:

Type:	RESTON®SPHERICAL bearings
Features:	ROBO®SLIDE high-grade sliding material
Installation:	2013

Structure:

City:	Canaã dos Carajás
Country:	Brazil
Completed:	2013
Type:	Rail car loading station
Client:	Polysius do Brasil

The facility is located in Canaã dos Carajás city, in the southwest of Pará State, Brazil



Exploded view of a RESTON®SPHERICAL bearing (guided sliding type), showing calotte in middle



Assembly of a RESTON®SPHERICAL bearing, with calotte being placed on concave lower part



Constanta Wind Farm (Romania)



Project description

The Fantanele-Cogealac Wind Farm in Constanta County, eastern Romania was constructed between 2008 and 2012, becoming the largest onshore wind farm in Europe.

With 240 wind turbines on a site of area 110 km², it has a total power generating capacity of 600 MW.

The spinning rotor of each turbine has a diameter of 99 metres, and is connected to the supporting hub at a height of 100 m above ground level.

mageba scope

In 2010, mageba supplied four vibration damping systems to control the movements of parts of a key transformer on the wind farm.

Each system comprises a RESTON®SA shock absorber and a LASTO®BLOCK elastomeric bearing.

The shock absorbers were designed for a force of 15 kN and a stroke of +/- 50 mm, and were fabricated from stainless steel to maximise durability.

Two of the shock absorbers were subjected to laboratory testing before delivery to site.

Highlights & facts

mageba products:

Type:	RESTON®SA shock absorbers, LASTO®BLOCK elastomeric bearings
Features:	Shock absorbers and bearings combined to form composite units
Installation:	2010
Structure:	
City:	Constanta
Country:	Romania
Type:	Wind farm transformer
Completed:	2011
Client:	Areva Energietechnik GmbH
Owner:	CEZ Romania

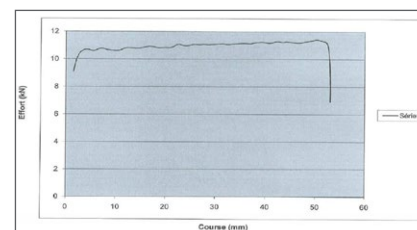
Constanta is located in eastern Romania, on the west side of the Black Sea



A RESTON®SA shock absorber, fabricated from stainless steel, following laboratory testing



Performance as tested at 65 mm/minute (Effort [kN, Y-axis] versus Movement [mm, X-axis])





Shougang Jingtang Steel Plant (China)



Project description

The Shougang Jingtang Iron & Steel Co. Ltd. is located in Tangshan City of the Hebei Province in China. The Central Committee and State Council (CPC) concluded on a strategic concept of development in which this steel plant had also been included.

The construction project started in 2007 and was fully completed in June 2010. The concept of this plant comprised crucial features such as adjacent location to the sea, closeness to the port, a reasonable layout, large scale equipment as well as domestic and international evaluation – all factors led to the creation of an advanced iron and steel enterprise.

mageba scope

mageba received an order 22 LASTO®BLOCK deformation bearings that act as an elastic connection between the factory's structural elements. They transmit vertical and horizontal forces, without constraints, from the superstructure to the substructure, and permit movements in all directions and rotations about every axis.

The type CR-B features an external chequer plate on the surface that enables installation directly onto a mortar bed. They have been chosen to support the travelling crane of the plant hence accommodating large movements, typical for the heavy industry.

Highlights & facts

mageba products:

Type:	LASTO®BLOCK deformation bearings of type C-RB
Features:	According to EN1337
Installation:	2009

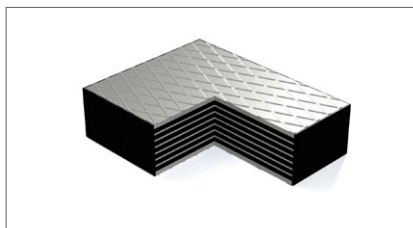
Structure:

City:	Tangshan City
Country:	China
Type:	Steel Factory
Construction:	2007–2010
Owner:	Shougang Jingtang United Iron & Steel Co., Ltd.

The steel plant is located in Tangshan in the north-eastern Hebei province of China



Built-up of a deformation bearing of type C-RB



Example of a LASTO®BLOCK deformation bearing with chequer plate



Boddington Gold Mine (Australia)



Project description

Boddington is one of Australia's largest producing gold mines and located within the Saddleback Greenstone Belt (SGB), an Archaean structure in the southwestern Yilgarn Craton.

The exploration strategy was to identify the resource potential of the remainder of the greenstone belt, with the emphasis on high-grade lode-type deposits.

The mine produces gold and copper concentrate, and began its commercial production in 2009. As of December 2015, the annual gold production had reached 794,000 ounces and the annual copper production had peaked to 79 million pounds.

It is operated by Newmont Mining Corporation, founded in 1921 and one of the world's leading gold producers.

mageba scope

mageba received the order for the supply of a total of 10 RESTON®SPHERICAL bearings of type KE-1. This bearing type allows sliding movements along one horizontal axis, and resists forces in the perpendicular direction.

All bearings are equipped with ROBO®SLIDE, a high-grade sliding material that allows very high contact pressure and has an excellent abrasion resistance which enhances the durability of the overall bearing tremendously.

The bearings are used to ensure the controlled transfer of the forces in the mine's pipe racks. These pipe racks transport the extractions gained from the exploration works in the mine and thus require proper facilitation of cumulative sliding movements.

Highlights & facts

mageba products:

Type:	RESTON®SPHERICAL bearings
Features:	Type KE-1 with ROBO®SLIDE
Installation:	2008

Structure:

City:	Boddington
Country:	Australia
Type:	Surface gold mine
Built:	1987, Expansion in 2009
Owner:	Newmont Mining Corporation
Engineer:	Granor Rubber & Engineering

The Boddington Gold Mine is located about 130 km south-east of Perth in Western Australia



Illustration of a RESTON®SPHERICAL bearing of type KE showing its main components



The finished bearings ready for dispatch





Clinker Silo – Vasilico Cement (Cyprus)



Project description

A clinker silo is a special silo type that features the following application description:

After the raw meal is burned, the emerging clinker of varying consistency is stored for further processing. In addition to the intense dust generation, the sometimes very high product temperatures and the strong abrasion place heavy demands on the measurement technology. Depending on the production capacity of a cement plant, the clinker silos can be of considerable size, often reaching a height of over 50 m.

The clinker silo at the Vasilico Cement Factory features concrete piles, a prestressed concrete wall, a steel roof with cellular beams resting on spherical bearings.

mageba scope

mageba received an order of 34 RESTON®SPHERICAL bearings to ensure the controlled transfer of the forces between the silo's superstructure and substructure.

Since these bearings are exposed to uplift loads, they are equipped with special clamps that ensure the integrity of the bearing.

Thanks to the use of ROBO®SLIDE high-grade sliding material instead of PTFE, the bearings are as small and compact as possible. ROBO®SLIDE is made up of a patented modified ultrahigh molecular weight polyethylene and offers increased wear-resistance and load capacity. It is thus particularly suitable for use in sliding bearings for bridges and buildings.

Highlights & facts

mageba products:

Type:	RESTON®SPHERICAL uplift bearings
Features:	Vmax = 450 kn Vmin = -150 kn Equipped with ROBO®SLIDE
Installation:	2007

Structure:

City:	Mari
Country:	Cyprus
Type:	Clinker Silo
Construction:	2007–2008
Owner:	Vasilico Cement Works
Contractor:	Medon Construction Ltd.

The silo is located in Mari, a village located in the Greek Cypriot area controlled by the Cypriot Government



The roof panels with bearings attached, in transit to the silo's roof



The 34 spherical bearings made in Switzerland and ready for dispatch



Hazardous Waste Site (Switzerland)



Project description

The Sondermülldeponie Kolliken Consortium was founded in the mid-1970s to create and operate a hazardous waste site. In total between 1978 and 1985, 300,000 m² or 475,000 tonnes of hazardous waste from a wide range of origins and compositions were deposited at the waste site.

In 1985, the waste site was closed and has been undergoing renovations since then. To complete the demolition, three airtight halls with an internal negative pressure (warehouse, manipulation hall and demolition hall) together with a rail connection had to be built. The complete demolition of the waste site is planned for 2017 with a deadline for the end of the monitoring phase in 2022.

mageba scope

mageba was commissioned to supply 164 bearings for this project, which were to reliably support the hall roof suspended on 28 arched girders.

The high-quality LASTO®FLONBLOCK tilting and sliding point bearings ensure a smooth load transmission into the load carrying structure; the LASTO®BLOCK distortion bearing acts as flexible, load-transmitting elements between the parts of the building sites to be connected free to move. Equipped with a sliding surface, which had to be fitted to the bottom for static reasons, they are especially suitable for the temporary support when moving large loads and for the incremental launching method. In addition, some bearings had to be designed with lift locks (Nd -420 kN).

Highlights & Facts

mageba products:

Typ: LASTO®FLONBLOCK, type KGa2360-Uplift as well as type KGe-1800 with fixing construction

LASTO®BLOCK type Nba-2360

Installed: 2006

Structure:

City: Kolliken

Country: Switzerland

Built: 2006

Type: Hazardous Waste Site

Owner: SMDK
Sondermülldeponie
Kolliken

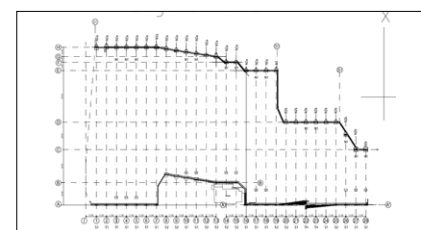
The hazardous waste site is located in canton Aargau, Switzerland's midland region



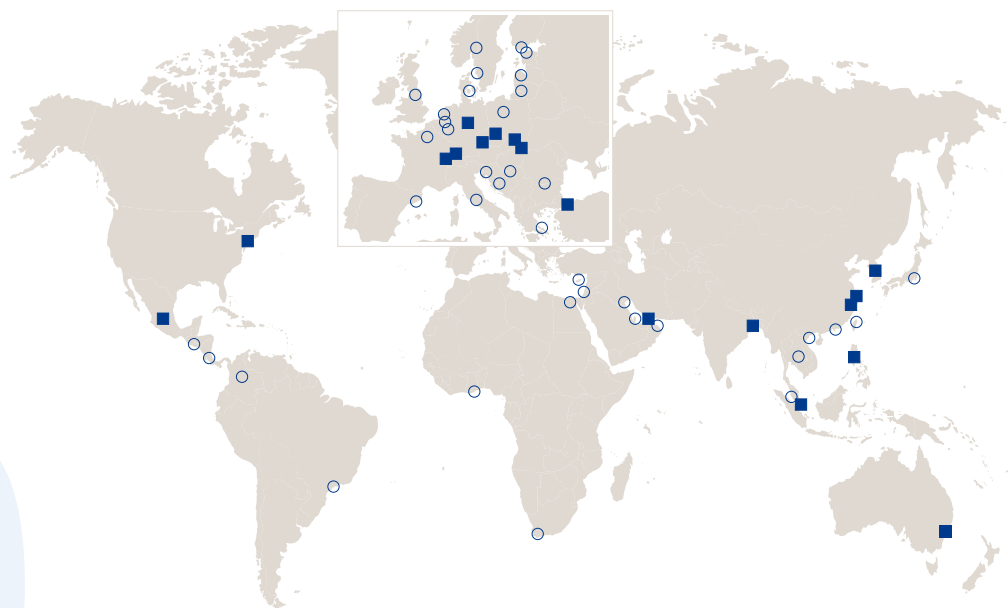
The bearing as a connecting element between the roof construction and concrete



The bearing location scheme, developed by mageba's headquarters in Bulach, Switzerland



engineering connections® – since 1963



■ Locations
○ Representatives

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